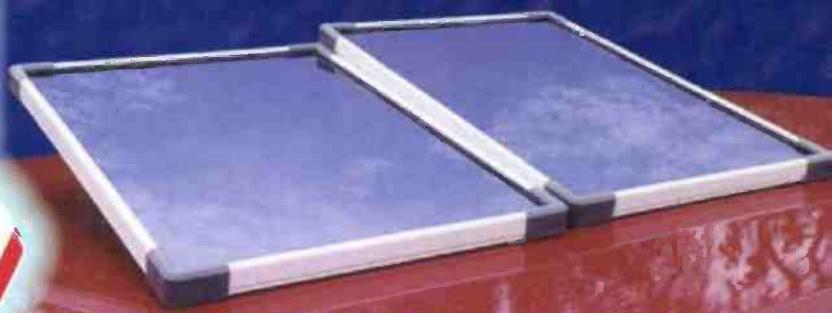


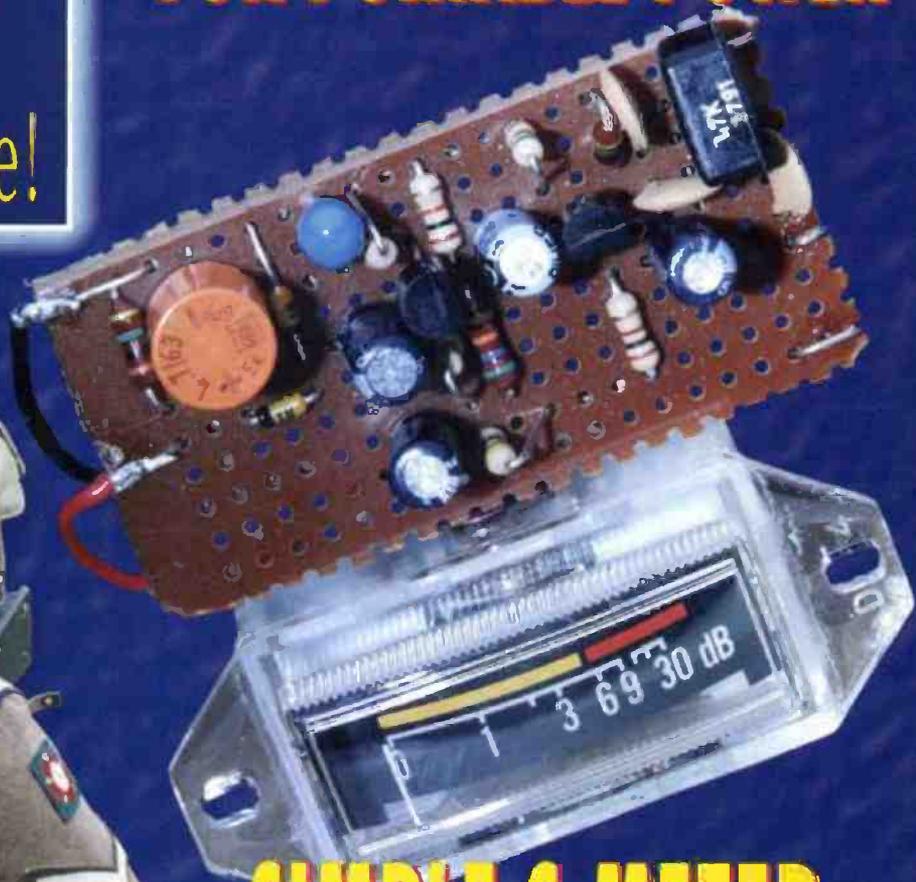
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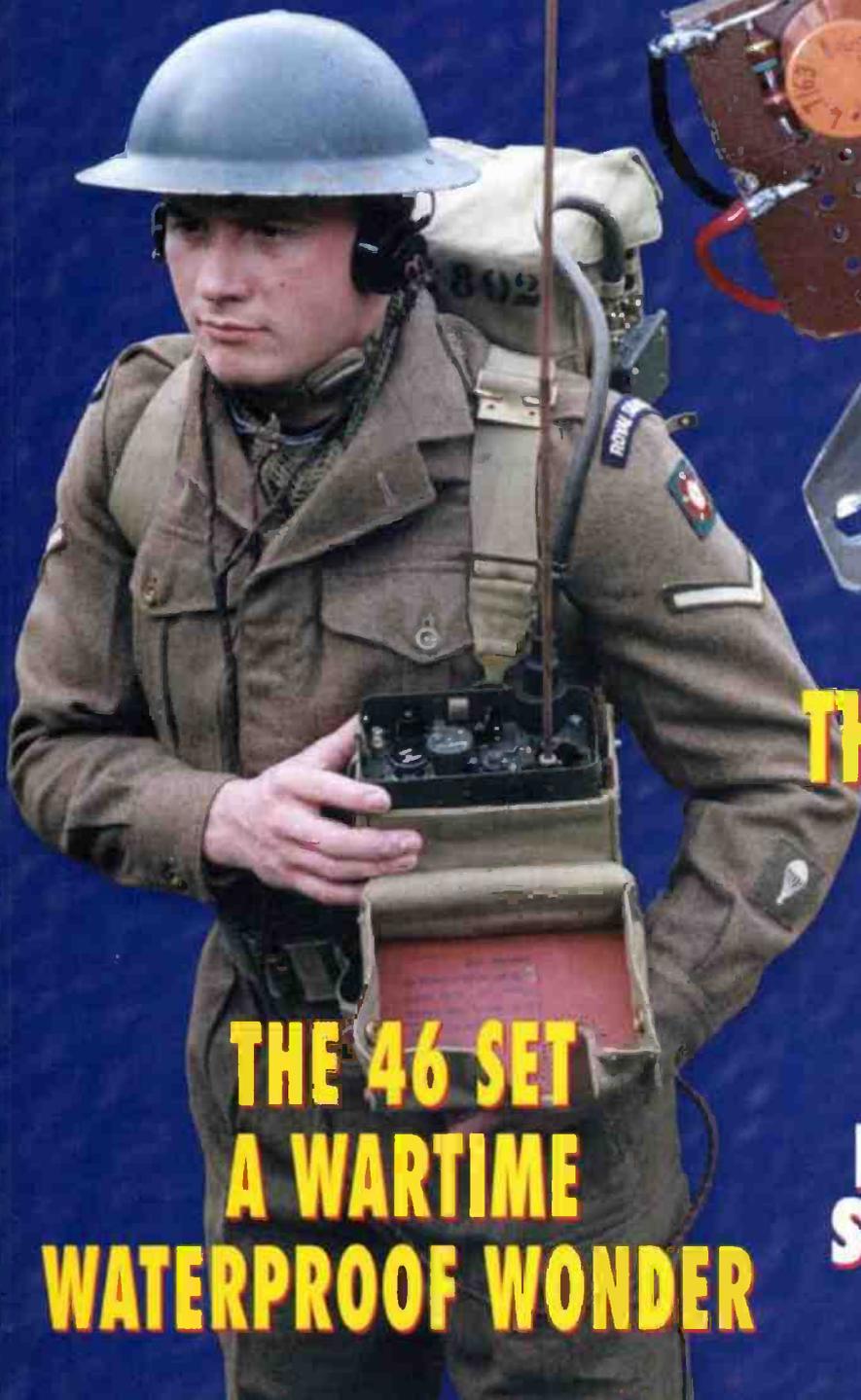
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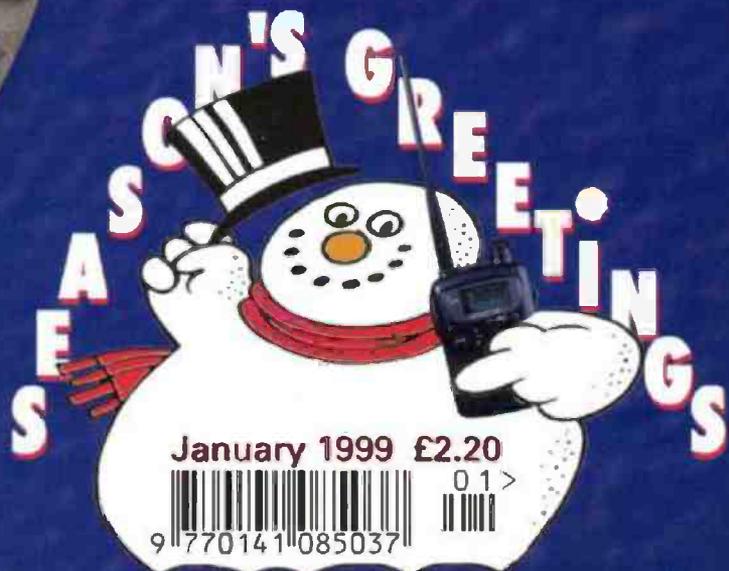
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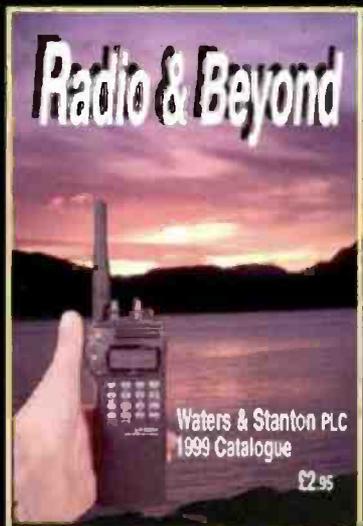
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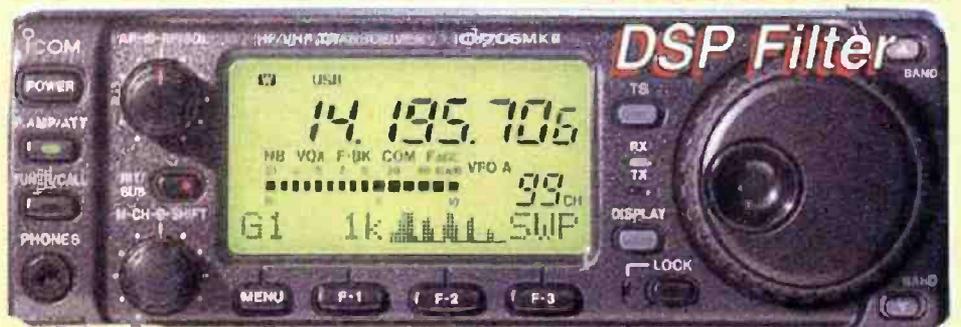
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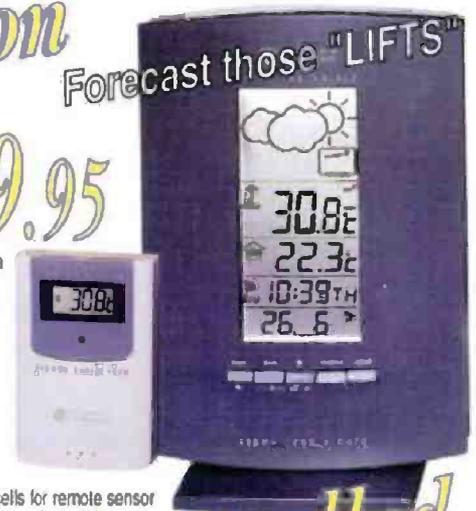
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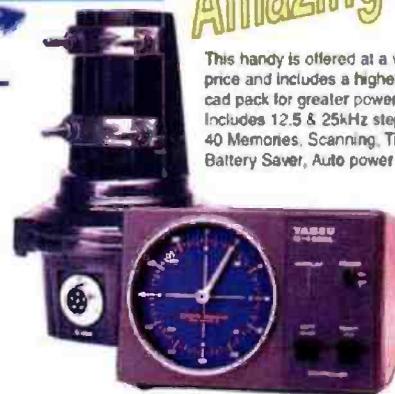
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The second part of the 'Tinny Dipper' project in Radio Basics will appear in next month's Practical Wireless. Please see 'Keylines' for further information.



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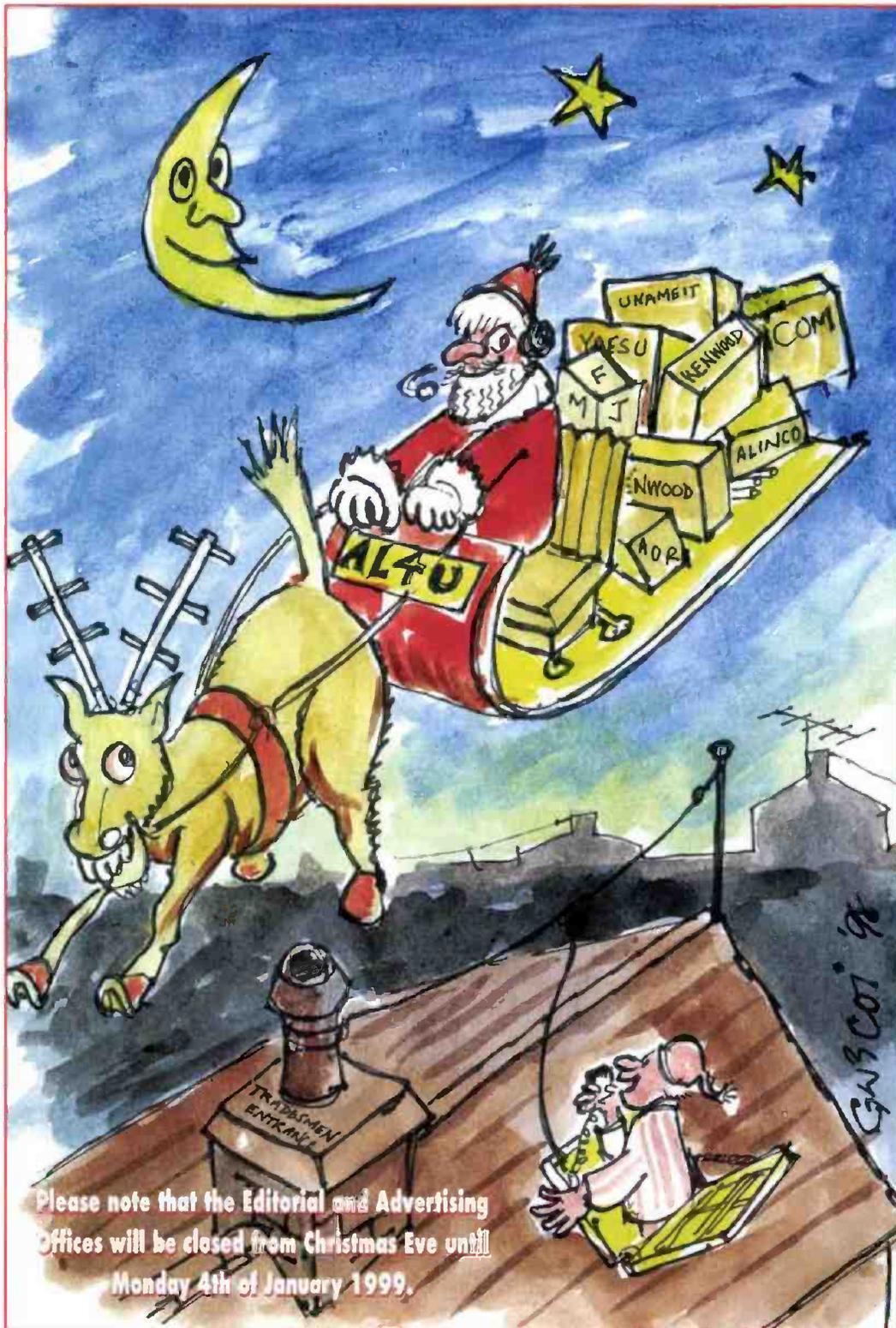


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The Directors and Staff of PW Publishing Ltd. wish all our Readers and Advertisers a Very Merry Christmas and a Prosperous New Year



Please note that the Editorial and Advertising Offices will be closed from Christmas Eve until Monday 4th of January 1999.

Keylines

Occasionally, I have to take the decision to 'hold over' publication of articles in PW and I must assure readers that such decisions are often very difficult. It's especially difficult when it's my own work that's involved and, in this case, it's the second part of the 'Radio Basics' continuing 'Tinny Dipper' project.

The reason why the project has been 'held over' is that for most of the production schedule of this issue I have been unwell following a minor operation which temporarily destabilised my diabetic condition. Fortunately though - I'm back at work and thanks to the Editorial team we're 'back on course' and I plan to finish the project soon.

In the meantime, because of the correspondence and interest shown in the 'Radio Basics' series, I've taken the opportunity to publish a 'Radio Basics Up-date' page to help answer all the queries that have come my way. I hope you find it helpful!

Finally, I'd like to thank everyone from PW Publishing who helped look after me when I was so much 'under the weather'. So, 'thank you' Alan, Margaret and husband Chris, Steve & Sandie and their friend 'Ed' and Shelagh. What a marvellous 'care team' they made!

Tipperary Tribute

I had only just arrived back in the office when a tribute arrived from Tipperary in Ireland - which really helped me cheer up! The letter - from Liam O'Brien EI7FE - was sent on behalf of the **Tipperary Amateur Radio Group** to tell me that at their Annual General

Meeting earlier in the month, they'd voted to extend honorary membership to me. No tonic could have worked better I can tell you!

Liam EI7FE (centre of photograph wearing the checked shirt) told me in the letter that they knew I'd had some health problems this year and they wished me well. Additionally, the invitation was extended because of "appreciation of your visits to us, the kind words about us and the very kind words about Irish Amateur Radio published in *Practical Wireless*".

Of course, I was deeply moved



The photograph taken at the Annual General Meeting of the Tipperary Amateur Radio Group in November 1998. Standing (left to right) Seamus EI8EPB, Paul EI5ENB, Hazel EI9ELB, Tony EI3GW, John (s.w.I.), John EI3DIP, Hugh EI2NI, Tommy EI2IT, Jim EI8W. Seated (left to right) Pat EIFXB, Liam EI7FE and invited guest, Nevin EI7IH, Editor of the Irish National Society's IATS Newsletter.

and the act of kindness and generosity reflects the deep affection held between Radio Amateurs within the separate nations here in the 'British Isles'. Our hobby knows no frontiers ... and I always feel very welcome wherever I go to visit clubs and radio friends. However, next time I visit Clonmel (where they meet) in Ireland I shall feel even closer to home than usual Amateur Radio ... what a wonderful hobby and what a privilege I have in writing about it!

Club Visits

My 'Club Visits' schedule was rounded off this year by an interesting trip to the **Mid Sussex**

ARS (MSARS) in Burgess Hill, West Sussex, **The Oulder Hill Club** in Rochdale and the **South Dorset Club** in Weymouth.

Along with a wonderful welcome, a magnificent club room and shack at the MSARS I had the very great privilege of having **Louis Varney G5RV** in the audience. Following the visit, the MSARS donated £50 to the Radio Amateur Invalid and Blind Club (RAIBC). Thank you!

Incidentally, the Mid Sussex Club's headquarters, shack, membership and their general approach struck me as being very similar to the Warrington Club in Cheshire. So, I've suggested a 'twinning' arrangement which I hope they'll take up - perhaps more clubs would like to consider this idea?

During my annual trip to the Rochdale QRP Convention in October I was made very welcome by the Oulder Hill ARS. This active group are based in the large Oulder Hill School Leisure Community complex in Rochdale itself. It was good to see many old friends

there and they kindly donated £42 for the RAIBC. Thank you folks!

Unusually, for my last club visit of the year I didn't have to travel very far! No overnight stay was needed for the short trip to Weymouth for the visit to the South Dorset ARS. What a welcome! - they enjoyed the PW 'talk' (and I enjoyed their reaction!) and they certainly 'pulled out all the stops' and for a relatively small club the welcome extended to me was outstanding (thanks for the food everyone ... lovely grub).

I came away from Weymouth with a donation of £20 for the RAIBC (thanks everyone) with the feeling that the future of Amateur Radio in south Dorset is assured. They've got a good number of Novices, a keen membership and are looking to the future in a positive way.

So, with that I wish you all a Happy Christmas and on behalf of everyone on the PW team hope you have a prosperous New Year. However, judging by our cartoon Christmas card on the previous page (prepared especially by **John Worthington GW3COI**) there's lots of 'goodies' coming your way (especially in PW!).

May God bless and keep you all - wherever you are.

Rob Mannion G3XFD

news

COMPILED BY JO WILLIAMS

HEADLINE NEWS

RSGB's ROVING RALLY

After 38 years of rallies at Woburn Park, the **RSGB** will be moving its National Mobile Rally to **Hatfield House**, Hertfordshire on the **1 August 1999**.

Yes, the home of Lord Salisbury will be the home of the **RSGB** next year and the new table of events reflects this mood for change. Along with all the old favourites, there will be a large car boot sale and flea market, an antenna park with expert advice at hand, a direction finding hunt, craft stalls and children's entertainment!

For further details, you can get in contact with Marcia Brimson 2E1DAY on (01707) 659015.



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Maplin Electronics has negotiated a deal to stock the market leading robotic invention system - **LEGO 'Mindstorms'**! Designed to develop problem solving skills in the area of robotics.

Targeted at the 12+ age group, Maplin say that 'Mindstorms' comes in a 700 piece set including two motors, light and touch sensors and much more - mechanisms, gears and wheels, etc. Maplin also tell us that a CDROM is included in the package which can download the appropriate software in order to programme your invention!

Strangely enough though, this hi-tech toy doesn't come with a construction booklet! Quite a challenge from what Maplin say. Also in the pipeline, Maplin tell us, is a plan to release two additional expansion sets: 'Robosports' and 'Extreme Creatures'. So, keep your eyes peeled for these. **For more information on the products or store locations, Maplin say that you can call their customer services department on Tel: (01702) 554002 or visit their Web site on <http://www.maplin.co.uk>**



LICENCE TO BECOME UNLICENSED!

The **Radiocommunications Agency (RA)** have announced that they will be shortly authorising a new hand portable mobile radio service for business, on a licence exempt basis!

According to the RA, **Private Mobile Radio (PMR) 446** radio equipment is a short range voice communication system which will replace **Short Range Business Radio (SRBR)** speech service which is not licence exempt. The service will provide a basic but effective radio system for both business and non-business users and will be ideal for communication over short distances, i.e. within office buildings, factories and building sites.

However, the RA state quite clearly that it will not be suitable for safety of life use or for users who need to have access to frequencies at particular locations and times and only speech transmissions can be made. The RA say that they will stop issuing SRBR licences but existing SRBR licences will be extended until 31 December 2001 to enable SRBR users to transfer to the new PMR 446 service. After this time, no use

BARRY ARC & THE BBC LIGHTEN UP THE NEW YEAR!

From the **17 December 1998**, the Barry ARC (BARS) will be involved in a very special event which will not only celebrate the beginnings of radio, but will hopefully



Glyn Jones GWOANA (left) with XYL, Margaret (far right). Richard GW4BVJ (back right) + Brian Brown GW0PUP with his XYL, Pat.

of SRBR equipment or SRBR speech frequencies will be permitted.

MARKING TIME WITH THE NEW ICOM IC-706MKIIG

Icom have just announced the release of a new edition to their range of compact multi-band, multi-mode transceivers - the **IC-706MKIIG**! This h.f./v.h.f./u.h.f mobile transceiver, according to Icom, incorporates an expanded frequency range which now includes 470MHz and provides access to the 70cm (430MHz) band in addition to h.f., 6m (50MHz) and 2m (144MHz) bands.

Icom state that a new addition of power MOS-FETS in all the power amplifier (p.a.) sections results in a considerable increase in the level of output power: the 144MHz band has been increased to 50W with 20W on 430MHz and 100W for the h.f. and 50MHz bands. With a compact body and carrying handle, Icom say that the IC-706MKIIG is very well designed. Its individual band change key and sub-dial facilitates mobile and memory operation.

Icom have also sent us word of their latest receiver to hit the Amateur Radio market. According to Icom, the **IC-R2** has a wide frequency coverage of 0.495-1309.995MHz which is divided into nine frequency bands and is capable of reception in f.m./w.f.m./n.b.f.m. and a.m. modes. It also has 400 memory channels separated into eight banks for easy memory channel management.

Dale Blackman, Marketing Manager for Icom said that: "The radio is extremely user-friendly and very competitively priced at **£139 including VAT**, yet it maintains the quality and features that have become Icom's trademark. It really is exceptional value for money".

For more information on either the IC-706MKIIG or the IC-R2 and any of Icom's products, you can get in contact with Icom at **Sea Street, Herne Bay, Kent CT6 8LD. Tel: (01227) 741741. You could visit their Web site on: <http://www.icomuk.co.uk>**

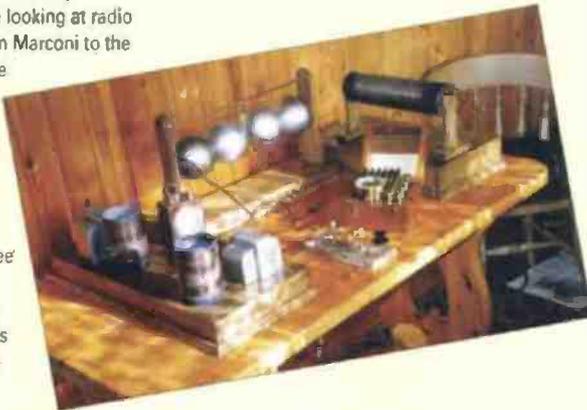


help build a brighter future for Amateur Radio in general.

In celebration of the first ever ship-to-shore wireless communication achieved between South Foreland Lighthouse and a lightship by Guglielmo Marconi, several members of the Barry ARC have been asked if they would reconstruct this very special moment in history.

PW phoned Glyn Jones GW0ANA, Chairman of BARS, to find out more about what will be taking place that week and discovered that he had some very good news. The BBC, having heard about the event, contacted Glyn and asked if they could record a re-enactment of Marconi's early work at South Foreland Lighthouse in Kent for an 'Open University' programme. It will be looking at radio communication - from Marconi to the Digital age and will be screened on BBC2 in February of 1999. The members of BARS taking part will be in dressed in the costume of the period - as you can see from the photo!

The programme will mean good things for Amateur Radio as



good publicity is just what is needed what with all the talk of scrapping the Morse test and the arguments over whether or not Amateur Radio is a dying hobby! As well as this, Glyn also informs us that **BBC Radio Kent** are interested in a live broadcast from the lighthouse. This will give Glyn the opportunity to tell the listeners what Amateur Radio is all about.

The stations will be operating under the callsigns **GB100SFL** (the lighthouse) and **GB100EGL** (the lightship) and will be operating for one week starting on the 17 December 1998.

Well done to the BARS for all their hard work in putting Amateur Radio back at the forefront of communications!

PIE HALL'S NATIONAL MILLS DAY!

Denby Dale (Pie Hall) Amateur Radio Society have dropped us a line to say thank you to all who supported and took part in **National Mills Day 1998**. According to Tony Barr, the Secretary of the Club, you can still claim the Mills day award for 1998 if you send a copy of your log, along with £3 made payable to Denby Dale ARS, c/o **Tony Barr G4LLZ QTHR**. (All profits from the fund will go to SPAB).

If you didn't know about the National Mills Day this year, do not fear! Denby Dale ARC will be running another one in 1999. This time, for two days: **Saturday 8** and **Sunday 9** of May 1999. Tony states that you don't have to do both days, but it will give all Amateurs a chance to put on a station on either day as some Mills will not be opening on the Sunday.

The set-up for 1999 will be the same as 1998: each club or individual will be responsible for approaching the Wind/Water Mill owners, applying for your own GB... callsign via the RSGB.

Various stations are already registering their interest so any of you Radio Amateurs who wish to get involved and haven't yet taken the first steps need to start doing so, in order to have your event published with the different media - which all takes time!

If you would like to register your interest or would just like more information, please send an SAE to Tony Barr G4LLZ QTHR, or E-mail him:

tony.g4llz@btinternet.com

Denby Dale Amateur Radio Society have also sent us some information via Sue Kirwan G0WFE, concerning another of their Special Events which will be taking place throughout the whole of 1999-2001! Administered by Denby Dale and District Amateur Radio Society, the **Millennium 2000 Award** is an event intended to encourage Amateur and short-wave listeners (SWLs) to work or hear Special Event Stations throughout the Millennium period.

Open to all Amateurs and s.w.l.s, it will run from January 1 1999 to December 31 2001 and stations can be heard or worked on any band or any mode during this period. In order to gain the award, you will have to have worked or heard 200 Special Event

Stations during these two years, Sue states.

Registration will be £1, which will entail you to a special Millennium Award claim sheet where all Special Event Stations worked or listened to will need to be recorded. Claims for the award will cost a further £3. (Donations being made to selected charities at the end of the award claim period by Denby Dale Amateur Radio Society).

To register for the Millennium Award and receive your claim sheet please send £1 to: Millennium Awards Manager, S. Kirwan G0WFE, 9 Broomhouse Close, Denby Dale, Huddersfield, West Yorkshire HD8 8UX.

SVETLANA SURVIVES ECONOMIC CRISIS

Readers of *Practical Wireless*, along with major businesses which are involved in Amateur Radio, may be pleased to hear that despite the major economic crisis that is occurring in Russia at the moment, **Svetlana Electron Devices** are still going strong.

In the middle of October, Svetlana sent PW a press release saying that "The current economic crisis in Russia ... should have a minimal effect on tube production at Svetlana SPb in St. Petersburg." This in itself was very good news, but at the beginning of November we received a further press release concerning the release of their new **Svetlana Audio Catalogue**.

According to Svetlana, their extensive variety of audio tubes (valves) are of exceptional quality and the **Winter 1998 Audio Tube Catalogue** is a complete reference for the entire Svetlana Audio Tube (valve) Line.



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news

MILLENNIUM SPECIAL EVENT FEVER!

