short wave magazine

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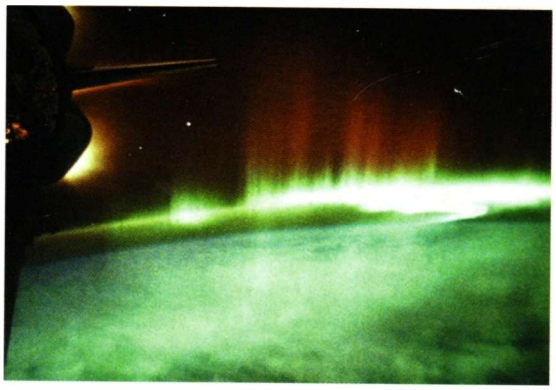
MAY 1998 £2.75

Propagation Special



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Top Receiver IC-R8500 now even better with PC remote software option!

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IC-8500

Icom (UK) Ltd. Sea Street Herne Bay Kent CT6 8LD. Telephone: 01227 741741. Fax: 01227 741742.
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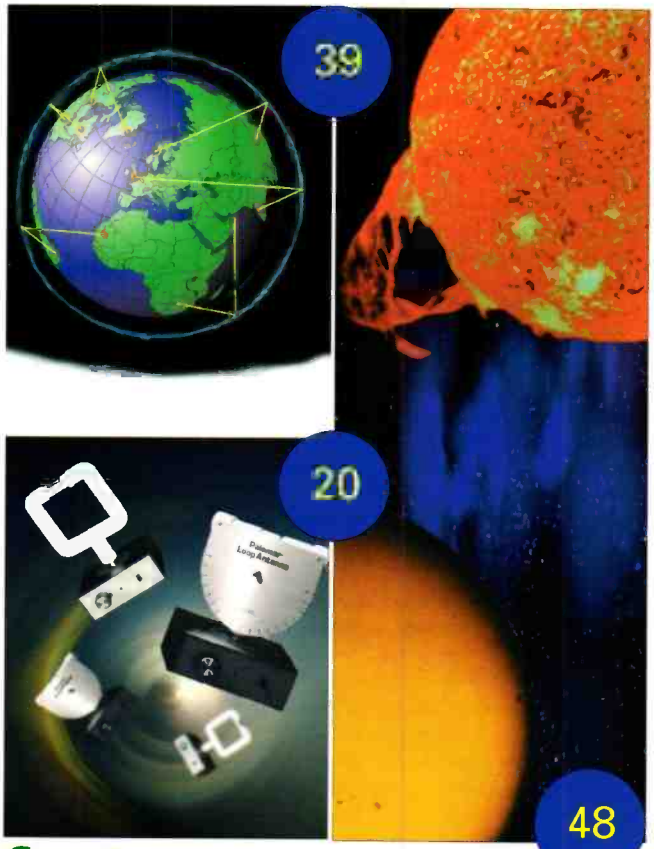
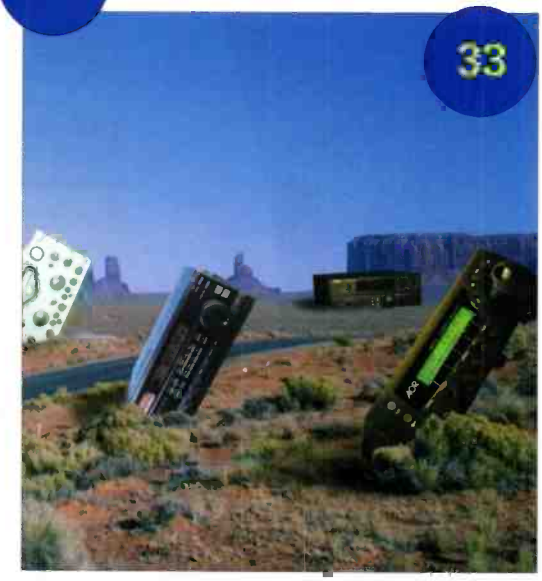
May 1998 Issue



Broadcast

Propagation Special

features



regular columns

WIN TICKETS TO THE INTERNATIONAL AIR TATTOO - PAGE 28

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Cover.
Aurorae Australis - the 'Southern lights'. Courtesy NASA

Please Help!

Please try and help to make Zoë's job easier by filling in your Trading Post forms as neatly and clearly as possible. Please write in **BLOCK CAPITALS** and always check your contact details are correct, you'd be surprised at the many who incorrectly write their own telephone number!

Don't Forget!

Remember, you can still receive a full listing of 'Grassroots' by sending a stamped self-addressed envelope to Lorna Mower at the Editorial Offices. Please mark your envelope 'Grassroots List'. If you have Internet access, take a look at **www.pwpub.demon.co.uk /SWM/grassroots**

Red Rose QRP Festival

The **West Manchester Radio Club** are holding their 2nd QRP Festival at Formby Hall, Atherton on **Sunday 7th June 1998.** There are large spacious halls at ground level with ample free parking, disabled facilities, refreshments, bar, talk-in on 2m, Bring & Buy stall and much more.

Contact **Leslie Jackson, 1 Belvedere Road, Atherton, Manchester M46 9LQ for more details.**

EXCLUSIVE !

NEW AOR SCANNER FOR THE UK

As always, *SWM* brings you the hot news first. AOR are set to launch a new hand-held scanner onto the UK market.

The new model is due to arrive towards the end of May. The totally new design will include the all important 8.33 kHz airband channel step is correctly implemented (eight-and-one-third, 33, 66, 00).

We understand that the new radio will not replace the AR8000, production of both units is due to continue in parallel.

Our research indicates that the key features of this new radio are:

- Wide frequency coverage from 530kHz to 2040MHz all mode: a.m., narrow a.m., u.s.b., l.s.b., c.w., auto, w.f.m., n.f.m., s.f.m.
- Wide variety of tuning step sizes from 50Hz upward including 8.33kHz and proper step adjust (as per the AR5000), a.f.c. for spot-on automatic tuning and noise limiter.
- Preselected v.h.f. front-end for superior signal handling.
- 45MHz i.f. for improved short wave reception, plug-in medium wave bar antenna with negative feedback circuit.
- Flexible dynamic memory bank layout - memory banks may be varied in size between 10 and 90 channels each. 1000 memories, 20 memory banks, 40 search banks.
- Large l.c.d. with contrast control, higher resolution signal meter and multi-function bandscope with adjustable width and save trace functions.
- Optional internal 'Slot Card' allowing the following options:

Memory Slot Card - increase storage to 4000 memories, 160 search banks.

CTCSS Slot Card.

Record chip Slot Card -records up to 20 seconds of audio.

Tone eliminator Slot Card, plus more...

- New four-way arrow key for navigation through on-screen menus, side mounted rotary tuner in addition to tuning from arrow keys and keypad
- Computer control - side mounted robust connector for optional lead
- Scratch resistant 'military green' cabinet with hard keys and revised top panel knobs

For more information on this exciting new hand-held, contact: **AOR (UK) Ltd., 4E East Mill, Bridgefoot, Belper, Derbyshire DE56 2UA**. Tel: **(01773) 880788**, FAX: **(01773) 880780**, E-mail: **info@aor.co.uk** or via the web: **www.demon.co.uk/aor**

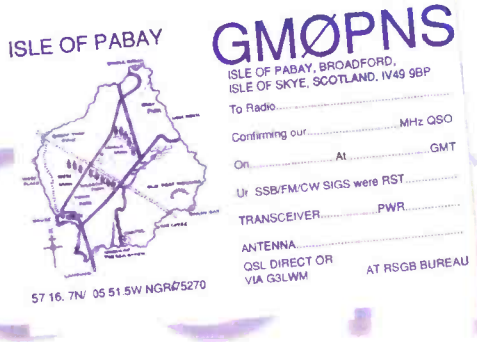
Be sure to keep you eyes peeled for the *definitive* review in *SWM*!

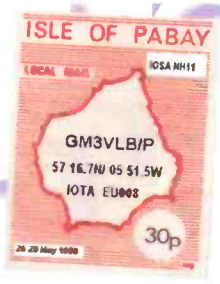
OPERATION FROM PABAY

During the 26-28th May 1998 **Andrew GM3VLB/P** will be operating from the Isle of Pabay. At the same time, it is hoped that the Stamp Club of Pabay Station, callsign **GM0PNS** (Pabay Near Skye), will be activated from the island, under the control of **Jeff Harris G3LWM**. Operations are expected to be on both 40 and 80m.

A special stamp has been issued to commemorate Andrew's activity on the Island. So, anyone who wishes to receive QSLs direct with the special stamps and also is interested in the other new Pabay Stamp, they should send an s.a.e. to G3LWM, **44 Fourth Avenue, Frinton on Sea, Essex CO13 9DX**.

The Pabay Web Site address is **http://www.netstamps.com/pabay** and the address for DXpedition information is **http://www.netstamps.com/pabay/dxped.htm**





DOUBLE FIGURES!

Formed in 1988, the **Scarborough Special Events Group** consists of radio amateurs ranging in age from teenagers to senior citizens, with calls ranging from G3s to 2E1s and M0s. However, one thing they all have in common, is innovation, enthusiasm, experience and excitement.

To mark the occasion of their **10th Anniversary**, the Group will be on air during the weekend of the **13-14th June** using the club callsign **GX0OOO**. All contacts will be acknowledged with a special anniversary full colour souvenir QSL card featuring a selection of the Group's most popular QSL cards.

The main h.f. station will be active around 3.725MHz s.s.b. and there will be other stations on c.w., 2m and RTTY. Regular listeners who collect Scarborough's QSL cards and newcomers to the hobby are most welcome to send in a report, either direct to the club callsign or via the Bureau.

Members of the Scarborough Special Events Group who operated from RAF Fylingdales, Britain's Ballistic Missile Early Warning Station.

White Papers

The well-known and respected RDI White Papers, which are produced by the International Broadcasting Corporation in the USA and give an in-depth report on the many popular receivers, are still available from the SWM Book Store.

Each report costs £6 and will be of tremendous value in helping you make that vital decision before spending your hard-earned cash. The list of available White Papers is as below:

PW-01	AOR AR3030
PW-02	Drake R8A
PW-03	Drake SW8
PW-04	Icom R71A/D/E
PW-05	Icom R9000
PW-06	JRC NRD-535
PW-07	Kenwood R-5000
PW-08	Lowe HF-150
PW-09	Sony ICF-2010/ICF-2001D
PW-10	Yaesu FRG-100
PW-11	How to interpret receiver specifications and lab tests
PW-12	Popular outdoor antennas

Please note that P&P is included for any quantity!

Order from the Book Store now by contacting Shelagh or Michael on (01202) 659930 or FAX your order on (01202) 659950 or alternatively E-mail at: bookstore@pwpub.demon.co.uk

NEW RANGE

To compliment the recently reintroduced **Datatester 64K**, Datalines has now added a range of three interface adapters to the standard V.24 unit.

Adapters for RS-422, V.35 and X.21 interface standards make the Datatester 64K a particularly versatile piece of equipment. The unit is completely portable, powered by internal batteries or a mains adapter making a very useful every day communications test tool.

The interface adapters simply plug in and lock into the purpose built bus connector on the base unit, the X.21 and RS422 adapters provide a full signal patching facility. The Datatester 64K and interface adapters are robustly constructed and particularly suitable for daily use in a workshop of field service environment.

More information from **Peter Lagesse** at **Datalines Communications Ltd.** on **(01908) 370011**, E-mail: **101546.3567@compuserve.com**

Datalines Datatester - The interface adapter range.

Send your news to Zoë Crabb at the Editorial Offices

rallies

May 4: The Dartmoor Radio Rally is to be held at the Yelverton Memorial Village Hall, Meavy Lane, Yelverton, Devon. There will be parking for 600 cars and access for disabled visitors. There will be trade stands, a Bring & Buy, refreshments, etc. Doors open at 1030, talk-in on S22. There are beautiful views over Dartmoor, so ideal for a picnic, why not bring the whole family? **Ron G7LLG** on **(01822) 852586**.

May 4: The Mid-Cheshire Amateur Radio Society present their annual Radio, Computer & Electronics Rally to be held at the Civic Hall, Winsford, Cheshire. Doors open at 10.30am for disabled visitors (11am others). Admission is £1. There will be a large Bring & Buy, full catering with bar service and free parking. Talk-in on 2m. Trade enquiries on **(01606) 77787** or general enquiries on **(01606) 592207**.

May 10: The Drayton Manor Radio & Computer Rally will be held at Drayton Manor Park, Fazeley, Tamworth, Staffordshire on the A4091. Main traders are in four marquees, there will also be a large outside traders flea market, a Bring & Buy stall, local clubs and special interest stands. Doors open 1000 onwards. For Trader information call **Norman** on **0121-422 9787**, for general enquires, call **Peter G6DRN** on **0121-443 1189**, evenings please.

May 17: The Mid-Ulster Amateur Radio Club Rally. The rally will be open to the public from 12 noon, traders will have access from 9am. The venue is again the Silverwood Hotel, Lurgan, Co. Armagh. **Jim Lappin GI0OND** on **(01762) 851179**.

May 17: The Dunstable Downs Radio Club will be holding its Annual Amateur Radio Car Boot Sale at the Stockwood Country Park, Luton, Bedfordshire. The site opens at 0900 until 1300. Leave M1 at junction 10a, turn left and follow signs for 'Mossman Collection'. Talk-in on S22. Note new address for bookings! Please do not use any other address or 'phone number. **DDRC, PO Box 4053, Dunstable, Beds LU5 5ZJ.**

May 17: The Rippon & District Amateur Radio Society (RADARS) are holding their 41st Northern Mobile Rally at The Pavilion, Great Yorkshire Showground, Harrogate. There will be the usual traders, a Bring & Buy and quality catering (possibly a bar). Doors open at 1030. Access behind Sainsbury's, off A661 Wetherby Road. **Gerald Brady G0UFI** on **(01765) 640229** (combined 'phone and FAX number), E-mail: **woody@tangon.demon.co.uk** or packet at **g1uxp@gb7cym**

May 24: The 22nd East Suffolk Wireless Revival (organised by Ipswich RC, Martlesham RS and the Felixstowe & DARS) is to be held at Stoke High School, SSE of main rail station, map ref: TM164435. This Radio & Computer Rally is open from 10am (9.30am for disabled visitors) until 4pm. Talk-in on S22. Further details from **Sam Jewell G4DDK** on **(01394) 448495**, E-mail **jewell@btinterbet.com**

May 24: The Plymouth Radio Club Rally is to be held at the College of Further Education, Kings Road, Devonport, Plymouth. It will run between 1030 and 1600. There will be Morse testing on demand and there will also be a canteen serving meals, snacks and drinks and a licensed bar also. There is ample free parking at the venue and easy access for the disabled. Talk-in will be on S22 and the venue will be signposted on the A38 'Devon ExpressWay'. Anyone who would

CONTINUED ON PAGE 7

New Venue!

The **Barry Amateur Radio Society Radio & Computer Fair** has changed its venue for February 21st 1999. The new and improved venue will be held at the **Holmview Leisure Centre, Skomer Road, Barry.** More information from Brian **GW0PUP** on **(01222) 832253** (combined telephone and FAX number).

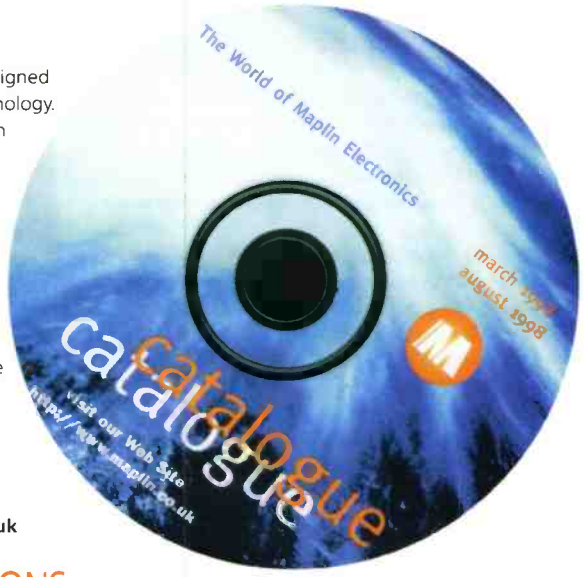
NOW ON CDROM

The latest version of the *Maplin Catalogue* has been re-designed and re-formatted, bringing it up-to-date with current technology. The twice annually published guide is now also available on CDROM, as well as its more traditional print format.

Over 1 000 new products are featured and the development of the CDROM means that the selecting and ordering of goods has never been easier. Once the required item is found, it can be transferred directly onto the order form by highlighting the product and clicking on the 'add to order' button.

Once the order is filled, the unit prices are automatically totalled and a finished purchase order can be printed off, which includes personal ordering details - records of previous orders are kept on the disk for easy reference. However, Maplin advises that orders should continue to be FAXed or posted.

To order your new catalogue call **(01702) 554002** or alternatively visit the website on **http://www.maplin.co.uk**



ANNIVERSARY CELEBRATIONS

Originally founded in 1957 by **Rev. Arthur W. Shepherd G3NJB**, as the Huddersfield South Methodist Radio Club and, finally, becoming the **World Association of Christian Radio Amateurs and Listeners** in 1958, WACRAL is well established in the amateur radio world.

To celebrate its 40th year, the Association will organise a number of special events, in which all amateurs and families are invited to participate, including a major activity weekend on air, a mass gathering at Whitsun and a Birthday Weekend Conference. Details of the full programme and a location guide is available from **G4UJW, 52 Wellfield Road, Alrewas, Burton-on-Trent DE13 7EZ, Tel: (01283) 791213**.

However, if you would just like to find out more about the organisation, contact WACRAL's Membership Secretary **G3XNX, 51 Alma Road, Brixham TQ5 8QR, Tel: (01803) 854504.**

Wind & Watermills

The **Wind & Watermills Special Event Station 1998** will take place on **Sunday 10th May**, which again coincides with National Mills Day. The Denby Dale ARS will co-ordinate the event. So, please register your station with **Tony G4LLZ, QTHR, by 30th April** (enclosing an s.a.e.). Further information from Tony on **(01484) 664360.**

YOUNG AMATEUR OF THE YEAR '98

The **Radiocommunications Agency** (RA), in conjunction with the **Radio Society of Great Britain** (RSGB), have recently announced the Young Amateur of the Year Award 1998. The Award, which is for the most outstanding achievement by a young amateur radio enthusiast, is open to anyone under 18 who has an interest in radio. Candidates do not have to be licence holders to apply.

The prize for the most outstanding achievement between **1 August 1997** and **31 July 1998** will be awarded by the RA and presented at the RSGB's HF Convention in September 1998. All entrants will receive a copy of the RSGB's *Amateur Radio Logbook*, while the winner will receive a £300 cash prize from the Agency, and amateur radio equipment from the RSGB. Both winner and runner-up will also be invited to visit the Agency's Radio Monitoring Station at Baldock, Hertfordshire.

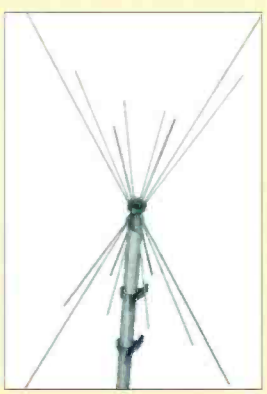
The closing date for applications is 31 July 1998 and the award is open to any resident of the UK, the Channel Islands, the Isle of Man, who has not reached his or her 18th birthday by the closing date. Entrants must be nominated by an adult sponsor, however there is no requirement for entrants (or nominees) to hold an Amateur Radio Licence.

Application should be sent to: **Young Amateur of the Year Award, Radio Society of Great Britain, Lambda House, Cranbourne Road, Potters Bar, Herts EN6 3JE, Tel: (01707) 659015.**

Airband Special

A quick note from our Book Store. If you were really taken back with interest in last month's Airband Special, you may be interested to know that we still have three previous Airband Editions available, all at £1 each! These are **March 1994**, **April 1995** and **July 1996**. Contact **Michael** or **Shelagh** in the Book Store on **(01202) 659930,** E-mail: **bookstore@pwpub.demon.co.uk** or use the Order Form on **page 99** of this issue to order the issues you want.

DUAL AIRBAND FROM CHELCOM



The Airmaster 117-137MHz and 224-400MHz airband antenna is a high performance, dedicated, civil and military airband antenna. Two pairs of angled dipoles cover the 117-137MHz civil band, and six pairs of angled dipoles cover the 224-400MHz military band nominal impedance is 50Ω via an N-type connector.

This unique design is claimed to out-perform general purpose, broadband, scanner antennas, because it is resonant only on its design frequencies, thus providing stronger signals within its operating range and reducing unwanted signals from outside these frequencies.

Weighing 1.35kg and with a length of 1.140m the antenna is construction of stainless steel, heavily chromed brass and anodised aluminium. Airmaster is supplied complete with mounting tube and brackets, etc., for mounting to masts up to 60mm diameter.

For more information contact **Chelcom Aerials, Riverside House, Homecroft Drive, Cheltenham, Goucesterhire GL51 9SN** Tel:/FAX: **(01242) 680653**, E-mail: **enquiries@chelcom.com** or take a look at their web site at: **www.chelcom.co.uk**

WAVECOM W41PC CARD

Market research has shown that many radio enthusiasts are also avid PC users. Now these two interests can be enjoyed by utilising the Wavecom W41PC card with a PC. The card itself boasts dual Digital Signal Processors handling more than 64 million instructions per second (MIPS), along with 4Mb on-board memory and a well tested software package. The system ensures optimal data demodulation even under extreme adverse reception conditions.

Set-up is easily completed via the *Windows* based software program, which has been developed by Wavecom Elektronik AG. The current software revision allows for the decoding of 70 modes across h.f., v.h.f., u.h.f. and s.h.f. ranges. When used in conjunction with SHOC Radio manager and the universally known Klingenfuss Verlag database, the user has an almost unlimited range of PC scanning options available.

A total of four W41PC cards can be fitted inside one PC ensuring concurrent monitoring of up to four data transmissions at any one time. Constant software upgrades, ease of use and product commitment ensures that Wavecom with the End User will always remain at the forefront of the radio monitoring market.