PRIDE OF PORTISHEAD

David Barlow G3PLE, the Radio Officers Association Special Event Manager has brought us news of a Special Event Station in honour of Portishead Radio which is due to close down on March 31 1999.

An award will be available for any Radio Amateur who contacts, or logs as a short wave listener (s.w.l.), four of the area stations on the map shown in Fig. 1. David Barlow states that qualifying stations will be on air during April 1999. The Portishead station will be on air during the first fortnight of that month. (Full details of stations on air will be available nearer the date).

Although mainly a c.w. event, there will be a strict rule that stations will send no faster than the station received and time will be put on one side for QRP and QRS working.

David also told PW that the 500kHz distress c.w. watch will cease on December 31 1998 and there will be a Special Event to acknowledge the work of all ex-marine and shore based Radio Officers. This will be mainly an s.s.b. event, although stations will be asked to spend some time on the Morse key. The RNLJ and the Mission to Seamen are the charities which will benefit from the event.

For further information, you can contact David Barlow G3PLE at "Pine" Churchtown, Cury, Helston, Cornwall TR12 7BW. Or you can E-mail him at: dbarlow@enterprise.net There is also a Web site which you can visit: <http://homepages.enterprise.net/dbarlow> Or failing that, you can reach him on Packet: g3ple@b7tas.#44.GBR.EU



Fig. 1.

RAE COURSE

John Beaumont G3NGD is starting another RAE course which will be taking place in Stretford, Manchester. The course will be starting on the 4 January 1999 and will take place on Monday evenings from 1800-2030. Please contact John at North Trafford College, Talbot Road, Stretford, Manchester M32 0XH. Tel: 0161-886 7077 or admissions on 0161-886 7000. Web site: <http://www.fortunecity.com/meltingpot/kings/674>

KENWOOD'S TH-D7E PACKET PACKAGE!

Kenwood have sent us news of the new TH-D7E Data Communicator - a new dual band/dual receive hand-held which, Kenwood say, is intended to fill the gap which was left by the TH-79E.

Kenwood go on to state that the TH-D7E has a "market leading feature" which should make it stand-out from the TH-79E and that is a Packet TNC which is built-in as standard. This TNC, according to Kenwood, has a number of facilities. It "... operates on both 1200 and 9600 baud and can therefore be used for DX cluster monitoring as well as for sending simple Packet messages via the keyboard". It also allows APRS location beaconing by using an external; GPS receiver - Kenwood say that it will also store received APRS data on up to 40 stations!

Finally Kenwood tell us that it can control many functions of the VC-H1 Visual Communicator which they also launched recently, therefore, for instant portable SSTV, it allows direct transceive mode selection and titling from its keypad. Kenwood state that the final price is not yet fixed but should be around £325.



WARRINGTON'S ANTENNA ANTICS



Warrington ARC were busy this summer when some misleading information from their planning authority meant that after having erected their Force 12 array on a fixed mast, they were ordered to then mount it on a retractable mast so that it could be 'parked' at roof level.

The photograph shows their daring member: Bill Rabbitt G0P2P who was brave enough to go up the crane and do the work. The crane had been organised through Maurice Jeffery G7HRN and in charge of overseeing the upgrading of the antenna system was George Fare G3OGQ. It's good to hear about your Club's antics, so keep PW updated on what's happening in your area!

NEW NOVICE KITS

Lake Electronics have sent *PW* a last minute FAX to telling us about two Novice kits which they are promoting at the moment. A simple **Radio Receiver** comprising of just one f.e.t. and one transistor in a basic t.r.f. circuit which covers 6-12MHz and can receive some short wave broadcast stations on a personal crystal ear piece is the first of these new kits, say Lake Electronics. Assembly is on a small printed circuit board and full instructions are supplied.

The second kit is an **Audio Amplifier** which, Lake Electronics state, closely follows the *NRAE Course Manual*. All parts - including the loudspeaker - are supplied and they say that it works well in conjunction with the Novice receiver. They cost **£8 each plus £1 P&P (for either one or both items)**. No pictures are available yet but you can contact Alan Lake G4DUVW at Lake Electronics on Tel: 0115-938 2509 or write to them at 7 Middleton Close, Nuthall, Nottingham NG16 1BX.

THE KIND HEART OF AMATEUR RADIO



Cockenzie & Port Seton ARC have written to the *PW* News desk to tell us that they have managed to raise **£873** over the past year for their Adopted Charity - the **British Heart Foundation**. In the photograph they sent us, you can see (from left to right): **Iain Lewis** (Director for Scotland for the British Heart Foundation), **Ron Brown GM4IKU**, **Wallace Moodie MM0AMV**, **Margaret Chalmers GM0ALX** and **Bob Glasgow GM4UYZ**.

Well done to the Cockenzie & Port Seton ARC and good luck for your future fund-raising activities!

Radio Astronomy Supplies have asked *PW* to re-print their Web site address in the News pages this month as it was incorrect on their advert in the December 1998 issue.

Their Web site can be found at:
<http://www.nitehawk.com/rasmit/ras.html>

WATERS & STANTON'S WATSON & WEATHER EQUIPMENT

If you were interested in the Watson WMM-1 Multi-Mode Data Modem, then you just may be even more interested to hear that **Waters & Stanton** have released the **Watson WMM-2** model which they say is "very advanced".

The IBM compatible Data Modem now comes with filters which, say W&S, make it especially stable. Coloured l.e.d.s show signal state and the new modem is also compatible with all of the Hamcomm/JVFX/BAYCOM programs. You can purchase the WMM-2 from W&S for **£89.95**.

The Essex-based company have also sent word of the **BP-2 Packet Modem**. This v.h.f.u.h.f. Packet with 1200 baud is also IBM compatible and mention that it plugs into your RS-232 PC D-25 port, is self-powered so the only connection you need make is to your transceiver. They supply the software on 3.5in disk and W&S say that there can't be a simpler or safer way to get started. It costs **£59.95** and is also available from W&S now.

"And now for the weather". A phrase which we in Britain have come to know and dread, but which is very apt for the next few items which W&S have sent us information of. **Oregon Scientific** have six new clocks on the market which not only tell the time but also the weather - and probably more accurately than the TV weather programmes!

The **12 Hour Radio Controlled Weather Centre (BAR888U)**, according to W&S, is a radio controlled clock which is locked to Rugby MSF. It has a barometer, tells you the inside and outside temperature, has up to three remote sensors (only one supplied) and is linked by a 418MHz radio system with a range of about 30m. It costs **£69.95**.

The **12/24 Hour Clock & Barometer, Thermometer Hygrometer (BA888)** has a built-in alarm plus a calendar and barometer. It also has a memory so you can recall the past 24 hours values. With temperature and humidity displays this also costs **£69.95**.

Waters & Stanton say that when going abroad the **12/24 Hour Travel Clock With 'Phone Organiser (AM133)** might be worth investing in. It shows local time plus the time in 27 major cities! It has a pocket calculator for currency conversions plus a telephone organiser which can, apparently, store 160 names and numbers and has Internet storage. It costs **£15.95**.

The **12 Hour Radio Controlled Clock (RM913E)** is said to automatically lock onto the Rugby MSF radio signal and tells you the time, date, day and month and also functions as an alarm clock, according to W&S and is priced at **£19.95**.

The **12/24 Hour Weather Alarm Clock (BA312E)** has all the functions of the 12 Hour Radio Controlled Clock, but also displays weather patterns with five weather forecast symbols. With a built-in thermometer which displays the temperature, W&S say that it is an "ideal low-cost clock for the desktop or bed side" at **£29.95**.

Finally, the **Radio Controlled Projection Clock (RM318P)**, according to W&S has a powerful beam which can be projected onto the ceiling so that you can see the time any time of the day or night without even moving! It also functions as an alarm clock and displays the day, date and month. Quite a novelty from what W&S say and it costs **£29.95**. For more information, you can 'phone their Dealer Hotline on (01702) 203353.



BARRY'S BRONZE APPEAL!



Barry Amateur Radio Society (BARS) have been busy trying to find a way to replace their bronze plaque which was, unfortunately, stolen last year from Lavernock Point in South Wales. The plaque originally marked the spot where Guglielmo Marconi made the first ever radio transmission across water and it has taken BARS all this time to be able to find the funds to replace it.

They would like to thank all the Radio Amateurs around the UK who donated to the appeal. So if you helped BARS in replacing the plaque, well done. BARS would especially like to thank **Martin Lynch** of **Martin Lynch & Sons** for their generosity in making up the shortfall in their appeal fund. They say that without his kindness, the appeal would have taken much, much longer!

In the photograph, you can see **Jim Chetcuti GW3PYX** and **Brian Vodden GW3WBU** who BARS tell us did a great job of fixing the plaque to the wall.

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Letters

COMPILED BY JO WILLIAMS & ROB MANNION



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

Harwell Mystery Solved

Dear Sir

I always wondered where the name "Harwell" came from and Ben Nock G4BXD gave me the answer (after 44 years) in the October 1998 issue of *PW*!

I was also trained in the Harwell, not in the 1940s, but in 1954 and not at any RAF station, but at Royal Netherlands AF Radio Radar School near Arnhem here in Holland.

The 'boxes' were placed in the attic of the building. Two rows of ten on either side with the Net Control Station at the very end which, I believe, was a pre-World War Two NSF transmitter (NSF - Nederlandse Seintoestellen Fabriek), which was operated by the instructor.

Our boxes had the same dimensions as described by G4BXD. It had no door and no d.f. loop on top (not needed in administration/log c.w. nets), but we did have a loudspeaker in the roof. The loudspeakers were there, not to let us hear the engine noise, etc., but the barking voice of our instructor when we did not use the correct NATO c.w. procedure!

The boxes were very badly lit, like the one in the article and equipped with T1154/R1155, two generators, dummy antenna and 'brasspounder' (Not the RAF type 'F'-key).

It was exciting to hear the generators start and the R1155 come to life after some seconds. It was also exciting to work for the first time, as a 19 year old airman, with a professional transmitter!

Harwell was the only name we knew and we used it to name our lessons in the attic. We had 'Harwells' two mornings a week during the last eight weeks of the 'WOP-course'. Considering the name we gave our lessons, the boxes, the equipment, etc., I came to the conclusion that Radio Netherlands Air Force had bought a number of boxes from the Air Ministry/RAF.

These days, a T1154/R1155 and type 'F'-key are in my shack. They can be heard on 3.575MHz (Surplus Radio Society here in the Netherlands) and 3.577MHz (Military Wireless Amateur Radio Society in the UK) on Sunday mornings.

So, thanks to Ben G4BXD who gave me great pleasure with the Harwell story.

Louis van Erck PAOLCE, Netherlands

Morse Pass?

Dear Sir

I have been retired now for some years, but I am an ex-Merchant Navy Wireless Operator and later, a Coastguard Wireless Officer.

On home leave, I always looked up a friend who is a G4 and used to catch up on all the Amateur Radio news in the back issues of *Practical Wireless* - especially the letters for and against Morse. But over the years, especially the early years of the G4s, not once did I read about the 'fiddles' that the 'clever clogs' used to get up to.

The lads at University, for instance, who somehow for weeks before an Exam - always managed to get copies of the exam papers and proceeded to sail through the exam. Then there were others, which I will not even bother to mention!

The other 'fiddle' was for the Morse test. For a little 'fee' and 'night out money' to cover a day off work, an experienced operator would go to a coastal station to take the test for one of the 'gang' - having first copied the signature (many times) of the one who was supposed to be taking the test. The lads who did these little trips for their 'oppos' must have thought - "Us lads from the village" - who gave them the test were as green as grass.

After years of experience, hours and hours of listening and transmitting on a shift, we could always tell an experienced 'fist' on a 'key'. Many were caught out, but sometimes we used to let them get away with it.

Since being retired, I have met the odd 'G' here and there - a 'licensed' operator who didn't know a 'dit' from a 'dah'. They were easily caught out in conversation. (Should you print this letter, there will be many who will feel ashamed of themselves for the method they used to 'pass').

You have an interesting magazine, Editorial team - keep it up! Always remember the old Service saying: "no man is fit to 'command' unless he can 'command' himself". Also, an old Arabic Proverb: "Three can keep a secret - providing two of them are dead"!

R. McGregor
c/o Royal Naval Association
Staffordshire

Editor's comment: The 'Two Passport Photos required'

system helps to minimise fraud nowadays and although the Radiocommunications Agency choose not to confirm the fact, the 'Licence Revocation' statements issued by them often refer to fraudulent Morse and RAE qualifications. I've often told the RA that they'd gain even more respect for their 'policing' activities if we knew what they were! But we still live in a 'secret society' don't we? My thoughts on this are backed up by (I've made a special exception in publishing this letter) the fact that the author has not provided his full address and given an 'accommodation' address only.

Brickfield - Not Binstead!

Dear Sir

Members of the Brickfield Society would be most grateful if, in the next issue of *PW*, you would kindly include a correction relating to the text on page 48 in the November edition of the magazine, where reference is made to the 'Binstead' ARS. The 'Binstead' ARS here on the Isle of Wight ceased to exist some seven years ago.

The references should have been to the 'Brickfields' ARS. In fact, Brickfields ARS headed the list of acknowledgements in the souvenir brochure which the author Ben Clegg G7RER mentioned in his article. Alan Gardner GONTH Chairman Brickfields ARS Isle of Wight

Number Plates & Web Sites

Dear Sir

I would just like to make a few comments about the November issue of *PW*.

I read the 'Letters' section and found the letter submitted by Duncan Walters G4DFV about callsign number plates. I had thought of this idea before, but never put it into practice. I would just like to add that I think it's a great idea and, not only would it save you the cost, but also the time having to wait for the correct number plate to appear and that's only if it's been made!

Apart from the 'Letters' page, I also read the bit about Internet sites by Mike Richards G4WNC. I have to confess

Morse & A Maltese Opinion

Dear Sir

A lot has been written, both in favour and against the abolition of the Morse requisite to obtain a class A Amateur Radio License. First of all, what is Morse code?

Morse is an art, another language with which one can communicate all over the world, music to the ear and a very efficient and cheap means of communication.

Most of the big Radio Societies like the RSGB and the ARRL are stating that the radio fraternity is becoming an ageing one and this is because Morse is keeping young persons from taking up the hobby. In my opinion, this is sheer nonsense!

One of the reasons why the young people are no longer interested in taking up Amateur Radio is the use of the Internet - which, first of all, is much cheaper to set up, can communicate all over the world and no licence or examination is needed.

Another reason is the price of radio equipment, who is that young idiot who is ready to spend more than £1000 on a black box instead of putting that amount of money as the first instalment to buy a car? I am afraid to say that the big Radio Societies have given much importance to the Internet and the computer.

I have also heard rumours - true or not, I don't know - that the *ARRL Handbook* is no longer to be issued in book form, but on disk! If this is true, such is the importance given to the computer.

In my opinion, by abolishing the Morse test, we will be killing Amateur Radio. A lot of Radio Amateurs, especially those interested in QRP (who I dare say are the people who are keeping the hobby alive), will lose interest and Amateur Radio will die a natural death.

Carmel Fenech 9H1AQ, Malta GC

though, I was not happy with a certain part of it. In the article in *Radio Scene*, it said: "...you can pinch interesting backgrounds and graphics from other people's Web sites", is this the correct attitude to take? Basically telling people that they can 'steal' other people's property! If these backgrounds and graphics are 'freely' available then fine, there is no problem. But if they were created by the individual, then they are, of course, copyright to that person and he may not want his graphics anywhere else.

At some point, everyone has thought "I like that, I'll take it" but nabbing a few at your own discretion and telling others to do it are two different things. I design and write Web sites, if I created a special graphic and someone used it without permission, I have every right to be upset and, if possible, do something legal about it.

I, like most other people, would rather be sent an E-mail asking to use it, the answer to this question is nearly always yes, so it's not worth stealing it in the first place, is it?

If it comes down to proving the graphic is yours, there are a few companies about that do digital marketing for images. They put the author's name in the graphic and onto a database for reference that can be used in a legal matter.

**Richard Smith G7WFC
Essex**

Illegal Operation on 28MHz

Dear Sir

It is with concern that I write this letter to you and feel that you

may help to bring this to the attention of your readers via the *PW* pages.

For a number of years now the 28MHz band has been suffering from 'Pirates' who have moved up from the CB band and operate anywhere from 28.250MHz downwards on f.m./a.m./s.s.b. This is not a new problem, but I fear that it is getting worse.

It seems to me, that when the sunspot cycle is at a minimum and the Amateur activity is low, they seem to think that they are safe from detection. Sadly, this problem has now spread to the 12m (24MHz) band, I have recently lost contacts on 12m due to the fact that Spanish-speaking pirates operating with converted CBs in South America are openly using the band and are ignoring requests to move.

I recently spoke to an American Amateur who had the same problem on 12m and he informed me that Taxi drivers in Sao Paulo were also using the band.

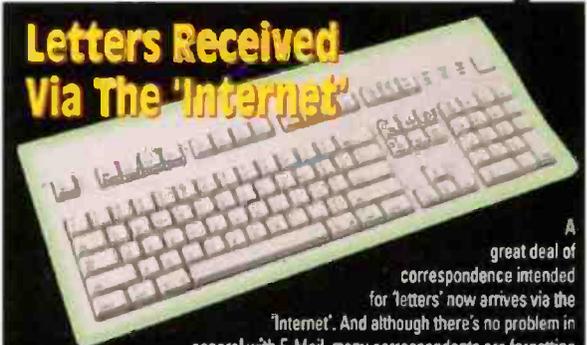
The point I would like to make here is - who is going to do something about it? We Amateurs in the UK pay £15 a year for a licence and it seems to me that the RA are doing nothing to justify the Licence fee. Now, if a Licensed Amateur were to operate out of band, then all hell would break loose and the wrath of the RA would come down on them,

I have no problem with CBers, as long as they operate on their own bands and not Amateur bands. Most CBers are Amateurs in training and good operators, but the few I mention are not and what I would like to

know is - who is going to do something about it? What band is next? The 21MHz band?

**Don Kirby GW0PLP
Cardigan**

Editor's comment: Although the illegal operation on 28MHz is a real problem (particularly on the 28.200MHz International Beacon Frequency) the Radiocommunications Agency (RA) would not be able to help us as we are an 'unprotected service' and pay a correspondingly very low licence fee. I think the answer lies in our own hands - via the International Amateur Radio Union but the chaos associated with the various South American bureaucracies doesn't bring me much hope of a solution - let's hope they all go to v.h.f. or the Internet!



A great deal of correspondence intended for 'letters' now arrives via the 'Internet'. And although there's no problem in general with E-Mail, many correspondents are forgetting to provide their postal address. I have to remind readers that although we will not publish a full postal address (unless we are asked to do so), we require it if the letter is to be considered. So, please don't forget to include your full postal address and callsign along with your E-Mail hieroglyphics! All letters intended for publication on this page must be clearly marked "For Publication".

Editor

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

To start off his 1999 series of practical ideas the Rev. George Dobbs G3RJV says why not "Add life with a moving meter needle" by making an audio S-meter for simple receivers?... After the usual appropriate quotation of course!

Carrying on the Practical Way

There was a time when Radio Amateurs knew what happened inside their equipment - they probably built it. Then came the time when they no longer built the equipment but still knew what happened inside the box. But nowadays - many amateurs do not know what all the controls on the front panel do. Such has been the progress of our hobby!

Certainly the front panels of modern equipment can be complex. They have multi-function readouts and indicate many of the internal functions. Perhaps this is sophistication, although I suspect the

ultimate sophistication is a transceiver with only one knob and one switch.

Home built equipment certainly tends to be less

complex. Although there are Amateur Radio constructors building very complex equipment, my mail seems to suggest that the most popular 'home brew' projects are those which cost very little and can be completed in a couple of evenings, or a weekend and will work first time.

One common project is the simpler

amateur bands receiver, perhaps direct conversion or a simple superhet. Neither of these is likely to include an S-meter as part of the circuit. Usually S-meter readings are derived from the automatic gain control (a.g.c.) voltage.

Direct conversion receivers have no (conventional) intermediate frequency (i.f.) stages, the usual location of a.g.c. control, and many simpler superhets do not include a.g.c. Despite this, in both cases it is possible to add a simple audio derived system of automatic gain control.

Re-Assuring Meter

When operating a receiver, I think there's something re-assuring about having a little meter needle dancing up and down in sympathy with the signal strength. The fact that it may not be doing much in the way of objective measurement seems to be of little importance!

Even the S-meters on the most sophisticated items of Amateur Radio equipment can be of little ultimate value. The more experienced operator knows what an S7 signal sounds like on the receiver and also tends to doubt anyone who says "you are S7 on the meter".

Many S-meters only offer subjective readings but they do look nice on the front panel. So, I begin this little project with honesty as the meter described here has no objective accuracy at all, but it does indicate the relative audio output of the signal being tuned.

The chief advantage of the project is cosmetic - it makes the front panel look better and gives the pleasing effect of seeing the signal as well as hearing it. The whole effect is enhanced if you can find one of those surplus CB rig type S-Meters with the built-in bulb. Doubly so, if you can remove the bulb and paint it with a green or orange felt-tipped pen to add a coloured glow!

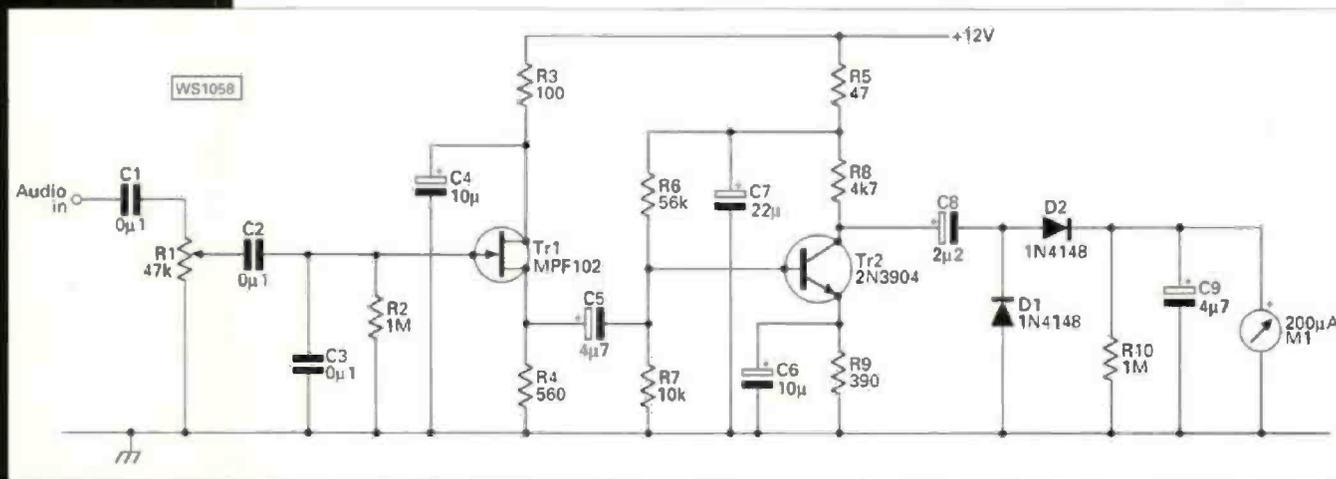
The Circuit

The circuit for the audio derived S-meter is shown in Fig. 1. Since the circuit has to connect to the existing receiver audio stages, it's important that it does not offer a significant load to these circuits at the point of contact. Thus the input

".....I really do not see the signal!"

Horatio Nelson (at the Battle of Copenhagen)

Fig. 1: Circuit of the G3RJV audio S-meter suitable for use with simpler receivers.



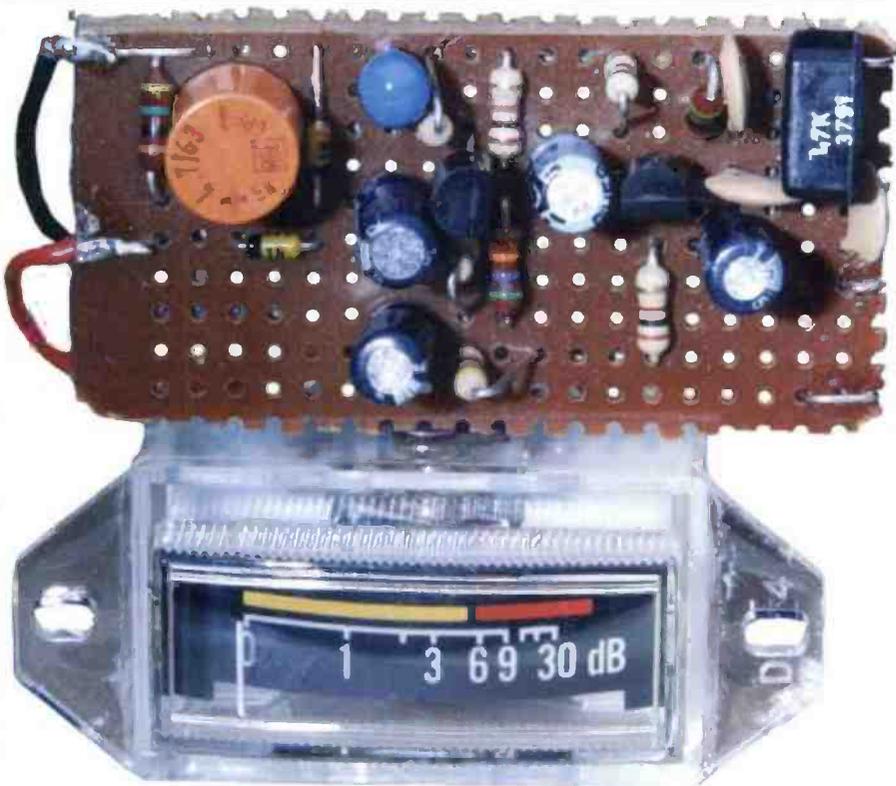


Fig. 2: The completed project assembled using 'Perf-Board'. (See text).

stage for the S-Meter offers a high impedance.

A relatively high value pre-set potentiometer feeds the signal to a field effect transistor (f.e.t.) stage. This arrangement is unlikely to have much effect wherever it's connected, apart from sampling the audio signal because the stage really acts as an impedance transformer.

My prototype used the MPF102 f.e.t. only because I have a lot of them. The more popular 2N3819 f.e.t. will serve the purpose just as well. **But remember that the 2N3819 does not have the same pin placements.** For some reason (perhaps to do with age!) I have often connected the 2N3819 the wrong way in a circuit, hence my stock of MPF102s.

The capacitor, C5, couples the audio signal to a relatively high gain audio amplifier stage. This uses a bipolar device. Once again this could be almost any generic *npn* transistor. I have stocks of the 2N3904 so that decided my choice.

The 2N2222 would be another good choice. If, in practice, the overall gain of the S-meter seems a little low, try increasing R6 to around 100k Ω .

The capacitor, C8, feeds the audio signal to a detector circuit, which converts the audio signal into a relative d.c. signal. The diodes D1 and D2 act as a voltage doubler detector to drive the meter from the load, R10. The diode types are also non-critical (mine are the popular 1N914, or they may have been the 1N4148 - who knows!).

The capacitor C9, a 4 μ F type, 'smoothes' out the movement of the voltage. (This may need a little

experimentation). If you want the needle to give steady readings, increase the value of C9, if you like it to dance around a little, decrease C9. I found that 4 μ F (in practice a 4 μ 7F) was a good compromise value.

The meter is one of those small edge-wise CB type S-meters so often found at reasonable prices. They usually have a full-scale deflection of some 200 μ A. However, any meter with a similar full-scale deflection would do the job.

Building the S-meter

The little circuit could be built in

almost any way. This time I chose to use Perf-Board: the board with a 0.1 inch matrix of holes but without the copper strips found on Vero-Board. I like it as a one-off building medium.

Using Perf-Board it's possible to replicate a p.c.b. layout without all the fuss of etching a board. The component leads push through the holes and the surplus lead lengths can be used to form the tracks to connect the components in the circuit. Where this is not possible, bits of snipped off leads from other components can be used to form the tracks.

The layout follows the circuit drawing placements. The choice of component types was solely governed by what I had in stock. The higher value capacitors are a mixture of radial electrolytic and tantalum types. The smaller values are cheap ceramic types.

Where To Connect?

The question remains - where to connect the S-meter? I tried the circuit on several receivers, from simple direct conversion receivers to commercial superhets. The most appropriate place seems to be at the top end of the audio gain control. (I suggest you avoid the slider of the control as this would obviously change the reading as the audio gain control was used).

In most cases using the 'top end' of the control will give enough audio signal to produce a useful range of readings. However, it's possible to connect the input of the meter further down the audio amplification circuitry.

There's no reason why it cannot be connected directly on to the output at the loudspeaker or headphone socket. The only answer is to try it and brighten up the front panel of that simple receiver...and I look forward to giving you an S7 report next time we meet on the bands!

PW



December 13: The Leeds & District Amateur Radio Society is to be held at the Pudsey Civic Centre (Dawsons Corner). There will be all the usual traders. Doors open at 1100 (1030 for any disabled visitors). There will be a talk-in, a licensed bar, etc. **John Mortimer M1CAI** on (01943) 874650 or **Malcolm Robertson G7VCK** on Leeds 0113-225 3379.

December 13: The Verulam Amateur Radio Club will hold its annual rally at the Watford Leisure Centre, Horseshoe Lane, Garston, Watford, Hertfordshire. **Ian Forsyth G0PAU** on (01923) 265572.