For full product details, contact **Sight Systems Ltd., Wavecom Sales & Marketing, Woods Way, Worthing, West Sussex BN12 4QY, Tel: (01903) 242001**, or a product portfolio can be found on the website at **www.sightsystems.mcmail.com**

Switch for high temperature applications.

HIGH-TEMPERATURE SWITCH

Recent developments in solder technology towards no clean flux put stress on components caused by the need for increased preheating to activate the no-clean flux. Some have been experiencing problems with existing components due to the increased heat exposure.

UNIMEC high-temperature switch versions are made of the high performance plastics LCP (Liquid Crystal Polymer), which is widely used in military and space applications. The advantages are a temperature range extended to +160° and increased lifetime of 10 million operations.

Due to its modular design UNIMEC can be programmed to provide eight different contact combinations by selecting the pins in use on the p.c.b. Both momentary and alternate versions are available. More information from **Quiller Switches Ltd., 2 Paisley Road, Bournemouth, Dorset BH6 5EU, Tel: (01202) 436777, FAX: (01202) 421255.**

SCANMASTER LP1300

Nevada Communications have a new beam antenna out - called the Scanmaster LP1300 Wideband Beam - this log periodic antenna covers 105-1300MHz, and is capable of both receive and transmit over this range and as such, should appeal to a wide variety of enthusiasts. Nevada say it is particularly useful for scanner enthusiasts where it can substantially out-perform a conventional discone antenna.

Supplied with a mounting hardware kit that allows for vertical or horizontal mounting on masts up to 50mm (2in) dia., the Scanmaster LP1300 is available for **£99.95**. Contact Nevada at **189 London Road, North End, Portsmouth, Hants PO2 9AE, Tel: (01705) 662145, FAX: (01805) 690626** for more information.

Send your news to Zoë Crabb at the Editorial Offices

rallies

like more information should contact **Stephen Ramsden**, during office hours, on **(01752) 662051**.

May 24: The Three Counties Radio & Computer Rally is to be held at Perdiswell Leisure Centre, Bilford Road, Worcester. Easy access from junction 6 (Worcester North) M5. There will be the usual mix of trade stands with radio and computer dealers, Bring & Buy, refreshments and a licensed bar. Doors open from 1030 to 1700 and admission is £1.50. Free parking. **Eddie Cotton G4PQZ** on **(01905) 773181**.

May 30/31: Peterborough Radio Festival '98 will be held in the Sacrewell Farm & Country Centre, Wansford, Nr. Peterborough. There will be activities for all the family, displays and exhibitions, caravan and camping facilities, disco and BBQ (Saturday) and a Radio Car Boot Sale (Sunday). More information from **Vince Edwards** on **(01733) 331211** or **G8NGZ@compuserve.com**

June 7: The Royal Naval Amateur Radio Society are holding their annual mobile rally at The Playing Field, opposite HMS *Collingwood*, Fareham, Hants (off M27 at J11, follow A32 & B3385 towards Lee-on-the-Solent). All the usual RNARS Rally attractions, with trade stands, Bring & Buy, RAYNET, SUNPAC, Club stands and a talk-in via PC/PH. There is also a children's play area and various other stalls and attractions. A grand day out! Further details from the **Secretary, RNARS, 103 Torrington Road, North End, Portsmouth**.

June 7: The Spalding Radio Rally is to be held at Springfields Exhibition Centre, Springfields, Spalding, starting at 10am. Talk-in on S22. There is easy access for any disabled visitors, a licensed bar and catering, trade stands, a huge car boot area and acres of free parking. **Mick Pell G1APV** on **(0976) 271796** or **David G7VQH on (0966) 362828** or **Dennis Hoult G4OO** on **(01775) 750382**.

June 14: The Nunsfield House Amateur Radio Group present the 29th Elvaston Castle National Radio Rally taking place at the Elvaston Castle Country Park on the B5010, five miles south east of Derby. There will be all the usual traders plus Special Interest Groups, a grand Bring & Buy and a huge flea market. Over 48,000 square feet of marquees makes this the largest outdoor rally in Europe. With crafts, bands, a museum farm, childrens entertainment and woodland walks, there is something for all the family. The venue also has a Caravan Club approved site. Talk in is provided by GB2ECR on S22 and SU22. **Brian Reid G1CUH** on **(01332) 751412** (combined telephone and FAX number).

June 14: The Bangor & District Amateur Radio Society are holding their major radio and computer rally at the Clandeboye Lodge Hotel (formerly The George), Estate Road, Bangor, County Down starting at 12 noon (11.30 for disabled visitors). This year's event will feature a full range of trade stands, including major cross channel names a Bring & Buy and computer software, etc. Free parking, facilities for the disabled, full range of meals and bar services available throughout the day. Morse tests available on demand, operational stations and GI3XRQ/P running all day. Admission is £2, under 16s go free. Talk-in on Ch22. **Roy GI0WVN** on **(01247) 460716** or **Stuart GI4OCK** on **(01247) 454049**.

Is there something you want to get off your chest? Do you have a problem fellow readers can solve? If so then drop a line to the Editor.

THE BEST LETTER WILL RECEIVE A £20 VOUCHER TO SPEND ON ANY SWM SERVICE.

Dear Sir

Some time ago you promised us that you would not have any more of the unreadable print that had started to creep in. Now, here we are a few issues later and it is getting worse and worse.

In the February issue, pages 12, 13, 16 and 17 were bad. I would be surprised if you did not have a complaint from Multicomm 2000 about their advert, which is almost unreadable.

You say in this month's Editorial, which again is more difficult to read, with smaller print and a black background, that you are going to have even more colour. What is the point of all this colour, it does not make it any easier to read and must cost a fortune to print. It seems that we are paying for a load of colour that is not needed.

I have for the past few issues found that there seems to be less and less of any real interest in the magazine and it has become very boring. I am considering whether it's worth renewing my subscription.

The article on the Ionosphere Indoors, for instance, must be of interest to only a tiny minority and for the rest of us are just wasted pages. I also do not see the point in reviewing a receiver that is very old and out of production, there are many new pieces of equipment that have not been reviewed that are of much more interest.

I suppose the next review will be the AR88 or perhaps the R1155. As you say, there are going to be vast improvements in the next issue, so I will wait and see what it is going to be like before deciding about my subscription.

G.E.R. Denman
Portsmouth
Hants

Magazines change, just as fashions in clothes change. Our Art Editor wants to try new ideas - often only now becoming available at a cost that can be afforded - and I, as Editor, want to see the magazine looking appealing to new and old readers alike. Not all ideas, however, work and I appreciate readers telling me what, in their opinion, hasn't worked. What advertisers do with the space they have bought is not totally under my control. They get their feedback from how well their advertisement has worked by the response to it.

When it comes to editorial content, I try to provide what I believe readers will find useful and interesting. Before labelling articles like 'The Ionosphere Indoors' as "of interest to only a tiny minority", ponder on the fact that every listener is governed by propagation, which in turn is governed by the ionosphere. Likewise, old receivers not only have their followers - who also make up a large section of SWM readers - but can often give an insight into development of radio over the years. ***Ed.***

Dear Sir

May I draw your attention to the front cover of April's issue of *Short Wave Magazine*, namely the bottom aircraft, the B1B. The whole picture is in reverse! The code belongs to the 384th Bombardment Wing, Heavy, McConnell AFB, Kansas, OZ being the 'Land Of Oz'.

Many thanks for an interesting magazine.

John Bookner
Warwickshire

Ooops, someone put the trannies in the scanner the wrong way up! Our 'arty type' has been sent off to read The Wizard of Oz. *Yellow bricks must be very strong to take the weight of the B1B on take-off and landing!* ***Ed.***

Help Wanted

Dear Sir

Firstly, may I say what a class publication, it gets better every month, both in content and presentation. As a relative newcomer to short wave radio and *SWM* I get frustrated and feel that I may lose interest because of the assumption that everyone who reads *SWM* knows all the basics of radio and antenna construction.

As the nearest radio club is 100 miles or so away, I have no practical guidance and therefore rely on *SWM* and other publications. Without exception I have yet to see a photo or diagram showing how to wire up a tuning capacitor from one soldering point to another before fitting it into a circuit. As I have several variable tuning capacitors taken from old radios, I could use them in many of the projects in *SWM*.

Finally, how do you work out the value when there are no markings on capacitors?

PS. What happened to Fig. 5 diagrams in the Small Loop Antenna feature?

Gordon Griffiths
Kingussie
Inverness-shire

You will find the missing pictures in Part 2 this month. Sorry for the inconvenience. ***KN.***

Dear Sir

Please could we have more practical circuits for long wave enthusiasts. Whilst I and many other devoted s.w. listeners thoroughly enjoy all the other h.f. bands, I know there are others out here in radio land who would love more l.w. circuits.

B. N. Freestone G8BNF
Louth
Lincolnshire

Do you crave receivers or antennas? ***Ed.***

Dear Sir

I wonder if your people can help me at all? I have just bought a scanner, hand-held (Yupiteru MVT-7100) along with Mr Rouse's book *Scanning 3*. It is suggested one connects to an outside antenna, along with an antenna tuner? I have scanned your magazine, contacted a lot of advertisers and local radio dealers with regard to an antenna, and all gave me different answers.

As you have no axe to grind, perhaps you could suggest an antenna whether outside or in and if I need a tuner for same and what make, etc. As I am on a pension and budget, I need to watch the cost.

I trust one of your technical people can help as I am keen to progress. Since buying the scanner, I have had plenty of happy hours, at my age too, I feel I have started to take in life.

K. Griffiths
Rochdale

Mr Griffiths, we covered this very subject some time ago via this very forum. If you refer to page 37 of June '96 (back issues available) you will find the answer - ***KN.***

Dear Sir

May I make an appeal through your magazine. I was a member of RAIBC but lost contact with them 2-3 years ago when I moved from 8 Appleby Road, Blackpool FY2 0SN to my present address.

I have a Century 21D receiver which I got through the kindness of G3LWY Francis Wooley (I am an invalid). The receiver has worked well from 1985 to today, however, the cause of the trouble is the u.s.b./l.s.b. has some wires coming loose, so nothing at all can be heard on any band.

Also the long wave change switch has loosened and needs looking at. I must stress that this has all happened in

normal wear and tear of use, no force was used at any time. I have no means of returning the RX for repair so it will need collecting.

I would like to re-join the organisation again and if they could supply another RX of general coverage I would be most grateful. I hope someone from the organisation will see the appeal and contact me. My 'phone number is (01253) 596133 any evening after 7pm.

Peter Singleton
Blackpool

Dear Sir

Could any reader please help with a instruction manual for a Yaesu FRT-7700 a.t.u., or could you tell me where to look for one?

Many thanks.

Barry, 15 Mountbatten Drive, Newport, Isle of Wight, PO30 5SG.

Dear Sir

I recently purchased an AR2002 from a local rally and I remember way back in 1987 a feature, in *Practical Wireless*, on a computer interface for this rig.

It was available from Lowe Electronics at the time and called 'rc-pack', but of course, is not available now. Garex also produced something similar called 'Scanmaster', I think.

Any help from yourself or *SWM* readers on tracking down one of these interfaces and software at a reasonable cost would be appreciated.

This brings me on to the subject of articles in *SWM*.

I would like to see construction features, such as a computer interface for popular scanners or h.f. rigs, as the cost of commercially made units is beyond a lot of people's means.

Also, how about reviewing some of the cheaper rigs or kits?

An example being my WXSAT receiver which was purchased from Cirkit as a ready assembled and aligned unit for about £75, works extremely well and is far cheaper than rigs from Timestep, etc. All that I had to do was mount it in a suitable box.

Regards.

Peter Hawkes
Wombourne
South Staffs.

Help Found

TOP QSL

Dear Sir

Re: The Medfrex Antenna *SWM* March 98

Just a few lines that might be of interest to your readers who are thinking of constructing the above antenna. After reading the article, I decided I would like to build it, so I contacted MMG Neosid with a view to buying the ferrite rods.

However, they informed me that they did not, or were not making them, but they went on to say that a lot of interest had been shown regarding the rods. They took my name and address and said they would keep me informed regards future developments.

They kept their word because a few days ago, 25th March 98, I received a letter from a supplier who was acting on behalf of MMG Neosid. If you would like to pass on this information to your readers, here it is.

Supplier: **Stewart Eletronics Ltd., Eagle Trading Estate, Brookers Road, Billingshurst, W. Sussex RH14 9YZ, Tel: (01403) 784861**. Order code 37-355-31 (12.7 x 200 in F14), £7.50 each, £5.50 for P&P and VAT at 17.5%.

J. Hill
Lancashire

Dear Sir

Re the letter from GM4VST about a repair to his PK-232 - Nevada should be able to repair it for him if he has no success in finding help locally.

I'm sending GM4VST a card to let him know about Nevada, but thought I'd also E-mail you in case you want to mention it in the magazine.

Regards.

Ian Brothwell G4EAN
Secretary, BARTG
E-mail: ian@bartg.demon.co.uk

Dear Sir

Having read the letter by Patrick Connor of Wiltshire (March *SWM*), I would like to praise Lake Electronics for their help. As a newcomer to radio, I bought one of their Carlton 3 kits and having made it, was unable to get it to work, so I sent it back to them on a Thursday by first class post and was amazed to receive it back on the following Tuesday with all my mistakes rectified and one third of the cost was the recorded delivery charge.

Again, my thanks go to Alan Lake.

S. J. Edwards
Leeds

The Irish Navy

Dear Ed

In the April issue, on page 36, an article about the Irish Navy, stating that we have a fleet of five mine-sweepers, all ex-Royal Navy. However, this is not the case - the current fleet is as follows:

Two Minesweepers, ex-Royal Navy,

LE Orla	P41
LE Ciara	P40

Four Patrol Vessels, built in Cork

LE Deirdre	P20
LE Emer	P21
LE Aoife	P22
LE Aisling	P23

One Helicopter Patrol Vessel, built in Cork

LE Eithne	P31

The total fleet is, therefore, seven ships, with three new ships, plus a new Irish-Lights ship on order, which can be also be tasked for SAR and carries a helicopter on board. All the above ships can also act as 'on-scene commander' during a major SAR.

Regards,

Philip Doherty
Waterford
Ireland

Trial By E-mail Listserver

Dear Sir

I am disappointed to learn of the demise of the 'Scanning' column, which I always found informative and easy to read as a beginner. I note that in the April edition you stated that there will be more content on scanning elsewhere in the magazine, but that month there was none.

Already there have been E-mails on the Euro Scanner Listserver commenting on the changes and some have said they will cancel their orders. I ask you to reconsider, or at least to give a fuller explanation of the reason for the changes, or I may cancel mine too.

Regards.

James McGahan
Southampton
E-Mail: V0117JM@SOLENT.AC.UK

ed's comments

The response to the 'new look' *SWM* has been mixed. We have had several short and to the point messages stating that "it looks good, keep it up." However, one group believes that it has been short changed. Some members of the 'euro-scanner' list on the Internet are convinced that *SWM* has abandoned scanners and scanning and devoted more pages to what they term 'non-radio related' subjects such as broadcasting, airband and television.

Nothing could be further from the truth. 'Scanning' as a regular column at the back of the magazine has been replaced by articles on Scanning in the middle. Just as the four pages devoted each month to broadcasting under the heading LM&S have been moved to the front

Any magazine that wants to survive needs to continually evolve. *SWM* is no different. That it meets the needs of 'listeners' is obvious by its continued success - its circulation is more than four times that of other UK listening magazines. The hobby of 'listening', 'monitoring' is probably a better description, encompasses many areas of interest. 'Scanning' is only one of them and *SWM* has to cater for a very much wider range of interests. There are readers who probably think that too much space is devoted to 'Scanning' and that the magazine should be carrying columns on many other topics. Mine is the enviable task of trying to keep everybody satisfied.

Propagation

This month's special subject is Propagation. Now, before readers take me to task for devoting pages to a 'non-radio related' subject, let me just say that every radio transmission, no matter what its mode or what information it is carrying, is subject to the laws of physics, in this case covered by the heading 'Propagation'. Every listener should know the elementary facts governing propagation. Why not try studying the subject - keep a daily note of weather conditions and how well those radio signals that interest you performed. After a while, you should be able to make reasonable estimates of what is likely to happen to the radio signals you regularly listen to.

Dick Ganderton G8VFH

Bandscan America

Gerry L. Dexter
c/o *SWM* Editorial Offices,
Arrowsmith Court,
Station Approach,
Broadstone,
Dorset BH18 8PW

E-mail: gdexter@pwpub.demon.co.uk

A new religious short wave broadcaster has come on the air from Chile, a country which doesn't have a lot of active short wave stations. The station is Radio Vision Cristina, which began testing in March - and may well be in full action by now.

Christian Vision purchased the former transmitting facility of long silent La Voz de Chile, located near Santiago. The station plans to cover all of South and Central America using four 100kW transmitters feeding an extensive antenna system.

Spanish and Portuguese language broadcasts are produced at studios in Miami, Florida, and then fed to the transmitters via satellite. But the organisation's headquarters are in England - at **Ryder Street, West Bromwich, West Midlands B70 0EI**.

The group also operates Christian Voice, located in Zambia. A full schedule of Voz Cristiana hasn't been issued as of this writing. The test broadcasts took place on 21.550, variable.

The organisation's web site - **www.christian-vision.org** - lets you E-mail a reception report. You can also send an E-mail direct to the station via **vozing@interaccess.cl**

The newest USA short wave broadcaster is WWBS in Macon, Georgia. Its initial (test) frequency was 11.910 with tests scheduled anytime between 0000 and 1200. Once things have been checked out, their broadcast day will likely start at 0000, though they probably won't begin to operate with a full schedule at first.

Still another US short wave station will take to the air later in the year. Alan Weiner, who has tried for years to obtain approval for a short wave station, has at last been granted a licence and will operate a 50kW station in the state of Maine.

Radio Miami International (9.955MHz) sends this full size confirmation with the earth in muted colours as the background.

Station News

Uruguay's SODRE (Servicio Official de Diffusion Radio Electrica - when's the last time you saw that spelled that out?) currently operates on 6.125 from 1000 to 0300 (part of that time it relays local medium wave Radio Educativa). Its 9.620 (momentarily inactive) during the same period, part of the time relaying SODRE medium wave.

Also heard from time to time are Radio Oriental on 11.735 up until sign-off some minutes after 0000. Another is Emisora Ciudad de Montevideo, 9.650, heard around 0000. This one doesn't use much power so it takes some digging, helped along by good conditions and minimal QRM.

People continue to receive those single sideband relays of local Argentine medium wave and f.m. stations. These don't seem to go by any regular schedule so you have to make regular stops at their known hide-outs.

The frequency 15.820 (upper sideband) has had Radio Rivadavia recently, as well as Radio Provincia de Buenos Aires and another Buenos Aires station -'FM News'. Yet another one is 'FM Feeling'. The period around 2200-0200 seems the most likely time to hear these.

Is Nicaragua's Radio Miskut putting out more power of late? Its 5.770 signal is often well heard from 1200 sign-on, as well as in the early evenings here. The station also seems to stay on past its listed 0130 sign off time more often than it used to.

Radio Cristal in the Dominican Republic continues to be heard fairly regularly on its 5.012 spot (actually, there's more than one 'spot' since it varies a bit from day to day). This one is scheduled until 0300.

Some really good news - maybe! Several DXers in North America have been noting improved signals from Radio Tahiti on 15.170. A sort of death watch has been underway for a year or two now since Radio Tahiti's 49 and 25 metre band transmitters gave up the ghost and the signals on 19 metres got weaker and weaker.

Radio Tahiti's people even said that when the last short wave transmitter died that would be the end. Now, however, it appears the 19 metre outlet may have been repaired. Another positive point - the station is back on its assigned frequency after years of hovering around the 15.167 mark. It wouldn't hurt to send Radio Tahiti a note of appreciation!

Brazilian short wave stations noted in the Americas since last time include the following:

3.205	Radio Ribeirao Preto, Ribeirao Preto
3.375	Radio Educadora, Guajara Mirim
3.385	Radio Educacao Rural, Tefe
4.765	Radio Rural, Santarem
4.775	Radio Liberal, Belem
4.795	Radiodifusora Aquidauana, Aquidauana
4.815	Radio Difusora, Londrina
4.825	Radio Educadora, Braganca
4.865	Radio Verds Florestas, Cruzeiro do Sul
4.875	Radiodifusora de Roraima, Boa Vista
4.935	Radio Capizaba, Vitoria
4.945	Emisora Rural, Petrolina
4.975	Radio Mundial, Sao Paulo
6.105	Radio Cultura, Foz du Iguacu
6.150	Radio Record, Sao Paulo
5.035	Radio Educacao Rural, Coari
9.585	Radio Globo, Sao Paulo
9.630	Radio Aparecida, Aparecida
9.665	Radio Marumby, Florianapolis
11.805	Radio Globo, Sao Paulo
11.815	Radio Goiania, Goiania
15.415	Radio Clube Ribeirao Preto, Ribeirao Preto

Best reception times are from around 2200 on the higher bands, 0000 and later on lower frequencies. In America, we also hear them very early in the mornings, i.e. 0800. The action in Peru continues at its always frantic pace (that's not a complaint!)

Here's a summary of recent hearings (frequencies often vary slightly).

3.235	Radio Luz y Sonido, Huanuco
3.250	Radio Comas
3.330	Ondas del Huallaga, Huanaco
3.339	Radio Altura, Cerro de Pasco
3.870	Radio Adventista Mundial, Celendin
4.039	Radio Marginal, Tocache
4.190	Radio San Juan, Aramango
4.300	Radio Huallgayoc, Huallgayoc
4.390	Radio Nueva Sensacion, Chiclayo
4.420	Radio Bambamarca, Bambamarca
4.460	Radio Nor Andina, Celendin
4.485	Radio Frecuenca VH, Celendin
4.534	Radio Horizonte, Chachapoyas
4.549	Radio Soledad, Parcoy
4.571	Radio Uno, Chiclayo (ex Radio Gotas de Oro)
4.746	Huanta 2000, Huanta
4.775	Radio Tarma, Tarma
4.790	Radio Atlantida, Iquitos
4.826	Radio Sicuani, Sicuani
4.855	Radio La Hora, Cusco
4.887	Radio Villa Rica, Huancavelica
4.890	Radio Chota, Chota
4.905	Radio La Oroya, La Oroya
4.914	Radio Cora del Peru, Lima
4.934	Radio Tropical, Tarapoto
4.950	Radio Madre de Dios, Puerto Maldonado
4.955	Radio Cultural Amuata, Ayachuco
4.971	Radio Imagen, Tarapoto
4.991	Radio Ancash, Huaraz
4.996	Radio Andina, Huanaco
5.015	Radio Juliaca, Juliaca
5.025	Radio Quillabamba, Quillabamba
5.039	Radio Libertad, Junin
5.046	Radio Integracion, Abancay
5.084	Radio Mundo, Cusco
5.097	Radio Eco, Iquitos
5.305	Radio La Immaculada
5.324	Radio Origen, Huancavelica
5.414	Radio Lajas, Lajas
5.471	Radio San Nicolas, Rodriguez Mendoza
5.522	Radio Sudamerica, Cutervo
5.561	Radio El Sol, Pucara
5.637	Radio Peru, , San Ignacio
5.658	Radio Illucan, Cutervo
5.767	Radio Master, Moyobamba
5.677	Radio Frecuencia San Ignacio, San Ignacio
5.730	Radio Santiago, Puerto Galilea
5.819	Radio Victoria, Lima
5.970	Radio El Sol, Lima
5.981	Radio Chasqui, Cusco
5.995	Radio Melodia, Arequipa
6.061	Radio JSV, Huanuco
6.095	Radio Nacional, Lima
6.115	Radio Union, Lima
6.174	Radio Tawantinsuyo, Cusco
6.188	Radio Oriente, Yurimaguas
6.204	Radio Cusco, Cusco
6.261	Radio JVL, Consuelo
6.405	Radio Huarmaca, Huarmaca
6.420	Radio Mi Frontera, Chirinos District
6.480	Radio Altura, Huarmaca
6.536	Radiodifusora Huancabamba, Huancabamba
6.675	Radio Ondas del Rio Maranon, Aramango
6.726	Radio Satelite, Santa Cruz
6.811	Ondas del Rio Mayo, Nueva Cajamarca
7.003	Radio La Voz de la Huarinjas, Huancabamba
7.040	Radio San Ignacio, San Ignacio
7.142	Radio Ayabaca, Ayabaca
7.746	Radio Cristal, San Hilarion District

Peruvians can often be caught at sign-on (0900, 1000) and are also well heard in our evenings - 0000 and onwards.

ADVERTISERS INDEX

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- RS232 computer I/F
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- Clock/Timer functions
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This receiver provides solid coverage from 50kHz to 30MHz with all mode reception of AM, SSB and CW. 50 fully tunable memory channels store frequency, mode and filter selections. The FRG-100 has twin 12 hour and 24 hour programmable clocks with on timer and sleep timer. The set requires 12V DC.

FM option available - add £39

DRAKE SW2

A new low cost receiver with exceptional sensitivity, selectivity and dynamic range.

- 100kHz - 30MHz
- AM/SSB
- 100 memories
- Easy tuning
- Dual antenna inputs
- 12V DC operation

DRAKE R8B

- AM, FM, USB, LSB, RTTY, CW
- Freq range: 100kHz-30MHz
- 1000 memories
- RS 232 computer interface

ICOM PCR-1000

ICOM'S NEW COMPUTER RADIO SYSTEM

- 100kHz - 1300MHz
- All mode reception
- Plus *LOTS MORE!*

£319.00

NEW
PCR OPTION DSP UNIT UT 106
£59.95

ROBERTS R861

SYNTHESISED RECEIVER FM STEREO/MW/LW/SW PLL

- 307 memories (261 in SW, 18 each in MW/FM, 9 in LW plus priority station)
- ATS auto scan and preset in priority pf signal strength in FM/MW/LW bands
- E2 PROM for memory
- FM stereo via earphones
- 29 pages SW stations memory, 9 mems in every page
- 8 characters for editing station name
- Built-in 42 world cities time plus DST devicer
- Battery & signal strength indicator

SONY ICF-SW7600G

PORTABLE SHORTWAVE RADIO

- Covers 153kHz - 30MHz
- AM/SSB/CW & 87.6 - 108MHz FM
- FM stereo via earphones
- 10 key Direct Access Tuning
- 22 Station presets
- LCD diplay
- Tone control
- External antenna & record jacks
- Clock/Timer with sleep & standby functions
- Includes compact reel antenna & carrying case

AOR AR8000

STILL the No1 seller!

- All mode FM, WFM, SSB, CW, AM
- 500kHz-1900MHz
- Computer control
- Data clone
- 1000 Memories
- C/w NiCads & charger

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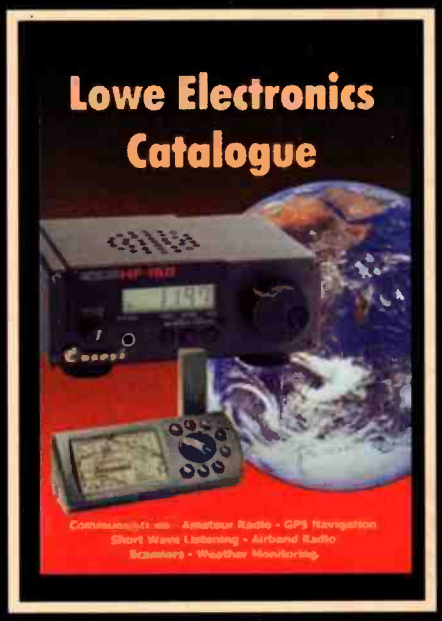

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LM&S

The information herein is based upon actual reception by listeners in this country and abroad. New contributors are always welcome - just send the details of the broadcast(s) you have been hearing to me with your name and address. I will write to you.

Long Wave Reports

Note: l.w. & m.w. frequencies in kHz; s.w. in MHz; Time in UTC (=GMT).
Unless otherwise stated, all logs were compiled during February.

At 0355UTC on the 8th **Alan Roberts** (Quebec, Canada) picked up a broadcast from DLF via Aholming, Germany on **207kHz** for the first time ever. He rated the 500kW transmission SIO222. At that time four l.w. stations in Germany were audible and he noticed that the DLF outlet at Donebach on **153kHz** was carrying the same programme. The broadcast from DRB via Oranienburg (500kW) on **177** was different until 0400, when all three shared a news bulletin in German, which was read by a lady. After the news DRB resumed its independent programming.

Very welcome first reports came from **David Stevenson** in Swansea and **Ernie Strong** in Ramsey, Cambs. Ernie compiled his list during daylight whereas David did so mainly after dark - see chart. Listeners who are unfamiliar with this band should bear in mind that during daylight only the radio waves which travel over the Earth's surface (ground waves) may reach a point of reception. Any which travel upwards (sky waves) will be absorbed by the highly ionised lowest (D) layer of the Ionosphere. After sunset the D-layer gradually disappears to expose the next higher (E) layer, which behaves like a giant mirror in the sky. It may reflect back to Earth the sky waves from quite distant stations!

Medium Wave Reports

The conditions at night for the propagation of m.w. transmissions over transatlantic paths were often poor during February but the broadcasts from a few stations in E. Canada and E. USA did reach the UK.

The night of the 5th proved to be the best for **John Slater** in Scalloway, Shetland. He heard WEEI in Boston, MA on **850** (SIO333 at 0500); WCBS New York, NY on **880** (SIO333 at 0510); CJFX Antigonish, NS on **580** (SIO333 at 0800); also WBBR in New York, NY on **1130** (SIO433 at 0805). On the 24th & 25th he logged WBBR as SIO222 at 0625 but no others were identified.

The band was searched after 0300 on the 12th by **David Edwardson** in Wallsend. Although six stations were heard only three in New York, NY could be identified - WABC on **770** rated SINPO 24542 at 0315; WCBS on **880** was 23452 at 0325; WINS on **1010** was 24532 at 0333.

More frequent checks were made by **Robert Connolly** in Kilkeel, Co.Down. On the 6th he heard CKVO in Clarenville, NF on **710** (23332 at 0100); CHAM Hamilton, ON on **820** (22222 at 0110); WCMQ Miami Springs, FL on **1700** (23332 at 0110). At 0200 on the 10th he logged WINS as 22332. Four stations were heard on the 13th - CFRA Ottawa, ON on **580** (22222 at 0105); CKVO (22222 at 0115); WCMQ (23332 at 0120); WTOP Washington, DC on **1500** (23232 at 0130). On the 23rd only CKVO could be identified (32322 at 0045).

The broadcasts from many of the m.w. stations in N. Africa, Europe, Russia and Scandinavia also reached the UK after dark - see chart. During the evening of the 27th **Ted Harris** (Manchester) listened to the broadcasts from fourteen stations in Germany and thereby improved his knowledge of the language. Some quite distant stations were also logged during daylight. Whilst the BBC R4 Lots Road relay on **720kHz** was off-air at 1505 on the 23rd, **Brian Keyte** (Bookham) was able to receive the ground waves from the co-channel Lisnagarvey 10kW R4 outlet, which rated 22431. He has found it worthwhile to check the BBC Engineering Information on Ceefax page 698 for opportunities to log unusual stations when a strong local transmitter is off-air.

Quite a few of the local radio stations were mentioned in the reports. Over on the Isle of Wight **George Millmore** (Wootton) compiled an interesting log during daylight - see chart. No doubt the sea paths accounted for the strong signals he received from stations on the Channel Isles and along the coast from Cornwall to Kent but some of the outlets inland were received well too!

Short Wave Reports

The **25MHz (11m)** band remained silent here during February but the propagation forecast charts in *SWM* suggest that it could now be used to reach listeners in some areas, so perhaps it will be included in a few of the broadcast schedules being implemented during the weekend of March 28/29.

Some improvement in reception has been evident in the **21MHz (13m)** band and a number of broadcasts to specific target areas can often be received here during the day. Those noted in the reports came from the Voice of Turkey **21.715** (Tur to W.Asia, Australia 0500-1000), rated 44333 at 0630 in Scalloway; UAER, Abu Dhabi **21.630** (Ar to N.Africa, Eur 0600-0900) 45545 at 0834 by **Vic Prier** in Colyton; BSKSA Saudi Arabia **21.495** (Ar [Holy Quran] to SE.Asia 0900-1200) 23232 at 0915 by **Robert Hughes** in Liverpool; R.Prague via Litomysl **21.705** (Eng to S.Asia, W.Africa 1000-1030) 35333 at 1021 by **Darren Beasley** in Bridgwater; UAER, Dubai **21.605** (Eng to Eur 1030-1100) 55545 at 1030 by **Simon Hockenhull** in E.Bristol; RAI Rome **21.520** (It to Africa 0600-1300) 34333 at 1035 Thomas Williams in Truro; HCJB Quito, Ecuador **21.455** (Eng, u.s.b. + p.c.) 33333 at 1210 by **Bernard Curtis** in Stalbridge; R.Nederlands via Madagascar **21.480** (Ind to SE.Asia 1130-1325) 43333 at 1225 by **Rhoderick Illman** in Oxted; RAI Rome **21.520/21.535/21.710** (Tt [Football] to Lat Amer, Africa 1330-1700, Sun only) 35543 at 1330 in Wallsend; R.Prague via Litomysl **21.700** (Eng to E.Africa 1400-1430) 22222 at 1405 by **Chris Shorten** in Norwich; BBC via Cyprus **21.470** (Eng to E.Africa 1400-1700) 44444 at 1430 in Kilkeel; BBC via Ascension Is **21.660** (Eng to W/E/S.Africa 1100-1700) 44433 at 1445 by **Stan Evans** in Herstmonceux & SIO333 at 1600 by **Philip Rambaut** in Macclesfield; WYFR via Okeechobee, USA **21.525** (Eng, Fr, Port to Eur, Africa 1600-2000) 34343 at 1714 by John Eaton in Woking.

Broadcasts from several continents can usually be received in the **17MHz (16m)** band during daylight hours. In the morning they include R.Australia via Shepparton **17.750** (Eng to Asia 0600-0900), rated 25552 at 0640 in Scalloway; Voice of Russia **17.860** (Eng [WS]) 44433 at 0845 in Herstmonceux; R.Slovakia Int via Rimavska Sobota **17.485** (Eng to Australia 0830-0857) SIO333 at 0851 by **Francis Hearne** in N.Bristol; Africa No.1, Gabon **17.630** (Fr to W.Africa 0700-1100, 1200-1600) 35544 at 0903 by Fred Pallant in Storrington; R.Prague, Czech Rep **17.485** (Eng to W.Africa 1000-1030) 34333 at 1003 in Truro; AIR via Bangalore **17.387** (Eng to Pacific areas 1000-1100) 44333 at 1039 by **Tony Hall** in Freshwater Bay, IoW; Israel R, Jerusalem **17.545** (Heb [Home Sce rly] to W.Eur,

LONG WAVE CHART

Freq (kHz)	Station	Country	Power (kW)	Listener
153	Donebach DLF	Germany	500	A*,B*,C,D,E,G,H*,I
162	Allouis	France	2000	A*,B*,D,E,G,H*,I
171	B'shakovo etc	Russia	1200	A*,D*,E,H*,I
171	Lvov	Ukraine	500	D*
177	Oranienburg	Germany	750	A*,B*,C,D*,E,H*,I
183	Saarlouis	Germany	2000	A*,B*,D*,E,G,H*
189	Tbilisi	Georgia	500	A*,C*
198	Droitwich BBC	UK	500	B*,D,E,G,H,I
207	Munich DLF	Germany	500	A*,B*,C*,E,F*,H*,I
207	Azilal	Morocco	800	C*
216	Roumoules RMC	S.France	1400	A*,C,D,E,G,H*,I
225	Raszyn Resv	Poland	?	A*,C*,D*
234	Beidweiler	Luxembourg	2000	A*,D,E,H*,I
243	Kalundborg	Denmark	300	A*,C,D,E,I,J
252	Tipaza	Algeria	1500	H*
252	Atlantic 252	S.Ireland	500	A*,E,G,H,I,J,K
261	Burg(R.Ropa)	Germany	200	E,H*,I
270	Topolna	Czech Rep	1500	D*,E,G

Note: Entries marked * were logged during darkness. All other entries were logged during daylight or at dawn/dusk.

Long Wave Chart

Listeners:-
(A) John Eaton, Woking.
(B) Ted Harris, Manchester.
(C) Simon Hockenhull, E.Bristol.
(D) Sheila Hughes, Morden.
(E) George Millmore, Wootton, IoW.
(F) Alan Roberts, Quebec, Canada.
(G) Tom Smyth, Co.Fermanagh.
(H) David Stevenson, Swansea.
(I) Ernie Strong, Ramsey, Cambs.
(J) Thomas Williams, Truro.
(K) Tom Winzor, Plymouth.

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***"Ham Radio Today Review", April 1998**

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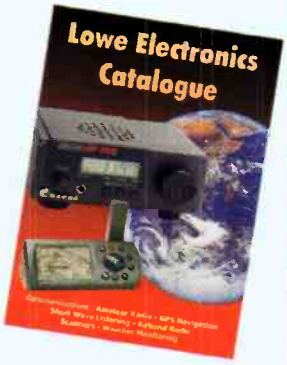

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N.America 0700-1455) 43343 at 1040 in Liverpool; R.Pakistan, Islamabad **17.835** (Eng to Eur 1100-1120) 55555 at 1105 in Norwich; DW via Rwanda **17.800** (Eng to W.Africa 1100-1150) 32442 at 1112 in Bridgwater; Vatican R, Italy **17.550** (It, Fr, Eng to Eur, Asia 1100-1200) 54444 at 1120 by Tom Winzor in Plymouth.

After mid-day RFI via Fr.Guiana **17.575** (Eng to Africa, Asia 1200-1300) was 33323 at 1200 in Stalbridge; R.Ukraine, Kiev **17.725** (Eng to Eur? 1200-1300) 54354 at 1200 in Woking; R.Romania Int, Bucharest **17.745** (Eng to Eur, N.America 1300-1355) 44444 at 1330 by **Sheila Hughes** in Morden; BBC via Skelton & Woofferton, UK **17.640** (Eng to E.Eur, M.East, E.Africa 0700-1500) 44554 at 1355 by **John Parry** in Larnaca, Cyprus; BBC via Antigua, W.Indies **17.840** (Eng to S/C.America 1400-1700) 34443 at 1405 in Kilkeel; BBC via Ascension Is **17.830** (Eng to W/C.Africa 0730-1000, 1100-2100) 33333 at 1645 by **Ernest Wiles** in NE.Bedford; BBC via Sackville, Canada **17.840** (Eng to N.America 1700-1900) SIO433 at 1820 in Macclesfield; WYFR via Okeechobee, USA **17.555** (Eng to Eur 1600-1945) 44444 at 1845 in Colyton.

The conditions in the **15MHz (19m)** band have also been improving and broadcasts from stations in several continents are audible during the day. They include R.Finland via Pori **15.225** (Eng, Lat to Asia, Pacific 0900-0930), rated 44444 at 0920 in Truro; BBC via Cyprus **15.575** (Eng to E.Eur, M.East 0600-1500) 54444 at 1024 in Plymouth; R.Pakistan, Islamabad **15.530** (Eng to Eur 1100-1120) 55555 at 1113 in Norwich; WEWN via Vandiver, USA **15.745** (Eng to Eur, Africa? 1200-1755?) 54444 at 1200 in Morden; R.Bulgaria, Sofia **15.130** (Eng to Eur 1200-1300) 54444 at 1208 in Freshwater Bay; VOIRI Tehran, Iran **15.084** (Home Sce relay) 34343 at 1225 in Woking; BBC via Seychelles **15.420** (Eng to Africa 1300-1700) 33443 at 1325 in Cyprus; V of Turkey, Ankara **15.290** (Eng to Eur, Asia, Pacific 1330-1430) 54454 at 1330 in Liverpool; WWCR Nashville, USA **15.685** (Eng to N.America, Eur 1100-2200) 44444 at 1430 in Kilkeel; RCI via Sines, Portugal **15.325** (Eng to Eur, M.East, Africa 1430-1500) 45544 at 1432 in Bridgwater; WYFR via Okeechobee **15.695** (Eng to Eur, Africa 1600-1845) 44433 at 1605 in Herstmonceux; Channel Africa via Meyerton **15.240** (Eng, Port to W.Africa 1700-1755) 44444 at 1700 by **Gerald Guest** in Dudley; KTBN Salt Lake City, USA **15.590** (Eng to N.America 1600-0000) 44444 at 1715 in NE.Bedford; VOA via Greenville, USA? **15.120** (Eng to Eur, N.Africa 1700-1800) 33333 at 1730 in Stalbridge; RAE Buenos Aires, Argentina **15.345** (Eng, Fr, Ger, It, Sp to Eur, N.Africa 1800-0000) 24322 at 1829 by **Vera Brindley** in Woodhall Spa; R.Nederlands via Bonaire, Ned.Antilles **15.315** (Eng to Africa 1830-2025) 42333 at 1830 in Colyton; DW via Rwanda 15.135 (Eng to Africa 1900-1950) 54333 at 1930 in Scalloway; RNB Brazil 15.265 (Port, Eng, Ger to Eur 1630-2020) 34322 at 1942 in Oxted.

Some broadcasters are making good use of the **13MHz (22m)** band. They include R.Austria Int via Moosbrunn **13.730** (Eng to Eur, Australia 0830-0900), rated SIO333 at 0857 in N.Bristol; R.Pyongyang, Korea **13.790** (Russ to CIS 0700-1000) 24333 at 0916 in Oxted; UAER, Dubai **13.675** (Eng to Eur 1030-1055) 44444 at 1030 in Morden; R.Norway Int **13.800** (Norw [Eng Sun] to SE.Asia, W.Australia 1300-1330) 23222 at 1300 in Truro; UAER, Dubai **13.675** (Ar to Eur 1055-1330) 34443 at 1309 in Woking; R.Kuwait via Kabd **13.620** (Ar to Eur, N.America 0930-1605) 44344 at 1400 in Liverpool; R.Prague, Czech Rep **13.580** (Eng to Europe, E.Africa, N.America 1400-1427) 43343 at 1420 in Norwich; WWCR Nashville, USA **13.845** (Eng to Africa 1400-0000) 34443 at 1420 in Kilkeel; AIR via Bangalore **13.720** (Swa to E.Africa 1515-1615) SIO444 at 1530 in Macclesfield; R.Norway Int **13.800** (Norw [Eng Sun] to E/C.Africa 1600-1630) 34433 at 1600 by **Ross Lockley** in Galashiels; WHRI South Bend, USA **13.760** (Eng to E.USA, Eur 1500-2200?) 44344 at 1820 in Woodhall Spa; UAER, Dubai **13.675** (Ar to Eur 1640-2100) 44434 at 1835 in Colyton; WEWN Birmingham, USA **13.615** (Eng to N.America, Eur 1600-2000) 23232 at 1910 in Bridgwater; RCI via Sackville **13.650** (Fr, Eng to Eur, Africa 2000-2200) 44333 at 2100 in Scalloway; VOA via Selebi-Phikwe, Botswana **13.710** (Eng to Africa 1600-2130?) 44344 at 2102 in Freshwater Bay.

Noted in the **11MHz (25m)** band during the morning were the BBC via Masirah Is **11.760** (Eng to M.East 0300-0915) rated 33453 at 0555 in Cyprus; Voice of Greece, Athens **11.645** (Gr, Eng to Eur 0600-0800) 55555 at 0606 in Plymouth; R.New Zealand Int **11.905** (Eng to Pacific areas 0459-0816 Mon-Fri, 0459-0758 Sat/Sun) 25333 at 0700 in NE.Bedford; Slovak R.Int, via Velke Kostolany **11.990** (Eng, Slov to Australia 0830-0927) 43333 at 0830 in Morden; HCJB Quito, Ecuador **12.005** (Eng to Caribbean 1100-1600) 41133 at 1119 by **David Hall** in Morpeth.