1999

January 17: The Oldham ARC Mobile Rally is to be held at the Queen Elizabeth Hall, Civic Centre, West Street, Oldham, Lancs. Doors open at 1100 (1030 for disabled visitors). The event features the usual traders and a Bring & Buy stall. Morse tests are available on demand. Talk-in on S22 via GB4ORC commencing at 0730. There will be refreshments and free parking. (01706) 846143 or 0161-652 4164.

February 7: The 14th South Essex Amateur Radio Society Radio Rally is to be held at the Paddocks, Long Road, Canvey Island, Essex. The Paddocks is situated at the end of the A130. Doors open at 1030. Features include Amateur Radio, computer and electronic component exhibitors. Bring & Buy, RSGB Morse testing on demand (two passport photos required), home-made refreshments, free car parking with space outside main doors for disabled visitors. **David G4UVJ** on (01268) 697978.

February 14: The 14th Northern Cross Rally is to be held at Thornes Park Athletics Stadium, Wakefield. There is one large hall, just out of

town on the Horbury Road. Easy access from M1 junct 39 & 40 - well signposted and with a talk-in on 2m and 70cm. Doors open 1100 (1030 for disabled visitors and Bring & Buy). **Roy GOTBY** on (01924) 893321 or packet **GOTBY@GB7WRG**. E-mail **rally@waveg.demon.co.uk** or visit the web page at **http://www.waveg.demon.co.uk/rally/**

February 21: The Barry Amateur Radio Society Radio & Computer Fair has changed its venue. The new and improved venue is the Holmview Leisure Centre, Skomer Road, Barry. Facilities include lounge bar, catering and parking. Admission is £1.50 and doors open at 1000 for disabled visitors and 1030 for general public. **Brian GWOPUP** on (01222) 832253 combined telephone and FAX number.

March 7: The Wythall Radio Club are holding their 14th Annual Radio & Computer Rally at Wythall Park, Silver Street, Wythall, near Birmingham on the A435, just two miles from junction 3 of the M42. Doors open from 1000 to 1600 and admission is £1.50. There will be the usual traders in three halls and a large marquee, Bring & Buy, bar and refreshment facilities are also on site. Talk-in on S22. There will also be a unique park and ride for easy and comfortable parking.

Contact **Chris GOEYO** on 0121-246 7267 evenings and weekends for more details, FAX on 0121-246 7268 or E-mail **goyo@compuserve.com**

March 21: The Tiverton South West Amateur Radio Club will be sponsoring and arranging their rally in the Tiverton Pannier Market. Doors open at 1000. There will be a wide selection of traders, catering for all aspects of the hobby. There will be the usual excellent food and catering facilities around and in the Pannier Market. More information from **Alan Sedgbeer GOMAS** on (01884) 252259.

March 21: The Bournemouth Radio Society are holding their 12th Annual Sale at Kinson Community Centre, Pelhams Park, Millhams Road, Kinson, Bournemouth. Doors open at 1030 and close at 1630. Talk-in from G1BRS on 2m S22. There will be Amateur Radio and Computer Traders, clubs and specialised groups, excellent refreshments and a Bring & Buy. Admission is just £1. More details from **Olive or Frank Goodger, 66 Selkirk Close, Merley, Wimborne, Dorset BH21 1TP** or telephone on (01202) 887721.

May 9: The Drayton Manor Radio & Computer Rally is to be held at Drayton Manor Park, Fazeley, Tamworth, Staffs on the A4091.

The main traders will be in four marquees with a large outside traders flea market. There will also be a Bring & Buy stall, local clubs and special interest stands. Open from 1000 onwards. Trader information from **Norman** on 0121-422 9787, other information from **Peter G6DRN** on 0121-443 1189 evenings please.

May 16: The Ripon & DARS are pleased to announce that the Northern Mobile Rally will take place at the Great Yorkshire Showground. There will be all the usual stalls, talk-in, Bring & Buy, free car park, disabled access, etc. Details on (01765) 640229 or E-mail **gerald@bronco.co.uk**

May 30: The 1999 Plymouth Amateur Radio Society are holding their rally at the usual venue, which is at the Plymouth College of Further Education, Kings Road, Devonport, Plymouth. Doors open 1030 till 1430 and admission is just £1. There will be the usual traders, plus Morse testing on demand. The venue is large and spacious with ample free car parking. The display halls have plenty of room for visitors to mingle and browse. There is also a large canteen serving freshly cooked light meals and snacks at reasonable prices. Plymouth City Centre, the Hoe and many major attractions are close by for the family. Signposting will be from the Manadon Junction on the A38 Devon Expressway and there will also be a talk-in on S22. More information on (01752) 662051 during office hours.

June 20: The Newbury & District Amateur Radio Society will be holding their 13th Annual Amateur Radio Car Boot Sale at Cold Ash playing field, near Newbury. Sellers/Traders should arrive by 0800. Sale open from 0900 till 1500. **Ian Trusson**, Secretary, on (01635) 826019, E-mail **G3RVM@compuserve.com**

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

The Editorial Staff of PW cannot be held responsible for information on Rallies, as this is supplied by the organisers and is published in good faith as a service to readers. If you have any queries about a particular event, please contact the organisers direct. - Editor

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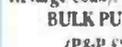
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In a way I'm pleased that I've been able to find somewhere in *PW* to publish this page because, in doing so, it's possible to answer many common questions which have been asked by readers in the last few months.

This page also provides an opportunity to defend those readers who've considered themselves as "being rather thick" (their words not mine!) for not understanding what turns out to be quite straightforward when we've discussed it together.

Additionally, I hope to

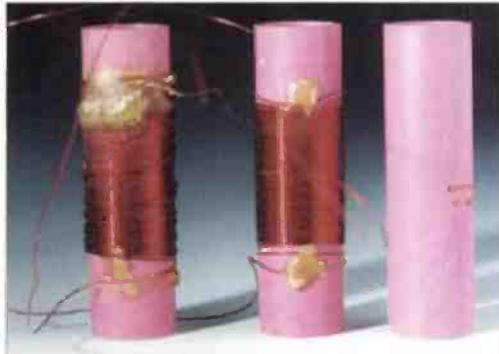


Fig. 1: Winding single layer and multi-layer coils (see text).

complete the 'Radio Basics' Information Sheet 3 soon, so it will join sheets 1 & 2 which are available free if you send a large s.a.e. (50p stamp),

Winding Coils

Unfortunately, one of the biggest problems for beginners in the radio hobby is the

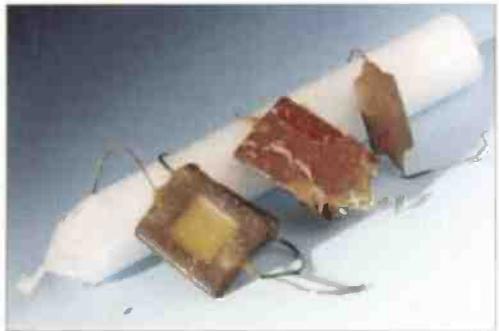


Fig. 2: Various sources of wax (see text).

winding of tuning coils and this statement is certainly backed up by the comments I've received from readers following the series! So, to help I've prepared some photographs to show the technique I use.

The photograph, Fig. 1, shows some demonstration coils wound onto plastic till-roll

centres. These are sturdy and brightly coloured and are ideal for photography. Several readers have suggested that I base the coils in the series on this type of former. However, as there are at least four different sizes available you could end up with the wrong one. So, for 'Radio Basics' I'll stick with using the paper former wound on a standard pencil.

The basic former is shown on the right of the photograph and a single layer coil is in the centre. Note how I've used beeswax to anchor both ends of the windings.

Incidentally, various sources of wax are shown in Fig. 2. The old silvered-mica (usually known as 'silver mica') capacitors are very useful for this purpose. You can see how I've scraped off little pieces of wax to use on the coils. These are placed as 'blobs' and

melted onto the former. The wax stays fairly flexible and provides an efficient 'adhesive' and insulator.

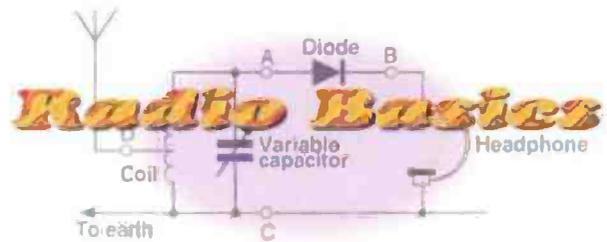
The candle wax from the candle shown in Fig. 2, can be 'dripped' onto the coil/winding to be sealed by taking advantage of the wick. You can probably just see where I've used the side of the candle in carrying out this process. It's a little smelly but there's no danger and you can very easily

clean the soldering iron by wiping it on the cleaning sponge (you have got one haven't you?). Please note however, that the candle wax (paraffin wax) is more brittle compared to the beeswax and should not be used for temporary

('anchoring') uses - only permanent fixing purposes.

Multi-Layer Coil

The coil on the far left of Fig. 1 is the start of a multi-layer coil and is shown because readers often have problems with this form of coil. At the top (indicated by a larger amount of wax) the winding is continued through the wax and



over the top of the first layer. At the bottom the process is repeated and so on until the required number of turns is completed.

Once you've wound the coil you can tidy the appearance of the coil by melting the wax evenly (taking care not to damage the former if it's plastic).

Incidentally, one of the advantages of using the paper tube type of former which have featured in 'Radio Basics' (see page 17 in the September 1998 issue of *PW* for full description of the technique) is that you can't damage the former with hot wax. In fact, the paper absorbs some of the wax, adding to the general stability...an old and useful technique!

Radio Frequency Chokes

Another item which seems to have caused confusion is the construction of home-made



Fig. 3: Winding 'home-brewed' radio frequency chokes on resistor bodies (see text).

('home-brewed') radio frequency chokes. I first described winding these items on page 16 of the May 1998 issue of *PW*, but to help those who've had problems I've made some simple examples which are shown in Fig. 3.

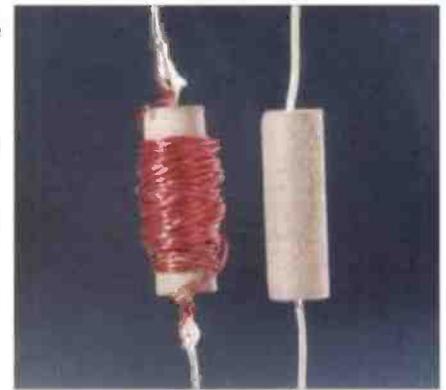


Fig. 4: Using a ferrite core with axial leads to wind radio frequency chokes (see text).

The chokes are wound on (in this case) 2.2M Ω 1W resistors. The basic resistor is shown in the centre and the sample with 60 turns of 24s.w.g. wire on the right. On the far left the finished choke is shown coated with clear paraffin (candle) wax.

The resistor-based chokes work very effectively, however if you wish, you can buy ferrite cores to wind your own chokes and Fig. 4 shows one which has been wound on a ferrite core. It so happens that I've got a range of these cores from Robin Sykes of Sycom (see advert) but they are available at many rallies and from many of our advertisers. Once you've completed the chokes, the windings should be sealed with wax to stop them unwinding or slipping off.

Hopefully, I've now straightened out one or two problems for budding constructors. And to re-assure those of you who've told me that they "feel rather stupid" for asking for clarification...I've got to point out that in a classroom situation they'd be able to ask the question there and then as they arise! (A small price to pay for 'distance learning perhaps?').

Please keep writing in with your comments and I hope you all continue to enjoy 'Radio Basics' as much as I do preparing it for you!

PW

As mentioned in 'Keylines', in place of the usual 'Radio Basics' column Rob Mannion G3XFD is taking the opportunity to provide up-dates and information on questions and reader's problems involving published projects in the series so far.

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Mosley Antennas have pre-drilled, colour coded elements making assembly quick and easy. Hardware is Stainless Steel, Tubing, aircraft grade, drawn, aluminium. The telescopic tubing is therefore closer tolerance, so no unsightly hose clamps like other makes. Mosely have two traps in each trap assembly. A Mosley 3 element, has 6 trap assemblies, other makes have twelve!

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Lightweight makes fold in the first wind, and have poor bandwidth due to small diameter elements. CQ-DX have excellent bandwidth - and no trimming capacitors! D.C. grounded, sealed to prevent moisture ingress, and with "N" socket downloads.

Don't throw money away on short term solutions.

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CQ-DX 144/10Y	2m	10 El	13.6dB	3.6m	£97.45 69.95
CQ-DX 144/10XY	2m	10 El Crossed	13.6dB	4.0m	£119.95 79.95
CQ-DX 430/10Y	70cm	10 El	13.6dB	1.5m	£77.45 54.95
CQ-DX 430/18Y	70cm	18 El	17.6dB	2.8m	£87.45 64.95
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Voltage	13.8v DC		With Voltage & Current Meters		
Current Rating	20/25A		Voltage 3.5-18v DC, 20/25A		

Sigma Wire Antennas

The World's Largest Wire Antenna Manufacturer

Sigma Antennas are easy to assemble using the supplied instructions

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SVS-42	40/20/15/10m	2 Trap	24CE long	£69.45	75.95
SVS-51	80/40/20/15/10m	1 Trap	56CE long	£67.45	59.95
SVS-52	80/40/20/15/10m	2 Trap	48CE long	£96.45	85.95
SVS-53	80/40/20/15/10m	3 Trap	42CE long	£126.95	109.95
SVS-64	160/80/40/20/15/10m	4 Trap	77CE long	£166.95	149.95
SVS-65	160/80/40/20/15/10m	5 Trap	73CE long	£199.95	179.95
SVS-161	160/80m	1 Trap	105CE long	£78.45	69.95

SO-239 Termination

Layout of 4 trap sloper

These vertical slopers are fed at ground level with the 'cold' side of the bottom connector connected to a ground stake.

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Kenwood TS850SAT, 100W, 12V, Auto ATU.....	£840
Mizuho MX-3.5S 80m 2W QRP Handheld + Options.....	£230
HF Receivers	
Kenwood R5000 0.1-30MHz.....	£570
JRC NRD-535DG 0.1-30MHz + Options (ex-demo).....	£1100
VHF Receivers	
AOR AR2000 Hand Held 0.5-1300MHz AM/FM/WFM.....	£140
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Accessories	
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Capco SPC300 HF ATU 1kW.....	£175

Wireless Set No. 46

The Waterproof Wonder

Ben Nock G4BXD, our Valve & Vintage military specialist, takes a very close look at the water-tight Wireless Set No. 46. Due to the conditions it was designed for, the Wireless Set No. 46, as you will discover, is truly a 'Waterproof Wonder' indeed!

During the years of the Second World War there were many innovations in the field of radio communication. Necessity being the mother of invention, great strides and leaps in design, construction and downright cleverness took place.

One of the interesting sets to emerge from this period was the Wireless Set No 46. This small, man-carried set used several clever design considerations and brought easy, reliable communications to the foot soldier and could even withstand a dunking in the sea.

Developed around the early part of 1941, one design consideration was that the 46 set could be used for a sea landing, with the Commandos for example, so the set should be watertight, easy to operate and able to withstand the knocking about it was likely to receive. Indeed, around the joint between the set and its case is a rubber gasket to keep out the water and all the controls have rubber gaskets around the shafts and the handbook tells the operator how to wrap the batteries to keep out the water.

The transmitter output of the No. 46 set is much greater than the other well known 'manpack' set of that period - the Wireless Set No 38. Between 1 and 1.5W is available from the No. 46 set, compared to the 0.25W (250mW) for the No. 38 set.

The receiver and transmitter of the No. 46 set are crystal controlled thus eliminating the need for the operator to 'net' onto another station. The frequency stability and relatively high power make the No. 46 set a very attractive choice for troops that have to be fast moving or first in to a particular action.

The wireless set is carried in a canvas bag on the operator's left chest with a separate canvas bag on the back holding the batteries. A single cable runs between the set and battery bag, there being a junction box on the side of the battery bag to which the headphones and microphone



Fig. 1: The Wireless Set No. 46 as carried by the foot soldier.



Fig. 2: The headphones and microphones as used with the Wireless Set No. 46.

are connected. (See Fig. 1).

Two pairs of headphones and a microphone can be connected, one for the operator carrying the set, another set for any passing officer. The headphones are the normal DRL2 type whilst the microphone uses the throat type. (See Fig. 2). The usual rubber 'snatch plugs', found on the No. 22, 19 and 62 sets for example, are used for easy connection.

The canvas cover for the set also holds the antenna rods when not in use and even has a dust cover for the microphone plug. All the controls are on the top of the set and are thus easily visible to the operator. The size of the set, as can be seen from the photographs, is about 300x175x100mm, the set itself weighs approximately 5Kg whilst a complete station, with one set of batteries, weighs in at approximately 11Kg.

Amplitude Modulation

The 46 set could be operated between 3.6 and 9MHz and offered amplitude modulation R/T (a.m.) or modulated c.w. (m.c.w.). The push-to-talk switch acting as the Morse key in this mode. There is no b.f.o. provided on the receiver so normal c.w. cannot be resolved. The coverage of the No. 46 set is divided into four bands, there being a small colour coded coil pack for each band, which plugs inside the set whilst in the workshop.

It was not envisaged that the operator would change either the crystals or the band coils in the field. Two 10XJ crystals are needed per channel, three channels being available. With the i.f. of the receiver at 1550kHz, the receive crystal needs to be 1550kHz higher than

the transmit crystal (which is always on the frequency of required operation) between 3.6 and 4.3MHz, whilst being 1550kHz lower for the remaining coverage. (See Fig. 3).

"...it's a real pity such design and production ideas aren't more prevalent today"

Circuit details

The complete set uses six valves in total, four on receive and three on transmit with one being common to both paths. The receiver is a standard single conversion superhet with an i.f. of 1550kHz as previously stated.

The first stage in the receive path is a common passive tuned antenna circuit, the first valve being the crystal oscillator and frequency changer. This feeds the first i.f. amplifier stage. A second i.f. amplifier stage also acts as the receive audio amplifier.

The fourth valve in the chain operates as the a.f. detector and a.g.c. detector on receive and as the modulation amp or m.c.w. oscillator on transmit.

Notice the clever multi-role use of these valves, saving on space and power consumption. On transmit the output of the modulation amplifier drives the modulator stage proper, which acts upon the single transmit stage, this being a crystal oscillator cum p.a. stage. Despite this method the p.a. still manages to deliver nearly 1.5W into the common antenna circuit.

Antenna Rod

The standard antenna would have been the 2.3m rod type, made up from B sections carried with the set. If manoeuvres permitted, a 4.8m whip, made up from F sections and using a ground spike and bracket along with a small adapter, using the terminal marked F to feed the antenna, that plugged into the set, could be used. (See Fig. 4).

Diagrams in the handbook also suggest the use of a trailing wire antenna laid on the ground of around 7.6m in length. The wire was to be laid in the direction communication was wanted. Wires thrown into trees or other high supports could also be used, again utilising the antenna adapter, this time using terminal 'L', which is in reality, a couple of series capacitors in a small box.

Another innovation of the No. 46 set was that a built-in dummy load was provided which could be used to give an indication of the state of the batteries. The dummy load represented the same match as the 2.3m whip. The quoted range of the sets, working 46 to 46 set, was up to 16km for the 2.3m antenna whip but, of course, this would be very dependent upon frequency, time of day and terrain.

Battle Battery

The No. 46 set used the same type of battery as that termed the 'battle battery' for the wireless set No 18, or the 163/3 battery. Supplies needed are around 150/160V

h.t., 12V grid bias and 3V for heaters. The power consumption on receive, in the a.m. mode, is about 10mA. In the m.c.w. mode it is also about 10mA. On transmit, in a.m. mode, the h.t. drawn is about 28mA, whilst in m.c.w. mode it is 37mA.

Heater current on transmit, either mode, is 550mA, whilst on a.m. reception it is 350mA. On m.c.w. reception it is up to 850mA. This is due to all the heaters being on in this mode for quick change over. However, if you wanted to use one of these sets today it is very unlikely the correct battery could be obtained.

The nice thing is though, with such a large back pack (see Fig. 5), it would be quite easy to make up and accommodate a set of batteries for the heaters - two D cells for instance - a set of AA cells for the grid bias (as little current is drawn) and a small inverter unit, running off D cells as well for instance, supplying the 150/160V h.t. needs. (I have described such a power supply in past articles).

Little Wonder

The Wireless Set No 46 is certainly one of the little wonders of the war. It is compact, reliable, easy to use and (of great importance) not too heavy. Though I guess if you're carrying the set, a rifle, ammunition, tin hat, full battle dress, webbing, supplies, etc., then it might all seem just too much!

Though the set does lack the facility of tuning around the bands, the crystal control option does mean the set is stable. It might not be very versatile on the amateur bands, but if a net frequency was being used - for example the 3.625MHz of the Military Wireless Amateur Radio Society (correct at time of writing) - then you could have a couple of crystals cut, or better still, grind them yourself and the set could be used in a limited fashion.

The set is a very nice example of the 'best of British', it's a real pity such design and production ideas aren't more prevalent today. My mark - ten out of ten for the No. 46 set. *PW*



Fig. 3: The operating position on the ground. The set unclips from the belt and is placed flat on the ground.

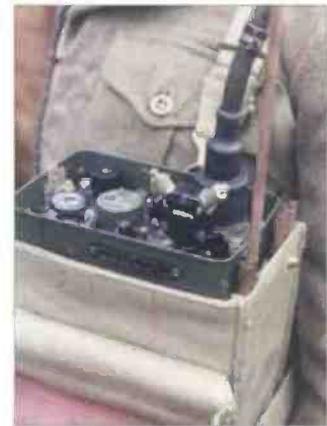


Fig. 4: The antenna unit for longer whips and wires. Note the rubber boot over the rear connector.

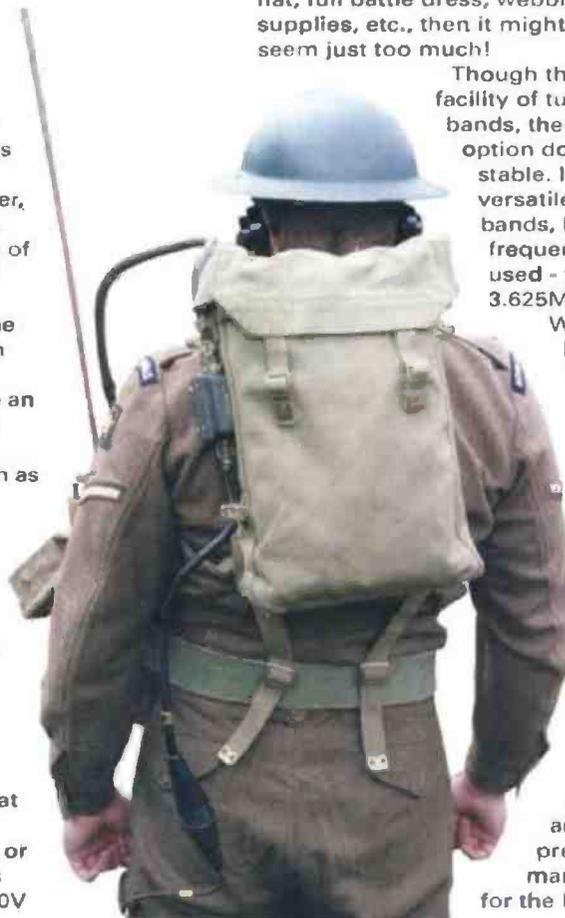


Fig. 5: The rear pack housing the battery. Note the headphones/microphone rubber connector.

Making Light Work...

Solving Power Problems

Reviewing solar panel units in the winter? You may think that Rob Mannion G3XFD has totally lost all his reason! But no, Rob considers that as we know they'll work in summer - he'd try them for possible all year round use.

Fig. 1: One of the pair of solar panels posed alongside a copy of PW for size comparison purposes. Each unit is rated at a nominal 8W (see text).



I've no doubt that some readers probably think I've lost my senses, but I was anxious to try solar power panels to provide a 'trickle charge' system for when I was operating in my car during the autumn and winter. During the summer, running the car engine up now and again (even with the air-conditioning on) became quite unpleasant and it was obviously not an 'environmentally friendly' thing to do.

Even in winter, when it can get quite cool at times, I still find it pleasant to sit in the car operating on h.f. as G3XFD/P. And, as many of you will know...it can get surprisingly warm in a car behind the windscreen so it seemed a very good idea to try a set of panels to see if they would be a good investment for possible all year round operation.

Key Solar Products

Bob Keyes GW4IED of Key Solar Products has been involved for some years now in both solar power and wind-driven energy sources. Bob has supported our 144MHz QRP Contest by awarding prizes for the runner-up and I was intrigued by the solar panels he'd donated - so I thought I'd try them for myself.

The panels Bob supplied were a nominal 8W at 12V type measuring 465 x 365 x 23mm in their casing. As they obviously incorporate glass - they're not that light (but still very portable) and weigh in at approximately 3kg.

For the review I was supplied with two separate units of the size mentioned, as Bob thought they'd be more portable and less cumbersome than a larger type. Each was fitted with a generous four metre length of lightweight 'mains' type twin cable with a fuse unit. The rear of the solar panel unit also contains diode protection to avoid 'feed back' from the battery that the unit is connected to for charging.

Useful Charge

Operating with the solar panels on the roof of my estate car I found that on the first day - chosen because it was overcast with intermittent rain showers - I found that the two solar panels working in parallel provided a very useful charge into the car battery. Even during a heavy rain shower the charge going into the battery (monitored using an AVO 8 meter) rarely dropped below 25mA.

During overcast conditions with no rain I found that the panels provided an average of 150mA, dropping to around 25mA in a heavy shower. It was fascinating to watch the meter vary its indication as cloud cover changed as the

clouds themselves moved.

In bright wintry sunshine the maximum current going into the my vehicle battery reached a peak of 500mA. I didn't think this was too bad at all...considering that the panels were laid almost flat on the car roof and weren't pointed directly to the weak wintry sun which was low on the horizon.

Running my Alinco DX-70 at 10W and less, I was quite happy that I could operate for long periods without risking a flat battery. I always worry about this because my car is a diesel (virtually impossible to push start!) and the battery has many demands on it because of the special adaptations so that I can drive the vehicle. So, I always take care to ensure I don't get stuck in lonely h.f. operating locations!

Practical Alternative

After my experiences using the solar panels over a month or so, I really think that they provide a practical, alternative charging supply. They would be absolutely ideal for a narrow boat holiday as you could place them on the cabin roof, or for



Portable power from the sun - G3XFD goes solar-powered while operating /P from his car.

camping to maintain a dedicated battery for a hand-held or portable rig. I'm so pleased with the results of the tests that I'm buying a set of panels for general and portable use. When not in the car I'll use them to 'trickle charge' 12V batteries I keep in the shack.

Solar panel efficiency (and value-for-money) has improved from the days I used them for maintaining the batteries at remote v.h.f. Band II radio and Band IV & V u.h.f. television 'active deflectors' in the Highlands of Scotland. In those days, solar panels cost the price of a hand-held transceiver but the price, even then, was worth it rather than having to carry freshly-charged batteries to the site once or twice a week!

So, it's without hesitation that I can thoroughly recommend these solar panels as an 'eco-friendly' battery charging system. With the appropriate care they should provide power for many years - providing we don't run out of sun!

My thanks go to Bob Keyes GW4IED of Key Solar Products, 4 Glanmore Crescent, Newport, South Wales NP9 8AX, Tel/FAX: (01633) 280958. Price of the solar unit reviewed are £33 each plus £10 P&P (per order, thus two panels cost £10 P&P). See Special Offer on page 51.

Bob also has a catalogue showing his full range of 'alternative' energy products and this is available in exchange for four First class stamps.

PW

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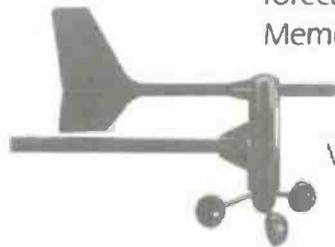
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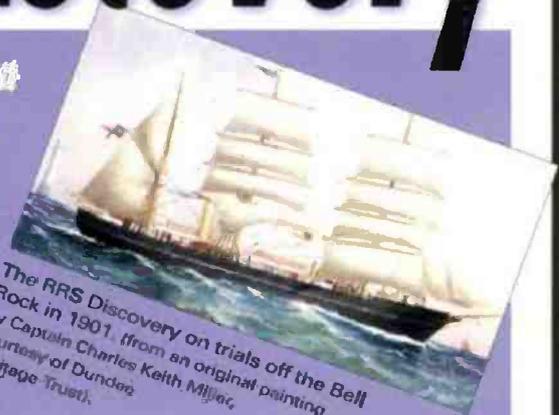
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A Special Event Dundee's Discovery

Ray Bennett GMOPTP shares the story behind a Special Event Station which took place back in November 1996 from the wireless cabin aboard Royal Research Ship *Discovery*, now based in Dundee, a city which is also famous for Jam, Journalism and (formerly) Jute manufacturing!



The RRS *Discovery* on trials off the Bell Rock in 1901. (from an original painting by Captain Charles Keith Miller, courtesy of Dundee Heritage Trust).

This fascinating story really begins when **Commander Robert Falcon Scott**, Royal Navy, led the National Antarctic Expedition for scientific and geographical work down South on *Discovery* in 1901. He'd already decided not to take wireless equipment which was still largely experimental after seeing telegraphy demonstrated in Switzerland where he was trying out sledges.

As a naval officer, Cdr. Scott knew of another officer - **Captain Jackson** - who had an interest in communications at sea by means of wireless telegraphy in association with **Marconi** and **William Preece**, (Chief Engineer to the Post Office in 1896). Another heavily timbered ship built to withstand the ice - the *Terra Nova* - didn't have wireless either. Built in Dundee, it took him on his fateful last journey to Antarctica in 1910.