During the afternoon Polish R, Warsaw **11.815** (Eng to Eur 1300-1355) was 44343 at 1328 in Bridgwater; R.Sweden via Horby? **11.650** (Eng to N.America 1430-1500) 33333 at 1430 in Truro; RCI via Sines, Portugal **11.915** (Eng, Fr to Eur, Africa 1430-1600) 43333 at 1440 in Stalbridge; Voice of Israel, Jerusalem **12.080** (Eng to W.Eur, N.America 1500-1530) SIO444 at 1530 in Macclesfield; Voice of Hope via Georgia **12.120** (Eng to Eur? 1500?-1655?) 34433 at 1530 in Galashiels; WWCR Nashville, USA **12.160** (Eng to N.America, Eur 1400-2200) 44433 at 1605 in Herstmonceux; R.Australia via Shepparton **11.660** (Eng to Asia 1330-1700) 45444 at 1615 in E.Bristol; REE via Noblejas **12.035** (Sp to Eur 0700-1700) 55555 at 1620 in Liverpool; R.Jordan via Al Karanah **11.690** (Eng to W.Eur, E.USA 1100-1730) 55444 at 1700 by **Clare Pinder** in Appleby; BSKSA via Riyadh? **11.715** (Ar to M.East, N.Africa, W.Eur 1700-1800) 33332 at 1717 in Oxted.

Later, R.Nederlands via Meyerton **11.655** (Eng to Africa 1730-2025) was rated SIO433 at 1730 by **Tom Smyth** in Co.Fermanagh; BBC via Skelton & Woofferton, UK **12.095** (Eng to Eur, N/W.Africa 0500-2100) 45434 at 1750 in Freshwater Bay; R.Kuwait via Kabd

LOCAL RADIO CHART

Freq (kHz)	Station	ILR BBC	e.m.r.p (kW)	Listener
558	Spectrum, London	I	0.80	G,H,J
585	R.Solway	B	2.00	A
603	Cheltenham R.	I	0.10	A,D,G,H,J
603	InvictaSG,Litt'brne	I	0.10	E*,G,H
630	R.Bedfordshire(3CR)	B	0.20	A,B,D,E,F,G,H
630	R.Cornwall	B	2.00	A,H,J
657	R.Clwyd	B	2.00	A,G,H
657	R.Cornwall	B	0.50	A,G,H,J
666	Gemini AM, Exeter	I	0.34	F,G,H,J,K
666	R.York	B	0.80	A,G
729	BBC Essex	B	0.20	B,G,H
738	Hereford/Worcester	B	0.037	D,E,G
756	R.Cumbria	B	1.00	A,E
756	R.Maldwyn, Powys	I	0.63	A,E,G,H,J
765	BBC Essex	B	0.50	G,H
774	R.Kent	B	0.70	B,E,G,H
774	R.Leeds	B	0.50	A,G
774	Cl.Gold 774, Glos	I	0.14	G,H
792	Cl.Gold 792,Bedford	I	0.27	G,H
792	R.Foyle	B	1.00	A,I
801	R.Devon & Dorset	B	2.00	A,D,G,H,J,K
828	Cl.Gold 828, Luton	I	0.20	G,J
828	2CR CG, Bournemouth	I	0.27	H
828	Townland R, Ulster	I	0.80	A,I
837	R.Cumbria/Furness	B	1.50	A
837	Asian Netwk Leics	B	0.45	E,G,H,J
855	R.Devon & Dorset	B	1.00	A,H,K
855	R.Lancashire	B	1.50	A
855	R.Norfolk, Postwick	B	1.50	E,G,H
855	Sunshine 855,Ludlow	I	0.15	D,E,G,J
873	R.Norfolk, W.Lynn	B	0.30	B,E,G
936	Brunel CG, W.Wilts	I	0.18	E,G,H
936	Yks Dales R, Howes	I	1.00	A,G
945	Derby (Gem AM)	I	0.20	G
945	S.Coast R, Bexhill	I	0.75	E,G,H,I*
954	Gemini AM, Torquay	I	0.32	G,H,J,K
954	Cl.Gold 954, H'ford	I	0.16	G
963	Asian Sd,Manchester	I	0.80	A
963	Liberty R, Hackney	I	1.00	G
972	Liberty R, Southall	I	1.00	G
990	R.Devon & Dorset	B	1.00	A,E,G,H,J,K
990	WABC, Wolverhampton	I	0.09	E,G
999	Gem AM, Nottingham	I	0.25	G
999	Red Rose 9-99 P'stn	I	0.80	A
999	R.Solent	B	1.00	B*,E,G,H
999	Valleys R. Aberdare	I	0.300	J
1017	WABC, Shrewsbury	I	0.70	A,E,G
1026	R.Cambridgeshire	B	0.50	G
1026	Downtown, Belfast	I	1.70	A,I
1026	R.Jersey	B	1.00	G,H,J
1035	RTL Country 1035	I	1.00	G,H
1035	R.Sheffield	B	1.00	A
1035	N.Sound 2, Aberdeen	I	0.78	A,G*
1116	R.Derby	B	1.20	A,G
1116	R.Guernsey	B	0.50	G,H
1116	Valleys R.Ebbw Vale	I	0.50	D
1152	LBC 1152	I	23.50	G,H
1152	Pic'ly 1152,Manch'r	I	1.50	A
1152	Xtra-AM, Birmingham	I	3.00	C,G
1161	R.Bedfordshire(3CR)	B	0.10	E,G
1161	Brunel CG, Swindon	I	0.16	E,G,H
1161	Southern Counties R	B	1.00	E,G,H
1161	Tay AM, Dundee	I	1.40	G
1170	GNR, Stockton	I	0.32	A
1170	SCR, Portsmouth	I	0.50	E,G,H
1170	Swansea Snd,Swansea	I	0.58	C,J
1170	1170AM,High Wycombe	I	0.25	E,G
1242	InvictaSG,Maidstone	I	0.32	E*,G
1242	IoW Radio, Wootton	I	0.50	G,H
1251	Amber SGR,Bury StEd	I	0.76	A,G
1260	Brunel CG, Bristol	I	1.60	H
1260	R.York	B	0.50	A
1296	Radio XL,Birmingham	I	5.00	A,E*,G,H,J*
1305	Big Easy Magic AM	I	0.15	A
1305	Premier via ?	I	0.50	G,H
1305	Touch AM, Newport	I	0.20	H
1323	S.Coast R,Southwick	I	0.50	E,G,H
1323	SomersetSnd,Bristol	B	0.63	C,E,G,J
1332	Premier, Battersea	I	1.00	G,H
1332	Cl.Gold 1332,Pt'bo	I	0.60	A,G
1359	BreezeAM,Chelmsford	I	0.28	E*,G
1359	Cl.Gold B9, C'try	I	0.27	G
1359	R.Solent	B	0.85	H
1359	Touch AM, Cardiff	I	0.20	J
1368	Southern Counties R	B	0.50	E*,G,H
1368	Wiltshire Sound	B	0.10	H
1413	Premier via ?	I	0.50	G,H,J*
1413	Yks Dales R,Skipton	I	0.10	A
1431	Breeze AM, Southend	I	0.35	E*,G,H
1431	Cl.Gold, Reading	I	0.14	E*,G,H,J*
1449	R.Peterboro/Cambs	B	0.15	A,G
1458	R.Cumbria	B	0.50	A
1458	R.Devon & Dorset	B	2.00	A,H
1458	Sunrise, London	I	50.00	D,G,H,J*
1476	CountySnd,Guildford	I	0.50	C*,G,H
1485	Cl.Gold, Newbury	I	1.00	D,G
1485	R.Humberside (Hull)	B	1.00	G
1485	R.Merseyside	B	1.20	A,E*,H,I
1485	Southern Counties R	B	1.00	G,H
1503	R.Stoke-on-Trent	B	1.00	A,E*,G
1521	R.1521 Craigavon,NI	I	0.50	A,I
1521	Fame 1521, Reigate	I	0.64	G,H
1530	R.Essex	B	0.15	G,H
1530	Cl.Gold W.Yorks	I	0.74	A,G
1530	Cl.Gold Worcester	I	0.52	D,G,H
1548	R.Bristol	B	5.00	H,J*
1548	Capital G, London	I	97.50	G,H,J*
1548	Magic 1548 Liverp'l	I	4.40	A
1557	R.Lancashire	B	0.25	A
1557	Mellow, Clacton	I	0.125	G
1557	Cl.Gold 1557,N.hant	I	0.76	G,J*
1557	S.Coast R, So'ton	I	0.50	G,H
1584	KCBC, Kettering	I	0.04	G
1584	London Turkish R	I	0.20	G
1584	R.Nottingham	B	1.00	E*,G
1584	R.Shropshire	B	0.50	A,H
1584	Tay, Perth	I	0.21	G
1602	R.Kent	B	0.25	A,E,G,H

Note: Entries marked * were logged during darkness. All other entries were logged during daylight or at dawn/dusk.

Listeners:-
(A) Robert Connolly, Kilkeel.
(B) John Eaton, Woking.
(C) Francis Hearne, N.Bristol.
(D))Simon Hockenhull, E.Bristol.
(E) Sheila Hughes, Morden.
(F) Rhoderick Illman, Oxted.
(G) Brian Keyte, Bookham.
(H) George Millmore, Wootton, IoW.
(I) Tom Smyth, Co.Fermanagh.
(J) David Stevenson, Swansea.
(K) Tom Winzor, Plymouth.

11.990 (Eng to Eur, N.America 1800-2100) 44444 at 1820 in Woodhall Spa; AIR via Bangalore **11.620** (Eng, Hi to Europe 1745-2230) 34433 at 1845 in Colyton; HCJB Quito, Ecuador **12.015** (Eng to Eur 1900-2200) 43333 at 1913 in Norwich; R.Nac da Amazonia, Brazil **11.780** (Port 0900-0200) 25533 at 2140 in Wallsend; WYFR Okeechobee, USA **11.580** (Eng to Eur, Africa 2100-2300) 34333 at 2225 in Scalloway; BBC via Kranji, Singapore **11.955** (Eng to F.East 2200-0300) 34443 at 0130 in Kilkeel; RAE Argentina **11.710** (Eng to N.America 0200-0300) 33333 at 0250 by **Bill Griffith** in W.London.

In the **9MHz (31m)** band R.New Zealand's broadcast to Pacific areas on **9.700** (Eng 0816-1206 Mon-Fri, 0758-1206 Sat/Sun) was rated 43433 at 0820 in NE.Bedford; 34343 at 1004 in Bridgwater & 33333 at 1134 in Truro. Also mentioned in the reports were KTWR Guam 9.865 (Eng to Asia 1000-1100), noted as 23322 at 1000 in Morpeth; SRI via Schwarzenburg **9.885** (Eng, Ger, Fr, It to SE.Asia 1100-1330) 44444 at 1152 in Oxted; R.Sweden via Horby **9.705** (Eng to Asia 1330-1400) 55544 at 1340 in Herstmonceux; BSKSA Riyadh **9.730** (Ar to N/C.Africa 1600-1800) 43343 at 1640 in Liverpool; TWR Manzini, Swaziland **9.500** (Eng to C.Africa 1600-1830) 43444 at 1702 in Woking; Africa No.1, Gabon **9.580** (Fr to C.Africa 0500-2300) SIO322 at 1815 in Macclesfield; R.Nederlands via Madagascar **9.605** (Eng to Africa 1730-2025) 44444 at 1830 in Woodhall Spa; R.Australia via Shepparton 9.500 (Eng to Asia, Pacific 1430-2200) 44434 at 2000 in E.Bristol; R.Nac del Paraguay **9.735** (Sp 0800-0400) 24542 at 2141 in Wallsend; RCI via Sackville **9.755** (Eng [CBC progs] to USA, Caribbean 2300-0100) SIO333 at 2356 in N. Bristol; VOA via Thailand **9.850** (Eng to S.Asia 0100-0300) 34443 at 0200 in Kilkeel.

Some of the broadcasts to Europe in this band come from HCJB Quito, Ecuador **9.365** (Eng 0700-0900) heard at 0700 in Appleby; SRI via Sarnen **9.535** (Eng, Ger, Fr, It 1100-1330) rated 33333 at 1100 in Truro; Polish R, Warsaw **9.525** (Eng 1300-1355) 44444 at 1330 in Morden; R.Romania Int, Bucharest **9.690** (Eng 1700-1755) 33433 at 1700 in Galashiels; Voice of Turkey, Ankara **9.540** (Eng 1930-2030, also to Africa) 55555 at 1953 in Storrington; Israel R, Jerusalem **9.365** (Eng 2000-2025, also to USA) 44333 at 2020 in Freshwater Bay; R.Thailand, Udon Thani **9.535** (Eng 2030-2045) 33333 at 2030 in Dudley; AIR via Aligarh? **9.950** (Hi, Eng 1745-2230) 43333 at 2048 in Norwich; Voice of Armenia, Yerevan **9.965** (Eng 2115-2145) 33333 at 2130 in Stalbridge; RCI via Sackville **9.805** (Fr, Eng 2000-2230, also to Africa) 44334 at 2210 in Colyton; R.Taipei Int via WYFR, USA

MEDIUM WAVE CHART

Freq (kHz)	Station	Country	Power (kW)	Listener
520	Hof-Saale (BR)	Germany	0.2	K
531	Ain Beida	Algeria	600/300	A*,J*,K*
531	Berg	Germany	20	A*,B*,K*
531	Beromunster	Switzerland	500	H
540	Wavre	Belgium	150/50	A,H
540	Sidi Bennour	Morocco	600	A*,H*,K*
549	Les Trembles	Algeria	600	A*,H*
549	Thurnau (DLF)	Germany	200	A,B*,F,H,K
558	RNE5 via ?	Spain	?	H*,K*
567	Tullamore(RTE1)	Ireland (S)	500	A,D,F,G,H,J,K*,M
576	Muhlacker(SDR)	Germany	500	A,B*,H*
576	Barcelona(RNE5)	Spain	50	H*,K*
585	Paris(FIP)	France	8	A,H
585	Madrid(RNE1)	Spain	200	A*,F,H*,K*
585	Dumfries(BBCScot)	UK	2	G,J
594	Frankfurt(HR)	Germany	1000/400	A*,B*,H
594	Oujda-1	Morocco	100	H*
594	Muge	Portugal	100	A*
603	Lyon	France	300	E*,K
603	Sevilla(RNE5)	Spain	50	E*,K*
603	Sousse	Tunisia	10	H*
603	Newcastle(BBC)	UK	2	E*,G
612	Athlone(RTE2)	Ireland (S)	100	A*,F,G,H,J,K*
612	RNE1 via ?	Spain	10	K*
621	Wavre	Belgium	80	A*,H
621	RNE1 via ?	Spain	10	K*
630	Vigra	Norway	100	H
630	Tunis-Djedeida	Tunisia	600	A*
639	Praha(Liblice)	Czech	1500	A*,H*
639	RNE1 via ?	Spain	?	A*,H*,K*
648	RNE1 via ?	Spain	10	H*,K*
648	Orfordness(BBC)	UK	500	D,G,H
657	Napoli	Italy	120	A*,H*
657	Madrid(RNE5)	Spain	20	H*,K*
657	Wrexham(BBCWales)	UK	2	E,F,G
666	MesskirchRohrd(SWF)	Germany	150	B*,H*,J,K*
666	Lisboa	Portugal	135	A*
675	Lopic(R10 Gold)	Holland	120	A*,D,F,H
684	Sevilla(RNE1)	Spain	500	A*,H*,K*
684	Avala(Beograd-1)	Yugoslavia	2000	A*,H*
693	Droitwich(BBC5)	UK	150	H,K
693	Enniskillen(BBC5)	UK	1	J
702	Flensburg(NDR)	Germany	5	A*,B*
702	TWR via Monte Carlo	Monaco	300	H*
711	Rennes 1	France	300	A*,D,F,H,K*
711	Heidelberg	Germany	5	B*
711	Laayoune	Morocco	600	H*
720	Lisnagarvey(BBC4)	Ireland (N)	10	G
720	Lots Rd,Ldn(BBC4)	UK	0.5	G,H,J,K
729	Cork(RTE1)	Ireland (S)	10	A,G,H*,J
729	RNE1 via ?	Spain	?	A*,H*
738	Paris	France	4	E,H
738	Poznan	Poland	300	A*,H*
738	Barcelona(RNE1)	Spain	500	A,F,H*
747	Flevo(Hilv2)	Holland	400	A,D,F,H
756	Braunschweig(DLF)	Germany	800/200	A,B*,E*,H*,K*
756	Bilbao(El)	Spain	5	E,F,H*
756	Redruth(BBC)	UK	2	J,K
765	Sottens	Switzerland	500	A,H*
774	RNE1 via ?	Spain	?	A*,E*,H*
774	Plymouth(BBC)	UK	1	K
783	Leipzig(MDR)	Germany	100	B*,F,H*
783	Miramar(R.Porto)	Portugal	100	H*
792	Limoges	France	300	A,F,H,KB
792	Lingen(NOR)	Germany	5	H*
792	Sevilla(SER)	Spain	20	A*,H*,K*
792	Londonderry(BBC)	UK	1	J
801	Munchen-Ismaning	Germany	300	A
801	Ajlun	Jordan	2000	H*
801	RNE1 via ?	Spain	?	A*,H*
810	Madrid(SER)	Spain	20	A*,E*
810	Westergien(BBCScot)	UK	100	A*,E*,F,G,H,K*
819	Batra	Egypt	450	A*,H*
819	Toulouse	France	50	A*
837	Nancy	France	200	A,J*
837	COPE via ?	Spain	?	H*,K*
846	Rome	Italy	540	A,H*
855	RNE1 via ?	Spain	?	A,H*,K*
864	Santah	Egypt	500	H*
864	Paris	France	300	A,H
873	Frankfurt(AFN)	Germany	150	B*,F,G,H*
873	Zaragoza(SER)	Spain	20	H*
882	COPE via ?	Spain	?	A
882	Washford(BBCWales)	UK	100	E,F,G,H,J,K,M
891	Algiers	Algeria	600/300	A,H*
900	Brno(CRo2)	Czech Rep	25	H*
900	COPE via ?	Spain	?	A,H*
909	B'mans Pk(BBC5)	UK	140	A*,H,J
909	Clevedon(BBC5)	UK	50	K
918	Plesivec(Sloven'nR)	Slovenia	600/100	H*
918	Madrid(R.Int)	Spain	20	K*
927	Wolvertem	Belgium	300	A,H,K*
936	Bremen	Germany	100	B*,H*,J,K
936	Venezia	Italy	20	A*,H*
954	Brno (CRo2)	Czech Rep	200	H*
954	Madrid(CI)	Spain	20	A*,H*,K*
963	Pori	Finland	600	A*,H*,I*
963	Tir Chonaill	Ireland (S)	10	K*
972	Hamburg(NDR)	Germany	300	B*,K
981	Alger	Algeria	600/300	A*,H*,K*
990	Berlin	Germany	300	A,B*,H*
990	R.Bilbao(SER)	Spain	10	A*
990	Tywyn(BBC)	UK	1	G,K*
999	Schwerin (RIAS)	Germany	20	K
999	Madrid(COPE)	Spain	50	A*,E
1008	Flevo(Hilv-5)	Holland	400	A*,H,K,L
1017	Rheinsender(SWF)	Germany	600	A*,B*,H*
1017	RNE5 via ?	Spain	?	H*
1026	SER via ?	Spain	?	A*,H*
1035	Lisbon(Prog3)	Portugal	120	H*
1044	SER via ?	Spain	?	A*
1044	S.Sebastian(SER)	Spain	10	H*
1053	Zarogoza(COPE)	Spain	10	K
1053	Talk R.UK via ?	UK	?	H,K,M
1062	Kalundborg	Denmark	250	A*,H,K*
1062	R.Uno via ?	Italy	?	H*
1071	R.France via ?	France	?	A*
1071	Brest	France	20	H*
1071	Bilbao(El)	Spain	5	H*
1080	SER via ?	Spain	?	A*,H*
1089	Talk Radio UK via ?	UK	?	H,J,K
1098	Nitra(Jarok)	Slovakia	1500	A*,H*
1098	RNE5 via ?	Spain	?	H*
1107	AFN via ?	Germany	10	A*
1107	Talk R.UK via ?	UK	?	H,K
1116	Bari	Italy	150	A*,H*
1125	La Louviere	Belgium	20	H*
1125	Deanovec	Croatia	100	A*
1125	RNE5 via ?	Spain	?	A*,E,H*
1125	Llandrindod Wells	UK	1	E,G,K
1134	COPE via ?	Spain	2	A*,H*
1134	Zadar(Croatian R)	Yugoslavia	600/1200	H*,K*
1143	Stuttgart(AFN)	Germany	10	G
1143	COPE via ?	Spain	2	A*,H*
1152	RNE5 via ?	Spain	10	H*
1179	Solvesborg	Sweden	600	H*,L
1188	Kuurne	Belgium	5	H
1188	Szolnok	Hungary	135	H*
1197	Virgin via ?	UK	?	H,K
1215	Virgin via ?	UK	?	H,J,K
1224	Vidin	Bulgaria	500	H*
1260	SER via ?	Spain	?	H*,K
1260	Guildford (V)	UK	0.5	H,J
1269	Neumunster(DLF)	Germany	600	B*,H*,K
1269	COPE via ?	Spain	?	H
1278	Dublin/Cork(RTE2)	Ireland (S)	10	C*,E,G,H*,J,K
1287	RFE via ?	Czech Rep	400	H*
1287	Lerida(SER)	Spain	10	H*
1296	Valencia(COPE)	Spain	10	H*,K*
1296	Orfordness(BBC)	UK	500	G,J
1305	Rzeszow	Poland	100	H*
1305	RNE5 via ?	Spain	?	H*
1314	Kvitsoy	Norway	1200	H,K,L
1323	W'brunn (V.Russia)	Germany	1000/150	B*,E,I
1332	Rome	Italy	300	E*,H*
1341	Lisnagarvey(BBC)	Ireland (N)	100	C*,D*,G,H*,J,K
1350	Nancy/Nice	France	100	H*
1350	Cesvaine/Kuldiga	Latvia	50	H*
1359	Arganda (RNE-FS)	Spain	600	H*,K
1368	Foxdale(Manx R)	I.O.M.	20	D*,E*,G*,H*,J
1377	Lille	France	300	H,K*
1386	Bolshakovo	Russia	2500	H*,K
1395	Fllake	Albania	1000	H*
1395	Lopic	Netherlands	120/40	A*,H,K*
1404	Brest	France	20	A*,E*,H
1413	RNE5 via ?	Spain	?	A*,H*,K*
1422	Heusweiler(DLF)	Germany	1200/600	A,B*,H*
1422	Valmiera	Latvia	50	A*
1440	Marnach(RTL)	Luxembourg	1200	H,J,K
1449	Squinzano (RAI)	Italy	50	H*
1467	Monte Carlo(TWR)	Monaco	1000/400	H*,K*
1476	Wien-Bisamberg	Austria	600	E*
1485	SER via ?	Spain	?	E*
1494	Clermont-Ferrand	France	20	A,H,K*
1494	St.Petersburg	Russia	1000	H*
1503	Stargard	Poland	300	H*
1503	RNE5 via ?	Spain	?	H
1512	Wolvertem	Belgium	600	A*,E*,H*,I,K*
1521	Kosice(Cizatice)	Slovakia	600	H*
1530	Vatican R	Italy	150/450	A*,G,H*
1539	Mainflingen(ERF)	Germany	350(700)	B*,H,K*
1539	SER via ?	Spain	?	A*
1557	Nice	France	300	J
1566	Sarnen	Switzerland	300	A*,H*
1575	Genova	Italy	50	A*
1575	SER via ?	Spain	5	A*,H*,K*
1584	SER via ?	Spain	2	H*,K*
1593	Holzkirchen(VOA)	Germany	150	H*,J,K*
1602	SER via ?	Spain	?	A*,K*
1602	Vitoria(El)	Spain	10	H*,K*
1602	R.Beograd	Yugoslavia	1	K*

Note: Entries marked * were logged during darkness. All other entries were logged during daylight or at dawn/dusk.

Listeners:-
(A) John Eaton, Woking.
(B) Ted Harris, Manchester.
(C) Francis Hearne, N.Bristol.
(D) Simon Hockenhull, E.Bristol.
(E) Sheila Hughes, Morden.
(F) Rhoderick Illman, Oxted.
(G) Brian Keyte, Gt Bookham.
(H) George Millmore, Wootton IoW.
(I) Clare Pinder, while in Appleby.
(J) Tom Smyth, Co.Fermanagh.
(K) David Stevenson, Swansea.
(L) Thomas Williams, Truro.
(M) Tom Winzor, Plymouth.

TROPICAL BANDS CHART

Freq (MHz)	Station	Country	UTC	DXer
2.310	ABC Alice Springs	Australia	2058	B,C
3.210	Em.Nacional, Maputo	Mozambique	1920	A
3.223	AIR Simla	India	0050	A
3.230	SABC Meyerton	S.Africa	0020	A
3.240	TWR Shona	Swaziland	1910	E
3.255	BBC via Meyerton	S.Africa	1918	A,E
3.270	SWABC 1, Namibia	S.W.Africa	1918	A,I
3.290	Namibian BC,Windhoek	S.W.Africa	2105	A,I
3.300	R.Cultural	Guatemala	0645	A,N,P
3.306	ZBC Prog 2	Zimbabwe	1916	I
3.315	AIR Bhopal	India	0025	A,O,N
3.316	SLBS Goderich	Sierra Leone	2102	I
3.320	SABC (RSG) Meyerton	S.Africa	1919	A,I
3.335	CBS Taipei	Taiwan	1926	I
3.345	AIR Jaipur	India	0040	A,O
3.365	GBC R-2	Ghana	2102	A,F,I,M,N
3.365	AIR Delhi	India	1735	I
3.395	ZBC Gweru	Zimbabwe	1948	I
3.870	Voz de la Esparanza	Peru	0100	A
3.915	BBC via Kranji	Singapore	2153	B,E,F,G,H,Q
3.950	Qinghai PBS, Xining	China	0120	A
3.955	BBC via Skelton	England	1800	A,B,F,H,I,M,O,P,Q
3.960	Xinjiang PBS, Urumqi	China	0110	A
3.965	RFI Paris	France	2230	A,F,P
3.970	R.Korea via Skelton	England	2200	B,F,I,K
3.975	R.Budapest	Hungary	2200	B,F,H,K,O
3.985	Nexus, Milan	Italy	1930	A,M
3.985	China R via SRI	Switzerland	2200	F,O,Q
3.985	SRI Beromunster	Switzerland	1830	B,F
3.995	DW via Julich	Germany	1922	A,B,F,H,P,Q
4.005	Vatican R.	Italy	1924	A,B,F,H,M
4.330	Xinjiang BS, Urumqi	China	0030	A
4.500	Xinjiang BS, Urumqi	China	2334	A,F
4.735	Xinjiang, Urumqi	China	0050	A
4.750	Xizang BS, Lhasa	China	0001	A,B
4.755	R.Educ CP Grande	Brazil	0155	A,E,N
4.760	Yunnan PBS,Kunming	China	0003	B
4.760	AIR Port Blair	India	0100	A
4.760	TWR Manzini	Swaziland	1925	N
4.765	R.Integracao	Brazil	0815	N
4.770	FRCN Kaduna	Nigeria	2100	A,B,E,H,I,N
4.775	AIR Imphal	India	0120	A
4.777	R.Gabon, Libreville	Gabon	2135	A,I,M,N
4.783	RTM Bamako	Mali	2134	A,B,I,N
4.790	Azad Kashmir R.	Pakistan	0050	A
4.800	AIR Hyderabad	India	1651	D,E,I,N
4.800	LNBS Maseru	Lesotho	2110	B
4.805	R.Nac.Amazonas	Brazil	0055	A
4.815	R.diff TV Burkina	Ouagadougou	2039	A,B,I,N
4.820	R.Botswana, Gaberone	Botswana	1838	B,E,F,I,N
4.820	AIR Calcutta	India	1612	I
4.820	Xizang, Lhasa	Tibet	0105	A
4.830	R.Tachira	Venezuela	0110	A,I,N
4.832	R.Reloj	Costa Rica	0803	B,N
4.835	ABC-Alice Springs	Australia	2136	I
4.835	R.Tezulutlan, Coban	Guatemala	0115	A
4.835	RTM Bamako	Mali	1947	A,B,E,G,I,L,M,N
4.840	AIR Bombay	India	1651	A,I,J,N
4.845	ORTM Nouakchott	Mauritania	2054	A,I
4.850	R.Yaounde	Cameroon	1945	A,B
4.850	AIR Kohima	India	1630	I,J,N
4.860	AIR Delhi	India	1738	B,I,J,N
4.865	PBS Lanzhou	China	2300	A,B,N
4.870	R.Cotonou	Benin	2108	I
4.879	R.Bangladesh	Bangladesh	0115	A
4.880	AIR Lucknow	India	0115	A
4.885	R.Clube do Para	Brazil	0907	I,N
4.885	R.Difusora Acreana	Brazil	0105	A
4.885	KBC East Sce Nairobi	Kenya	2045	N
4.890	R.Port Moresby	New Guinea	2007	I
4.895	AIR Kurseong	India	0120	A
4.895	Pakistan BC	Pakistan	1700	I
4.900	Haixia 2	China	1500	J
4.905	R.Relogio Federal	Brazil	2138	I
4.910	Tennant Creek	Australia	2140	I
4.910	R.Zambia, Lusaka	Zambia	2100	I
4.915	GBC-1, Accra	Ghana	2137	A,B,I,N
4.915	R.Cora de Peru, Lima	Peru	0725	N
4.920	R.Quito, Quito	Ecuador	0832	C,E,N
4.920	AIR Madras	India	0125	A,N
4.927	RRI Jambi	Indonesia	2225	N
4.935	KBC Gen Sce Nairobi	Kenya	2038	A,I,N
4.940	AIR Guwahati	India	0120	A,N
4.950	AIR Srinagar	India	1702	I,J
4.950	VOA via Sao Tome	Sao Tome	2037	E,F,I,K,N
4.960	R.Federacion, Sucua	Ecuador	0005	B
4.960	VOA via Sao Tome	Sao Tome	0310	D
4.965	R.Alvorada	Brazil	0145	A
4.970	PBS Xinjiang	China	0115	N
4.970	AIR Shillong	India	0120	A
4.975	R.Uganda, Kampala	Uganda	1939	E,F,I,N
4.980	PBS Xinjiang, Urumqi	China	0125	A
4.980	Ecos del Torbes	Venezuela	2200	A,E,G,I,N
4.985	R.Brazil Central	Brazil	0130	A
4.990	R.Ancash, Huaraz	Peru	0900	N
5.005	R.Nepal, Kathmandu	Nepal	1704	A,I
5.009	R.TV Malagasy	Madagascar	1650	N
5.010	AIR Thiru'puram	India	0117	A,N
5.025	ABC Katherine	Australia	2138	I
5.025	R.Parakou	Benin	2105	A,B,I,N
5.025	R.Rebelde, Habana	Cuba	0722	A,N
5.025	R.Uganda, Kampala	Uganda	2040	B,I,N
5.030	AWR Latin America	Costa Rica	2340	F
5.035	R.Aparecida	Brazil	0705	I,N
5.035	R.Bangui	C.Africa	1955	A
5.045	R.Cultura do Para	Brazil	0135	A
5.047	R.Togo, Lome	Togo	1940	A,I,L,N
5.050	R.Tanzania	Tanzania	1943	I,N
5.055	RFO Cayenne(Matoury)	French Guiana	2355	A
5.060	PBS Xinjiang, Urumqi	China	0115	N
5.075	Caracol Bogata	Colombia	0431	A,C,E,N
5.100	R.Liberia, Totota	Liberia	2127	I,N

DXers:-

(A) Robert Connolly, Kilkeel.
(B) John Eaton, Woking.
(C) David Edwardson, Wallsend.
(D) Bill Griffith, S.W.London.
(E) David Hall, Morpeth.
(F) Brian Heath, Stapleton.
(G) Simon Hockenhull, E.Bristol.
(H) Rhoderick Illman, Oxted.
(I) Fred Pallant, Storrington.
(J) John Parry, Larnaca, Cyprus.
(K) Clare Pinder, while in Appleby.
(L) Peter Pollard, Rugby.
(M) Vic Prier, Colyton.
(N) John Slater, Scalloway.
(O) Tom Smyth, Co.Fermanagh.
(P) Ernest Wiles, NE.Bedford.
(Q) Thomas Williams, Truro.

9.985 (Eng 2200-2300) SIO333 at 2300 in Co,Fermanagh.

Quite a few of the broadcasts in the **7MHz (41m)** band are intended for European listeners. Amongst those noted were VOA via Greece? **7.170** (Eng 0400-0700, also to N. Africa), rated 33453 at 0545 in Cyprus; Vatican R, Italy **7.250** (Eng 0600-0620) 54444 at 0604 in Plymouth; R.Japan via Woofferton, UK **7.230** (Jap, Eng 0600-0800) 54444 at 0700 in Appleby; Monitor R.Int via WSHB **7.535** (Eng [Various Sat/Sun] 0400-0958) 44444 at 0826 in Woking; AWR via Forli, Italy **7.230** (Eng 0900-1000) 44333 at 0930 in Scalloway; R.Portugal **7.110** (Port 0600-1300) 44444 at 1129 in Oxted; Sudwestfunk via Rohrdorf **7.265** (Ger 24hrs) 33233 at 1245 in Liverpool; AIR via Aligarh? **7.410** (Hi, Eng 1745-2230) SIO444 at 1820 in Macclesfield; VOIRI Tehran **7.260** (Eng 1930-2028, also to M.East) 32432 at 1931 in Bridgwater; Voice of the Mediterranean via Russia? **7.440** (Eng 2000-2100) 44444 at 2005 in Morden; Israel R, Jerusalem **7.465** (Eng 2000-2025, also to USA) 22222 at 2020 in Truro; DW via Sines **7.285** (Eng 2000-2050) 44444 at 2030 in Galashiels; RCI via Skelton, UK **7.235** (Eng 2100-2230, also to Africa) 23322 at 2105 in E.Bristol; R.Bulgaria, Sofia **7.530** (Eng 2000-2100) 55555 at 2110 by **Peter Pollard** in Rugby; R.Romania Int, Bucharest **7.195** (Eng 2100-2156) 54444 at 2114 in Norwich; China R.Int via Russia **7.170** (Eng 2200-2257) 43334 at 2200 in Dudley; R.Ukraine via Myklolayiv **7.150** (Eng 2230-2300) 53444 at 2225 in Colyton.

Some to other areas may also be received here. They include KTBN via Salt Lake City **7.510** (Eng to N.America 0000-1600), logged as 23322 at 1035 in Morpeth; R.Prague, Czech Rep **7.345** (Eng to N.America 2230-2257) 44344 at 2230 in Woodhall Spa; R.Austria Int via Moosbrunn **7.325** (Ger, Fr, Eng to N.America 0000-0230?) SIO444 at 0130 in Co.Fermanagh; WJCR Upton, USA **7.490** (Eng to E.USA 24hrs) 34443 at 0135 in Kilkeel.

In the **6MHz (49m)** band HCJB Quito **5.865** (Eng to Eur 0700-0900) was 45554 at 0709 in Wallsend; WEWN Birmingham, USA **5.825** (Eng to Eur 2100?-1000) 54444 at 0710 in NE.Bedford; Croatian R via Deanovic **6.180** (Eng, Cr to Eur) 32332 at 0700 in W.London; KAIJ Denton, USA **5.810** (Eng to N.America 0000-1400) 23322 at 0859 in Morpeth; WWCR Nashville, USA **5.935** (Eng to USA 0100-1400) 24433 at 0940 in Oxted; R.Nederlands via Julich **6.045** (Eng to Eur 1130-1325) 55555 at 1130 in Dudley; R.Nederlands via Wertachtal **5.975** (Eng to Eur 1130-1325) 54444 at 1210 in Plymouth; SRI via Lenk **6.165** (Eng, Fr, Ger, It to Eur 0500-2030) 55533 at 1350 in Herstmonceux.

Later, Vatican R, Italy **5.883** (Various to Eur [Hung 1815-1830]) was SIO555 at 1820 in Macclesfield; R.Pyongyang, Korea **6.575** (Eng to Eur 2100-2155) 33333 at 2120 in Galashiels; China R.Int via ? **6.950** (Eng to Eur 2000-2157) 43433 at 2115 in Freshwater Bay; Polish R, Warsaw **6.035** (Eng to Eur 2030-2125) 33443 at 2120 in Rugby; RCI via Skelton, UK **5.995** (Eng to Eur, Africa 2100-2200) 22322 at 2150 in E.Bristol; RCI via Sackville **5.925** (Eng to Eur, Africa 2100-2200) 44554 at 2156 in Bridgwater; R.Taipei Int via WYFR? **5.810** (Eng to Eur 2200-2300) 33233 at 2200 in Appleby; R.Ukraine Int. **5.905** (Eng to Eur 2200-2300) SIO444 at 2200 in Co.Fermanagh; BBC via Antigua, W.Indies **5.975** (Eng to C/N.America 2100-0800) 32223 at 2200 in Stalbridge; Deutschland R. Berlin **6.005** (Ger to Eur 24hrs) 32232 at 2225 in Liverpool; R.Prague, Czech Rep. **5.930** (Eng to USA 2230-2300) 54544 at 2230 in Morden; R.Austria Int via Moosbrunn **6.155** (Eng to Eur 2230-2300) 43444 at 2230 in Truro; WHRI South Bend, USA **5.745** (Eng to E.USA, Eur 2200-0400) 45444 at 2340 in Woking; Voice of Greece **6.260** (Gr, Eng to N.America 0000-0350) SIO333 at 0146 in N.Bristol; R.Nederlands via Dushanbe 5.905 (Eng to S.Asia 0030-0125) 33443 at 0150 in Kilkeel.

LIST OF EQUIPMENT USED LM&S $February, #March, *April'98

$# * Darrin Beasley, Bridgwater: Yaesu FRG-100 + a.t.u. + 15m wire.
$# * Vera Brindley, Woodhall Spa: Sangean ATS-803A + r.w.
$# * Robert Connolly, Kilkeel: JRC NRD-525 + Datong AD370 active antenna.
$ * Martin Cowin, Kirkby Stephen: Hitachi TRK-5854E + built-in whip.
Paul Crankshaw, Troon: AOR AR7030 + 1m square loop.
$# * Bernard Curtis, Stalbridge: Tatung TMR7602 or Grundig Ocean Boy + r.w.
$ * Martin Dale, Stockport: Grundig Satellit 3000 or Sangean ATS803A or Codar CR70A + a.t.u. + r.w.
Eric Duncan, St.Andrews: Icom IC-R8500 + 1.75m diam m.w. loop or W-Q m.w. loop or balun + 60m wire.
#* John Eaton, Woking: JRC NRD-345 + Datong AD270 or a.t.u. + r.w.
$# * David Edwardson, Wallsend: Trio R-600 + Pi-Balun + invert V trap dipole or 2.5m X 2.5m loop.
$# * Stan Evans, Herstmonceux: Kenwood R-2000 + Balun + 11m wire in loft.
* Bill Griffith, W.London: JRC NRD-535 + 25m wire.
* Alec Griffiths, Thurso: Radio Shack PRO-2045 or Philips AS440 or Sanyo G3001 or Steepletone MBR-7 or Vega Selena + dipole or r.w.
$# * Gerald Guest, Dudley: Roberts RC818 + r.w. (location 300m a.s.l.)
$# * David Hall, Morpeth: AOR AR7030 + 13m wire.
$# * Tony Hall, Freshwater Bay, IoW: Yaesu FRG-7 + 13m wire or RF-B45
$# Ted Harris, Manchester: Roberts RC818
$# * Francis Hearne, N.Bristol: Sharp WQT370 + r.w.
* Brian Heath, Stapleton: JRC NRD-535? + r.w.
$ * Simon Hockenhull, E.Bristol: Roberts R817, ITT Colt, Bush TR130.
$# * Robert Hughes, Liverpool: Lowe HF-225 Europa + PR-150 or AOR AR7030 + 15m indoor wire or Drake R8E + RF Systems MTA on roof.
$# * Sheila Hughes, Morden: Sony ICF-7600DS + loop or Panasonic DR48 + 15m invert L.
$# * Rhoderick Illman, Oxted: Kenwood R-5000 + r.w. or AN-1.
$# * Brian Keyte, Bookham: AOR AR7030 + r.w. or loop.
$# * Ross Lockley, Galashiels: Realistic DX-300 + a.t.u. + 40m wire or Sangean ATS803A.
$# * Eddie McKeown, Newry: Tatung TMR 7602.
$# * George Millmore, Wootton, IoW: Sangean ATS-803A or Racal RA17L + loop.
$# * Fred Pallant, Storrington: Trio R-2000 + Howes CTU8 a.t.u. + r.w.
$# * John Parry, Larnaca, Cyprus: Realistic DX394 + r.w.
$# * Clair Pinder, while in Appleby: JRC NRD-525 + a.t.u. + r.w. or Sony ICF-SW55.
$# * Peter Pollard, Rugby: Sony ICF-2001D + r.w.
* Vic Prier, Colyton: RCA AR88LF + a.t.u. + 20m horizontal loop in loft or Redifon R551N + active vertical in loft.
# Paul Pybus, Hull: Fisher 58 tuner + 13m wire or loop.
#* Philip Rambaut, Macclesfield: Int Marine Radio R.700M + r.w.
$ Tom Read, Macclesfield: Tatung TMR 7602 + a.t.u. + 10m wire.
* Richard Reynolds, Guildford: Sangean ATS-803A + l.w./m.w. loop or 60m dipole or r.w. in loft.
$# Harry Richards, Barton-on-Humber: Grundig Satellit 700 + AD270 or r.w. or Grundig Yacht Boy 400 or Matsui MR4099
$ * Chris Shorten, Norwich: Matsui MR4099 + 10m wire.
$# * John Slater, Scalloway, Shetland: Lowe HF-150 + a.t.u. + 20m wire.
$# * Tom Smyth, Co.Fermanagh: Sangean ATS-803A or Morphy Richards R191.
Tony Stickells, Thornton Heath: AOR AR7030 + 20m wire or loop.
$ Phil Townsend, London: Lowe HF-225 + preselector + r.w. or loop.
$ Ernest Wiles, NE.Bedford: AKD Target HF3 + a.t.u. + Windom.
$# * Ernest Wiles, while in Malta, Tenerife & Tunisia: AKD Target HF3 + indoor wire.
$# * Thomas Williams, Truro: Gundig Yacht Boy 206 or Sharp 5454 + r.w.
$# * Tom Winzor, Plymouth: Kenwood R-1000 or Trio 9R59D or Trio 59D 9RS + Miller ant.