(Incidentally, despite research I cannot find mention of telegraphy in books on *Terra Nova*, or any evidence of antennas rigged on the vessel in photographs, or telegraphists 'signed on' in the crew manifest).

Major Refit

The *Discovery* was sold to the Crown Agents in 1923 and had a major refit by Vosper before beginning life as Royal Research Ship (RRS) *Discovery*, intended for scientific research in the Southern Ocean.

Modifications were made to improve the ship's sailing performance by moving the main mast approximately 2.5 metres forward. Additional modifications included upper works built to carry a Gipsy Moth seaplane and the present larger deckhouse, in place of three smaller ones, to accommodate a wireless cabin with separate battery room, vented to disperse hydrogen fumes and a scientific lab where Special Event stations took place in past years.

The *Discovery* then had her port of registry changed from London to Port Stanley since she was then owned by the Governor of the Falkland Islands. A very long way from her eventual resting place, which was also her birthplace - Dundee!

The first expedition was led by **Dr Stanley Kemp** in 1925. Later, **Sir Douglas Mawson** an Australian geologist, led the British, Australian and New Zealand Antarctic Research Expedition (Banzane, 1929-31) when Wireless Petty Officer **A. J. Williams** RN used two Marconi sets, each of 1.5kW output. For his valuable work trying to maintain communications up to 4300km he was awarded the Bronze Polar Medal in 1934.

Historical Information

At this point, I should mention that I'm indebted to **Mr Hugh Scott**, Ship's manager, to **Duncan Nicoll GM7TRP**, a *Discovery* guide and particularly to **Martyn**

Jones G4XZJ for historical information.

I have been re-reading correspondence with Martyn some years ago when reconstruction of the wireless cabin on board *Discovery* was first mooted. He has been studying polar exploration for 40 years, has a library of 400 books on the subject and is a member of the Høgluyt Society which caters for such specialists.

Details of Williams' c.w. exploits, problems with propagation and getting signals are published in *Antarctic Days With Mawson* by Harold Fletcher, which is in the Wellgate Library.

My research has also been rewarded by some information from **Mrs Betty Hence**, Company Historical Dept., GEC-Marconi Electronics Ltd, who advises me that the first Marconi wireless equipment fitted in *Discovery* was in the 'T-type' series

Contemporary Gear

I am also pleased to report the members of the **Royal Naval Amateur Radio Society** (RNARS) have kindly offered help to find early contemporary gear to 'refurbish' the *Discovery* wireless cabin. Can you visualise a figure in Petty Officer's uniform seated at the bench, hand on key with a continuous Morse tape playing? With this facility, visitors to the ship will have a peek into the past on board at early maritime wireless communication.

Our Special Event Station was actually operated on the weekend of 16/17 November 1996 in aid of the BBC's 'Children In Need' appeal from which we raised £295. The *Discovery* was built in Dundee in 1901 and we operated in the original radio room which was last used in 1932.

So, perhaps when you do "Cross The Silvery Tay" - to quote a line of Victorian poetry celebrating the original Tay railway bridge, you'll also find time to visit RRS *Discovery*. If you do - you'll find a traditional welcome and much of historical radio interest. I look forward to meeting you - Haste Ye Back to Dundee!

PW



No, not the natural 'fireworks of the Antarctic's 'Aurora Australis' - but man-made fireworks celebrating the 10th anniversary of the preservation of the RRS *Discovery* at her Dundee birthplace.

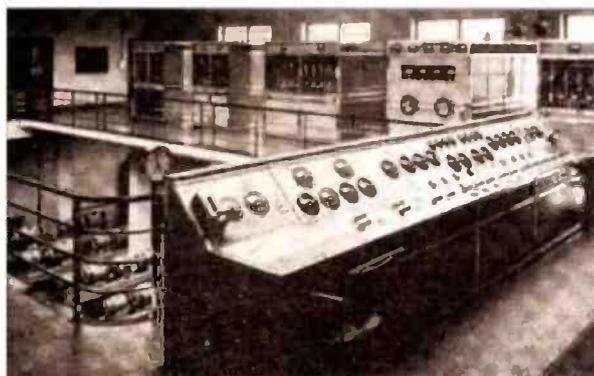
(From a postcard photograph courtesy of Dundee Heritage Trust).

RAY BENNETT GMOPTP INVITES ANYONE VISITING DUNDEE TO PEEK INTO THE PAST ABOARD RRS DISCOVERY

Valve Vintage

The warm smell of polished wooden cabinets and the dim glow of valve filaments announces that Charles Miller is looking after PW's vintage 'wireless shop' this month. This time he's chatting about 'ruling the waves' and 'waiving the rules'!

"...obviously, the high power long wave (1500 metres) National transmitter at Droitwich couldn't be fitted into the scheme so it was closed down altogether for the time being". This photograph (courtesy of the BBC) shows the control room at the famous Midlands transmitter just prior to the Second World War.



First of all, I would like to thank all the readers who wrote to tell me their personal experiences with the Barker 88, the subject of my last piece. Incidentally, it was also one of the few radio sets that continued to be produced through the Second World War after most of the manufacturers had been co-opted into making military equipment.

One particular letter referred to a development of the '88' called the '838'. Someone else has sent me brief details of what appears to be a projected push-button version which does not appear to have materialised.

As regards the bomb damage to Barker's store during the war, at the recent *Radiophile* exposition at Cowbit (Lincolnshire) I met a surprisingly young-looking gentleman. He told me that he'd been a student in London at the time and had actually seen the German V1 'Doodle-bug' pilot-less flying bomb fall onto the premises.

Turning back to 1939, considering the ever-worsening situation in Europe during the August of that year, the annual RadiOlympia went ahead in what appeared to be a spirit of almost total optimism on the part of the radio and television trade.

In fact, the only admission of concern about what might

happen if war broke out, was the decision by radio makers to postpone the fitting of new dials marked in accordance with the wavelength changes planned to take place the following March! It was a good idea at the time, as they say, but it didn't work out as expected.

Optimistic Noises

Whatever optimistic noises might be being made in public by the establishment as Britain experienced a glorious summer, in private there was little doubt of what was about to happen as the Nazi hordes poised themselves to cross the River Vistula into Poland.

The invasion took place in the early hours of Friday September 1st and, as Britain was pledged to give military support to Poland, war with Germany became inevitable. That same day, BBC engineers started to put into operation a long-planned emergency measure designed to prevent enemy aircraft from using its transmitters as handy radio beacons by which they could home in to the main UK centres of population.

All the medium wave regional stations and some of the nationals were re-tuned to one of two groups on 391.1m and 449.1m, the former being used in the northern part of Britain, the latter in the south.

Even the old long-wave transmitter at Daventry, mothballed since 1934, was dragged out of retirement and re-tuned to work on 391.1m. The result of this reorganisation was to render it impossible for enemy aircraft using radio direction finding equipment positively to identify the location of any one station until it was virtually within sight, by which time it was anticipated that the station in question would have been closed down on orders sent out by RAF Fighter Command.

Listeners in the area concerned would notice a considerable drop in signal strength but, provided they had decent antenna and earth systems, they ought to be able to carry on listening via one of the other stations in their particular group.

The idea was ingenious but unfortunately, to make it effective, all the transmitters had to carry the same programme material so the BBC had to abandon its cherished National and Regional set-up in favour of a single nationwide programme.

Obviously, the long wave National transmitter at Droitwich couldn't be fitted into the scheme so it was closed down altogether for the time being. Meanwhile, the former National transmitters at Brookman's Park, Moorside Edge and Westerglen on 261.1m were reassigned to a new night-time European Service.

A few weeks later the Droitwich transmitter was returned to the same wavelength and joined the other three. Because it too used a unique wavelength, the television transmitter at Alexandra Palace had to be shut down, which happened unceremoniously on that fateful Friday morning at the end of the trade transmissions made for the benefit of exhibitors at RadiOlympia.

In fact, the show itself closed down the same day instead of remaining open until the Saturday. Presumably someone had tipped the wink to the organisers that to remain open would be to risk grave embarrassment for the radio set exhibitors when the wavelength changes took effect.

Air Became Blue

When the following morning dawned the air

became blue all over Britain with the curses of listeners who could not find their usual Regional or National programmes, only a single new one calling itself the BBC Home Service. Particularly incensed were those people who had invested in expensive new sets featuring automatic tuning which had no longer worked as expected.

Added to the chorus of complaints were those of radio set designers who discovered that all their carefully considered new tuning dials had become obsolete overnight. As regards television, those would-be viewers who had recently paid out very large sums for receivers were not exactly pleased to discover that, effectively, they had wasted their money.

For that matter, gloom and despondency descended like a pall on the set makers who had invested much time and money in producing television receivers that now might as well be put back into their packing cases and dumped into store rooms. All this must also have caused some heart-searching on the part of our old friends at the BVA: what were they going to do with all those special types that had been specially developed for television?

There was an additional problem...what was going to happen if and when domestic radio receiver production had to take second place to military communications equipment? However, it's the proverbial ill wind that blows nobody any good and on further consideration of the situation certain compensations became apparent.

Television & Radar

Most of the television valves could be used equally well for radar purposes and ordinary radio types would still be needed for the military sets. In fact, the valve manufacturers were about to enter the nearest thing to paradise they could expect to find on earth!

When domestic receiver production did taper off about a year later, the existing vast range of different valves was reduced to a core of essential types. These were to be made in their millions and paid for by the best customer that any firm could wish for - the British tax-payer.

As an unexpected bonus, the Nazi occupation of most of Europe did something that the BVA never could manage on its own...it brought an end to the importation of cheap Continental valves. In addition, restriction of trans-Atlantic shipping curtailed imports from the USA.

The sound of cash registers ringing merrily in the valve makers' warehouses was music to the ears of the fortunate shareholders. Meanwhile, that section of the Establishment devoted to thinking up arcane rules and regulations about broadcasting had turned its attention to the various radio relay exchange companies, of which Rediffusion Ltd. was the best known example, that had been set up to distribute interference-free radio programmes to households via cable networks.

To preserve the BBC's monopoly the cable networks had always been forbidden to generate their own programme material. But now this rule was to be relaxed to permit them to send out emergency messages at the behest of the local Chief Constable or Air Raid Precautions Controller.

Nothing is simple to the official mind however! So the facility was

hedged about with a myriad of restrictions that must have made it all but impossible for anyone to judge what constituted an emergency within the meaning of the law.

For instance, to the ordinary individual it might well seem to be a good idea, if part of a town was a raging inferno due to incendiary bombs, to warn people to keep clear of it: but no, not a word was to be said!

The same applied if a certain area had been deluged with poison gas - keep quiet about it. If streets had been blocked and bridges brought down by bombs, too bad - road users must be left to find that out for themselves.

Under No Circumstances!

Even if hordes of panic-stricken citizens were to be observed running like lemmings towards areas of extreme danger, under no circumstances were they to be warned by public address loudspeakers. Oh, and to make sure that citizen morale was kept low, it was not permitted to report that enemy aircraft were being driven off by our own fighters.

It must have been great fun for the Civil Servants concerned, to sit in deep bomb-proof shelters and dream up the measures. There was, however a concession. Relay companies with two-channel services were to be permitted to put out foreign music broadcasts on one of them even during devastating air raids, provided, of course, that the other channel carried the BBC Home Service.

There was a catch though, as no foreign spoken items might be sent out. So presumably, someone had to sit by the main amplifiers in the relay company's headquarters and flick the switches to off when announcements between musical items were being made.

How the local Chief Constables and Air Raid Precaution (ARP) Controllers ever managed to get a word in edgewise through all this red tape is difficult to see. Unless, that is, they did a quick babble between foreign musical items!

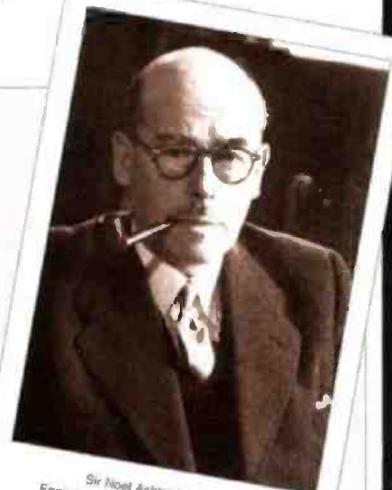
In fact, as far as can be deduced from the complex list of 'thou shalt nots', all that they were permitted to utter were the words "action alert" or "raiders passed" (which must have been a great help).

As I've remarked before, it seems almost incredible nowadays that no one ever seems to have stood up and told the people responsible for all those regulations that most of them were a load of rubbish. In fact, it's hard to avoid the conclusion that we won the war in spite of them and not because of them. **We did win, didn't we?** PW

Further Reading: The BBC At War

Readers interested in learning more about the (fascinating) and often heroic work carried out by the BBC and its Engineering staff (some of whom made the ultimate sacrifice while on duty) during the Second World War are strongly recommended to read *BBC Engineering History 1922-1972* (Published by the BBC). Although it's a rare book and long out of print, your local library can obtain a copy for you. You will not be disappointed!

Editor.



Sir Noel Ashbridge, Chief Engineer/Director of Technical Services, 1929 - 52.

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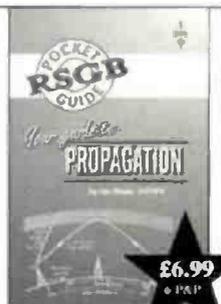
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Receiving Top Band - Vintage Style

Laura Scott G4HUV describes a 'vintage style' t.r.f. receiver Try it....and rediscover the delights of getting the best from a simple receiver!

The tuned radio frequency (t.r.f.) receiver I'm describing was originally constructed to meet the spirit of the December 1996 transatlantic tests on 1.815MHz. The 'tests' used a reconstructed vintage style transmitter to re-create the first transatlantic QSO by an Amateur Radio station (1BCG) from Greenwich

Connecticut some 75 years ago.

I found that 1920s parts were not readily available. So this receiver - whilst using triode valves as in 1921 - also uses parts dating from around the 1950s.

Additions to the circuitry have been made which recognise the increased occupancy and power levels in today's radio spectrum. Because of this, the end project might be correctly called 'practically vintage'.

Delightful Receiver

The result is a delightful little receiver which, from concept to completion took two weeks of spare time and was constructed entirely of junk box parts. With switched or plug-in coils, it could probably be extended to cover the 3.5 and 7MHz bands.

Two 12AT7 double triode valves are used which saves space. Additionally, the valve holders are still available (from scrap or junk boxes) and at rallies.

The first triode section, V1a, is used as an r.f. amplifier which isolates the regenerative detector (second section) from the effects of antenna loading. It also inhibits radiation from the oscillating detector.

I used a grounded grid configuration in the r.f. amplifier for stability and the gain can



A 'Vintage Style' receiver as built by G4HUV.

be preset by adjusting the cathode tap on the link winding. A second link winding connects the antenna input via a 1kΩ attenuator potentiometer (which can be wirewound).

Due to the low impedance at the r.f. amplifier cathode plus the antenna loading, the input tuned circuit is well damped and

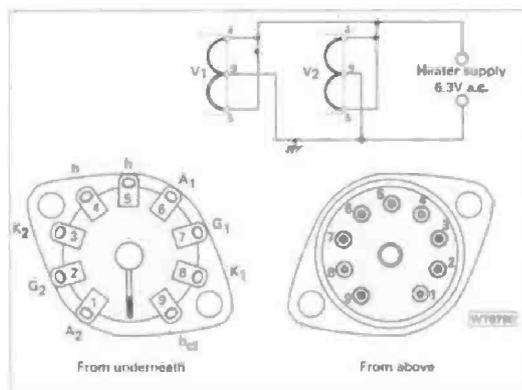
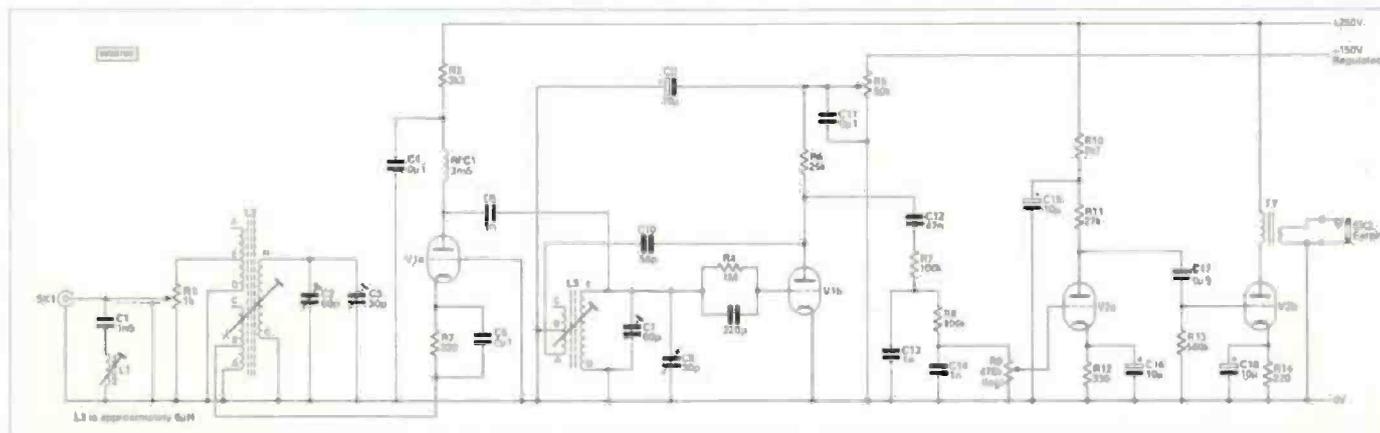


Fig. 2: Valve base diagrams showing pin-outs (the underneath view is on the left) for the valves and the required circuitry for operating the valve filaments from a 6.3V a.c. source (see text).

Fig. 1: Circuit of the 'vintage style' tuned radio frequency (t.r.f.) receiver.



does not need to be ganged with the detector tuning. Sensitivity is constant over 1.8 to 2MHz.

The detector tuned circuit, L3/C7/C8, is overwound with 15 turns tapped at five turns which allows for coarse adjustment of the positive feedback (use 5, 10 or 15 turns). The 56pF capacitor may also be changed to vary the feedback. Windings of suitable inductance were found on some scrap Toko i.f. coils (remove any fixed tuning capacitors).

Extra windings were added to the coils as indicated. KANK 3333 coils should be suitable with around 180pF of tuning. Trimming capacitance - with link windings should be added or adjusted to suit. (By using wafer switches to modify the fixed capacitance the 3.5MHz band could also be covered).

Terminations for the additional windings can be provided by cutting 'lands' in a piece of p.c.b. material. This can then be stuck to the side of the coil can.

The recovered audio signal at the detector anode is passed through a two stage resistance-capacitance filter to remove r.f. and then to the volume control and a.f. amplifier. (the 1920s circuitry would have used a 3:1 step-up transformer to couple the detector and audio amplifier, but one was not available, however, the 9.5dB loss is not important with this circuit).

Crowded Bands

For today's crowded bands, an active resistance-capacitance audio filter can be added before the volume control. This filter should have an input resistance greater than about 300k Ω to avoid significant loss of audio signal.

The audio output transformer, T1, which I used, is an RS Components 250V to 6.3V 1A filament transformer. It performs admirably into an 8 Ω load.

My Version

My version was built on the copper side of a piece of p.c.b. material with the valve holders standing upright 15mm above the copper on 6BA screws and nuts. Isolated pads were then cut in the copper below the valve holders for the pin connections.

I mounted tall components upright from the copper base or from pads on the board itself. Small components were suspended between their relevant connection points.

As construction progressed I found it necessary to fit a series resonant trap (C1/L1) across the 50 Ω antenna input connection. This was to prevent overloading and rectification of



Fig. 3: Rear 'chassis' view of the G4HUV project. The prototype uses a plywood front panel with a p.c.b. material main 'chassis'.

the audio from a local broadcast transmitter on 1650kHz.

Reaction Control

For those readers who are unfamiliar with this type of circuit, the reaction control (the 50k Ω variable resistor, R5), is rotated so that the detector is just over the 'threshold' of oscillation. This is indicated by a significant and sharp increase in background hiss.

At the 'threshold' point, the sensitivity is maximum and c.w. and s.s.b. signals are converted to audio frequencies. In the

prototype, this point occurred when the wiper of the reaction control was at a potential of 40V.

With some modern (high

power!) signals, the detector is easily overloaded so I fitted the 1k Ω r.f. attenuator, R1, and found it to be very effective (if not essential). It works as a form of r.f. gain control.

Sensitivity Good

The receiver sensitivity is very good and on a quiet band (in a quiet location) the background hiss increases by 10 to 15dB when the antenna (which should present a 50 Ω impedance) is connected. I found the audio output level is adequate for 8 to 16 Ω headphones or a small loudspeaker.

For my receiver, an elderly p.s.u., which provided 250V and 150V d.c. (from a VR150 regulator) plus 6.3V a.c. was used. The current drain at 250V is 25mA maximum.

The detector circuit takes only about 2mA which could be supplied from a 70V string of zener diodes across the 50k Ω reaction control. This is fed from the 250V line through a 33k Ω 2W resistor.

That's all there is to it! So, why not have a go yourself...you won't be disappointed!

PW

"... took two weeks of spare time and was constructed entirely of junk box parts"

LARRA SCOTT G4HUV SHOWS YOU HOW YOU CAN STILL GET THE BEST FROM A SIMPLE RECEIVER

A Shining Example of International Co-operation

The International Beacon Project

Following the publication of PW's 'Lo Band' Data Card with h.f. beacon information, Martin Harrison G3USF the RSGB beacon co-ordinator for h.f. International Amateur Radio Union (IARU) provides the facts and fascinating story behind the International co-operation needed to operate such a system.

Often the perennial query in every operator's or listener's mind as he or she sits down at the h.f. rig or receiver is "What are the bands like"? A quick tune gives some impression but silence may simply mean that nobody else is calling rather than that the band is closed. Many a good contact has been lost in that way, especially on 24 and 28MHz where inactivity breeds inactivity.

Fortunately we now have propagation indicators that never sleep and never weary with an apparently dead band - the NCDXF/IBP beacon network. That mouthful of initials needs some unpacking and that's my job in this article!

North California DX Foundation

The NCDXF is the North California DX Foundation which conceived, initiated and developed the project. The acronym IBP stands for International Beacon Project, as the network is now known.

In essence, the IBP goes back to 1979, when the first of eight frequency-sharing beacons was set up on 14.100MHz. This limited scheme has now been supplanted by an 18-station network on 14.100, 18.110, 21.150, 24.930 and 28.200MHz - a quantum leap forward.

Traditional 10W beacons (mainly on 28MHz) have given excellent service over many years. And I say 'Hats off' to the operators who maintain them so devotedly, usually with little recognition and they still have a useful role.

However, these new 100W beacons give us a much better idea of what we ordinary operators with basic transceivers and modest antennas are likely to hear or work. **And they do this on five bands, 24 hours a day.**

The World

The IBP beacons are dispersed as evenly around the world as geography and licensing authorities allow. They lie at a fair range of

beam headings and distances. So, they quickly tell us something about paths to the Western hemisphere, the Far East, the Antipodes, Southern and East Africa and closer to home.

Each beacon transmits on each frequency in turn for 10 seconds and then goes silent until its 3-minute cycle resumes. The sequence moves westwards from New York across North America, Asia and the Pacific, to Africa, Europe and, finally, South America.

So, by leaving the receiver on your

chosen frequency you can get a pretty good impression of the state of the band in only three minutes. Or just under 16 minutes for all five bands.

At the moment, 16 of the planned 18 beacons are already installed (though the California and Hawaii beacons are not yet licensed for 18 and 24MHz). Additionally, **KH6WO** and **OA4B** are operating from temporary locations, pending transfer to their long-term sites.

The Canadian beacon, **VE8AT**, was to have been moved to one of the Northern Arctic islands during this past summer. However, the building that was to have housed it burned down so, for the present, it's at

"... 'Hats off' to the operators who maintain them so devotedly, usually with little recognition..."

Fig. 1: Beacon locator map as published on the PW 'Lo-Band' Data Card.

Slot	Country	Call	Location	Latitude	Longitude
2	Canada	VE8AT	Alert	82_31' N	62_18' W
14	Finland	OH2B	Espoo	60_11' N	24_50' E
3	United States	W6WX	Mt. Umunhum	37_09' N	121_54' W
4	Hawaii	KH6WO	Honolulu (temporary)	21_17' N	157_48' W
1	United Nations	4U1UN	New York City	40_45' N	73_58' W
15	Madeira	CS3B	Santo da Serra	32_43' N	16_48' W
13	Israel	4X6TU	Tel Aviv	32_06' N	34_48' E
18	Venezuela	YV5B	Caracas	10_25' N	66_51' W
17	Peru	OA4B	Lima (temporary)	12_04' S	76_57' W
7	Japan	JA2IGY	Mt. Asama	36_16' N	138_18' E
12	Kenya	5Z4B	Kilifi	3_37' S	39_50' E
10	Sri Lanka	4S7B	Colombo	6_54' N	79_52' E
16	Argentina	LU4AA	Buenos Aires	34_37' S	58_21' W
11	South Africa	ZS6DN	Pretoria	25_54' S	28_16' E
6	Australia	VK6RBP	Rollystone	32_06' S	116_03' E
5	New Zealand	ZL6B	Masterton	41_03' S	175_36' E
8	Russia	—	—	—	—
9	China	—	—	—	—

Edmonton in VE6.

Negotiations are under way for the remaining two sites in Central Siberia and China. Updates are posted promptly at the NCDXF Website - <http://www.ncdxf.org/beacon.htm>. Major changes are also announced in the UK via the RSGB's GB2RS News broadcasts.

Kenwood Transceiver

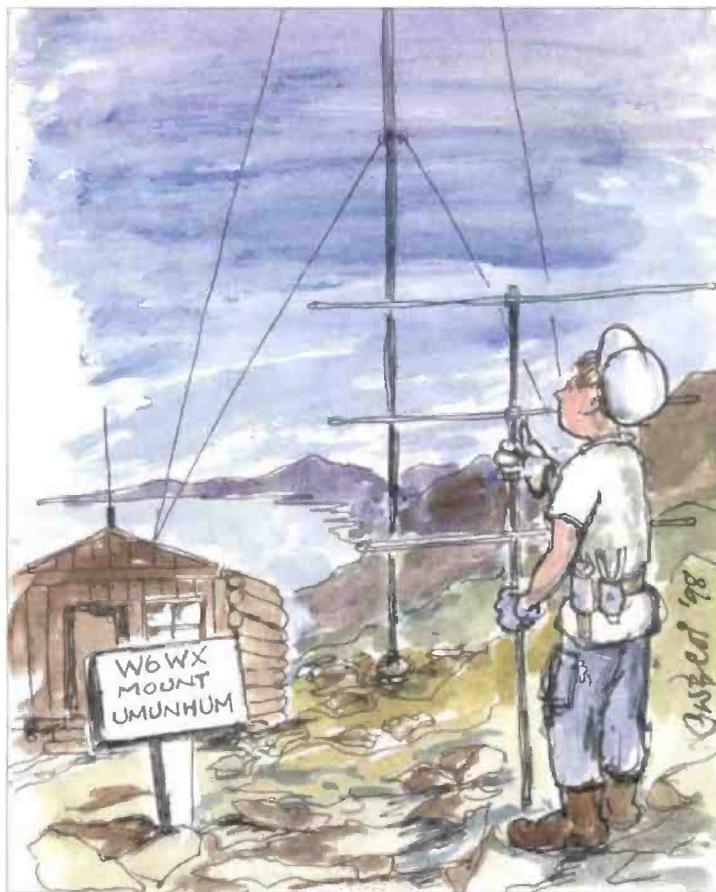
All the beacons are identical: Each uses a Kenwood TS-50 transceiver, Trimble Navigation Acutime GPS Receiver, controller (purpose-built by N6EK) and Cushcraft R-5 multiband vertical antenna.

Transmissions are also standardised: callsign at **22wpm** followed by **four one-second dashes**. The callsign and first dash are at 100W, the other three dashes at 10, 1W and 100 milliwatts respectively.

In marginal conditions, only the 100W transmission will be audible, but I find that if the band is reasonably open, the 10 and 1W level transmissions can usually be heard too - very heartening for QRPers! The 100 milliwatt dash is altogether more demanding and is more readily imagined than truly heard.

Yes, I agree that **22 wpm Morse is faster than most of us are comfortable with**. (So much has to be packed into a 10-second transmission.) However, if you know what you are looking for, the different beacons are easier to identify than you might think!