WITH 8.33/12.5 KHZ STEPS (SPACING)

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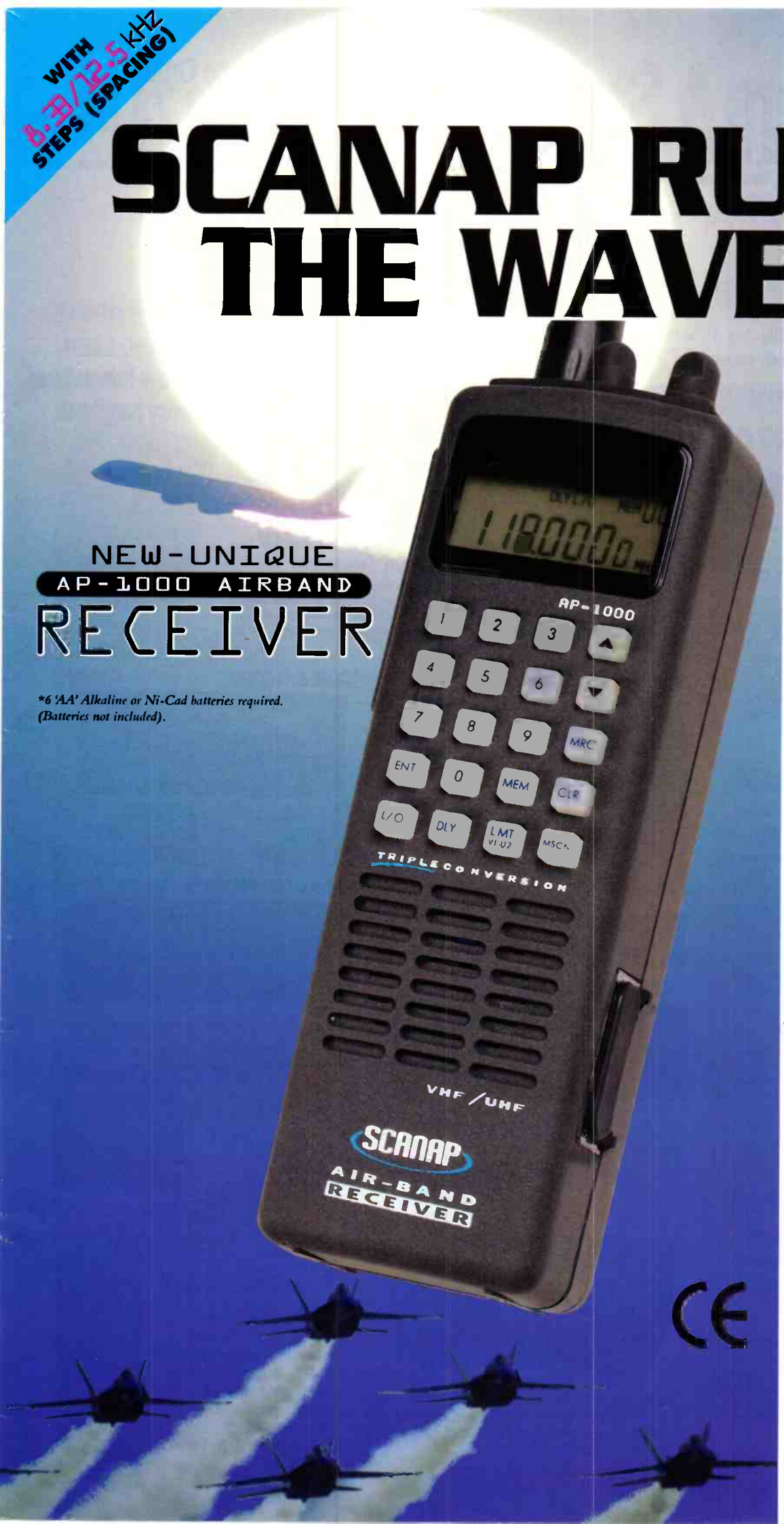

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* 100kHz - 2GHz
* SSB CW FM WFM AM
* 1000 Memories
* 4 IF Bandwidths
* Alphanumeric display
* Analogue S-meter
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* Min tuning step 10Hz
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The new Fairhaven RD-500 offers you wide band coverage on all modes SSB - CW - FM AM. The enormous memory capacity and alphanumeric display enables you to build up a very comprehensive data base of stations.

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* 100kHz - 30MHz
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* 10Hz steps
* 3 IF Filters
* Analogue S-meter
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* Wide dynamic range
* Notch filter
* IF shift control
* Built-in timer
* Built-in AC supply
* Ext. 12v DC operation

WAT-2 Short Wave ATU

WATSON

£69.95

* 500kHz - 30MHz
* 6 Band Positions
* "Q" Control
* Long wire systems
* Coax feed systems
* SO-239 output
* Size 84x55x60mm

Lowe HF-150 Europa

£499

5kHz - 30MHz SSB - CW - AM, Dual Filters, 60 Memories, Front-end bandpass filters, Internal 8 x AA ni-cad holder plus charger, 12V or 230V external supply - see Review this month

SPECIAL

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* NFM, WFM, SSB, AM
* 1000 Memories
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* Illuminated keypad - display
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* 30 Ch. per second speed
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PRICE MATCH

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+ Temperature & Date

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* 55mm digits
* date - day - month
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W&S £39.95

* 1.6GHz GPS ant.
* Low profile for car
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* 6dB gain design
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* OK for Garmin etc.

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* 400 Memories
* 255 hits record
* Auto store/ recall
* Interfaces with AR-8000
* Ni-cads and charger

WATSON FC-130 Counter £79.95

1MHz - 2.8GHz

This new model has a wide frequency range and is powered by internal ni-cads. External BNC socket with aerial makes it very sensitive. Supplied with AC charger, it is very well built. Don't be fooled by the price!

SALE

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This Month

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Part2

Small Loop Antennas

Building and Deploying

Now That You've Built It, What Are You Going To Do With It?

Last month in part one we ommited to feature the pictures Fig. 1.5a, b & d so here they are. The photo shown was Fig. 1.5c.

Last month Joe Carr took a look at the basic loop antenna, the theory behind its ability to discriminate between interfering stations, some construction details, and started to discuss how to actually use the loop antenna. This month he looks a bit more at deploying the loop. After all, it's in the use that a project proves its merit.

Deploying the Loop - Coaxis Stations

The ability of the loop antenna to null interference results from the fact that the maxima and the nulls are separated by 90°. Thus, the loop antenna has two nulls 180° apart. Although some less-than-ideal loops have different null depths on the two sides, most well constructed loops have a balanced situation unless there is some local object distorting the pattern. This geometry means that the best null occurs when the undesired signal arrives from a direction that is 90 degrees with respect to the desired signal. In that ideal situation, the maxima is aimed at the desired station and the null at the interfering station.

But what happens when the interfering station and the desired station are on the same axis? If both are in the same direction, the answer is "not much." But if they arrive from opposite directions (as in **Fig. 2.1**), then there is quite bit we can do. One solution is to use a loop in conjunction with a sense antenna, while another is to place a spoiler loop behind the receiver loop. Let's take a look at both options.

Figure 2.1 shows the use of a spoiler loop placed between the receiver antenna (a loopstick) and the offending station. The spoiler loop is a box loop of similar dimensions to the Sports Fans Loop in Part 1. It is skewed on the axis 60° to 90°, the exact amount being determined experimentally for each situation. The spoiler is placed 300 to 900mm behind the receiver antenna, again the exact amount being determined experimentally. Although the use of a loopstick is shown (the assumption being that a portable m.w. radio is being used for reception), a box loop can also be used for the receiver. Indeed, when a communications receiver is used, both loops will be box loops.

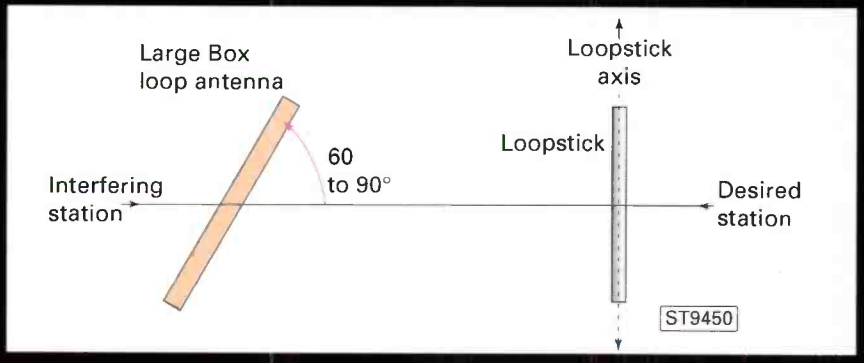
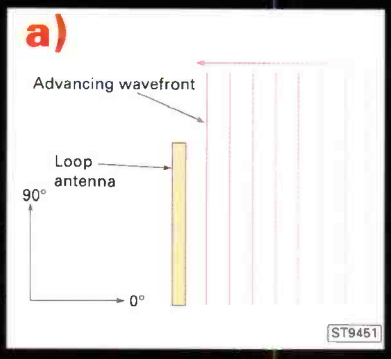


Fig. 2.1: Use of a spoiler loop to null, coaxis, same or adjacent channel interference.



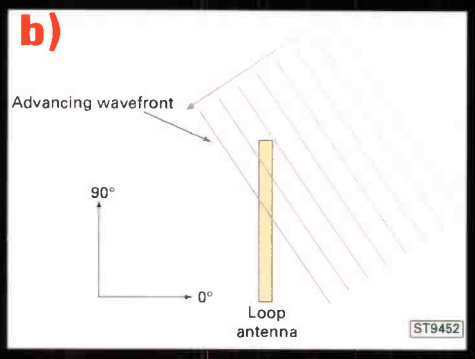


Fig. 2.2 a) 0° angle of arrival; b) 45° angle of arrival; c) 90° angle of arrival.

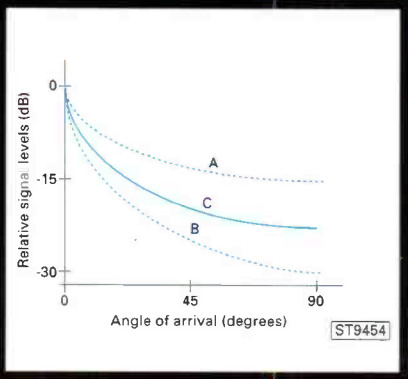


Fig. 2.3: Relative signal level v angle of arrival for three ground conditions.

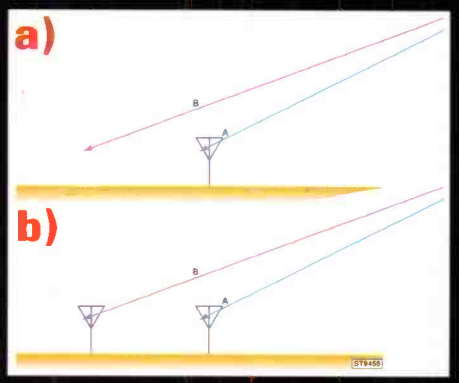


Fig. 2.4: Effects of changing angle of arrival.

Deploying the Loop Antenna in Elevation Extent

Most discussions of loop antennas assume that the signal arrives in the horizontal plane, i.e. at an angle of 0° with respect to the horizon (**Fig. 2.2a**). For most ground wave signals, this is the situation. But for sky wave signals, the angle of arrival is higher than 0°. For example, in **Fig. 2.2b**, the signal arrives at a 45° angle, while at **Fig. 2.2c** it arrives at a 90° angle.

Unfortunately, loop sensitivity is not uniform at all elevation angles. **Figure 2.3** shows the relative sensitivity of a typical loop antenna for different angles of arrival, and for different ground conductivity and dielectric properties. Curve A in **Fig. 2.3** shows the response when the loop is over ground with poor conductivity, while curve B shows shows the response over ground with good conductivity. Note that there are only a few values shown on the axes of **Fig. 2.3**. The reason is that this graph is to show the concept. Any attempt at more precision would be fallacious because it would pertain only to one location with one specific ground dielectric and conductivity situation

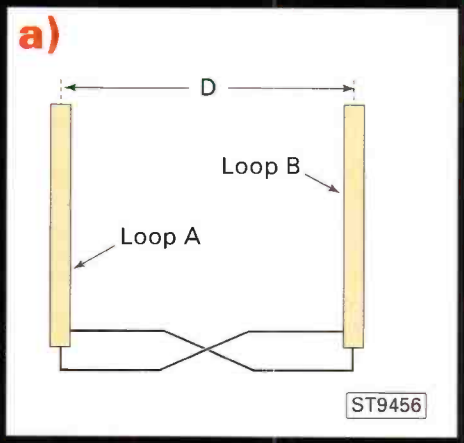


Fig. 2.5: Diversity loops: a) vertical; b) horizontal.

(there is too much variability to make any one graph meaningful). Most people would find performance more resembling curve C. The point to take away from **Fig. 2.3**, however, is that two factors will affect the signal strength received: angle of arrival and the properties of the ground underneath the antenna.

A solution to the angle of arrival problem is to provide the loop antenna with an AZ-EL mount similar to those used by amateur astronomers on their telescopes. The azimutal function would take care of pointing the loop at the station, while the elevation function would accommodate different angles of arrival.

Sky waves can be notoriously fickle, as anyone who'se tried to listen to fading short wave signals will attest. Unfortunately, instabilities in the ionosphere cause the angle of arrival of sky wave signals to shift. In **Fig. 2.4a**, the antenna will pick up a decent signal when the signal's angle of arrival is as line A, but when the ionosphere shifts, depressing the angle of arrival at bit, the signal will overshoot. The antenna will pick up considerably less signal, or none at all. A solution to this problem is to use a pair of antennas in what is called 'space diversity reception' (**Fig. 2.4b**). In this case, two antennas, usually space half wavelength apart, are connected together so that the signal will increase in one as it fades in the other.

A approach proposed by Jasik [1961] is to use a diversity loop antenna array, such as **Fig. 2.5**; the configuration in **Fig. 2.5a** is a vertically oriented scheme, while that in **Fig. 2.5b** is horizontally oriented. In both cases, the loops are spaced a distance (d) apart that is less than quarter wavelength, but not too much less. My best guess is that the spacing ought to be 0.1 to 0.25λ. The exact spacing for a particular frequency and location should be found experimentally.

The antenna configurations of **Fig. 2.5** are not for free, however. The patterns of the loops alters. Depending on the positioning of the two loops, the pattern may deteriorate rather badly, although at some spacings it will be a rather clean "four-leaf clover" pattern.

The feedline harness between the loops is phase reversed to provide a 180° phasing difference. The feedline to the receiver is connected to the feedline approximately midway between the two antennas.

Deploying the Loop Antenna - Undirectional Nulling

The pattern of the ideal loop antenna is a figure-of-eight, with nulls orthogonal to the plane of the loop and maxima in line with the loop plane. Nearby objects can distort the pattern. Various problems seen include filling in the nulls, or making the nulls uneven, or altering the positioning so that the nulls are not exactly 180° apart. One reason for using a shielded loop is to overcome these effects. In this section, let's look at loop antennas in which the pattern is intentionally distorted.

One problem with loop antennas is that they are bidirectional: you have two maxima 180° apart, and two minima, 180° apart, with the nulls and the maxima being orthogonal to each other. This pattern results in a problem that especially afflicts radio direction finding (RDF) applications of the loop. In RDF work, the loop is aimed at the station such that the null intercepts the

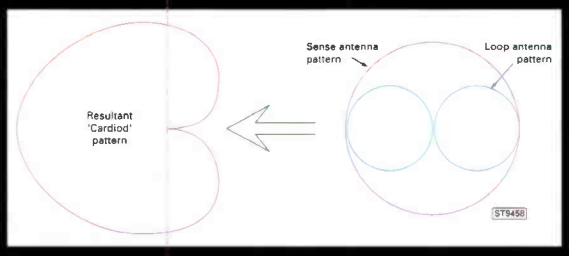


Fig. 2.6: Combining figure-8 and omnidirectional patterns to produce the cardioid pattern.

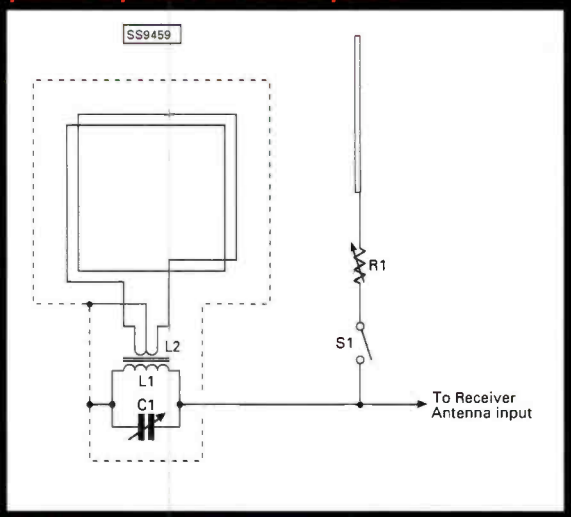


Fig. 2.7: Use of a sense antenna to produce cardioid pattern.

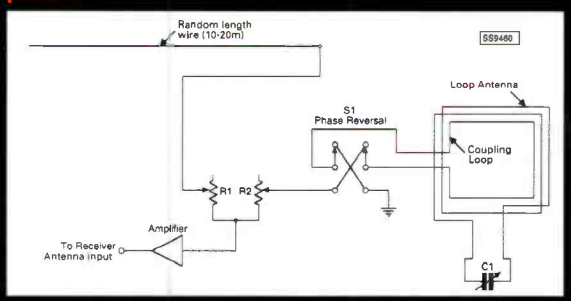


Fig. 2.8: Use of a random length wire sense antenna.

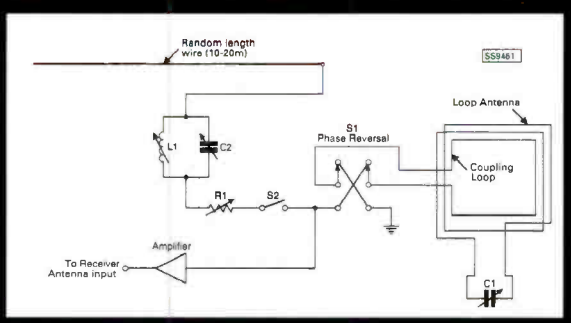


Fig. 2.9: Adding phasing control to the random wire sense antenna.

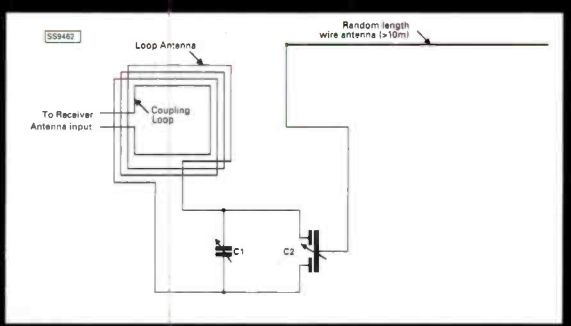


Fig. 2.10: a) use of a differential capacitor for phasing and amplitude control; b) a differential capacitor.

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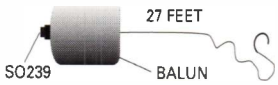

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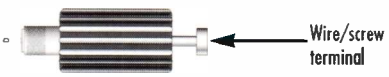

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signal. The null being so much sharper than the maxima makes the bearing obtained from the null much more accurate than a maxima bearing. But there are two nulls, 180° apart. The best you can say is that the signal is arriving either from one direction or its opposite.

The solution to the problem is to create a undirectional loop antenna that has but one null. **Figure 2.6** shows how this is done. If a loop antenna, with its figure-of-eight pattern, is paired with an omnidirectional sense antenna (with a circular pattern), then the algebraic sum of the two patterns is a cardioid shape: it has one broad maxima and one narrow null, positioned 180° relative to each other.

One approach to making a loop with a cardioid pattern is shown in **Fig. 2.7**. A loop is paired in close proximity with a small telescoping whip antenna. The loop shown here is shielded, and that is preferred, but non-shielded loops can also be used. The loop is tuned by L1 and C1, rather than the inductance of the loop. The purpose of C1/L1 is not simply to resonate to the desired frequency, but also to provide some phase shifting. The proper setting of C1 is close to, but slightly off, resonance. Potentiometer R1 is used to adjust the amplitude of the signal from the whip so that it matches the loop signal amplitude. In some cases, a phasing network is also included with the sense whip.

Both **Fig. 2.8** and **Fig. 2.9** show methods for using what many people erroneously call a 'long wire' antenna as the sense antenna. In truth, it's not a long wire (which would have to be $\geq 2\lambda$ to qualify as a 'long wire'), but rather a random length wire antenna. For this application, the wire should be 10 to 20 meters long, although longer and shorter lengths of wire would probably also work. In both of these antenna systems the signal is picked off from a resonant loop by a one-turn coupling loop. A d.p.d.t. phase reversal switch is used to help position (or detect) the null. In **Fig. 2.8**, a pair of potentiometers, R1 and R2, are used to adjust the relative amplitudes of the two signals before they are summed at the input of the amplifier. The variation of Fig. 9 shows the use of a series potentiometer (R1) to adjust the amplitude. Network L1/C1 is used to adjust the phase of the signal from the random length wire antenna. The correct adjustment point will be slightly off resonance.
Another variant is shown in **Fig. 2.10a**. The tuning capacitor (C1) that resonates the loop is in parallel with a 'differential variable capacitor' (C2a/b). This type of capacitor has two sections positioned 180° from each other (**Fig. 2.10b**). The total capacitance of the series-connected pair is constant, but the capacitance of each sections changes differentially. In others, as C2a increases, C2b decreases by the same amount. Thus, the pair, C2a and C2b, connected in series will exhibit a constant capacitance as far as C1 and the loop inductance is concerned, but will alter the phase and amplitude of the signal from the sense antenna.

Conclusion

There seems to be an awful lot of articles and book chapter on small loop antennas. Indeed, my own *Receiving Antenna Handbook* and *Practical Antenna Handbook* have chapters on loops, and my mail indicates that they are among the most popular chapters. One reason for the popularity of small loops is that they offer a compact means for dramatically improving the signal-to-noise and desired-signal-to-undesired-signal ratios. In this two-part series we discussed what is often missing from those articles: how to actually make the best use of the loop antenna.