Only **LU4AA** has a double letter; only **YV5B** starts with a Y. Incidentally, due to a fault, **CS3B** currently sends all four dashes at 100W and so on. But if you really find the Morse too much of a struggle, the BeaconClock program tells you which beacon you should be hearing for any given time and frequency and it is free at

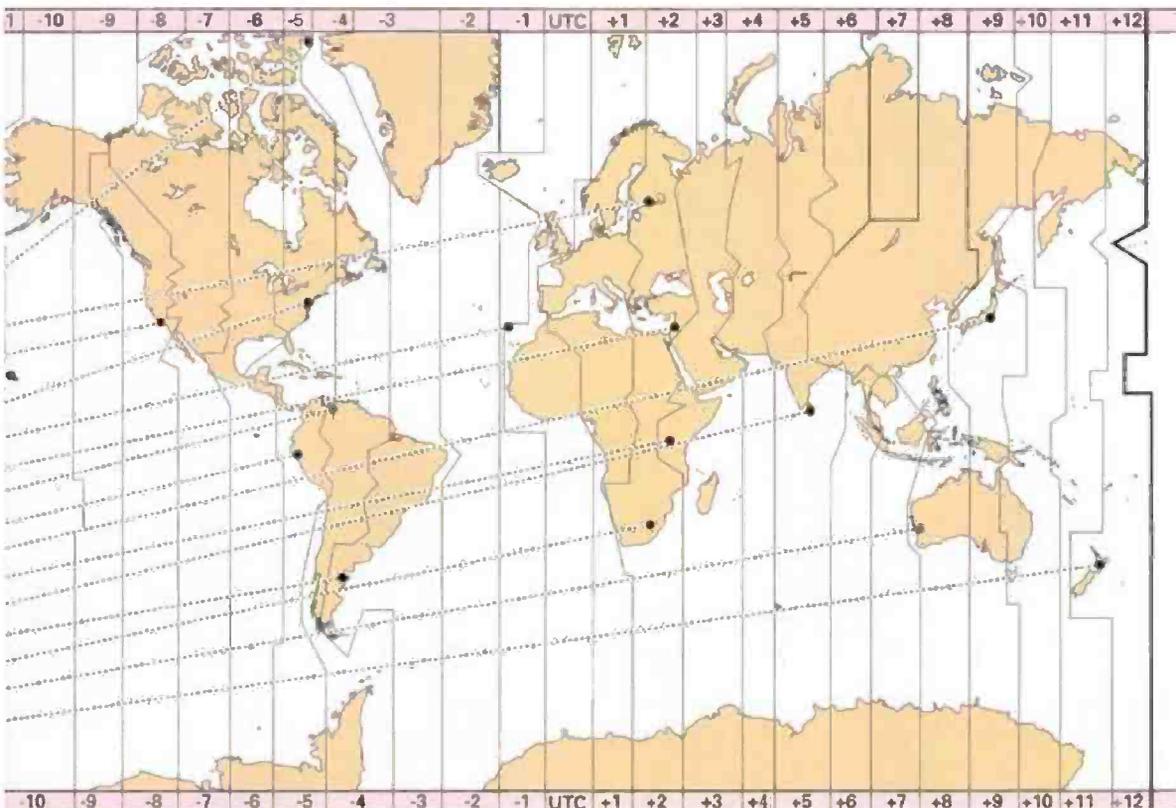


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Crucial Synchronisation

The crucial synchronisation of the entire system is achieved by means of the GPS receiver and the control unit designed and built by **Bob Fabry N6EK**. Bob is one of two people

All the IBP beacons use the same equipment, including a Cushcraft vertical antenna and a Kenwood TS-50 transceiver. The illustration, depicting the W6WX beacon on the West Coast of the USA, provides a good idea of the enormous amount of work hidden behind each beacon callsign.



Continued on page 40...

"ANYONE USING THE BEACONS OWES A GREAT DEBT TO BOB N6EK AND JON W6ISQ"

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Again, the only base transceiver to offer 2/6/70/23 all mode in one box. Discontinued only 18 months ago, we have once again a couple that have been well looked after, offered with 12 months warranty and still make a fine investment.
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Delivery now Feb '99. Once again we're asking for a £25 deposit to secure earliest delivery, just like all of you that placed a deposit for the FT-847GX and got ahead of the rest of the suppliers! HF + 6m + 2m + 70cm (4m ?? Don't know!)
All in a package the size of a Dual Band mobile.



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Slot	Call	14.100	18.110	21.150	24.930	28.200	Operator	Status
1	4U1UN	00:00	00:10	00:20	00:30	00:40	UNRC	OK
2	VE8AT	00:10	00:20	00:30	00:40	00:50	RAC	Off air: moving
3	W6WVX	00:20	00:30	00:40	00:50	01:00	NCDXF	No op on 18 or 24MHz
4	KH6WQ	00:30	00:40	00:50	01:00	01:10	UHRC	No op on 18 or 24MHz
5	ZL6B	00:40	00:50	01:00	01:10	01:20	NZART	OK
6	VK6RRP	00:50	01:00	01:10	01:20	01:30	WTA	OK
7	JA2GY	01:00	01:10	01:20	01:30	01:40	IARU	OK
8	UA...	01:10	01:20	01:30	01:40	01:50	SRR	Does not exist
9	BY...	01:20	01:30	01:40	01:50	02:00	CRSA	Does not exist
10	ZS7B	01:30	01:40	01:50	02:00	02:10	RSSL	OK
11	ZS6DN	01:40	01:50	02:00	02:10	02:20	ZS6DN	OK
12	5Z4B	01:50	02:00	02:10	02:20	02:30	RSK	OK
13	4X6TU	02:00	02:10	02:20	02:30	02:40	U.Tel Aviv	OK
14	OH2B	02:10	02:20	02:30	02:40	02:50	U.Helsinki	OK
15	CS3B	02:20	02:30	02:40	02:50	00:00	ARRL	OK
16	LU4AA	02:30	02:40	02:50	00:00	00:10	RCA	OK
17	OA4B	02:40	02:50	00:00	00:10	00:20	RCP	OK
18	YV5B	02:50	00:00	00:10	00:20	00:30	RCV	power doesn't reduce below 60W

Fig. 2: The IBP beacon time slot and sequencing for the 14, 18, 21, 24 and 28MHz bands (see text).

Continued
from page 37...

without whom the International Beacon Project would never have come to fruition.

Bob's technical expertise and countless hours of constructional work were allied to the dedication of **John Troster W6ISQ** in locating sites, ensuring financial support and backup and seeing through the endless negotiations needed to get the project off the ground. Anyone using the IBP beacons owes a great debt to these two, NCDXF and the societies and institutions who will maintain the beacons through the years ahead.

How Best To Use It?

So, we now have a very advanced beacon system ... how best to use it? In answering the question I've got to say....it obviously depends largely on our individual needs and interests.

One way to use the system is to set the receiver for your favourite band and listen through the 3-minute cycle to assess what state it is in. Alternatively, if you want to work, let's say South Africa, wait for ZS6DN to come up on 14MHz, move with it to 18MHz and so on and see which frequency gives the best signal. If you do either regularly, you develop a feel for what is 'normal' for that band or path at any particular time and consequently, whether conditions are 'up' or 'down'.

Against that understanding of what is 'normal', the abrupt disappearance of the beacons may indicate a Sudden Ionospheric Disturbance, heralding disturbed conditions 24-48 hours later. Alternatively, if **4X6TU** (Tel Aviv, Israel) surges back after evening fadeout this can be due to F2 enhancement, which sometimes occurs in the early stages of an ionospheric storm, briefly providing unusual DX contacts up to 50MHz.

If **OH2B** (the Finnish beacon) 'goes auroral' with a rusty note you can look to 50 and 144MHz for auroral contacts. And if it comes through strongly during disturbed conditions there may be auroral-Es at both h.f. and v.h.f.

I'm hoping that when VE8AT finally reaches its Arctic home it may provide valuable pointers to transpolar openings on 50MHz as well as h.f. In short, once we get to know them, the beacons are useful for those of us who work above 30MHz as well as below.

What Next?

What next? Even an 18-beacon network leaves lots of gaps. There's scarcely space for more beacons on 14MHz but there's certainly room on 'ten' metres where 28.190 to 28.199MHz is designated for regional frequency-sharing networks. That gives three frequencies for each IARU region - enough for as many beacons as we are likely to need.

Europe could take the lead in establishing the first of the continental 28MHz (even better would be 28/50MHz) frequency-sharing networks, building on lessons of the IBP system. Surely there are sufficient people interested in the challenge of creating such a state-of-the-art network to bring it into being? No existing beacon would be obliged to close but some might well 'trade up' to a new system.

The beacons are also an ideal platform for propagation buffs. They make it so easy to set up a personal project on, let's say, the 'breakfast path' to VK6 or propagation at 18MHz. The former could be done very simply by direct monitoring or using a time-controlled cassette recorder. More ambitious projects would require computer-controlled logging.

Worldwide Challenge

The IARU will shortly be issuing a worldwide Challenge for the best automated monitoring system for the IBP beacons. Details will appear in *PW* in due course. But there's certainly nothing to stop you pondering your own approach even now!

However, if you do not fancy rolling your own, DL4FBI's program (described in the ARRL's October 1997 *QST* magazine, can be downloaded from the ARRL's 'ftp' site oak.oakland.edu/pub/hamradio/arrl/qst-binaries directory, where the file is **DL4FBI.ZIP**

The only real problem is that the beacons are vulnerable to interference. Although they operate in IARU beacon sub-bands, and on 14MHz have done so for many years, the 14.100MHz transmissions are frequently buried under digimode transmissions or contest c.w.

Unfortunately, there are also ominous signs of the other frequencies being affected as maximum usable frequencies (MUFs) rise with the new solar cycle. Band plans are, of course, only advisory, but if you operate on h.f. **please respect the beacon frequencies.** (Sadly, some long-established G calls are regular 'ragchewers' on 28.200MHz c.w.).

If you do hear someone operating on a beacon frequency, even if you are not yourself a beacon user, do please ask them as courteously as possible to move. The IBP network is a superb tool for operating or propagation study. So, let us exploit it to the full and do everything we can to maintain its full usefulness for the entire Amateur Radio community worldwide.

PW

antennas in action

NEWS & PRODUCTS ■ QUESTIONS & ANSWERS ■ ANTENNA WORKSHOP ■ REVIEWS ■

welcome to AiA!



Welcome to Antennas-in-Action, a bi-monthly section of *PW* dedicated to all to do with antennas, feeding them and building and looking after them. In this section you will find articles, ideas, mini reviews, readers' tricks and tips all together. This is also your section of the

magazine where you can share your ideas about good, and bad, antennas with other readers.

In *Antenna Workshop* this time David Butler continues with his microwave tales of 10GHz and above. In 'Tex Topics' you'll find a clothes dryer support, a dual-band v.h.f./u.h.f. portable antenna, a couple of simple but ingenious ideas, a satisfied antenna user, and some more on the accuracy of the MFJ-259B Antenna Analyser. Oh and of course - some books for your bookshelf.

G17EX

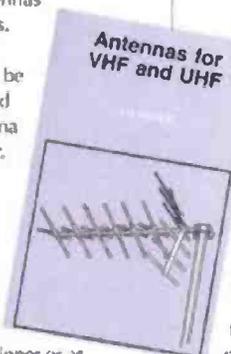
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David Butler G4ASR	

A Few Books

Let me start off with a few books for Christmas as, by the time you read this column there's probably just time before Christmas to get yourself that 'extra Xmas present'. At the lower end of the price range, but offering very good value for money, is *Antennas For VHF and UHF* from the pen of Ian Poole G3YWX. This 100-page Babani book with over 50 illustrations, covers in nine chapters most of the basic information that is needed, from basic concepts, to feeders to the antennas and measurements.

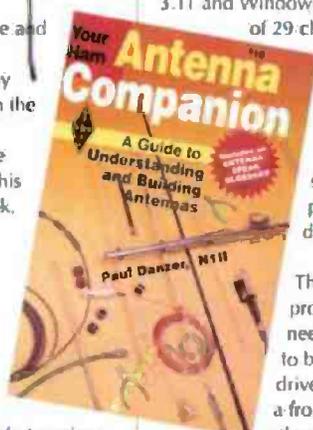
Each antenna type, be it Yagi, cubical quad or wideband antenna has its own chapter. Even vertical antennas and the simple dipole have their own chapters. All in all very good value for money and suitable for the beginner or as an 'aide-memoire' for the more advanced user. Ian has also mentioned to me that he has a new book due out soon and I shall be looking at it on your behalf. The book, published by the RSGB, is



about propagation, so keep looking in! Moving up, in both size and coverage, *Your Ham Antenna Companion* by Paul Danzer N111 from the ARRL covers antennas from h.f. to u.h.f. There are seven chapters in this new edition of the book, covering h.f., v.h.f., u.h.f. and 'hidden' antennas, before dealing with how to feed the antenna and how to get it up in the air to start with.

Although the book's American origin shows in the chapters on safety and resources, it's illustrated with enough drawings and photographs to make it a very good read for every one. In the resources section are a variety of book titles suggested, including several from the RSGB, and for those of you with internet access, there are some antenna start-point addresses for you to have a look at with your new computer.

The final book I've got for you this time is from Joseph J. Carr. The *Practical Antenna Handbook* now has an accompanying CDROM



with software (runs on Windows 3.11 and Windows95). Consisting of 29 chapters and an Index, this book really has 'everything'. The CDROM has various software programs and data files on it. The antenna program, which needs the CDROM to be resident in your drive to work acts as a front-end to several other programs to

calculate antenna dimensions. The types dealt with are: Wire antennas, Vertical antennas, Beam and small loop antennas. Another program to be found is *miniNEC*, which is a 'freeware' program to evaluate antennas as short discrete sectional parts.

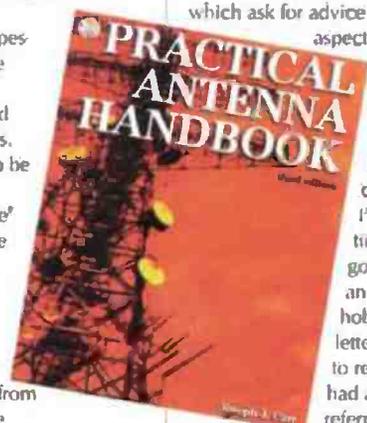
Other programs on the CDROM apart from VOACAP, calculate Latitude/longitude, impedance matching and wavelength

/frequencies. Turning now to the VOACAP program, which is a propagation prediction program said to be used by Voice of America when making their own schedule predictions.

This book is a splendid reference book, even if you do not at present have an IBM (or clone) PC computer with a CDROM. However, if you have a PC then this book/CDROM is to be highly recommended to anyone with a fascination for antennas in general.

Your Letters

Now to turn to your letters, many of which ask for advice about some aspect of antennas, either to recommend one type or another or how to mount or feed them. I've said many times, that a good library is an asset for any hobbyist, and two letters I've replied to recently have had answers that referred back to articles that have appeared in previous issues of *PW*.



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ECC88	6.00	PL509/519	10.00	6C25	3.00	6Y2B	95.00
ECC89	15.00	PL802	4.00	6C4	2.00	805	45.00
ECC90	1.50	PY500A	3.00	6C85A	3.00	807	7.50
ECH35	3.50	PY800/801	1.50	6CD6G	5.00	811A	25.00
ECH42	3.50	0QV02-6	12.00	6CL6	3.00	812A	55.00
ECH81	3.00	0QV03-10	5.00	6CG7	7.50	813	27.50
ECL82	3.50	0QV03-20A	10.00	6CH6	3.00	833A	85.00
ECL86	3.50	0QV06-40A	12.00	6CW4	6.00	866A	20.00
ECL1800	25.00	U19	8.00	6D05	17.50	872A	30.00
EF37A	2.50	UABC80	1.50	6D05B	10.00	931A	25.00
EF40	4.00	UIC42	5.50	6F56	6.00	2050A	12.50
EF86	10.00	UIC82	2.00	6F07	7.50	5751	8.00
EF91	2.00	UIC83	2.00	6GK6	4.00	5763	6.00
EF183/4	2.00	UFB9	4.00	6J5G	6.00	5914A	5.00
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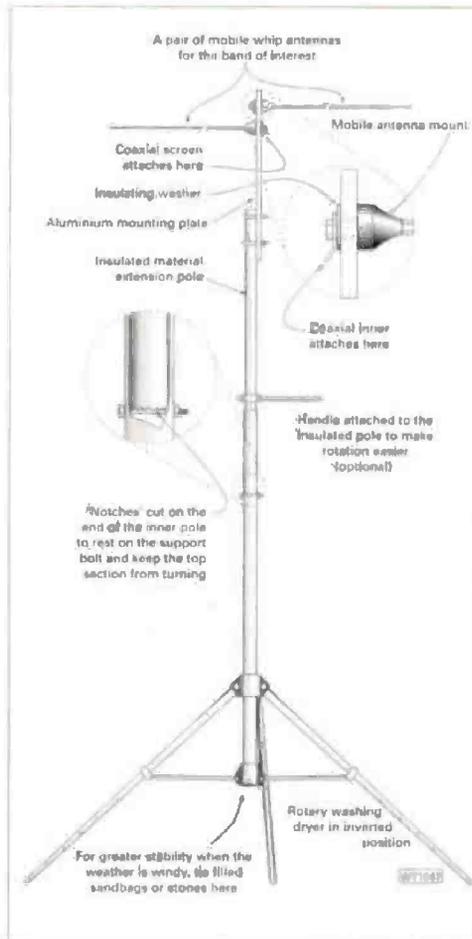


Fig. 1: A spare clothes dryer can make a simple, quick to erect antenna support (see text).

From Ian Hughes came a request for information about converting an old CB 'Silver Rod' antenna (physically 5λ/8, but electrically 3λ/4 - I think) to use as on the 50MHz band. This one turned out easier to remember than to find - but eventually I tracked it down to the August 1994 'Antenna Workshop' where J. Bolton G4XPX described just the modifications needed ('A Cheap 50MHz vertical Antenna' page 36).

It was to another 'Antenna Workshop' that I turned for an answer to the query sent in by Ken Smith G3IYU, who asked for some information about stacking various antennas on a single stub mast. The answer was once again in an August issue of PW, but this time in 1996,

where on pages 44/45, David Butler G4ASR explained just how to stack various antennas on one pole.

Clothes Dryer

I've had a letter from Glenn Loake G0GBI with a rather novel use of a 'spare' clothes dryer. In his letter Glenn writes: "As winter is approaching, perhaps our thoughts turn to next year's special event and portable operations. This idea is basically for use in locations where no ground spike or guy wires can be used, such as car parks, school playgrounds and the like. This project is to allow portable working anywhere.

First the mast support. This is an inverted clothes dryer setup to

become a self supported short mast, as shown in Fig. 1. A cross bolt is fitted in the upright stem about 450mm down from the top (bottom!) to support the extension mast when dropped into the tube. The extension mast is a 1.5m length of non-conducting material (fibreglass or wooden pole etc.)

You will notice that the extension mast is serrated at the bottom so as to 'lock' when the dipole is rotated into desired direction. A short cross-arm may be clamped to this extension mast to aid rotation. But if a simple dipole antenna system is used, then the requirement for pointing accuracy is reduced.

Now The Dipole

I'll now turn to the dipole, which is made from two mobile whip antennas formed into a dipole as

shown. The plate for the whips is as shown in Fig. 2, which is attached as I mentioned to the insulated material extension mast for best results. Of course the results were not as good as a full-sized λ/2 dipole as expected. In spite of this limitation, I have still managed to work into Europe as far as Italy and most of the former Russian states.

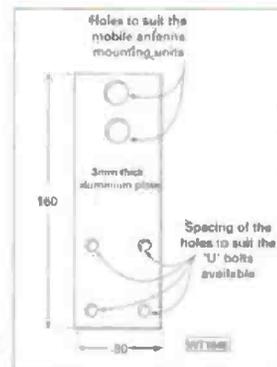


Fig. 2: Approximate dimensions for the aluminium plate used.

I haven't managed to get into the USA yet, perhaps due mainly to the time of day. The results are better than just using one of the whip antennas on the car. I can hear someone asking why not just use a vertical antenna? My answer to that is that a bidirectional antenna, such as this dipole, allows unwanted signals to be 'nulled out'.

This year I have only made the 14MHz (20m band) version and I was pleased with the results, with the exception of one minor problem. The drawback is that the dipole made from simple mobile whips is very narrow band in use. The only adjustment of matching is with the short stainless steel whip ends. I've found that a bandwidth of 25-30kHz is useable and although this can be improved by using an a.t.u., the performance does drop slightly.

Transportation is easy, as the clothes dryer frame folds up into a short(ish) single 'pole'. One of the whips forming the dipole is taken off and the plate removed from the extension mast. This leaves three narrow 'packages' that can be fitted into most cars. A plus point of course, is that

the removed whip can be used on the car while travelling to the location.

The whips I used in the design were purchased from QSL Communications, a supplier I found that has a good speed of return for mail order items. I shall try whip antennas for other bands in the coming year, and although it's not as efficient as a full-sized dipole, the compensation is ease

of erection (one person) for a simple short duration station. If you intend using the system in windy conditions then a couple of large stones or sandbags on the 'legs' should keep the system stable in all but the strongest winds".

On reasonably calm days the dryer support could be used to support a small h.f. mini-beam or, perhaps a two or three element beam for 50MHz. This is something you could try for yourselves. I've noticed that there are similar designs for portable mast supports on offer at shows that I've been to recently".

Thanks Glen, I like the idea, it seem to be a little cheaper than the portable mast supports I've seen, and at a push, you could 'borrow' one from the back garden to try it.

Fig. 3: An N-type plug set into a plastic block forms the centre of a portable dual-band dipole.



tex topics



Fig. 4: Two 4mm plug/socket arrangements are used for mounting the elements of the antenna.

out first! I've used something similar myself at home to support a small 144MHz beam while carrying out tests on it so, I know this idea works.

Mind you, I had to put the rotary dryer the right way up before 'she-who-must-be-obeyed' came home. Questions such as 'I wonder why my dryer is so dirty?' gave me a few minutes of having to think very quickly though (not to mention the drain on the pocket to foster 'peace' afterwards). So beware readers, should you try this one at home!

Dual-Band Dipoles

I've been looking at a very neat portable dipole that may be used with acceptably low s.w.r. on both the 144 and the 430MHz bands. Suitable for both horizontal or vertical polarisation the Hari antenna consists of a central block with a substantial N-type socket with 4mm sockets and two whip antenna elements fitted to 4mm 'banana' plugs.

What is actually hidden within the central block I don't know, but when assembled it worked quite well on both bands. I fitted it with a two metre length of RG58 coaxial cable to a 430MHz hand-held transceiver. Even though this wasn't an ideal feeder to use, the signal increase on a distant repeater was significant, and it became fully

quieting in almost any position of the antenna.

To fix the antenna to a support, there's a sturdy bolt with a plated wing nut set into the material of the centre. This bolt is isolated

from either of the two-elements, so it may be attached to metal poles for support. The central part of the antenna is shown on the photographs of Fig. 3 and 4. I found that the antenna, as supplied, had a commendably low s.w.r. in both the 144 and 430MHz bands.

Available from Waters & Stanton for £19.95 the unit is ideal for those bands it's designed for. However, I was intrigued to see what other element lengths could be used with the centre piece. I took two measurement test leads that were both one metre long and plugged them into the sockets.

I found that an acceptably low s.w.r. was to be had a little under the 70MHz band. Not wanting to cut up a pair of test leads, I tried a little trimming on a pair of made-up leads and found that I could easily trim to a low s.w.r. over most of the 70MHz band. With a little more experimentation I could have made a pair of portable whips for that band.

After this success, I then tried a pair of leads that I thought would work on the 50MHz band and, after a little more trimming I had a pair of elements suitable for that band too. Afterwards I put a pair of longer leads in and found it made quite a good antenna for my h.f. radio. So, all-in-all a very useful dual-band antenna.

As an aside at this point, in the next 'Tex Topics' column I shall be looking at an interesting dual-band yagi for 144 and 430MHz. It's interesting, because it too, has only a single feed point!

E-mail Query

Some time ago I had an E-mail from Shane G0NCF asking for some information about the Qtek Penetrator antenna. I had to reply that I knew nothing about it, all I could offer were articles that I thought might be of help. But since then I've had another E-mail from Shane, who said "I have taken the plunge!, and bought one, but I am very pleased with it. The long wire version is 45ft (14.5m) long with an 'AMU' (auto matching unit), and the s.w.r. is 1:1 on all bands except 80m (3.5MHz) where it is 1.3:1. I was told that it uses 'variable reactance' to achieve this, I would still be interested to know exactly how this is achieved, but it works!

"Considering my small loft (4.5x3.5m) it works well, I get good reports on 20m (14MHz) and up, but 40m (7MHz) and below are not so favourable as you would expect, but I have had QSOs on 40 and 80m. An earth is recommended for the antenna but after reading up on the subject, including your article in the Practical Wireless, it does not seem worth while as the antenna is in the loft, and the size of ground plane I would need is not practical, so I am going to try a short counterpoise as mentioned in the HF Antennas For All Locations book. The antenna will then be an asymmetrical dipole (sort of!) negating the need for an earth I tried connecting the antenna in a

loop but the signals dropped slightly on the lower bands so I think it is best to use it with a counterpoise".

I'm glad you've had some success Shane, I'm sure your words will be of help to readers wondering if such an antenna will work for them. They can take heart from your success! Now, if one of our readers could explain how the 'variable reactance' part of the antenna works - I for one would be very interested.

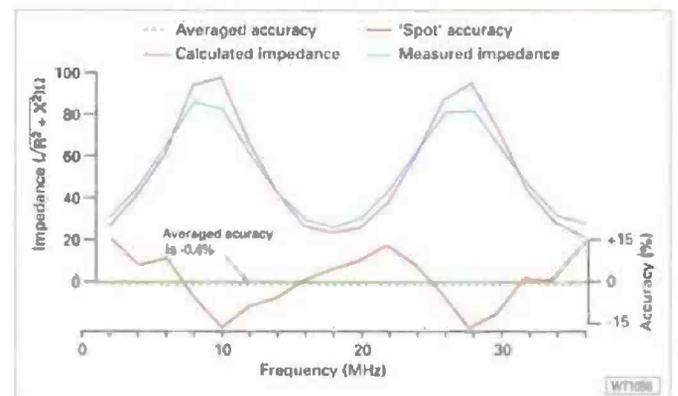
Antenna Analyser

Some time ago I had a call at home from a reader who bought an MFJ-259B Antenna Analyser after



Fig. 5: Computer software can make Smith chart operations much easier to do. (The 'Softwindows' heading is the program I ran on a Macintosh computer to take the screenshot).

Fig. 6: Combined graphs of the accuracy of one MFJ-259B antenna analyser unit; (see text).



antennas in action

Table 1

Freq (MHz)	λ (m)	Cable length	(Calc) R	(Calc) X	(Real) R	(Real) X
2	150.00	0.05	25.05	9.0	29	11
4	75.00	0.11	36.40	26.85	39	23
6	50.00	0.16	53.95	36.70	59	28
8	37.50	0.22	90.60	24.90	86	0
10	30.00	0.27	95.40	-17.71	81	15
12	25.00	0.33	58.94	-37.65	53	30
14	21.43	0.38	38.73	-28.74	36	22
16	18.75	0.44	27.88	-14.29	28	10
18	16.67	0.49	25.06	-2.25	26	0
20	15.00	0.55	26.39	11.84	29	10
22	13.64	0.60	33.74	23.87	39	21
24	12.50	0.66	54.25	36.29	58	25
26	11.54	0.71	84.14	30.47	81	0
28	10.71	0.77	95.38	-17.71	81	10
30	10.00	0.82	64.89	-37.38	57	27
32	9.38	0.88	38.49	-28.84	39	23
34	8.82	0.93	28.90	-16.73	29	12
36	8.33	0.99	25.05	-0.30	28	0

work them out and the screen grab shows the screen that I had for one measurement. I tabulated these values as shown in Table 1 under the column headings 'Calc R' and 'Calc X'.

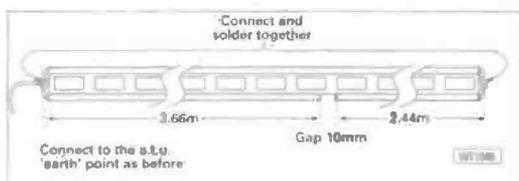
The three other columns in Table 1 are the frequency (in MHz of course) and its freespace wavelength (λ). The column headed 'Cable length' is the electrical length, in terms of λ , taking the velocity factor (0.67) of the cable into consideration. To

reading my review in the October 1998 issue of *PW*. The reader (I'm sorry I'm unable to remember his name or callsign) mentioned that he had noted that his unit seemed to be rather inaccurate at times. Unfortunately he didn't write to me as I thought he was going to, but the basis of his test was, to take a length of 50 Ω coaxial cable then, to mismatch it and measure the reflected impedance at various frequencies.

As I promised to try the same on my own unit, here are my results for that reader. I took a 5.5m length of new RG58 and terminated it with a 25 Ω load (25.5 Ω at d.c.) and recorded the 'R' and 'X' values displayed by my MFJ-259B over the 2-36MHz range (every 2MHz). Look at the column values shown in Table 1 (labelled 'Real R' and 'Real X'). These are the values read off the display.

I then sat down and did some work with a Smith Chart to determine what values of resistance and reactance I would get at the various frequencies. To speed up this part of the task, I used software, Fig. 5, to

Fig. 8: Bill G3NQX uses this as the counterpoise to increase the number of bands on which he uses his W3EDP antenna (see text).



explain how the table works, look at the line for, say, 10MHz. The freespace λ is 30m and the 5.5m length of RG58 represents some 0.27 λ at this frequency.

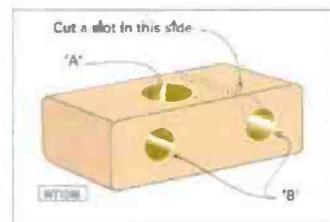


Fig. 7: Tony G4WIF says, this plastic furniture joining block can be a versatile part in antenna building (see text).

From the Smith chart (or software), at the antenna analyser end of the coaxial cable, there's an impedance representing 95.4 Ω resistive and -17.71 Ω reactive. The '-' sign in the reactance value, means (by convention) that the reactance is actually capacitive. As I mentioned in my review, the MFJ-259B cannot determine the nature of the reactance - only its magnitude.

From my initial test I have to say that I was somewhat surprised at the results. The values of R and X that were displayed seemed, at times, to be very 'wrong'. In an

effort to try and understand why I put the values into a 'spreadsheet' on the computer and I tried a few variations.

After my deliberations I think I know what the problem appears to be! When the value of the resulting impedance is used (a combination of resistance and reactance), then the figure became more regular. The graphs shown in Fig. 6, should make the readings a little clearer. As you can see there is a better correlation of results to calculated values when using the impedance values, rather than resistance and reactance values separate.

When the impedance is close to 50 Ω (say 40-60 Ω) the accuracy is quite good, but when the impedance differs more from the nominal 50 Ω of the bridge, accuracy suffers. An interesting point is that when I averaged out the inaccuracies (sum of all points divided by the number of measurements), the accuracy became a far more creditable 0.4%.

So, while the MFJ-259B isn't a laboratory instrument for displaying complex impedance values, it is a more than useful piece of test equipment when the impedance approaches the optimal 50 Ω resistive, which is after all the main object of the exercise. And again I must apologise to the reader, whose query started this line of experiment, for being unable to remember his name or callsign.

Tips To Try

Now let me look at a couple of tips you can try out yourself. From Tony Fishpool G4WIF, comes a tip about cheap insulating supports for wire antennas. Tony has obviously been building some furniture recently, and had some of those brown block connectors left over. I've shown the type in the drawing of Fig. 7 if you haven't seen them before, they're corner joining blocks used when making chipboard furniture.

The joining blocks have three holes through them making them useful, Tony says, in a variety of places. They can be used as wire antenna centre supports, by bringing the feed cable up through the single hole and attaching the screen and the inner to element wires secured by passing them through the other two holes.

By cutting a slot into the block as

shown in Fig. 6 it can become a support hook for a wire antenna so that as Tony says "I use the block as a hook to keep the centre of my doublet from drooping in the centre". Even then, Tony mentions that it also makes a good end insulator for an antenna due to its high strength.

Because of the type of plastic used, it's also quite 'slippery' and makes it ideal for running the antenna support 'string' through - or even the antenna wire itself should you have to 'droop' the ends of a doublet due to space limitations, it saves on expensive 'egg-insulator'. Thanks for those tips Tony, I'll never look at a joining block the same way again!

Modified W3EDP

"It's a modification to the W3EDP antenna" says Bill G3NQX with his idea for a multi-band counterpoise. The W3EDP antenna, that was featured in the May 1998 issue of *PW* in an article by John Heys G3BDQ, needs differing lengths of counterpoise if it's to be used on all the h.f. bands. However, Bill writes in to say that, by using his counterpoise, made from 300 Ω slotted feeder (Fig. 8), you can use the W3EDP on all the bands from 3.5 to 28MHz without having to change the counterpoise.

Bill went to say that he couldn't claim that it's his idea. He wrote "This idea works well, given to me by a fellow amateur who got the idea from another amateur on the air". Apparently the latter amateur was using a kite to support his W3EDP antenna with this form of counterpoise as the only 'earth' connection. Such a simple modification to make a simple antenna even easier to use - and of course in the best traditions of amateur radio - from a friend of a friend!

Ah well that's the end of the space I have available this month so, I'll say 73 until the March issue. But don't forget we need your tricks, tips and antenna related ideas - so get writing!



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antenna workshop

The 10GHz band has seen a large increase in activity over the past few years. This can be traced to the commercialism of direct-to-home satellite television equipment. The reduction in price of active microwave devices such as diodes and transistors has been considerable. Hardware such as antennae, low noise block down converters (l.n.b.) and low noise amplifiers (l.n.a.) have similarly dropped dramatically in price.

Because component costs are now so low, enthusiasts such as Charlie Suckling G3WDG, Sam Jewell G4DDK, Andy Talbot G4JNT and Michael Kuhne DB6NT have been developing state of the art microwave equipment that can literally be built on the kitchen table. Satellite equipment, ripe for modification, is also obtainable on the surplus market for only a few tens of pounds.

There are also a number of commercial 10GHz systems available off-the-shelf for those who haven't the time or the inclination to build a station from scratch. The uses these are being put to are as varied as can be found on the lower v.h.f. and u.h.f. bands. Most 10GHz operation is now based on narrow-band s.s.b. and c.w. transverters, just like the lower bands.

Wideband l.m. systems based on surplus intruder alarm doppler units are also popular and can be used for telephony, television or data links. Domestic satellite receiving equipment can also be modified to receive amateur telephony and television transmissions.

When the Phase 3D satellite eventually gets launched it will use a number of microwave up and downlinks including the 10GHz and 24GHz bands. All of these activities require the use of some form of microwave antenna so here are some ideas you could adopt.

Off-Set Dish

Surplus t.v.r.o. (television receive only) dishes usually between 350-

900mm in diameter can be used as a high gain antenna (reflector) on the 10GHz band. These dishes are normally of an off-set fed design, as shown in the photograph, Fig. 1. One problem with an off-set fed dish is that the main lobe of the antenna pattern is pointing upwards (in the sky) by typically around 25° because they are designed for reception from satellites.



Fig. 1: Off-set fed dish - the dish is 'looking' 25° above the apparent line of sight.

In Cornwall the (the typical elevation angle for a satellite is 30° (in the Shetland Islands it is around 20°) so, you have to angle the off-set fed dish down by some 25° (or so) before the main lobe is beaming horizontally. More about this later. Another problem with using an off-set t.v.r.o. dish is that they are designed to work with an l.n.b. with an integral feed horn. So you will either need to purchase a suitable horn from a satellite TV supplier or make your own.

Although a t.v.r.o. horn can be pressed into service it will not be optimised for use within the 10GHz amateur band and the efficiency will therefore be reduced. Furthermore, it will probably be terminated in a WG17 flange (waveguide size 1.7) whereas most Radio Amateurs use WG16. So you may end up having to make a WG17 to WG16 transition losing you a little more valuable signal.

So, considering all the losses, I would recommend that you make your own feed horn. A year ago in this column¹, I showed you how to make an optimised feed horn for a surplus 600mm Amstrad dish from copper water pipe and couplers.

Although the use of an off-set dish is quite attractive I would not recommend you use a large one (greater than 600mm) until you have gained some experience in aiming a smaller dish.

Many contacts are probably lost due to the inability to point the dish in exactly the right direction than for any other reason. An old off-set dish or one of the new 450mm Astra dishes will be ideal

for initial experimentation.

Front-Fed Dish

Another type of dish antenna you could use is the front-fed parabola as shown in the diagram Fig. 2. However, before obtaining this type of dish it is worthwhile making a few calculations to confirm how easy it is to feed with an external radiator. You need to work out where the focal point of the dish is (i.e. where you place the radiating element). The f/D ratio of the dish ultimately dictates what beamwidth the radiating element should possess.

The focal length (f) of the dish is derived from the formula shown in Fig. 2, where D is the dish diameter and c is the depth of the dish. The units of 'f' are the same as those used to measure the diameter and depth. As an example the much sought after PW EXE dish #2 has a diameter (D) of 460mm and a depth (c) of 103mm. Put these figures into the formula and you'll see that the focal length (f) is 128mm. Having obtained the focal length the f/D ratio can now be calculated. In this example it results in an f/D of 0.28.

The chart, shown in Fig. 3, shows that beamwidth or subtended angle the radiating device (such as a horn or dipole) should possess for this

particular f/D ratio. As you can see, for maximum antenna efficiency an f/D ratio of between 0.4 to 0.6 is considered to be ideal. It then only requires a simple feed possessing a beamwidth ranging somewhere between 90-130°, dependant on the actual f/D ratio.

You should be aware that dishes with a low f/D ratio are increasingly difficult to illuminate. For example a dish with an f/D ratio of 0.25 requires a feed beamwidth of 180° which can produce some undesirable effects. The reflecting dish will often be over-illuminated (power falling outside of the dish edges) giving rise to a degraded sidelobe performance and a subsequent decrease in efficiency both on transmit and receive.

Penny Feed

One type of feed suitable for dishes with an f/D ratio of between 0.25 and 0.3 is the classic 'Penny Feed' design originally developed by G4ALN. To create a 'penny-feed', two slots, 14.5mm wide and 1.5mm deep are filed in the broad end of a section of WG16 waveguide as shown in the photograph Fig. 4. A 30mm diameter copper or brass disc is then soldered across the end of the guide.

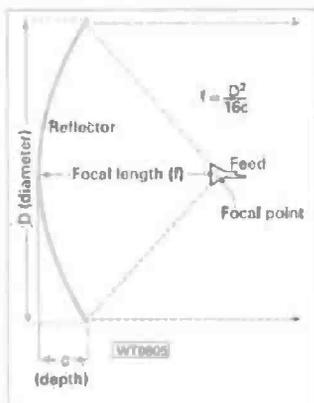


Fig. 2: A front-fed paraboloid dish and how to calculate the various parameters

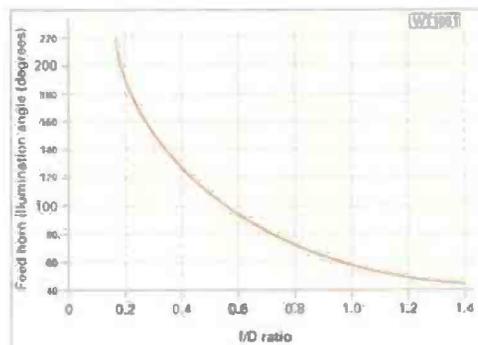


Fig. 3: Charting the f/D parameter of a dish against the beamwidth of illuminating horn radiator. (Based on a graph in the 1971 edition of Microwave Engineers Handbook Vol.2 (Horizon House-Microwave Inc.).

The disc should only be soldered to the smaller dimensioned side of the guide and care should be taken to ensure that no solder enters the waveguide. It is useful to use a small butane blowlamp or an electric hotplate when carrying out this task. To mount the feed into the dish I terminated the waveguide assembly in a square WG16 flange.

Coincidentally the type of flange I

References

- #1. *Practical Wireless* January 1998 p38-40 'Antenna Workshop - A 10GHz feed for a 600mm off-set fed dish'.
- #2. *Practical Wireless* May/June 1981 The PW 'EXE' 10GHz transceiver.

used had a circular 30mm collar exactly the same size as the reflector disc. I therefore cut a hole very slightly larger than 30mm in the centre of the dish and mounted the feed into the dish with the waveguide flange at the rear as shown in the photograph Fig. 5. Four small bolts then fixed the feed to the dish surface.

Focal Point Accuracy

Before soldering the waveguide into the rear flange I assembled all items and then adjusted the length of the guide until the radiating slots were exactly at the focal point of the dish. With the PW dish this is at a distance of 128mm from the back of the dish. And although I didn't set mine exactly, it is important that you pay attention to the focal point accuracy.

Experiments have shown that, when using a 600mm dish of 0.39 f/D at 10GHz, an error of only 6mm results in a 1dB loss of gain. Dishes with a low f/D ratio are very critical in this respect. Although a larger f/D is better it is still vital to have the phase centre of the feed exactly positioned at the focus of the dish.

If you have a front-fed dish you can

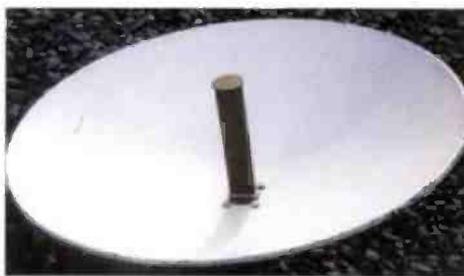


Fig. 5: A 460mm diameter dish (originally made for the PW EXE) with penny feed.

use the following method to confirm that the feed is correctly aligned in the dish. The method is extremely easy, you point the dish at the sun and listen for an increase in solar noise. The sun, of course, is an excellent wide-band signal generator! Note that you can only use the sun-pointing technique if you are able to take a signal from the feed system via a suitable down-converter into a v.h.f. (or u.h.f.) receiver set in s.s.b. or c.w. mode.

To check my dish feed I used a DB6NT 10GHz transverter feeding a Kenwood TS-790E transceiver tuned

to the 144MHz band in c.w. mode. On a sunny day point your dish at the sun, moving it until you get maximum solar noise on the receiver. I got approximately 2dB of sun noise with a 460mm PW dish and G4ALN penny feed. Having obtained a peak in the noise level you then note where the shadow of the feed is on the dish face.



Fig. 4: The G4ALN Penny Feed, the slots cut in the 'long' side are 14.5x1.5, and the 'cap' has a diameter of 30mm (almost the same size as an old English penny).

Maximum Noise

If necessary you then adjust the feed mechanical supports so that the shadow is central on the dish and at the same time the receiver is producing maximum sun noise. You then repeat these adjustments until you have a central shadow coinciding with a peak in the solar noise signal. Then you adjust the feed radiator moving it in or out from the dish surface. The feed is then locked in the position that produces maximum noise.

If you are using a feed that has no additional support mechanism (such as a penny feed) you need only carry out this latter adjustment and you don't need a sunny day either. Similarly if you have an off-set fed dish you can make adjustments to the feed horn position to maximise your antenna gain.

You may be fortunate to possess a feed assembly that has dual polarisation, both horizontal and vertical. Now would be a good time to check that changing polarisation has little effect on the received solar noise. If there is a large disparity between the two polarisations you will need to check the feed horn mechanism, polariser and associated waveguide.

Whilst on the subject of polarisation,

it should be noted that if you use waveguide as a feed mechanism (such as the G4ALN penny feed) horizontal polarisation occurs when the thin face of the guide is in a vertical position. Don't forget this fundamental point!



Optimised Dish

Now that you possess an optimised dish

there are still some other considerations that are worth noting. First I'll turn to practical use of the off-set fed dish. Earlier I mentioned that these type of dishes need to be angled down by some 25° before the main lobe is in a horizontal plane. Having made this adjustment you will then notice that the open-ended feed horn is placed an almost perfect position to act as a rain collector!

So instead of angling the dish downwards the best option is to rotate the antenna so that the feed assembly is above the dish with the feed horn pointing downwards. The dish is then adjusted upwards by approximately 25° to bring the beam pattern into the horizontal plane. Another way of overcoming the beam off-set is to rotate the dish through 90° and mount the dish sideways onto the mast.

Then all you need to do is take into account the directional off-set from the true bearing. Don't forget to alter the feed horn polarisation by 90° if you adopt this method or else you'll wonder why you cannot hear anyone. If you intend to operate permanently from your home location it will be necessary to waterproof the antenna feed system to stop rain entering the waveguide.

Recommended materials for rain-proofing include Mylar sheeting or very thin fibreglass. However the chosen material must be loss-free at microwave frequencies. One way of checking its suitability is to put into a microwave oven (along with a

glass of water) for a minute or two. If the test sheet becomes hot then reject it.

No matter what type of antenna you use it will normally need to be rotated just like you would on the lower frequency bands. However because of the much narrower beamwidths involved (5° or less) you need to pay much closer attention to mechanical details. If you're going to use the antenna for portable activity it might be useful to fix a simple visual sighting aid onto the side of the dish.

This need only be a simple narrow tube and can be aligned when carrying out the sun noise adjustments. Take care not to look directly at the sun though! You will also find it useful to mount a small bubble spirit level onto a suitable part of the antenna to ensure it is mounted horizontally. Make sure the mast or tripod to which you attach the antenna is really vertical or else



Fig. 6: The 460mm dish on a convenient fence post.

you will need to provide some form of elevation control.

Indeed, unless you are going to operate over a fixed point-to-point path an elevation control is worth implementing. Then you will be able to exploit propagation modes such as rain scatter that requires the antenna to be tilted upwards. For portable operation a good quality pan-and-tilt mechanism should be used. For fixed station operation I would suggest you use a surplus t.v.r.o. actuator jack.

I'll be looking at elevation and azimuth drive rotators when it's my turn again to write this column. So until then 73 and have fun on the microwave bands!



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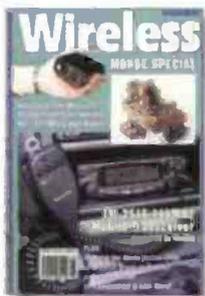
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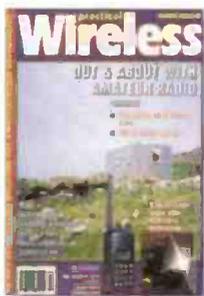
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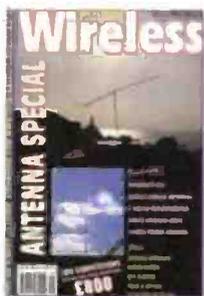
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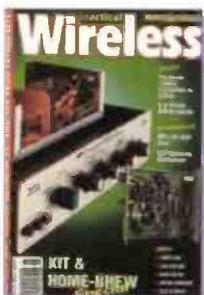
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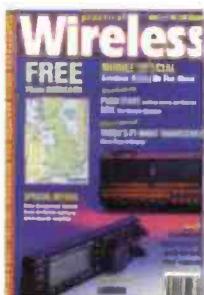
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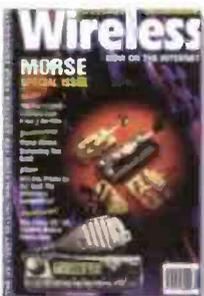
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ALINCO	DR M06 6Mccr 25W	£185
AOR	7030 General Coverage Remote	£500
DRAKE	TR7 GENCOV TRANSCEIVER	£375
ICOM	IC 706 Mk1	£599
ICOM	IC735 General Coverage	£425
ICOM	IC 2K2 + Power Supply	£950
ICOM	IC AT500	£325
ICOM	IC R7000 25 - 300MHz	£600
ICOM	IC W32E Dual Band Handie	£130
ICOM	IC 820 Base Dual Band	£675
ICOM	IC 805 Multi fm	£350
ICOM	IC 746 2 MONTHS OLD	£1,200
ICOM	IC-706 MK I	£575
ICOM	IC-275E 25W multimode	£550
ICOM	IC-275H 100W multimode 2M	£675
JRC	NRD 525 HF Receiver	£475
KENWOOD	DR13 Voice Scaler	£80
KENWOOD	R5000 Receiver	£500
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KENWOOD	TS 5700SP (New)	£500
KENWOOD	TS 530 "Nice" Boxed	£295
KENWOOD	TS 4305 + FM	£350
KENWOOD	TS 670 7-21-28-50MHz Base	£425
KENWOOD	AT 250 Auto ATU	£195
KENWOOD	TR 9130 2m Multi	£275
KENWOOD	TS-940 SAT	£800
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YAesu	FRG 9600 VHF/UHF	£200
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Traders Table

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Yaesu FL-2100Z HF Linear.....	£495
Kenwood TS-830M.....	£350
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Yaesu FT-290R I.....	£225
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The New Year is fast approaching and because this issue is our first of 1999, the PW Editorial team are taking a serious look at the technology which is with us now and will take us into the Millennium! Microwaves are a fast growing industry, with a high percentage of the world's population carrying a mobile phone nowadays microwaves will be the topic that many will need to know more about. So see the New Year in by discovering that microwaves do more than simply warm up your Xmas turkey leftovers! - Go on, treat yourself or someone special with a last minute serious Christmas stocking filler!

BOOK PROFILES AS

You may not think that one topic could be so versatile, but this month the PW Editorial Team will attempt to show you just how microwaves can be used for more than cooking! Seriously though, we are aware that all you Radio Amateurs out there will know something about microwaves and their uses in communication and so on, but this month we have a wide selection of books for you - whether you are an 'amateur' Radio Amateur where microwaves are concerned, or if you make a living from them - there is bound to be a book here that you just won't be able to 'function' without.

Microwave Engineering With Wireless Applications.

S. R. Pennock & P. R. Shephard. £54.99.

This up-to-the-minute guide has its foundations in basic microwave engineering. Beware though, the use of the word 'basic' here does in no way mean that this book by Pennock & Shepherd is easy to digest! In its own words, the book states that it "... offers engineers and advanced students a clear understanding of microwave engineering in: Radar; Communications; Antennas and Mobile Radio".

Published by McGraw-Hill Telecommunications, *Microwave Engineering With Wireless Applications* is a

volume from their telecommunications series. It claims to cover all necessary information needed in order to develop circuits and systems for the "newest" applications and claims to have "complete coverage" of a number of interesting topics relating to microwave technology. Just a few examples of what the



book covers are as follows: Transmission Lines; Electromagnetic Waves; Matrix Representation of Circuits and Signal Flow Graphs; Passive and Active Devices; detectors and mixers; Amplifiers and Oscillators and Microwave Management.

As you may have gathered from that small selection of ingredients, this book is rich in information and is supported by the wealth of illustrations which take a mainly diagrammatic form. If you have more than just a basic knowledge of microwaves already and would like to learn more about this ever expanding aspect of technology, then you would be wise to consider purchasing this book.

At £54.99, it may feel like you'll need to take out a mortgage in order to afford it, but it will more than likely pay back dividends! **Highly Recommended to the keen and determined microwave enthusiast.**

An Introduction To Microwaves

F. A. Wilson £3.95.

If you have absolutely no idea what a microwave is or how it affects you as a Radio Amateur,

then this could be the book for you! It does, however, ask one thing of the reader - that you have absolutely no knowledge of microwaves or their uses!

As astounding as this may seem, it's true. It claims that all you need in order to read and understand this book is a little electronics experience. Even the mathematics is fairly straightforward. Therefore as a Radio Amateur, you should have little (or no) difficulty in following this book.

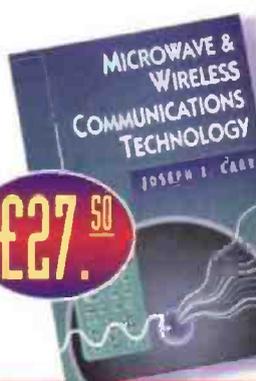
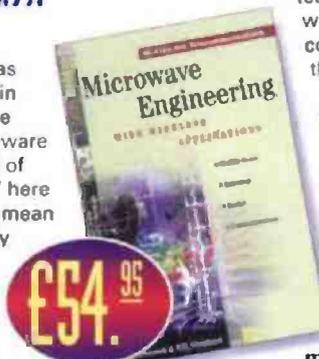
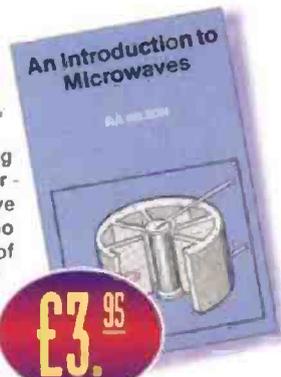
Not a book for the microwave expert, it nevertheless covers everything which you'd need as a beginner. If an introduction to microwaves is what you are looking for, then this might be just what you need. However, if you are more knowledgeable about them, then you wouldn't find anything in this book that you didn't already know.

Most of what you need for an appreciation of microwaves is in this book. From technical explanation to microwave generators and amplifiers leading on to the practical uses of microwaves in communications, mobile communications and TV. **Recommended.**

Microwave & Wireless Communications Technology.

Joseph J. Carr. £27.50.

Mainly aimed at the students of new technology, Joseph J. Carr's book on microwaves takes the reader through the basics of



microwave technology such as microwave signal propagation, transmission lines and wave guides. It then gently steers you through the more involved aspects of microwave systems like transmitters, receivers, radars and wireless communication devices.

Joe Carr is an author who is well known for his ability for displaying the facts in a clear and concise manner and you would do well to take a closer look at this book if you are hoping to broaden your horizons in communications.

With more and more household items becoming involved in the developments of microwave technology, technicians and engineers would also benefit from reading this book, it claims. It has quite a 'hands-on' approach because it encourages the reader to tackle some of the equations involved. **Highly Recommended.**

The ARRL UHF/Microwave Experimenter's Manual.
Various Authors £15.50.

Claiming to have been written especially for those Radio Amateurs who populate the frequencies at 420MHz and above - the u.h.f. realm - the *ARRL UHF/Microwave Experimenter's Manual* does just that. Both a theoretical and practical approach to microwave devices, equipment and antennas is found between the covers of this book.

With information on design and fabrication techniques, propagation, antennas and feed lines and transmission media, this book truly is an 'Experimenter's Manual'. Keep it near your tool kit if you're a Radio Amateur, in your van if you're a technician - either way you will want to keep this book handy.

It is illustrated with circuits, drawings and black and white photographs and is a fairly accessible volume. Various chapters include: 'A Brief



History' by Dr. H. Paul Schuch N6TX and Maureen Thompson KA1DYZ, 'Notes On UHF And Microwave Systems Design' by Geoffrey Krauss WA2GFP and many, many more. **Recommended.**

The ARRL UHF/Microwave Projects Manual (Volume One).
Various Authors.
£15.50.

This manual contains dozens of construction articles ranging from 'transmitting and receiving equipment to low-level amplifiers, oscillators and multipliers, antennas and test equipment.

Some of the articles are previously unpublished but others are ones which have already been published in *Proceedings, QST* and *QEX*. So, if you would like to own a handy reference manual about microwaves, then this could be the one for you! Once again well illustrated with diagrams, circuits and black and white photographs (which seems to be a characteristic of most ARRL handbooks) you could do a lot worse than to add this to your collection. But remember to bear in mind the fact that it was first published in 1994. **Recommended.**

The ARRL UHF/Microwave Projects Manual (Volume Two).
Various Authors
£11.50

Slightly smaller than its predecessor, *The ARRL UHF/Microwave Projects Manual Volume Two* is an updated version of Volume One.

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Whereas the earlier version had eleven big chapters, the newer version has only three. You should be able to see from this, the reasons why Volume Two is cheaper.

However, having said that if you have purchased the first volume then you would be very wise to 'top up' your library with the second volume. According to David Sumner K1ZZ, Executive Vice President of

ARRL, since publication of the first volume (which has continued to be in demand) "More and more components are becoming available..." to the Radio Amateur and "... many commercial parts and subassemblies are starting to appear in v.h.f./u.h.f. and microwave equipment and many 'hams' are jumping into an area previously thought to be only for a few experimenters".

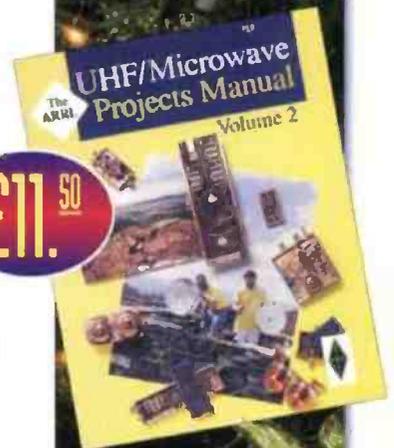
Once again, excellent use of diagrams and pictures to help explain the theories involved. Some of the information which you'll find in Volume Two will be on antennas and transverters, using a TVRO feed, converting a radar detector, 2W 10GHz amplifiers and updates on the popular no-tune transverter. If you want to keep up-to-date with all that is happening in microwave projects then you could well do with this book. **Recommended.**



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VHF REPORT

REPORTS & INFORMATION BY
THE LAST SATURDAY OF EACH
MONTH.

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THIS MONTH DAVID BUTLER
G4ASR REVIEWS YOUR BAND
REPORTS AND DISCOVERS
THAT YOU DON'T NEED A BIG
STATION TO WORK SOME OF
DX ON THE VHF BANDS.

Apart from some good trans-equatorial propagation (t.e.p.) on the 50MHz band, the conditions on the v.h.f. bands and above were not particularly good during October. There was some auroral activity during the month but most events were generally quite weak and restricted to stations in northern England and Scotland.

The stormy weather during October was not conducive to tropospheric openings but the heavy rain did allow some forward scatter contacts to be made on the 10GHz band. The 50MHz band is where all the real growth in DX activity is taking place so I'll now take a look at what's been happening there.

THE 50MHZ BAND

The first real indications that solar activity was gaining the upper hand came in August when some UK stations reported a few openings to Africa (TZ6VV, Z22JE, 3C5I, 7Q7RM), North and central America (KP3A, KP4EIT, N5JHV) and South America

(CX6AW, LU3EMK, PY5CC). At the same time, some stations in South Africa started to report almost daily openings into the Mediterranean area.

As we headed towards the autumn equinox (September 23 - when the Sun crosses the equator), we also reached the period when t.e.p. conditions become most prevalent. Although there was a good opening on September 3 between 1700-1900UTC to Z22JE and 7Q7RM and again on September 14, it was not until October that considerably more openings were reported.

On October 3, the station of G6YIN (IO93) reported hearing TR8CA and TR8XX between 1725-1750UTC but an opening on the following day, October 4, was much more widespread. Between 1130-1415UTC and later in the day around 1630UTC and between 1800-1900UTC, stations located in southern and central England and Wales reported working into VS1, Z22, Z56 and 7Q7.

Jamie Ashford GW75MW (IO81) worked the stations of Z56AXT, Z56EIN, Z56NB, Z56VWB, Z56X) and Z56Y with all stations peaking 59+10dB. Some other DX worked from the UK during this opening included V51KC, Z22JE, Z56BTE and 7Q7RM.

Your reports also show that other openings to Africa occurred on October 7, 9-11, 17, 19, 21-25, 29-30, a total of 15 days during that month. The best of these was probably the event on October 21 when the 50MHz band was open to Z56 for nearly three hours during the afternoon.

The following day also saw a good opening to the Gambia with the contest station C56A (IK13) being worked by a few UK stations around 1600UTC and between 1800-1820UTC. Other African stations worked from the UK during October included A22BW, FR5DN, TZ6VV, V51E, Z21FO and 3C5I.

If this wasn't enough, the 50MHz band was also briefly open to South America with

G4FUF (JO01) hearing PT7NK at 1905UTC on October 10. On the following evening, around 2130UTC the station of G8GXP (IO93) heard very weak signals from stations in Argentina and Brazil and on October 19, a station in Jersey reported hearing LUI DMA.