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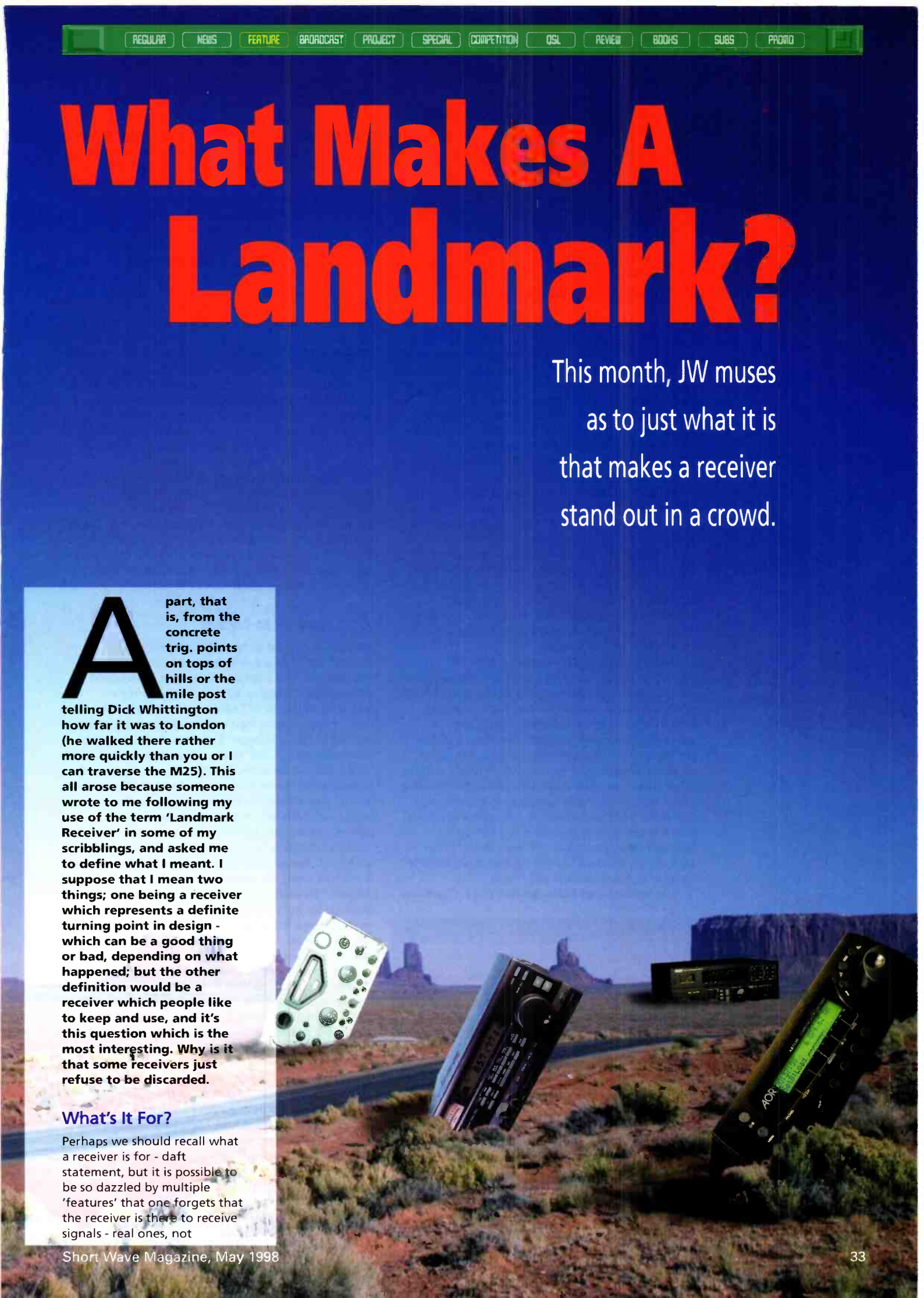
What Makes A Landmark?

This month, JW muses as to just what it is that makes a receiver stand out in a crowd.

Apart, that is, from the concrete trig. points on tops of hills or the mile post telling Dick Whittington how far it was to London (he walked there rather more quickly than you or I can traverse the M25). This all arose because someone wrote to me following my use of the term 'Landmark Receiver' in some of my scribblings, and asked me to define what I meant. I suppose that I mean two things; one being a receiver which represents a definite turning point in design - which can be a good thing or bad, depending on what happened; but the other definition would be a receiver which people like to keep and use, and it's this question which is the most interesting. Why is it that some receivers just refuse to be discarded.

What's It For?

Perhaps we should recall what a receiver is for - daft statement, but it is possible to be so dazzled by multiple 'features' that one forgets that the receiver is there to receive signals - real ones, not



In demand! The Trio R-820.

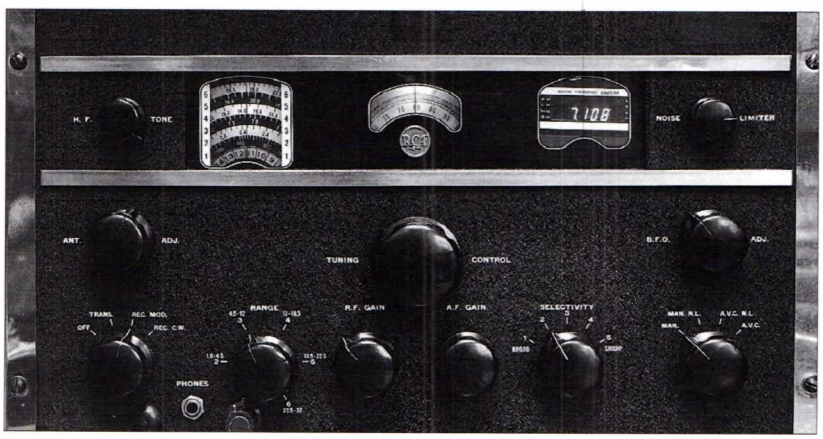
hundreds of spurious responses, and having received a signal, to convey it to your ears with a minimum of distortion so that you can understand what is being said or played. Even with data signals, it pays to keep distortion down because it reduces the chance of stray errors in decoding. It's quite surprising how many designers have put together a receiver with terrific r.f. performance and then stuck a cheapo five legged audio amplifier on the end and ruined their work. I'll refrain from naming names...

My wife listens to an old Hacker 'Sovereign' for which she paid a lot of money (relatively) back in the good old days, and it's still the receiver we prefer above all others when just broadcast listening. The secret seems to be in the wooden case and an elliptical speaker which fills the front panel and sounds delightful when compared to my (still use it) ICF-2001D with its microscopic squawker of a speaker. The Hacker may not be 'Hi-Fi' but it's very easy on the ear. Did I hear an echo of Bob Ellis saying "Mellow"?

NRD-545 - will this exciting new receiver from JRC fit John's requirements for a 'dream receiver'? Join us to find out in next month's definitive review of this Flagship radio.

Not that it's all down to audio; a lot of distortion can be caused by the transient response of sections of the receiving chain, and these effects are particularly noticeable (and very annoying) when listening to s.s.b. signals, where the incoming r.f. rapidly fluctuates from zero to full signal. One common contributor to this type of distortion is the a.g.c. system, which needs to have a fast attack to get the receiver gain down quickly, but without overshoot which tends to compress the wave front and distort it. I've seen more than one instance where the entire a.g.c. loop is basically unstable which can cause funny little squeaks on the audio at the start of every syllable in an s.s.b. transmission - very nasty.

The transmission characteristics of i.f. filters can



The AR88 gave us a hernia on demand.

be a source of apparent transient distortion, and there can be very unpleasant effects even when tuning to an a.m. station. I'm sure that experienced operators will have noticed how some receivers generate shrill howling noises when tuning slowly towards an unmodulated carrier, and it's difficult to locate the actual mechanism by which the filter generates the noise, but think about how a mechanical filter works - by converting electrical energy into mechanical and then converting the mechanical energy back to an electrical signal at the other end of the filter. If you have a receiver with a built in loudspeaker, it's perfectly possible to have mechanical acoustic feedback to the filter. The same scenario applies equally to crystal filters, because they are also mechanically coupled devices.

Now theoretically, the entrance on to the scene of digital signal processing (DSP), in which the filtering is effectively a mathematical process, should signal the end of i.f. filter problems, but there are a couple of little effects which cloud the otherwise clear sky, and I'm looking forward to analysing these in the near future. More to come on this one.

When considering mechanical feedback, it brings to mind the microphony caused in old receivers which use capacitor tuned conversion oscillators, where the vanes of the tuning capacitor could 'ping' very nicely and send the whole radio into acoustic orbit. The same effects still occur in fancy synthesised devices as well, although not quite so easily or dramatically, but it's amazing how microphonic a loose printed circuit board securing screw can be when it's not tightened down properly. Note that the receiver doesn't have to be actually howling to notice these effects; they can occur as little transients and make the audio sound awful without making a continuous whine.

God Said Unto Moses

All well and good so far, but signal distortion doesn't make or break a receiver by itself; the receiver which is kept as a long time friend must have other attributes, such as simply being a pleasure to use. Now I admit here and now that I was brought up on lead weighted flywheels behind tuning knobs, analogue 'S' meters, controls which rotated through 270° when driven by a human hand and a control for every function. This is my way of admitting personal preferences for these things, and I must also emphasise that I'm talking in the main about receivers which tune from about 50kHz to 30MHz. When you get into v.h.f. and u.h.f. receivers, the requirements for the operation are somewhat different. Apropos of nothing, Dick Ganderton and I have had many discussions about why God said unto Moses; "Thou shalt stop at 30MHz and go no further, for in that high country my laws do not prevail", and it's quite true that techniques change at this strange barrier (and this is, after all, *Short Wave Magazine*).

You could have the lead weighted tuning knob of a vintage Eddystone, but not the r.f. performance, or you could have the r.f. performance of a Collins 390A but develop early arthritis by cranking the incredibly tedious tuning knob. I suppose the first real landmark receiver was the AR88, but it came with a free offer of a hernia truss, so even that wasn't perfect. My own personal favourite (which of course you all know) is probably the Collins 51-S1, which does combine top class r.f. performance with ease of tuning. Notice how I carefully avoided any mention of lead weights? Even the 51-S1 isn't perfect when tuning across a wide band of frequencies because the tuning feels quite dead, and accompanied by a strange mechanical 'clacking' noise, but it's the nearest I can get to a landmark.

Passport To Happiness

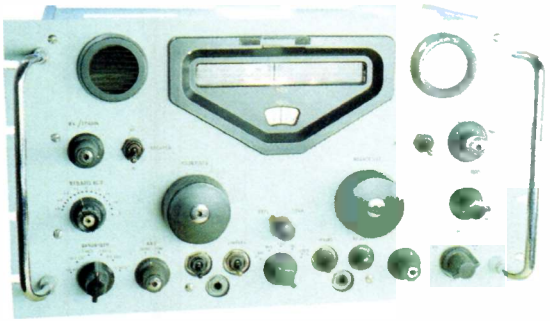
A couple of months ago you may have read my dissertation on the Trio R-820, which definitely was a landmark and amusingly resulted in a 'Wanted' ad. in the next issue of *SWM* - an ad. which was answered by my old friend Gordon Bennet who was persuaded to sell his immaculate R-820 and make someone very happy. A previous article of mine dealt with the Barlow-Wadley XCR-30, and I was surprised to receive a FAX from Larry Magne, publisher of the *Passport to World Band Radio* to tell me that he once had a Barlow-Wadley and he regrets ever selling it. Now he should know about receivers, having reviewed everything that's ever come on to the market in the last 15 years or so. Actually I think that *Passport* is a landmark in itself, because it uniquely combines up to the minute information on short wave broadcasting with equally up to the minute meaningful equipment reviews. It's Larry's guidelines I follow when I do my own reviews, and I never miss getting a copy of *Passport* each year.

Having mentioned Wadley, I must also therefore choose the Racal RA-17 and its derivatives as representative landmarks, but before you say that I'm living in the past, let me also mention the range of receivers from JRC; a strange company which has a large part of the commercial and marine radio and radar market under its belt but which still has an enthusiastic development team somewhere in the organisation which produces top class general coverage receivers aimed at the hobby and short wave market. Oddly enough, my particular favourite from the JRC stable was the NRD-515 in which JRC abandoned their traditional approach of having a complex mother board into which all the sub assemblies were inserted, in favour of a completely new "one board" construction. Although the NRD-515 tuned in 100Hz steps, it was just so easy to use that it was a total pleasure, and for the radio amateur who could afford to buy the matching NSD-515 transmitter - well, there would be a happy man.

As I look over the receivers I have quoted as landmarks, it becomes obvious to me why I chose them, apart from their evident technical design features; it's because they are all outstandingly easy to use, and they are all capable of (a) digging signals out of the air, and (b) producing pleasant audible results from those signals. I should therefore be in a position to specify my own dream receiver, so here goes.

Dream Time

I want r.f. coverage from 15kHz to 30MHz with 'proper' performance across the whole range and not, as some receivers do, degenerate into noise and jingle bells below 100kHz. The AR7030 performance would suit me there. I want a decent, weighted tuning knob of about 40 to 50mm diameter, placed with its centre line 80mm above the desk top. This has to be used to drive the receiver at selectable tuning rates, switch selected, and have no automatic 'speed-up' which I find a damned nuisance, and the minimum tuning increment should be 1Hz. Either the Eddystone or Hammarlund SP-600 tuning 'feel' would be perfect. The knob should sit on the vertical centre line of the front panel so as to give every user the same ease of use. I want a bright, easy to read frequency display, the best of current offerings being the Icom or Yaesu black on yellow readouts - look at the FRG-100 to get the idea. You may have already guessed that I want a proper analogue meter for signal strength, and I want it calibrated in both 'S' units and in dB relative to 1μV - the R-820 is perfect.



Wadley Loop, RA-17 style.

The size...I think I have smallish hands, but even my delicate prodders feel clumsy with some recent control panels so I'll choose something the size of a Drake R-8 or anything from JRC. The lovely FRG-100 is probably as small as I'll accept because another of my wants would be separate controls for each function so that I can play the mighty organ rather like Captain Nemo - or Carlo Curley if that's your modern equivalent (What's this man gibbering about? Carlo Curley?). Thank you JRC for the NRD-535 which did indeed have separate controls with not even a dual concentric pot. to be seen.

AR7030 small, simple looking - phew, what stunning r.f. performance.

I must have good front-end selectivity to get rid of second order out of band intermod. products, even though this may mean a 'preselector' twiddler on the panel - not a problem unless you want to store frequencies and control settings into memory; and of course I definitely need variable bandwidth, passband tuning and notch filtering somewhere in the i.f. The R-820 did all this, but DSP will probably achieve what I want so long as it doesn't affect the overall distortion of received signals. Now - I've mentioned memory facilities so what do I want in this department. The memory channels must be able to store and recover all receiver settings at any frequency and be capable of organisation into open ended banks of channels so that I can keep all similar types of signal together - for example a bank of h.f. s.s.b. air frequencies, or a bank of all the outlets of VOA, or whatever. Having storage brings the possibility of scanning the channels, so flexible scan controls are necessary, as is the facility to download and upload information from a computer. Dare I mention the AR7030 again as the perfect way to approach this, or the RD500 from Fairhaven.

What Do You Think?

These are only my basic thoughts, and no doubt many readers will have their own suggestions. Why not let *Short Wave Magazine* know what you think, and let's design a receiver together. I'm rather hoping that the new NRD-545 from JRC will be the answer to most enthusiasts' wants, and if the NRD-345 is anything to go by, we may yet see the latest 'landmark' receiver. If it's not, I'll have to return to my much cherished 51-S1 and enjoy all that it offers. It's never let me down yet.

BASE ANTENNAS

DD 1300 Double Discone

A completely new concept in wideband omni-directional antennas. The Double Discone has a superior wideband coverage for receive and a low SWR match for transmit right across the VHF and UHF spectrum. The Double Discone has approximately 2.8dB gain over a conventional single discone and provides excellent matching into 50 ohms for transmit. Manufactured here in England from quality components designed to last in all types of environments.

Type .....16 element Double Discone
Size.....Element length - 740mm PL259 type
Freq (RX).....25-1300MHz
.....VHF 130-175MHz
.....UHF 410-475MHz
Connector type.....PL259 type
£59.95 P&P £8

DDA 1300 Active Double Discone

A high performance wideband antenna offering gain over a conventional discone. Gives superior performance on both Civil and Military Air bonds, Marine and PMR bands.Stainless steel construction, 20dB masthead amplifier plus mounting kit and pole.

Type .....16 element D Discone
Freq (RX).....25-1300MHz
Freq (TX) .....VHF 130-175MHz
.....UHF 410-457MHz
Connector type .....PL259 type
£79.95 P&P £8

D1300 Discone

A superior wideband omni-directional antenna covering 25-1300 MHz, not only receives but can also transmit on 50, 144, 430, 900 & 1200 MHz bands with a maximum power rating of 200 watts. Stainless steel construction complete with mounting kit and short pole.

Length 1.7M
Type .....8 element omni-direct
Impedance 50Ω
Freq range.....25-1300MHz
Polarisation.....Vertical
Connector type .....Standard 'N' type
£49.95 P&P £8

DA 1300 Active Discone

Consisting of a good quality basic design wide band discone antenna which offers up to 20dB of gain across mid band VHF. Covering the full range of 25-1300MHz and constructed from stainless steel including a mounting kit and short pole.

Type .....8 element omni-direct
Impedance 50Ω
Freq range.....25-1300MHz
Polarisation.....Vertical
Gain.....up to 20dB
.....@ 150MHz approx 20dB
.....500MHz approx 14dB
.....1GHz approx 10dB
Noise figure 2.8dB
Power supply req.12-15VDC @ 16mA nominal
Connector type .....Standard 'N' type
.....**£69.95** P&P £8

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SP-55Scanner Pre-amplifier 24 - 1500MHz

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- Powered by 2 x AAA batteries (internal) or 12 VDC (external).

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SNF-170 Adjustable RF Notch Filter

Many receivers & scanning receivers may suffer from overloading and blocking when connected to an external aerial such as the wide band discones & active vertical antennas. This type of interference is primarily due to overloading from Band (II) FM broadcast signals in the range of 85 - 175 MHz. Other sources of common interference are the VHF paging transmissions, Airband, Marine & VHF Taxi radio systems.

The SNF-170 is designed to overcome these types of interference. With minimum insertion loss of <1.5dB. Notch Approx.30dB -70dB ATT.Below 1.7MHz and 50 ohms impedance **£27.95** P&P £3.75

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A really neat little "add-on" accessory! This mounting bracket clips directly onto the plastic air vent grill on the dashboard of most cars. You are then able to hang your handheld via its own belt-clip on the bracket directly in front of you.

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£39.95 P&P £8

Scanmaster Skyscan Desktop

A complete desktop antenna covering 25 -1300 Mhz just 36" high with 4 metres of cable, fitted BNC plug with a magnetic base.

£49.95 P&P £8

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- Marine
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- 900MHz Band
- Plus other public services

Frequency .....25 - 1300 MHz
Connector type .....Standard 'N' type

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Scanmaster LP 1300 Log Periodic Wide Band Antenna

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BA 1300 Active Base Antenna

A high quality fibreglass vertical antenna complete with mounting kit which offers up to 20dB of gain. Covering the full range of 25 - 1300MHz this multi trapped vertical is an ideal choice for a discreet installation.

Type .....Multi-trapped vertical
Impedance 50Ω
Freq range 25-1300MHz
Polarisation.....Vertical
Gain .....up to 20dB
.....@ 150MHz approx 20dB
.....500MHz approx 14dB
.....1GHz approx 10dB
Noise figure 2.8dB
Power supply req.....
.....12-15VDC @ 16mA nominal
Connector type .....Standard 'N' type

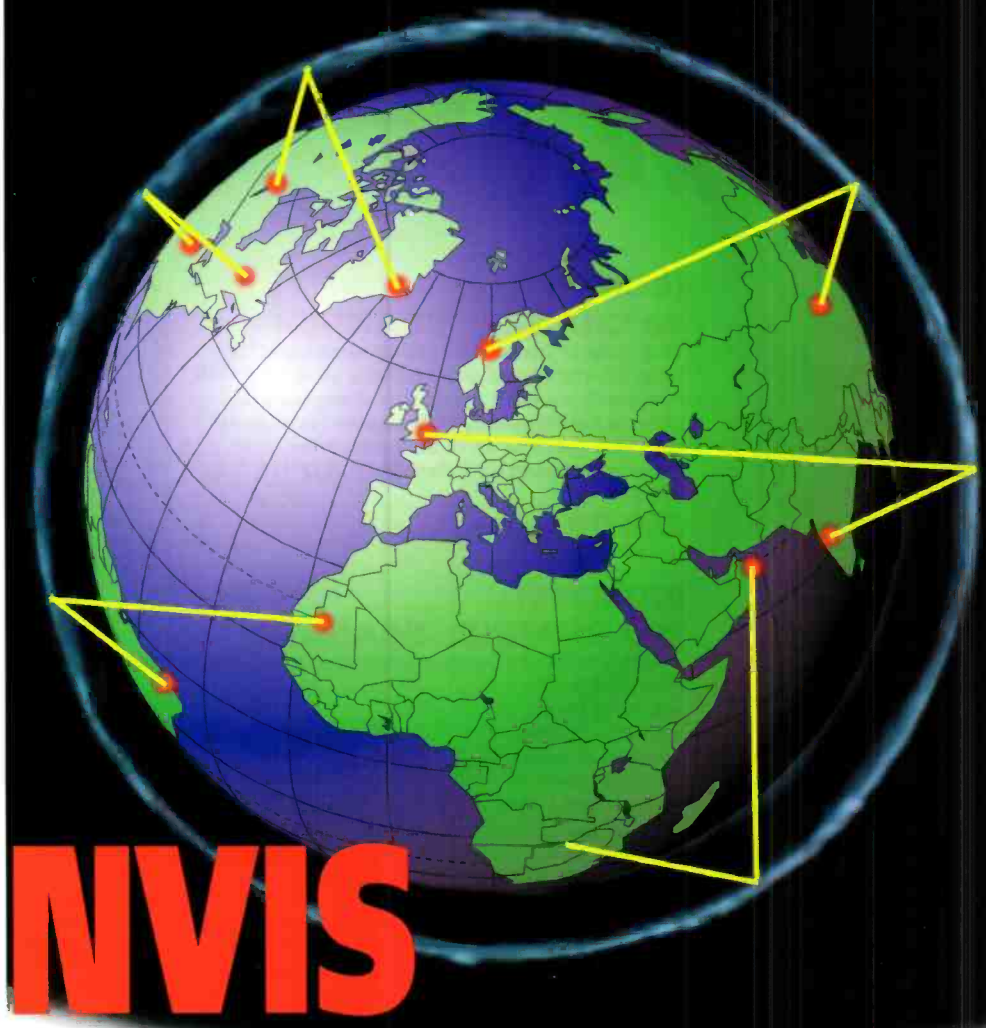
£59.95 P&P £8

PROPAGATION

Propagation Feature

Without propagation there is no radio communication! Whatever our radio monitoring interests, we rely on the quirk of nature that allows the transmission of electromagnetic energy though our flimsy but life sustaining atmosphere to be refracted by ionised layers hundreds of kilometres above our heads. At higher frequencies we rely on constellation of man-made transponders to return boosted signal earthward. These systems are easy to take for granted - they all rely on a stable set of circumstances driven by a relatively stable sun. Long may it continue.

In this issue we take a look at some of the mechanisms that we inhabitants of this small planet exploit, have come to rely upon and indeed take for granted.



PROPAGATION

NVIS Propagation

A seldom discussed mode offering definite, but often overlooked advantages. The story is told by Jacques d'Avignon.