The 50MHz band is definitely on the up and much DX will be worked either side of the spring equinox which occurs on March 21.

LOW POWER CONTACTS

Hopefully, the following reports will show you that you don't need a large system on the 50MHz band to work some good DX. Sean Gilbert G4UC (IO92) has improved his 50MHz station since he last wrote in to the column. He is now using an HB9CV beam in the loft instead of a quarter wave vertical located in the shack although he is still only running 4W from an Alinco DX70 transceiver.

In two months of operating, Sean has contacted stations in 109 locator squares and 30 countries. His best DX contacts on the 50MHz band have included IS0, IT9, OH0, OY, YO, S5, ZB, 9A and 1A0KM.

Peter Lowrie G17JYK (IO74) uses a Yaesu FT-690R transceiver running 3W into a 2-element beam matched with an MFJ antenna tuning unit.(a.t.u.). The beam is a simple dipole-reflector arrangement at six metres above ground and fixed towards central Europe. With this simple set up, Peter has worked many countries around Europe including stations located in Prefix areas DL, F, HB9, HB0/HB9QQ, OE, OK, OM and SP.

A warm welcome to Martyn Medcalf G1ELF (JO01) who has written in to the column for the first time. Martyn has been active on the 50MHz band for four years but because of local planning restrictions he can only use wire dipoles in the loft of his house. He uses an Icom IC-706 Mk1 transceiver normally at

50W but sometimes increasing it to 100W output.

Although the station has limited capability, Martyn (shown in the photograph Fig. 1) has a total of 128 locator squares and 38 countries confirmed. He has also received several awards including the ARRL and the RSGB 100 squares certificates.

Some of his numerous contacts made last summer with the indoor dipoles include the stations of EH6SA (JM19), ES1M (KO29), EV5M (KO32), IMQ/IK2GAO (JM49), LY2B) (KO14), SO0GUR/P (IO74) and YL3AG (KO26). Although the 50MHz band is not open all the time it is surprising what can be worked with low power and small antennas. All you need is dedication and a little luck!

CONTEST ACTIVITY

Colin Smith reports that he was active as GM0CLN/P (IO85) during the RSGB 144MHz cumulative contest on October 1. He described the conditions as very poor with only eight contacts being made over 100km!

Running 80W from a Microwave Modules solid state amplifier driven by a Trio TR-9130 transceiver and a 14-element MET Yagi, his best contacts included the stations of G8FBG (IO91) at 529km, G0HAS (IO81), G0OWU (IO82), G8IYG (IO82) and M1AFB (IO92).

David Dodds decided to operate on the 430MHz band as GM4WLL/P during the IARU Region 1 u.h.f./s.h.f. contest on October 4. The conditions seemed to be quite poor and activity low, but nonetheless he succeeded in working G8OHM/P (IO82), G0EHV (IO94), M8A (IO92) and G8P (JO01) for his best DX at 583km.

The equipment used was a Yaesu FT-290R MkII, a Microwave Modules transverter, a Microwave Modules 50W amplifier and a 24-element Yagi. David admits it was all thrown together very quickly but he was encouraged by the distances worked so much so that he intends to make the portable station a bit more competitive next time. Look out for him during the 144/432MHz contest in March.

I decided to make use of the increased activity during the contest on October 4 to make my first contacts on the 10GHz band from my home QTH (IO81). I was using the latest

DAVID G4ASR TAKES YOU THROUGH HIS MONTHLY VHF NEWS AND REPORTS

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DB6NT transverter driving a G3WDG amplifier giving 1W output into a 460mm PW dish. All this was mounted on top of my tower at 20m above ground.

External feeds to the mast-head unit consisted of a 3-core cable for the 12V transverter supply, 24V for the 10GHz coaxial relay and press-to-talk (p.t.t.) control and a coaxial cable for the 144MHz drive from a Yaesu FT-221 transceiver in the shack.

Without any system adjustment (just plug and play) the following stations were worked in a two hour period - G4MAP/P 59 59 over a 61km path, G4ERP/P 59 59 at 64km, G3UKV/P 53 439 at 84km, G8VOI/P 53 53 at 178km and G1JRU/P 51 51 also at 178km. (By the way, all contacts were made on s.s.b. [one on c.w.] just like you would on any other band).

Interestingly, I didn't need to line-up up the 10GHz dish other than point the 144MHz beam (used for talk-back) in the direction of the wanted station. I couldn't understand this as the 460mm dish should have a beamwidth of around five degrees and would require some very accurate adjustment of the antenna rotator.

However, when I checked later I noticed that in my hurry I hadn't lined up the dish exactly in a horizontal plane. I was therefore probably receiving stations on a broader vertical sidelobe. These initial results were very pleasing and I am now engineering the system properly with a larger dish and elevation control.

MOONBOUNCE CONTACTS

If you think you need a very large antenna to make earth-moon-earth (e.m.e.) contacts then you're completely wrong. Chip Margelli K7JA reports that on October 2 he contacted the station of W5UN via the moon. This isn't particularly unusual as W5UN has an enormous array of 48 17-element Yagis and 1500W output but K7JA was only running a barefoot Yaesu FT-847 transceiver into a single 10-element K5GW Yagi.

Chip's FT-847 transmitter runs 50W output and was fed to

the antenna via 25m of coaxial cable. He mentions that the signal from W5UN was approximately 6dB above the noise level with the c.w. filter switched in and the d.s.p. filter set to a bandwidth of 25Hz.

Rees Roberts K9UUT, using an 18-element Yagi and an FT-847 (his measuring 45W output), also worked W5UN whose signal was peaking 529. Rees also heard the stations of F3VS, IK3MAC and SM5FRH.



Fig. 1: Martyn Medcalf G1EFL at his station.

The first leg of the ARRL e.m.e. contest held on October 10-11 also provided an opportunity for the small station to work some good DX. Jean-Jacques F1FLA reports that he was active with a single 10-element DJ9BV Yagi and 800W. He made a total of five c.w. QSOs, contacting the stations of IK3MAC, SM5FRH, KB8RQ, K5GW and W5UN.

Jean-Jacques is currently building a new antenna system comprising of four 24-element Yagis with both horizontal and vertical polarisation, each on a 16m long boom. In case that passed you by, that's four 50-foot long Yagis!

So, what is the minimum antenna requirement for e.m.e. operation? Ray Soifer W2RS reckons that depends on exactly what you want to accomplish.

If your minimum requirement is to consistently hear your own echoes on the 144MHz band then approximately 20dBd of antenna gain is in the right ballpark. Ray mentions that many people have done very well on this band with considerably less.

Recently the stations of W5UN and F/G8MBI worked

each other with a single Yagi at each end and the station of PA0JMV has had hundreds of contacts with two Yagis of approximately 17dBd of gain. Results such as these on the 144 MHz band are made possible by using propagation mechanisms such as ground gain and libration enhancement.

Loop Mutter PA0JMV reports that many operators have proven that there is no absolute minimum antenna gain required to make e.m.e. contacts at 144MHz. In his opinion, it really depends on how easy you want to make your contacts.

If you don't like to work hard and struggle for each QSO then the figure of 20dBd suggested by W2RS won't be enough and you might need 23dBd or more. However, if you are smart and take advantage of many phenomena such as low sky

noise, ground gain, perigee, an excellent 'clean' antenna pattern, polarity rotation, digital receiving techniques and above all persistence and patience you will be able to make dozens of e.m.e. contacts with antennas of only 14-15dBd gain.

Loop mentions that he made 1020 e.m.e. QSOs with his old 2-Yagi system (17dBd) before moving to a new QTH last summer. Since then he has operated temporarily with a single 12dBd gain Yagi and worked thirty stations, ten of them being 4-Yagi stations.

Of course, if you move up in frequency to the u.h.f. bands then the antennas get physically smaller. Recently, Neil Whiting G4BRK mentioned on the Moon-Net reflector that he made a partial e.m.e. contact on the 430MHz band some years ago with the station of DL9KR.

At the time, Neil was using a single 21-element Tonna Yagi and 400W. A few months ago he put up a small array of four very old 21-element Yagis at a fixed elevation. He was rewarded by his efforts by making his first e.m.e. contacts with the stations of DL9KR (who gave G4BRK a report of 549), K1FO and OH2PO.

Andrea IK5QLO is also interested in making e.m.e. contacts on the 430MHz band. He is using a pair of 28-element

Yagis each with a six and a half metre long boom. In two years of operation he has worked 36 different stations via the Moon.

Andrea does mention that if you are using small antennas then you must optimise every part of the station. You should have very low cable losses and the minimum number of coaxial connectors.

It also helps to plan your schedules so that contacts are made when the Moon is nearest to the earth (perigee) and the sky noise temperature is low. Having polarity adjustment at the far end is also very useful. This is more normal if the other station is using a dish with a feed that rotates.

CORONAL DISTURBANCES

An unexpected vigorous interplanetary disturbance impacted the Earth on October 19. The disturbance was thought to be related to the coronal mass ejection (c.m.e.) from a recent eruption of a solar filament. This action produced reasonably strong levels of auroral activity particularly for operators located in Scotland. By the way, a c.m.e. is often associated with flares and with erupting prominences but many occur independently of other phenomena.

The outer solar atmosphere, the corona, is structured by its magnetic fields. Where these field lines are closed and loop back to the sun, as is often the case, solar material is contained. However, the confined solar atmosphere sometimes suddenly and violently releases bubbles or tongues of gas and magnetic fields. These are the so called coronal mass ejections.

A large c.m.e. can contain ten billion tons of matter which can be accelerated to more than 1000km per second in a spectacular explosion. Solar material and its permeating magnetic field flow radially out through interplanetary space impacting any planets, spacecraft or slower material in its path and all of this occurs just to give v.h.f. DXers a few hours of excitement!

On the 50MHz band, the stations of GM1IKQ (IO76), GM1WKR (IO87), MM0AMW (IO75) and MM1DEE (IO75) were heard working into central England and Wales. Activity was also noticed on the 144MHz band with GM7OIN (IO75), GM8LFB (IO88) and

GM8ZCS (IO85) putting in an appearance around 144.300MHz, the s.s.b. calling frequency.

John Peters PE1OGF mentions that he was active in the aurora on the 144MHz band with 400W and four 11-element Yagis. Between 1400-1600UTC he contacted stations in DL, LA, LY, PA, SP, G3IMV (IO91) and GM4ILS. All of his contacts were on c.w. which was a bit of a problem for John as he has a v.h.f. license and is not very fast with Morse.

Nevertheless, he recognised the value of using this transmission mode during auroral openings. Udo DK5YA (JN49) was also active on c.w. during the event. He uses an array of four 9-element Yagis and a GS35b amplifier. Just like the station of PE1OGF he heard the aurora between 1359-1605UTC. Very similar contacts were made with stations in DL, LY, OZ, PA, SM, SP and GM0GMD (IO87).

SATELLITE NEWS

Now for some news of what's happening in the amateur satellite world. The Phase 3D spacecraft has recently undergone pre-launch testing to analyse the satellite's ability to withstand the harsh environment of space.

The satellite was placed in a large chamber for thermal-vacuum tests which required the spacecraft to be subjected to a maximum temperature of 45°C and a minimum of -20°C over five testing cycles. This was to simulate the harsh heating and cooling environment that P3D is expected to encounter whilst in space.

The satellite is now scheduled to undergo vibration testing in early 1999. The vibration testing is designed to simulate the stresses the spacecraft must endure during launch - if it ever does get launched!

A new Amateur Radio satellite SEDSAT-1 was recently launched on October 24. The satellite's name is an acronym for Students for the Exploration and Development of Space Satellite and was built by students at the University of Alabama.

The spacecraft package includes a Mode-A analogue repeater and a Mode-L digital packet store-and-forward transponder. The Mode-A frequencies are 145.915-

145.975 MHz uplink and 29.350-29.420MHz downlink. Mode-L frequencies are between 1268.175-1268.250MHz uplink and 437.850-438.000MHz downlink, frequency shift keying (f.s.k.) at 9600 baud.

However, the satellite was in serious trouble after fewer than two dozen orbits around the Earth. Intermittent telemetry suggests that the batteries were not storing their specified 8Ah charge although the solar panels appear to be producing as much power as expected. At one point, the spacecraft's power had dropped to zero and the satellite had reset itself. For more up to date information, you can visit the SEDSAT Web site at <http://www.seds.org/sedsat/>

Another Amateur Radio satellite, PANSAT, was also launched in the same period. This is also a digital store and forward microsat but because of its low inclination orbit it will never be visible from the UK.

A satellite you should be able to hear was scheduled to be launched on November 11. Readers of this column may recall that on November 3 1997, a one-third scale model of Sputnik was hand-launched from the Mir Space Station to commemorate the 40th anniversary of the first artificial satellite, Sputnik-1.

Two working models of the Sputnik were made as a joint project by Russian and French students but only one was launched. The unused unit is virtually identical to the one launched in 1997. It is solely battery powered and runs 150mW output on a frequency of 145.820MHz.

This time, Instead of a 'bleeping' beacon it will incorporate a digital voice playback unit. The previous satellite ran on its dry batteries for a period of 55 days so if all went to plan you should be able to hear the satellite until the end of December 1998. Last time I received a number of reception reports so I look forward to receiving the same this time.

DEADLINES

That's it again for another month. Please forward any news, views, comments and especially photographs to the address and by the date given at the top of the column. Alternatively you may find it more convenient to make a simple telephone call.

THANKS FOR YOUR LETTERS AND GOOD LUCK WITH THE DX. SEE YOU AGAIN NEXT MONTH.

73 David G4ASR.

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LEIGHTON SAYS THAT THINGS ARE REALLY GETTING BUSY - ESPECIALLY ON 24MHZ AND HE ALSO NEEDS YOUR PHOTOGRAPHS FOR THE COLUMN PLEASE!

Well, the upturn in conditions on the higher frequency bands has certainly had an impression upon our reporters this last month! It seems that 14MHz and above has been 'where it's at' for all concerned, with spectacular reports coming in of all sorts of DX, from all parts of the globe!

It's not just the DX, but much of it has been worked using simple antennas such as dipoles and verticals, so there's no excuse now - if you're limited to using just a piece of wire for an antenna, there's DX to be worked - it can be done!

BANDPLANS

A telephone call came in this month from Carl Mason GW0VSW, who complains of 'phone contacts taking place on our extremely narrow 10MHz allocation. This band is just 50kHz wide and, as such, only narrow band modes are recommended there.

However, Carl says that he's heard quite a few stations, including various UK callsigns using s.s.b on that band, taking up as much as 8kHz of space each!

The informative 'PW Lo-Bands Datacard' clearly shows that c.w. and digimodes are the recommended modes for operation on 10MHz. However, as some rightly say, we are allowed to use telephony there.

The question I ask is: although our licences allow the use of telephony on 10MHz, is it really good practice to operate with that mode, given

the mere 50kHz that we're allocated? What do other readers think? This could generate quite a bit of interest I think, so write and let the know what you think!

RE-ACTIVATED CALLSIGN

I've received news via Dave Griffiths GW0JUF of a well known callsign being 're-activated' here in Wales. Danny Phillips (formerly GW1VVK) has cracked the c.w. test and taken out the callsign GW8HF, once a well known callsign belonging to the late Alf Laws, of Pontypridd.

Danny was hospitalised shortly after gaining his callsign, but I'm sure that he'll be back on his feet and using it pretty soon!

Incidentally, the original GW8HF was once the Manager of the Rediffusion Cable TV service in Pontypridd just after the Second World War and, as Dave explains "Contrary to popular belief, Cable TV (or 'piped' TV as we used to call it!) was developed here in Pontypridd, well before the USA had adopted the system. In fact, Pontypridd was the first place in the world to have a Cable TV system". So now you know!

NEWS SNIPPETS

Now over to the RSGB's DX News Sheet, and there's news that Jacky ZL3CW continues to be active from Eritrea as E31AA using a damaged TS-50 rig, with no s.s.b. above 22MHz. His length of stay is not known, but QSLs should be sent to ZL3CW.

In Mongolia, Baator JT18G is now active on the 3.7MHz band, often between 2300 and 0000UTC on 3.799.5MHz with 500W and a dipole antenna. (QSLs should be sent direct).

For low band enthusiasts, Per LA7DFA is on the air as JX7DFA from 0400UTC on the 3.5MHz band, and will QSY to 1.8MHz on request. (QSLs to be sent to his home call).

Finally, from the Ivory Coast there's news that TU2MA is now operational on 1.8MHz but no times given, and there's also news that Dave KBMN is now active from Tanzania as 5H3US during his three year stint at the US Embassy there. (QSLs should go to WABJOC).

PROPAGATION REPORT

Time to go over to our regular 'Propagation Report' from Don

LEIGHTON GW0LBI BRINGS YOU THE LATEST ON THE 24MHZ BANDS WITH AN RODEO PLAYER FOR MORE PHOTOS PLEASE!

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McLean G3NOF of Yeovil who says: "The long path to Australia and New Zealand has been open most days on the 14MHz band between 0600 and 0900. African stations came in between 1600 and 2000, with strong signals from Asia heard via the short path around 1600-1900. The band seemed to be open day and night.

"On 18MHz, the long path to Australia and New Zealand and sometimes Japan was open around 0700-0900 and the short path to these areas around 0900. A few stations from the Pacific areas were heard over the North Pole between 0900 and 1000. Africans came in during the afternoons, while north Americans were heard at various times between 1000 and 2100. The band usually closed by 2100.

"On the 21MHz band the long path to Australia, Japan and Asia was open between 0900 and 1100, with Africans heard between 1500 and 1800. North America was heard from 1200 until the band closed at around 2000.

"The short path to Australia on the 28MHz band was sometimes open around 1000-1100 and to Asia at around 1600. North and south Americans came in from 1300 onwards, and African stations between 1500 and 1800. The band usually closed around 1800".

YOUR REPORTS

As I said earlier, the higher frequency bands have been 'where it's at' for all our roving reporters this month. Conditions certainly have been excellent, so we'll start with the log from Sean Gilbert G4UCJ in Milton Keynes.

Sean reports 14MHz c.w. contacts using 3W and a G5RV dipole with FM5CW (Martinique Island) and CM2TI (Cuba) at around 2250, with HC5AI (Ecuador) at 0824. Also logged were ZP5GM (Paraguay) at 0026, and LU/HA7SK (Argentina) at 2312UTC.

Incidentally, Sean has recently modified his Alinco DX-70 rig to run a maximum of 3W output. This is not only

because he's a keen QRP'er, but also because his wife Jayne has passed her Novice RAE and the Novice c.w. test and is patiently (or should that be impatiently, Jayne!) waiting for her licence to drop through the letterbox! Well done Jayne, and welcome to the bands! Now I'll probably get two reports each month from the Gilbert household eh?

Next comes John Constance G0VGD of Aylesford in Kent, who, using an Icom IC-706 transceiver and an Outbacker mobile antenna.



Fig. 1: GB2IWM - the Imperial War Museum's QSL card. They are based at Duxford Airfield near Cambridge and is the largest aviation museum in Europe with much of radio interest.

hooked up with 5A2B (Libya) at 1227, ZG2FX also known as G3RFX, (Special call marking Gibraltar Day) at 1222, SV1TP/P (Poros Island) at 1150, RU3QE (European Russia) at 1752, and W8MJC (USA) at 1510UTC, all contact made using s.s.b.

Over to our intrepid Yeovilian reporter Don McLean G3NOF now, whose list includes s.s.b. contacts with TF8GX (Iceland) and VK6RI (Australia) at around 1750, plus ZD7HI (St. Helena Island) at 1852, as well as a string of South African stations plus VU2NGS (India) at around 1800UTC.

THE 18MHZ BAND

"Conditions are much better this month" are the words from Ted Trowell G2HKU on the Isle of Sheppey in Kent starting the reports on 18MHz. Ted spent most of his time on the bands above 20MHz this time around, but does report a c.w. contact with 3W7TK in Vietnam at 1500UTC on the band.

Meanwhile over in

Pontypool, Gwent, avid QRP'er Bev West GW00SQ lists his low power s.s.b. contacts with VK2FKH and VK7RL (Australia), both at 1300, 7Z1IS (Saudi Arabia) at 1410, NH0E (Mariana Islands) at 1500 and DJ3FK/AM aboard a Boeing 767 flying over Iceland at 1400UTC.

Other stations Bev contacted include JH8MWW (Japan) at 1200 and 3D2DX on Rotuma Island slightly later, as well as HL3VO (South Korea) and 3V8/G0XAM/MM near Kerkennah Island, off the coast of Tunisia.

Back down in Yeovil, Don G3NOF has been working all over, again with the s.s.b. mode. His 18MHz contacts include D44BS (Cape Verde Islands) at 0930, FM5DN (Martinique Island) at 2229 QSL

to KU9C, TG9NX (Guatemala) at 2145, TJ1HP (Corsica) at 0855, VP2EE (Anguilla Island) at 2212. Also worked were special call W98ITU (QSL via Box 13145) St. Paul, Mn, 55113, USA, 3D2DX/P

(Fiji) at 0825 and 9A4QV/MM (off the coast of South Africa) at 1740UTC.

Yours truly, GW0LB, offers, a couple of QRP contacts on 18MHz, in the form of W1SYA (USA) at 1650, T94M (Bosnia) at 1300 and C37URA (Andorra), at 1100, all with 5W s.s.b., while 100 milliwatts of c.w. brought in a contact with OK1XW (Czech Republic) at 1205UTC.

THE 21MHZ BAND

A letter arrived from new reporter (and regular PW author) Ben Nock G4BXD who, whilst trying out a newly acquired Yaesu FT-707 during the CQ World Wide SSB Contest hooked up with VE3KZ (Canada), K5ZD (USA), V26B (Antigua & Barbuda Islands), DK8YY/HI8 (Dominican Republic), 9Y4VU (Trinidad & Tobago), and EA8AH (Canary Islands) all on the 21MHz band.

However, Ben reports hearing MBT on the 14MHz band and asks is this a legal English callsign? Well, in answer I heard at least one

other similar callsign Ben, so it looks as though they may have been special club calls.

Ted G2HKU was 'bashing the key' on the 21MHz band and came up with DU10DX (Philippines) and YV1NX (Venezuela) at 1500, while operating slightly later at 1900 brought in CE2LZR (Chile) and PY4ZF (Brazil). At 2100UTC he hooked up with LU1BMT (Argentina).

Down in Kent, John G0VGD used s.s.b. to contact LU4FPZ (Argentina) at 1952, ZW5B (Brazil) at 1900, P43A (Aruba Island) at 1800 and N3BNA (USA) at 2122UTC.

Sean G4UCJ mentions just one QRP c.w. contact on 21MHz in the form of ET3AA, worked at 1149UTC.

THE 24MHZ BAND

Now here's one band - 24MHz - that has really taken off over the past couple of months! After being possibly the most under-used of the h.f. bands, it really has attracted the DX crowd of late!

First comes Don G3NOF, who lists his s.s.b. contacts using a TET HB-33 beam antenna with BV5BG (Taiwan) at 1154, DU1KT (Philippines) at 1400, HL2DNN (South Korea) at 0840 and N7QXQ/HR6 (Honduras) at 1647UTC. Also logged were TA2BK (Turkey) at 1610, TG9NX (Guatemala) at 1300, TLSA (Central African Republic) at 1300 (QSL via PA3DMH), and 6W1RD (Senegal) at 1630UTC.

Sean G4UCJ offers QRP c.w. contacts with N2KK/6 in Los Angeles at 1500 and PT7WX (Brazil) at 1158, while Ted G2HKU spent quite a bit of time on 24MHz this month, swapping c.w. with HF0POL (Antarctica), A45XR (Oman), C91RF (Mozambique), TLSA (Central African Republic), 9M2TO (West Malaysia) and 9V8OK (Singapore) all at around 1500UTC.

Operating at 1800 brought Ted contacts with ZB2EO (Gibraltar) and Z56DM (South Africa). All in all a fair catch for such a small band. This certainly looks like one to listen out on!

THE 28MHZ BAND

Up to the 28MHz band now where spare time has been at a premium this month for QRP operator Eric Masters G0KRT of Worcester Park in Surrey due to

college work. But he did manage to spend some time at his low power station.

Using a 10W Yaesu FT-7 transceiver and a W3EDP wire antenna, Eric reports his 28MHz s.s.b. contacts with CU3DP (Azores Islands) at 1220, RA6AR (Russia) at 1500, EA6AE (Balearic Islands) at 1700, CN8EC (Morocco) at 1830, as well as 9J2BO (Zambia) at 1648. Not bad for your low power, Eric! Keep it up! (And the college work too!)

Another single-band report comes from **John Wheeler G0IUE** of Melksham in Wiltshire. He runs 100W into a 2-element beam antenna, and lists his s.s.b. contacts with ZP5OP (Paraguay) and NE4Z/P/CE3 (Chile) both at around 2100, CX5ABM (Uruguay) at 1950, VO1XT (Newfoundland) at 1700, P43E (Aruba Island) at 1944 and a couple of new countries for him, in the shape of HP3FL (Panama) at 1800, 5R8GC (Madagascar) at 0900 and 4S7EA (Sri Lanka) at 0914UTC. John also lists contacts with AD6DO (west coast USA) at 1930 and a little closer to home, 3A2MD/P (Monaco) at 1520UTC, via some short skip propagation. However, John also tried his hand at operating on the 29MHz FM allocation and hooked up with - yes, you guessed it - another new country, XE1E2M (Mexico) at 1720, a first for him on 28MHz narrow band frequency

modulation (n.b.f.m.)!

Finally, to round things up, we go to Bev GW0OSQ, who used his QRP sideband and his 28MHz home-made cubical-Quad antenna effectively to work VK6APZ (Australia) at 0830, HS0ZAZ (Thailand) at 0800, 9N1AA (Nepal) at 0900 and 3B8CE (Mauritius) at 0830UTC.

SIGNING OFF

That's about it for this month folks...it's signing off time! It's also clear that our reporters are having good results from the present conditions on the h.f. bands, so long may it continue! Many, many thanks to all reporters who have contributed to the column this year and I'd like to take this opportunity to wish you and all PW readers a Merry Christmas and a Happy New Year - Nadolig Llawen a Blwyddyn Newydd Dda I Poh Darllenwyr PW!

As usual, reports and information (and photos as I'm desperate for photographs of our reporters!) by the 15th of each month. Details at the top of this column.

Leighton GWOLBI

SCENE USA

PLEASE SEND ME REPORTS, COMMENTS AND INFORMATION FOR THE APRIL COLUMN BY 15TH JANUARY.

ED TAYLOR NOED
PO BOX 261304
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COLORADO 80226,
USA

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GETTING YOUNG PEOPLE INTERESTED IN ELECTRONICS AND AMATEUR RADIO IS A COMMENDABLE GOAL. 'HAMS' IN THE USA ARE COMING UP WITH NOVEL WAYS TO ACHIEVE THIS. ED DESCRIBES A NOTEWORTHY PROJECT BY A JUNIOR RADIO CLUB WHICH HAS ACCOMPLISHED OUTSTANDING RESULTS.

Radio Amateurs worldwide have a problem. Our average age is increasing - at the last count, the ARRL (US national society) estimated it was 51 years. Interest in the hobby seems to be waning among young people. Is this really a problem and are we, as a group, losing the energy to do anything about it?

I think there IS a problem and, in brief, there are two main reasons why we should be concerned. The first is our own

self-interest. If the average age keeps creeping up, there will be no Radio Amateurs left alive some day (or young enough to fight for its survival) and our hobby will no longer exist.

Secondly, there are good social reasons for interesting younger people. For example, our society is always short of electronics specialists, mainly because this is not a field which is widely known in schools. Don't we also think that any activity which gets kids out from in front of the TV just has to have a redeeming social value?

As far as the question of our collective energy is concerned, I have to (once again) mention one of the great American virtues. There is an optimism and "can do" attitude in the USA, which says that the application of enough time and enthusiasm to a problem (and perhaps a little money) will achieve the required goals. Sometimes this doesn't work, but mostly it does.

It's worth noting that the ARRL attaches a great deal of importance to educating future young 'hams'. The head of their Educational Activities Department, **Rosalie White WA1STO**, spends quite a lot of time travelling to conventions and meetings throughout the USA. She speaks and makes presentations extolling the virtues of a local approach and encourages groups to set up training schemes for children. She is also well-known in the UK, particularly for her work in amateur satellite co-ordination.

REMARKABLE WORK WITH YOUNGSTERS

There is a group of amateurs in the USA who are showing what can be done to bring in youngsters. Their record of achievement is remarkable. I was interested to find out how things worked and if others could emulate their success. As with many similar situations, I found that a couple of people were leaders, but that they had help from supporters both



Working with youngsters brings success and pleasure.

PW LISTENING & OPERATING WATCH LIST

(All times UTC)

Charlie Blake M0AIJ listens and operates: 0500 - 0700 on 7.061MHz s.s.b. with an NRD-525 receiver & sloping wire antenna and is also busy with his mobile rig.

George Woods G3LPT (Suffolk) operates: an open net on 29.570 n.b.f.m. every weekday morning, except Monday, at 0930.

Don McLean G3NOF operates: 1030 Saturdays on 3.685MHz on the ISWL Net or 1030 Sundays on the Yeovil ARC Net on 3.665MHz s.s.b. using a Kenwood TS-950 & trapped dipole antenna.

John Wheeler G0IUE monitors: 28.500 s.s.b. every evening between 1700 and 2200 regardless of conditions using an Icom IC-706 and a 2-element TET triband beam antenna.

Leighton Smart GWOLBI operates: Some weekday evenings at around 2100 - 2330 on 1.949MHz s.s.b. using a Yaesu FT-747 transceiver at 5W and a long wire Marconi antenna.

Rob Mannion G3XFD listens and operates: (weekdays & weekends) 1800 - 1830 on 3.7MHz 100W s.s.b., & 3.530 or 3.560MHz and 18.105MHz QRP c.w. using an Alinco DX-70 transceiver and a long wire antenna. Also at 2300 on either 3.560, 7.025MHz (c.w.) or 3.7MHz s.s.b. (All operation dependent on PW workload!).

Sean Gilbert G4UCJ operates: around 0700 to 1100 and 2100 to 0000 seven days a week on 14MHz and 7MHz using an FT307 and Alinco DX-70 transceivers at 3/30W output and a G5RV dipole antenna in the loft space.

RadioScene



Working with youngsters as a team.

It's an absorbing hobby!

kept BARC Junior vital and growing.

HUGE RANGE OF ACTIVITIES

When I went to talk to Ellie and Rip, they were eager to tell me about the Club. This was by no

means the first time they had been interviewed for the media, but they were keen to spread the 'Gospel'. Ellie began: "As well as a Radio Amateur, Rip was an electrical engineer and on retirement, we were looking for a way to combine his talents with my teaching experience. From the start, we knew that we would have to include all sorts of activities to keep kids interested. Of course radio is already a huge field, but you need to wrap it around things children are already familiar with."

I asked for examples and the reply was: "We love to have FOX HUNTS, which are really just electronic forms of HIDE AND SEEK. Most children like talking, so we introduce them to the CLUB NET right from the start and all kids like eating, so events often include a break for pizza or something similar. Of course, we spend quite a bit of time giving instruction, but we try not to make the 'lessons' too much like school. We've developed a good combination of seriousness and fun over the years."

Fox Hunts are a form of Direction Finding on 144 or 430MHz. A hidden transmitter a mile or so away sends out a signal on a pre-arranged frequency. Using hand-held antennas and battery rigs, the competitors take bearings and then proceed on foot to try and find the transmitter.

Naturally, obstacles such as fences and houses get in the way. As they get close, they must reduce their signal level and get more accurate bearings.

within and outside the 'ham' radio community.

The husband and wife team of Rip and Ellie Van Winkle (NV0M and N0QCX) are the stars. They have been members of BARC (Boulder Amateur Radio Club) for many years. Boulder is a fairly prosperous university city next to the Rocky Mountains, known also for high-tech industry. The Van Winkles live on the edge of town, with a large house and fine antenna system.

In 1991, Rip and Ellie were invited by BARC to start a radio organisation for local youth. Ellie is a retired teacher and she approached a local school to see if they were interested in licence classes. The venture was very successful, leading to several new 'hams'. They decided to continue, forming an offshoot of the club called BARC Junior. The classes moved from the school to their home and they broadened the scope to cover not just getting a licence, but all aspects of amateur radio.

Such was the interest locally, Ellie and Rip soon had to find others to help. They recruited a cadre of Elmers*, who have varying skills and can instruct in many topics. They settled on a Saturday afternoon meeting lasting an hour and a half. Then their quiet neighbourhood home becomes a place of concentrated and intensive study - sometimes serious, sometimes noisy, but always instructive. From the beginning, the commitment of Ellie and Rip is what has

They're never too young to start.



*"Elmer" - "Radio Amateur who voluntarily helps others to make progress in the hobby. Origin: obscure, but thought to be named after a real person".

The winners, usually running at that stage, are the first to find the transmitter. At BARC Junior, more experienced members and Elmers join with newer children to form teams of three or four.

"They have a great time and pick up some radio knowledge" said Ellie. "They learn how to use simple radios, where the bands are, how to tune, variation of field strength, how antennas work and the meaning of polarisation. We also involve parents, some of whom have become licensed as a result."

What about the Club Net? This takes place on Sunday evenings on the club's 144MHz repeater and is run by one of the members. There is no age limit on amateur licences in the USA, so the controller could be very young, or perhaps just inexperienced. In that case, a parent will deliver the controller to Rip and Ellie's house to operate under supervision. A "theme" is suggested for discussion, sometimes radio related, sometimes not.

PARENTS' SUPPORT CRUCIAL FOR YOUNG AMATEURS

It's clear that parents must be closely involved with BARC Junior. Ellie was emphatic: "Yes, we couldn't do all this without their support. Occasionally a parent will be indifferent, but most are thrilled to find something their kids like. One of them said she was grateful to have found a spot where her 'nerd' can get together with a bunch of other 'nerds'. Well, I would just say that we provide a focus for children with technical interests, where they can get together with like-minded friends.

"It's of the greatest importance that parents are reassured their child is in a safe environment. Parents can attend every activity and there are some events such as overnight stays (depending on child's age) where their attendance is compulsory. We have up to 30% of members who are girls and parents are obviously concerned that everything is above board. Needless to say, we are very particular about Elmer". (In view of all the outings I heard about, it was clearly essential to

be fully insured. The Club is covered by the main BARC insurance, which is a back-up in case something goes wrong).

For their part, the children are expected to act properly at the Club. "We provide a consistent environment and a light but very clear discipline. Once or twice we have asked kids to leave because they couldn't behave, but this is rare. Of course, radio is not for everyone and a kid who drops out has probably found some other interest. Everything is voluntary."

I wanted to know about the format of the Saturday meetings. Rip told me, "We divide the 90 minutes into four sessions. First we have announcements and administrative matters. Then we do Morse practice. We cover zero to twenty words per minute in several groups. Next we have theory classes, covering the five exams in the incentive licensing system. We use almost every room in the house for this (including the large basement), since kids are all learning different things at different times. Then we have a practical demonstration, usually



Pedal power (see text).



We'll find them! (DF hunting).



There they are....!

conducted by me. This might be something straightforward like Ohm's law or measuring output from a dynamo. Occasionally, I'll amuse the kids in a more spectacular way - perhaps connecting an electrolytic capacitor to a high voltage the wrong way round - don't try this at home! They love noise and explosions!"

There are about 16 Elmers at present and they fit into the Saturday timetable as organised by the Van Winkles. The Elmers teach each of the Morse and theory sessions for about twenty minutes. This seems to fit in well with the children's attention span, especially when they are only seven or eight years old. There is often homework to do, which some kids just lap up (and progress very rapidly) and some ignore. Nobody minds too much either way, but an average of more than one new licensee every single month for seven years, shows that the system is working.

RADIO-RELATED OUTINGS

Once a month, the Saturday meeting is replaced by a 'Field Trip'. This may be a visit to a local company, or participation in an event such as 'Jamboree on the Air'. Because of the number of technically oriented organisations locally who are usually enthusiastic about promoting themselves, there is no problem in finding things to do. Ellie showed me the 1999 schedule, already completely full. These were outings that an adult club would be happy to offer, including an amateur television demonstration, a visit to an antenna company and a presentation from the 'Federal Aviation Administration'.

Other popular activities have been a trip to the police emergency dispatch centre, a hike to the mountain where the local repeater lives and a look at the operations of an airline. "We have to get detailed parental permission for all of these", said Ellie... "It's essential to get the paperwork done properly, although this is a chore".

The BARC Junior have recently started to enter a station in the US annual Field Day. This is easier than in Europe, because of its less competitive nature and because all bands and modes are allowed. There are many categories and points can be

earned for almost any contact. Ellie was pleased this had started. "The kids love the idea of setting up the antennas and everything, then operating. They get a big thrill from talking to so many stations - some 'phone and some Morse. We also have an old exercise bicycle that they use to drive a generator and have 'human power' QSOs. They'll run out of energy after half an hour or so, but it really illustrates how little power it takes even for a long distance contact.

"Another annual trip is to the Dayton Hamvention. We can usually afford to send several kids, with the costs of airline tickets and overnight stays to cover. We participate in the 'Youth Forum' and provide young speakers who will make presentations and take questions. It's a really big deal for the children and we have to hold a selection procedure to see who will go. This is normally the first time they will have had to speak in public. It's an experience they won't get anywhere else, especially at such a young age. Even those who don't succeed in going will have learnt a lot and we have them make their prepared presentations later. It's a lot of work for everyone, including the Elmers, but very rewarding."

I wanted to know how the Club managed to arrange funding for all its diverse events and Ellie explained: "We get donations and rarely have to ask. Parents put cash into a coffee cup each week and amateurs help with contributions, sometimes extremely generous. They also give us gear they no longer need. Companies supply books and equipment at cost and organisations are frequently willing to help. We're lucky that the community appears to recognise our accomplishments and to support us in this way."

It seemed to me that there is little luck involved - mainly hard work and enterprise. The impressive results achieved by the Van Winkles and their Elmers are a model of what can be done. Not everyone could contribute the amount of time they put into BARC Junior, but I think the example they set is an ideal to work towards.

MANY THANKS TO NVOM, N0QCX AND WM0G FOR THEIR HELP IN PRODUCING THIS ARTICLE AND PROVIDING PICTURES. I AM ALSO

GRATEFUL TO DAVE, KE00G, WHO SUPPLIED PHOTOGRAPHS AND GAVE PERMISSION FOR THEIR USE. IF YOU HAVE ANY COMMENTS, PLEASE LET ME KNOW. THE COMPLIMENTS OF THE SEASON TO EVERYONE, AND A HAPPY NEW YEAR.

73 Ed Noed

DATA SCOPE

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THIS MONTH, ROGER COOKE G3LDI TAKES YOU THROUGH MORE OF THE INTERNET LOOKING AT A PROGRAMMER'S KIT, AMATEUR RADIO SITES ON THE WEB AND MUCH, MUCH MORE!

PROGRAMMER'S KIT

A Programmer's Kit is probably just the thing for those among you who are into, or would like to get into, programming. If you have the time and fancy a DIY course on C and C++ programming, then why not consider this book written by Peter Brunning: *Experimenting With C & C++ Programs*.

Peter Brunning's book teaches the reader to program by using C to drive simple hardware circuits which the reader constructs using a supplied plug-board, components and software supplied in the kit of parts.

The circuits plug onto the end of your PC's printer lead and the programming techniques for the experiments are kept as simple as possible, making the programs easy for a complete beginner to follow. Even the final program driving the storage oscilloscope circuit employs relatively simple C techniques, although the overall program is by no means simple. None of the experimental circuits require soldering.

The author wrote

the book as he himself was learning to program and has written it in several stages, thus catering for the absolute beginner in the first instance. It takes the reader through several stages including practical work and then some theory, alternating as the reader progresses and would make an ideal starter kit for a youngster thinking of taking up programming. The front cover of the book is shown in Fig. 1.

The 338 page wire-bound book costs £24.99 and there are three kits available: Kit CP2a costs £46.00; Kit CP2u costs £39.99 and Kit CP2t which costs £22.99. The kits include two Compilers, one of which will run on any IBM compatible PC. This should be a minimum of a 386 with 14Mb of free hard disk space.

If you are interested, then the address to contact is: 138 The Street, Little Clacton, Clacton-on-Sea, Essex. CO16 9LS. Tel: 01255 862308.

LOCATED IN RUSSIA

Octavia Company Ltd. is a privately held company located in Maikop, Russia and has been producing software, QSL cards, etc. for Radio Amateurs since May 1989.

They have now produced a Visual Callsign Database CDROM Vol 2. It covers all over the CIS and provides instant access to over 62 000 licenced amateurs in Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldavia, Russia, the Ukraine, Uzbekistan, Tajikistan and Turkmenistan.

The new 32 bit version has a radically new interface and lots of new features including contests, special event calls, clubs, Silent Keys and nearly

13 000 cross references from old to new calls. There are over 700 high resolution personal and DX photographs and QSL cards with slide show facilities.

Also provided are E-mail and packet radio addresses, WWW URLs and over 4000 telephone numbers with dialling codes, club member and so on. Screen shots, a free demo

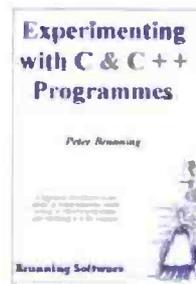


Fig. 1: The front cover of Peter Brunning's book: *Experimenting With C & C++ Programs*.

RadioScene

and ordering facilities are available on the Internet at: <http://www.octavia.com/vcd.htm>

A list of retailers are available also on the Internet at: <http://www.octavia.com/sales.htm>

NETSCAPE REVISITED

Following my first experiences with Netscape, I thought I was doing quite well until, that is, I needed to look at some of my saved GIF files. I could not find them at all. Asking around, it became evident that Netscape is very crafty and stores these files in what is not the most obvious place! If you have the same problem, you will find your cache holds all the html/gif/jpgs, etc., that you see on a web page. In my case, it's located at

C:\ProgramFiles\Netscape\User\rhjrcooke\Cache (change the drive letter to suit).

You can also have more than one Navigator window open at a time. If, for instance, you find a page of interest you can save it or just open another window (File>New>Navigator Window) and continue 'surfing' from there.

If you don't close Netscape down when you disconnect from the Internet you can use the back button to step back through pages in your cache. This is limited by the size of your cache and how often you clean it out. Even after a few



Fig. 2: Screen grab taken from the 'Amateur Radio & DX Reference Guide' Web site at <http://www.ac6v.com>



Fig. 3: Screen grab from the 'Sunspots & The Solar Cycle' Web site at <http://www.sunspotcycle.com>

weeks of visiting various sites, there were lots of files in there and the file names are quite meaningless.

All the settings are under Edit>Preferences>Advanced>Cache. Looking at each file takes time, but it is worth the effort as some of them can be quite useful to keep after re-naming and store in case you are designing a Web page.

MAIN FEATURES OF RCKRTTY:

- Modes: RTTY, c.w.
- German, English, Czech, Italian, Russian, Spanish language versions available.
- Simultaneous Packet-Radio connects possible (DX-Cluster, Mailbox).
- take-over the DX-announcements into the QSO-fields.
- DX-announcements with a simple mouse click possible.
- full off-line operation possible. (without modem/without transceiver/without Packet-Radio).
- full mouse support.
- one registration for several call extensions. (for example: DL4RCK, G/DL4RCK, G/DL4RCK/p, DL4RCK/m)
- frequency/band and mode maybe read from transceiver.
- frequency control of transceiver.
- T3 function keys with all lots of variables for custom "brag" configuration.
- names from a "friendList" file.
- DXCC-, country-, WPX-, CQ-zone-, ITU-zone- evaluation with display of local time available (use of CTY.DAT).
- show beam direction to all countries, with call area detection of W, VE, VK, JA, ZL (e.g. W1, VE2, W6)
- calculate the distance in Kilometer or Miles to the other station.
- full and partial call-search using a "MASTER.DAT" file, more

than 11500 calls available.

- comments for each call can be stored/saved.
- take-over data from the same call in the log (if worked before).
- automatic CQ with user settable timing and variable text.
- modem commands can be sent within the program.
- save of received text to hard disk.
- several log files with different set-ups selectable.
- edit, sort and print functions for log files.
- conversion of log files to standard ASCII file.
- online print of every logged QSO.
- partial string search in all fields of the log.
- UTC difference to local time settable.
- Operating hour meter for online- or contest operation.
- several macro-files (text-files) with all available variables possible.
- macro-files can be sent by single keystroke.
- automatic call detection, mouse-click transfers call into log-field.
- double-click on received call transfers same into call-field and allows 'simultaneous' sending of a user defined text.
- double-click on received text transfers same into QSO-fields.
- display of band already worked for current call sign - JOTA - State - CQ-zone - ITU-zone - WPX - DXCC
- font type and font size for each program window selectable.
- Several acoustic signals or jingles possible at different events, for example: DX-announcements from a PR-cluster.

AMATEUR RADIO SITES

One site that is a must to visit is <http://www.ac6v.com> Here you will find just about anything you will ever want in the Amateur Radio world. There are 88 pages to browse through and if you don't find what you are looking for there, 3000 links to other sources will help. I spent a happy hour just reading what was available. There are some interesting propagation programs, loads of DX information and much much more - too numerous to mention. Fig. 2 shows the site heading.

Another quite fascinating site is:

<http://www.sunspotcycle.com>

This one not only gives the sunspot count every day, but also provides interesting solar information in the form of articles, pictures and other relevant descriptions of solar events that have an effect on our hobby. There are some very nice graphics on this site too and these tend to make the site very attractive. (See Fig. 3).

TRANSLATOR

For those amateurs that want to brush up their linguistic skills, I've found something that could be just what is needed: **Power Translator Pro**. It's not cheap, but it does work in a similar way to a word processor. Opening a window, you are asked to select the language pairs that you require. Selecting English and German for example would entail typing text into the top window in English and at the click of a button, the translated text appears in German in the lower screen. It comes with Italian, Spanish, French, German and

Portuguese plus many ex-colonial countries.

Power Translator Pro can integrate with other programs, has an extensive set of utilities and can import RTF and HTML text. Linking into E-mail and the Web is possible using the browsers. It also comes with more than 30 specialised dictionaries covering technical and business areas in French, German and Spanish.

Flexible and powerful, it is not cheap at £200 and it might be outside the budget of most people, but it's very tempting as I've said. If you want further information, try www.globalink.com

COMPETITION FROM LINUX

Microsoft expects to face more competition from Linux and is worried at the gathering pace of industry support for this low-cost operating system. The latest software supplier to throw its weight behind Linux is IBM and Big Blue has announced that it is willing to offer its DB2 Universal Database for the operating system with the possibility of more applications to follow.

Linux has a following in the amateur world too and this will be good news for the devoted few who are using it, although that few seems to be increasing in numbers. I can't really believe that Microsoft is worried though, can you?

SPAM AND MORE SPAM

Not fanned spam again! Don't worry... it's nothing to do with Monty Python this time, Spam is the pseudonym given to **Unsolicited Commercial E-mail (UCE)**. This is the Internet's version of the notorious telephone call offering free double-glazing! It's the much-hated practice of sending out millions of copies of a message, typically advertising get-rich-quick scams or pornographic Web sites.

The first rule is to never respond. In many cases, a promise to 'remove' you from a list merely validates your address for further spam. Most Internet Service Providers (ISPs) now prohibit relaying, which is causing some of the problems. Sending junk mail back is a fruitless task too as the return address is usually fake.

Software is available to detect spam and erase it before

the user sees it, but it would be nice to see some ethical standards on the Internet, with a proper approach offering a "Don't send me any more" box that can be ticked!

NEW RTTY PROGRAM

The new version **RCKRity V1.21** is available. **RCKRity** is a comprehensible program for logging and administration of RTTY and CW-QSOs with simultaneous control of transceiver and real-time operation with Packet-Radio. It runs on any IBM PC or compatible with **Windows 95/98** or **Windows NT** system.

The current program and further development (Beta-Versions) can be downloaded from the homepage of **Walter DL4RCK** at <http://www.qsl.net/dl4rck/index.html>.

Supported modems: SCS-PTCII, SCS-PTCplus, AEA-PK232, AEA PK-232MBX, AEA-PK900, MFJ127B, DSPCOM, KAM, KAM-Plus.

Supported Transceiver control: Kenwood, ICOM

Simultaneous Packet-Radio (DX-Cluster): TNC's with Terminal-Mode or with WA8DED Hostmode (The Firmware)

THAT'S ALL FOR THIS MONTH. SEE YOU ON THE INTERNET AND HAVE A HAPPY CHRISTMAS!

73 Roger J Cooke G3LDT

BROADCAST

REPORTS AND INFORMATION TO ME PLEASE.

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THIS MONTH, PETER BRINGS THE READERS OF **PRACTICAL WIRELESS** A REPORT OF A NEW INITIATIVE FROM DEUTSCHE WELLE'S DIRECTOR GENERAL, A WORLD FIRST AND INFORMATION ON NEW STATIONS AND OLD AND WHERE TO FIND THEM.

A new initiative has been announced by Dieter Weirich, Director General of Germany's international broadcaster, **Deutsche Welle**. He wants to launch an international radio service from the whole of Europe, targeting Latin America in the first instance using Spanish and perhaps Portuguese. The new station would draw on Deutsche Welle's output, plus material from **Radio France Internationale**, **BBC World Service** and **Radio Netherlands**, and the programmes would be produced in Brussels.

This seems to mirror the **Radio:E** project which is funded by the European Commission, and delivers three half-hour radio programmes each week. The English-language version of this is called **Weekend** and is broadcast by a good number of Europe's English-language international services. EC funding for **Radio:E** ceases at the end of this year (1999) and so the main participants are looking for a new funding line for a new project from Europe.

A WORLD FIRST!

International radio broadcasting could be on the threshold of a new age with the launch of the first **WorldSpace** radio satellite. The **AfriStar** satellite was sent into orbit from French Guyana at the end of October last year on board an Ariane 5 launch vehicle. The satellite is now in position at 21° East, ready to beam programmes in 'digital quality' to the whole of Africa and the Middle East, as well as parts of southern Europe.

The satellite will carry programmes from a range of African broadcasters and negotiations are continuing with major international stations - including BBC World Service, Deutsche Welle and others - over the potential carriage of their African services via this new digital satellite system.

However, despite the hype surrounding the launch, there are still many industry observers who cannot see how the project will work. No high technology products have ever been rolled out in Africa before and the



satellite power does not allow reception of the digital radio signals under heavy foliage or inside buildings.

With receivers costing around US\$300, it is difficult to see how many Africans will be able to afford the sets needed to access this potentially enriching technology advance.

'MERLIN' JOINS THE NETWORK!

Merlin Network One, the new station operated by the privatised BBC World Service transmission company, is making full use of the UK short wave sites it runs. It is on the air with English seven days a week: 0000-0030 (UTC) on 9.56 and 3.985MHz; 0300-0600 on 9.895 and 3.985; 0600-0700 on 13.72 and 6.11; 0700-0800 on 21.55, 17.63, 13.72, 9.915 and 6.11; 0800-0900 on 21.55, 17.63, 13.72, 13.66 and 9.915; 0900-1200 on 21.55, 17.63, 13.66 and 9.915; 1200-1400 on 21.55, 17.63, 13.645 and 9.915; 1400-1600 on 21.55, 17.63, 13.68 and 9.915; 1600-1700 on 21.55 and 6.185; 1700-1800 on 21.55, 6.185 and 3.965; 1800-1900 on 21.55, 6.125 and 3.965; 1900-2000 on 9.69 and 6.125; 2000-2200 on 11.985 via the UK and 11.755 via Sackville, Canada; 2200-2300 on 9.835, 7.17 and 7.12; 2300-2400 on 9.835, 7.17 and 3.985.

Merlin Network One programming is principally music-based and includes shows like 'The Album Show' and 'Radio Caroline output'. The station is also aired via m.w. on Ascension Island in the Atlantic Ocean, home of the Merlin short wave transmitting station. Try to catch the signal on 1485kHz!

Merlin can be contacted at **20 Lincoln's Inn Fields, London WC2A 3ES**, or via E-mail at mno@cix.co.uk. There is a Web site - with quite a number of errors - at www.mno.net

More Frequency News

Radio Tirana from Albania has English programmes: 0245-0300 (UTC) on 7.16 and 6.115MHz; 0330-0400 on 7.16MHz; 2015-2030 on 9.65 and 7.18MHz and finally at 2230-2300 on 7.16 and 6.02MHz plus 1215kHz m.w. **Radio Prague** is on the air with

English: 0000-0027 (UTC) on 9.465 and 7.345MHz; 0100-0127 on 7.345 and 6.20MHz; 0300-0327 on 9.435 and 7.345MHz; 0800-0827 on 15.26 and 11.64MHz; 1000-1030 on 21.745 and 17.485MHz; 1130-1157 on 21.745 and 11.64MHz; 1230-1257 on 21.745 and 6.055MHz; 1400-1427 on 21.745MHz; 1700-1728 on 17.485 and 5.93MHz; 1800-1827 on 7.315 and 5.93MHz; 2100-2127 on 7.345 and 5.93MHz and finally at 2230-2257 on 9.435 and 7.345MHz.

Radio Vlaanderen Internationaal has a new mailing address of **1043 Brussels, Belgium**. The station's listener letter programme has been renamed from PO Box 26 to reflect this change; it is now called simply **1043 Brussels!** The station is on the air with English at: 0830-0900 (UTC) on 9.94 and 5.985MHz plus 1512kHz m.w.; 1130-1155 on 13.745 and 9.925MHz plus 1512kHz; 1300-1330 on 1512kHz; 1730-1755 on 13.65, 12.08 and 5.91MHz; 1830-1900 on 13.745MHz and 1512kHz; 2100-2130 on 1512kHz and finally at 2230-2300 on 13.67MHz.

Look out for the return of French-language programming from Belgium this year. The **Danish Shortwave Club** reports that **RTBF** is planning s.w. transmissions in French to Central Africa and to the Mediterranean. No frequency information has been given, or details of which transmitting station might be used. The French community ceased s.w. broadcasting more than eight years ago and the transmitting station used was closed at that time.

Channel Africa from Johannesburg is on the air in English to Africa: 0300-0325 (UTC) on 9.525MHz; 0400-0430 on 5.955MHz; 0500-0530 on 15.215MHz; 0600-0630 on 15.215MHz; 1500-1530 on 17.87MHz; 1600-1630 on 6.00MHz; 1700-1730 on 17.87 and finally at 1800-1830 on 17.87MHz.

THAT'S ALL FOR THIS MONTH. KEEP YOUR EARS TUNED TO THE SHORT WAVE BROADCAST BANDS FOR THE LATEST NEWS FROM AROUND THE WORLD AND LET ME HAVE ANY INTERESTING SNIPPETS FOR OTHER READERS OF **PRACTICAL WIRELESS**. GOOD LISTENING!

Peter Shore

Fig. 1: Screen grab from the WorldSpace Web site at www.worldspace.com

Classified Ads

To advertise on this page see booking form.

Whilst prices of goods shown in advertisements are correct at the time of going to press, readers are advised to check both prices and availability of goods with the advertiser before ordering from non-current issues of the magazine.

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VALVES WANTED for cash: KT88, PX4, PX25, DA100, EL34, EL37, CV4004, ECC83. Valves must be Mullard/GEC, West European to achieve this price. Ask for free wanted list. Prompt and courteous service. Visitors please phone for an appointment (we are a very busy Export Warehouse). Billington Export Ltd, Billingshurst, West Sussex RH14 9EZ. Tel: (01403) 784981. Fax: (01403) 783519. E-mail: BillingtonExportLtd@btinternet.com

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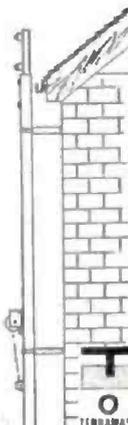
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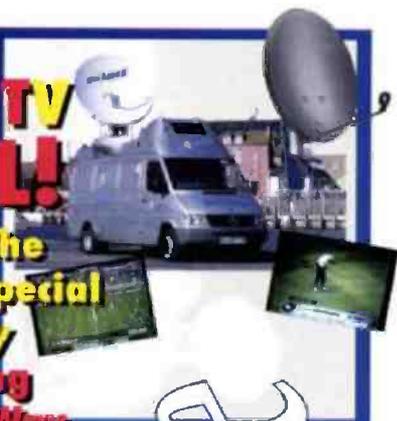
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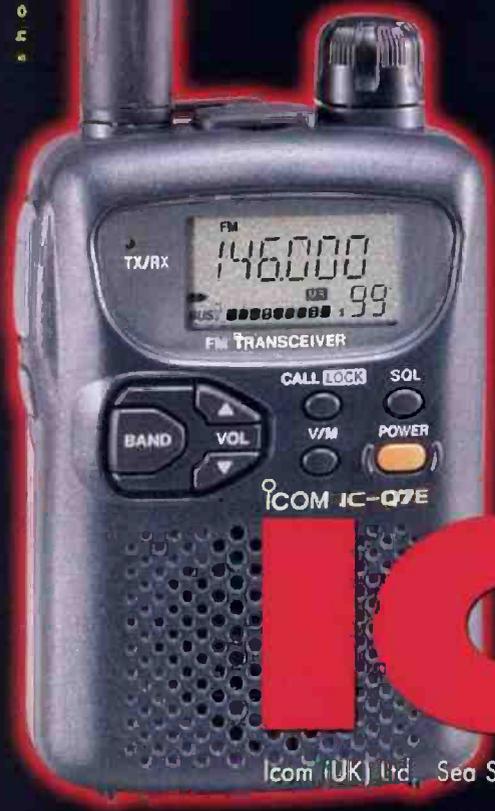
spike up your shorts* with a Q7

the IC-Q7E - ideal for short range contacts* and repeater operation

Owning an Icom IC-Q7 will not be a painful experience, in fact far from it, as this mini-handheld definitely falls into the 'mighty atom' category, including wide-band Rx capability for VHF broadcast, airband, FM and TV.

- Receives 30~1300MHz wide frequency range
- Ultra compact body with drip-resistant construction
- Economical ~ only 2 x AA (R6) alkaline or Ni-Cd batteries needed
- Economical output ~ 300mW RF
- Compact design ~ 58(W)x86(H)x27(D)mm
- Band switching and a minimum of function switches give simple operation
- 200 memories provided for storing operating frequencies and other settings such as tuning steps, operating mode etc.
- EEPROM memory ~ needs no back-up battery and gives maintenance-free memory storage
- Digital squelch for high-speed squelch attack and release
- Large internal speaker
- LCD backlight with timer
- Power-save function
- Tone scan function
- and much, much more...

shown actual size - ICOM's VHF/UHF FM mini-handheld



IC-Q7E

Icom (UK) Ltd, Sea Street Herne Bay Kent CT6 8LD. Telephone: 01227 741741. Fax: 01227 741742.
URL: <http://www.icomuk.co.uk> e-mail: info@icomuk.co.uk

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"And the DSP
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