When talking about radio transmissions in the h.f. bands, it is always assumed that these transmissions are made for long range communications using the multi-hops skywave propagation mode. Most textbooks always discuss the use of the h.f. for medium to long range circuits, and we regard that portion of the spectrum between 1.5 and 30MHz to be of use to reach stations that cannot be reached by v.h.f./u.h.f.

It is very seldom that a system suitable for communication in the geographical zone between the limit of coverage of v.h.f./u.h.f. systems and the h.f. skip zone that encircles every h.f. transmitter is discussed or even considered.

The Problem

In our regular use of h.f. a skip zone always occurs between the termination of the ground wave radiation from the transmitter and the first return to earth of the skywave component of the transmission. This zone also covers an area where, under normal propagation conditions, the v.h.f./u.h.f. systems cannot access: the two terminals not being within line of sight of each other.

The Solution

But there is an h.f. propagation mode that is used in commercial and military operations that can fill this wide gap in our communications capabilities. Unfortunately, this mode does not appear to be discussed and explained very often. It is not mentioned in many text books dealing with communications. This forgotten h.f. propagation mode is called NVIS, Near Vertical Incidence Skywave.

This mode also has other names that you may find in the literature the Australians refer to it as 'District Propagation Mode' in their propagation forecasting software, ASAPS. I have also seen it called the 'Jungle Broadcasting Mode'. This last name may have been derived from the tropical broadcasting stations using this technique to reach their scattered audiences or for military

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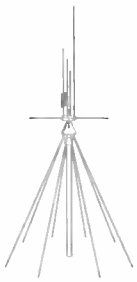
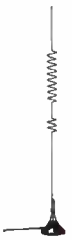
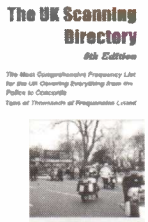


Skyscan DX-V1300 base disconne – Most disconnes only have horizontal elements and this is the reason that they are not ideal for use with a scanner. Most of the transmissions that you are likely to receive on your scanner are transmitted from vertically mounted antennas. The DX-V1300 has both vertical and horizontal elements for maximum reception. Constructed from best quality stainless steel and aluminium and comes complete with mounting pole. **£49.95** + £3 P&P.



Wideband mini-mag antenna – Wideband (25-1300MHz) receive antenna featuring super strong miniature magnet and coax cable terminated in BNC connector. **£29.95** + £3 P&P.



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Uniden Bearcat 9000 XLT – AM/FM/WFM switchable base station HF/VHF/UHF scanning receiver. Covers 25-550 and 760-1300MHz. Features 500 memories, auto sorting, backlit orange LCD display. Scan rate of 100/300 channels/sec. **£259.95** + £10 P&P.

Yupiteru MVT-7100 – All mode switchable handheld HF/VHF/UHF scanning receiver. Covers 0.5-1650MHz. Features 1000 memories, over 500 pass memories, 10 limit search banks, 12 step sizes. Comes complete with earpiece, belt clip, wrist strap, rechargeable batteries, PSU, in-car adaptor and telescopic antenna. **RING FOR THIS MONTH'S SPECIAL OFFER**

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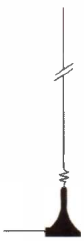

Airband mini-mag antenna – Civil (108-137MHz) and military (225-400MHz) dual band receive antenna featuring super strong miniature magnet and coax cable terminated in BNC connector. **£24.95** + £3 P&P

AOR AR-8000 Best seller, 0.5 to 1900MHz. All mode. **Price match**.

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Yupiteru MVT-3300 – Latest Yupiteru scanner AM/FM switchable. Limited stock at **£149.95** + £5 P&P.

Commtel COM 206 – AM/FM handheld VHF/UHF scanning receiver. Covers 66-88MHz (FM), 108-137MHz (AM), 137-174MHz (FM), 380-512MHz (FM). Full civil airband coverage, comes complete with free case and rechargeable batteries. **£129.95** + £5 P&P.

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- ★ Stereo/mono switch
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- ★ Telescopic antenna
- ★ 2 x 1.5V AAA batteries ★ Size 116(H) x 64(W) x 22(T)mm

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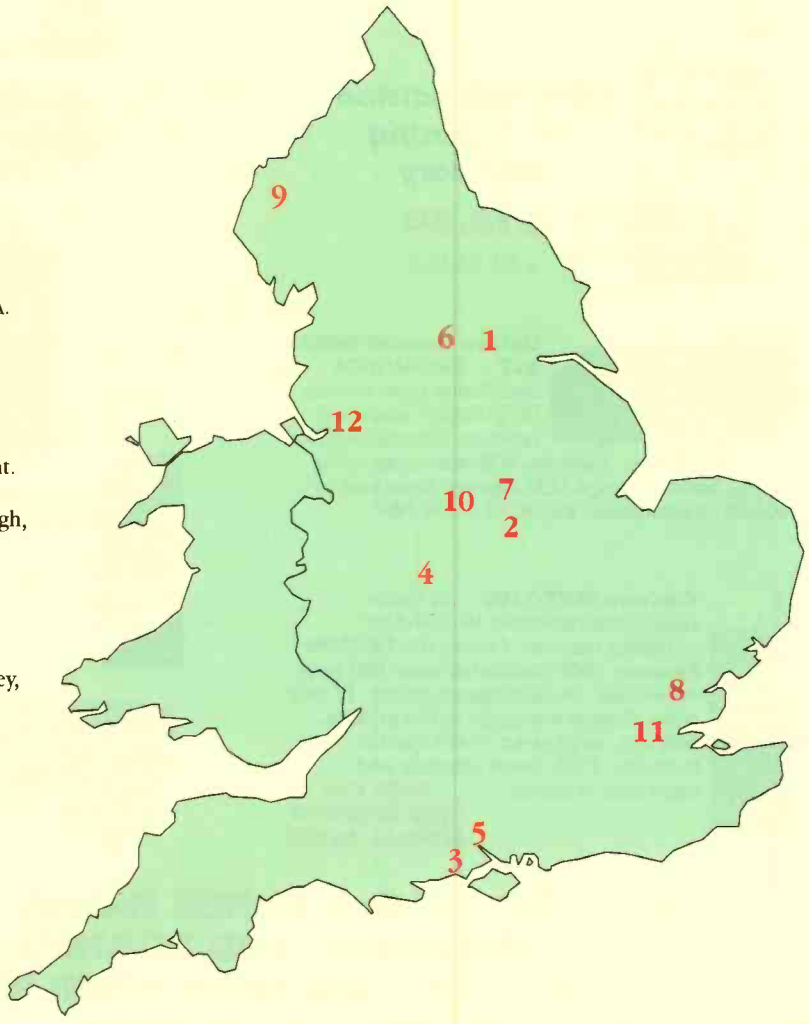


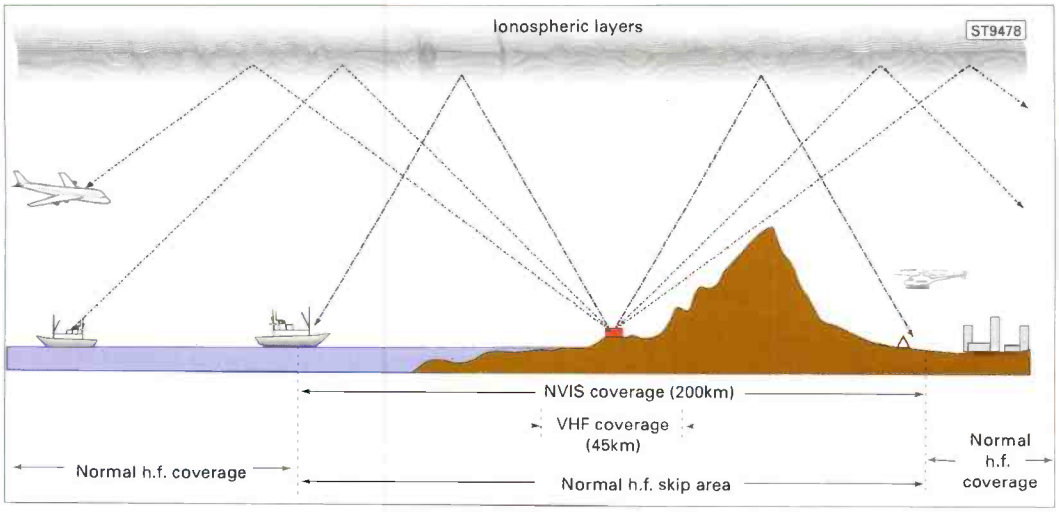


Fig. 1: Near Vertical Incidence Skywave propagation. NVIS bridges the gap between the nominal v.h.f./u.h.f. coverage area and the typical h.f. 'skip zone'.

communications in a jungle environment.

If you want to experiment and see for yourself how NVIS works you can try this very simple and very wet experiment. When you next water your garden, point your hose straight up inside an umbrella, and look at the water coming back down and how much it disperses in a large area compared to the size of the hose nozzle - please wear a bathing suit when attempting this experiment as I cannot be held responsible for wet clothes!

In the tropical areas of the world, the extreme attenuation of the normal broadcasting ground wave mode by the dense and in some cases jungle-like vegetation, makes the ground wave mode impossible to use.

The Numbers

The lateral attenuation of the ground wave has been demonstrated by Hagn and Barker (Ref. 1) to be an increasing function of frequency:

$$a_L(dB/m) = 0.009xF(MHz)+0.1 \qquad (1)$$

If we use equation (1) we find that at 3.0MHz the lateral attenuation due to vegetation would be 127dB/km and at 10MHz, along the same path, the attenuation is now up to 190dB/km! In the same reference, Hagn and Barker cite the losses using NVIS as being only 97dB for 600km or 0.16dB/km along the ionospheric virtual path, when using NVIS at 3.0MHz. This is a substantial difference! This extremely high loss for ground wave is obviously the reason that the ground wave mode cannot be used economically for broadcasting in a jungle or tropical environment.

Hot Veg.

If the normal h.f. ionospheric mode was used for local broadcasting, the 'local' audience widely scattered in small pockets around the transmitter site, would be located inside the skip zone of the h.f. transmitter and, looking at equation (1) above, it is obvious that it would not be commercially viable to increase sufficiently the power to use the ground wave mode. Increasing the power would not insure that you would reach your audience but, because of the absorption, would definitely warm-up the vegetation surrounding the transmitter site! So for tropical broadcasting, we are left with one option: the NVIS mode of h.f. propagation.

Some stations in the interior of Australia, Alice Spring is one example, have been broadcasting using this technique as their audiences are widely scattered and the 'District' propagation was the only way to reach them. These Australian stations are broadcasting in the 'tropical domestic' band that extends from 2.300 to 2.495MHz in the tropical broadcast band in use in that area of the world. The transmissions designed to be local in nature are fulfilling their role very well, but can also be heard in Eastern North America in the early morning hours at certain time of the year.

This broadcasting technique is also prevalent in Africa and South America for daily domestic broadcasting use, check your short wave receiver in the 'Tropical Bands' and you can listen to the stations from those regions in late afternoon if you live on the East Coast of North America. In Europe, the African stations can probably be heard very well.

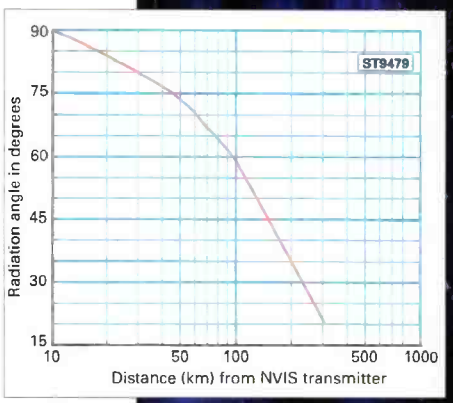


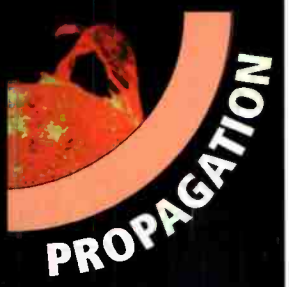
Fig. 2: Graphical representation of the range, in km from the NVIS site, versus elevation angle.

The Bands

The specific world-wide tropical bands are located between: 2.300 and 2.495MHz, between 3.200 and 3.400MHz and finally between 4.750 and 5.060MHz. In addition, there are the 'domestic bands' between 3.900 and 3.950MHz in Asia and 3.950 and 4.000MHz in Europe. This latter band 'infringes' in the top of the 75m band in use by the radio amateurs in North America! But in Europe it is a very popular broadcast band used by many international broadcasters. So NVIS does work, it is being used commercially for local broadcasting, but it is not assured that your signal will not be heard half way around the world, a NVIS circuit is not a secure circuit!

(Ref 1). Hagn, G. H. and G.E. Barker, 1970, *Research-Engineering and Support for Tropical Communications, AD-889-169, Final Report*, Contract DA-36-039 AMC-00040(E), SRI Project 4240, Stanford Research Institute, Menlo Park, CA.

■ JACQUES D'AVIGNON VE3VIA



Propagation Forecasts

How to use the Propagation Charts.

The charts contain three plots. The lower dashed line represents the lowest usable frequency (LUF), or ALF (Absorption Limiting Frequency). The chances of success below this frequency are very slim.

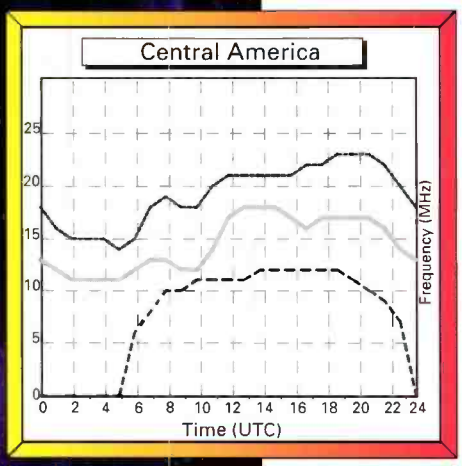
The middle line indicates the optimum working frequency (OWF) with a 90% probability of success for the particular path and time.

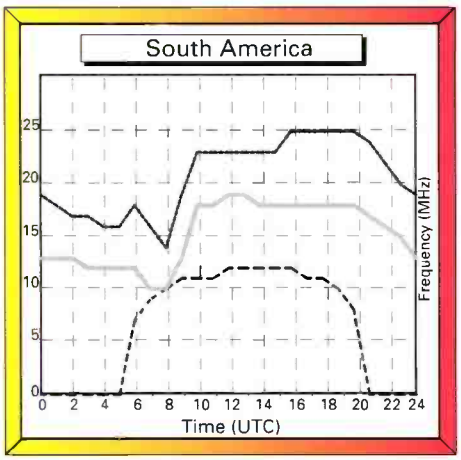
Lastly, the upper dashed line, represents the maximum usable frequency (MUF) a 50% probability of success for the path and time.

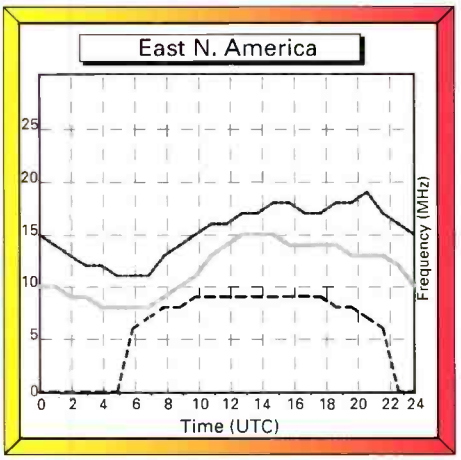
To make use of the charts you must select the chart most closely located to the region containing the station that you wish to hear. By selecting the time chosen for listening on the horizontal axis, the best frequencies for listening can be determined by the values of the intersections of the plots against frequency.

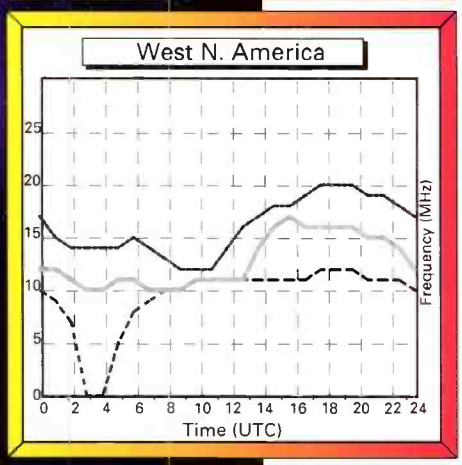
Good luck and happy listening.

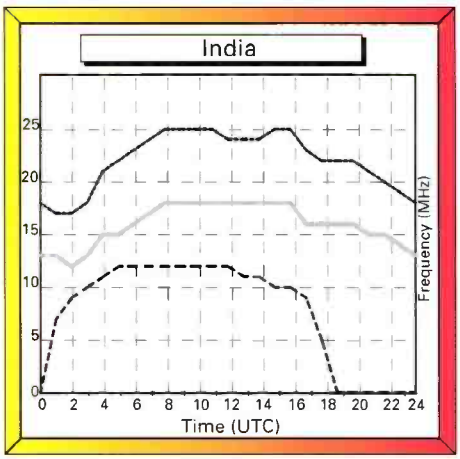
May 1998
Circuits to London

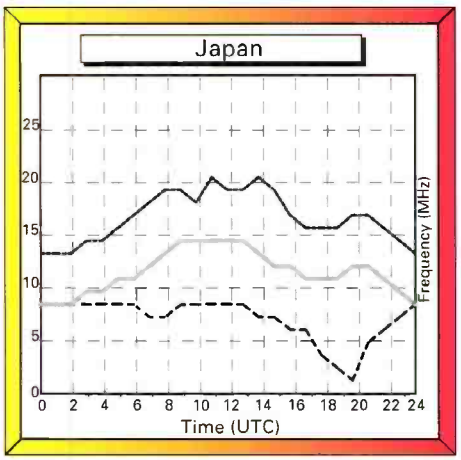


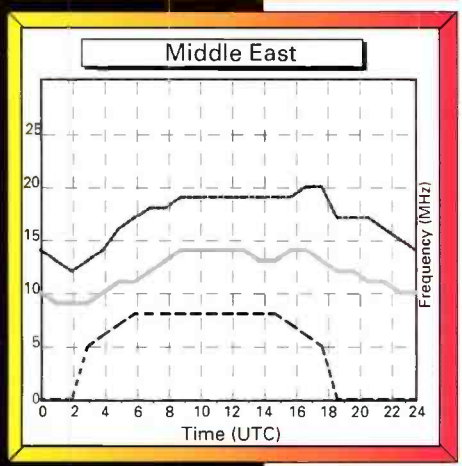


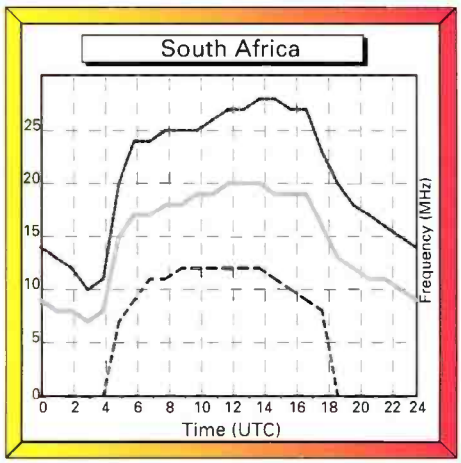


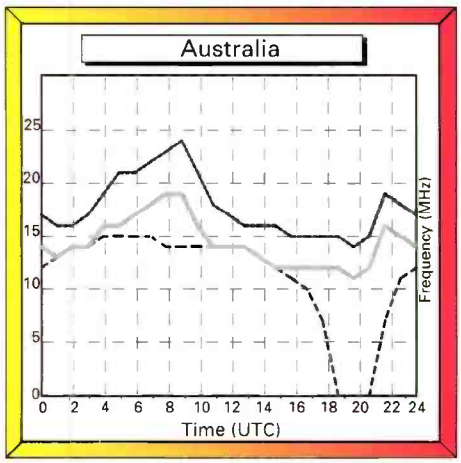








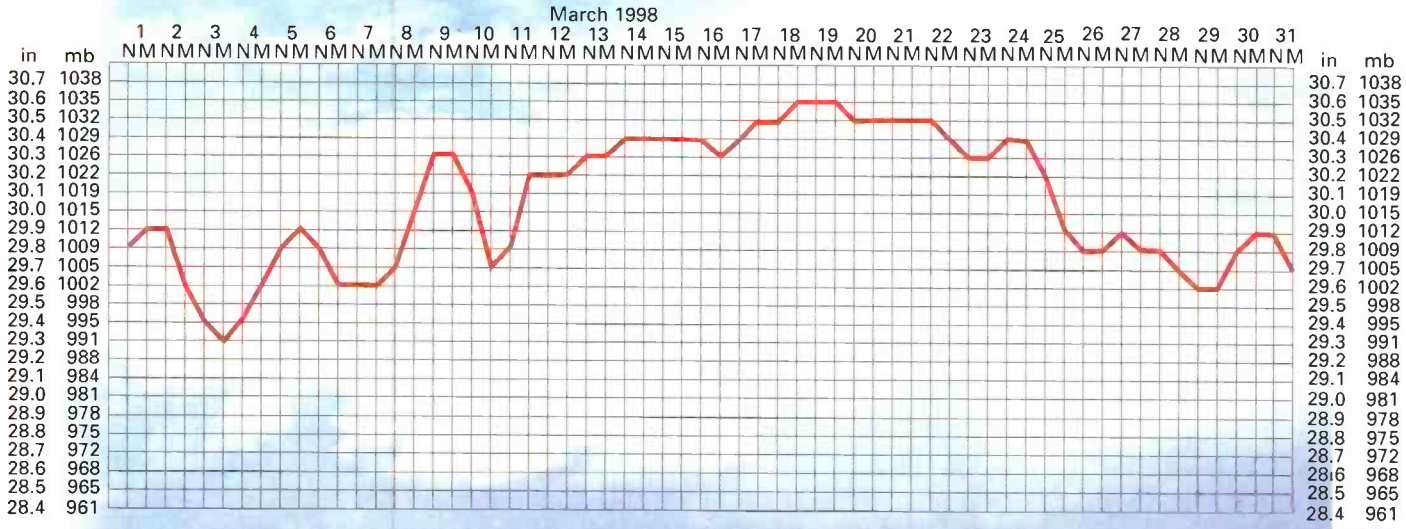


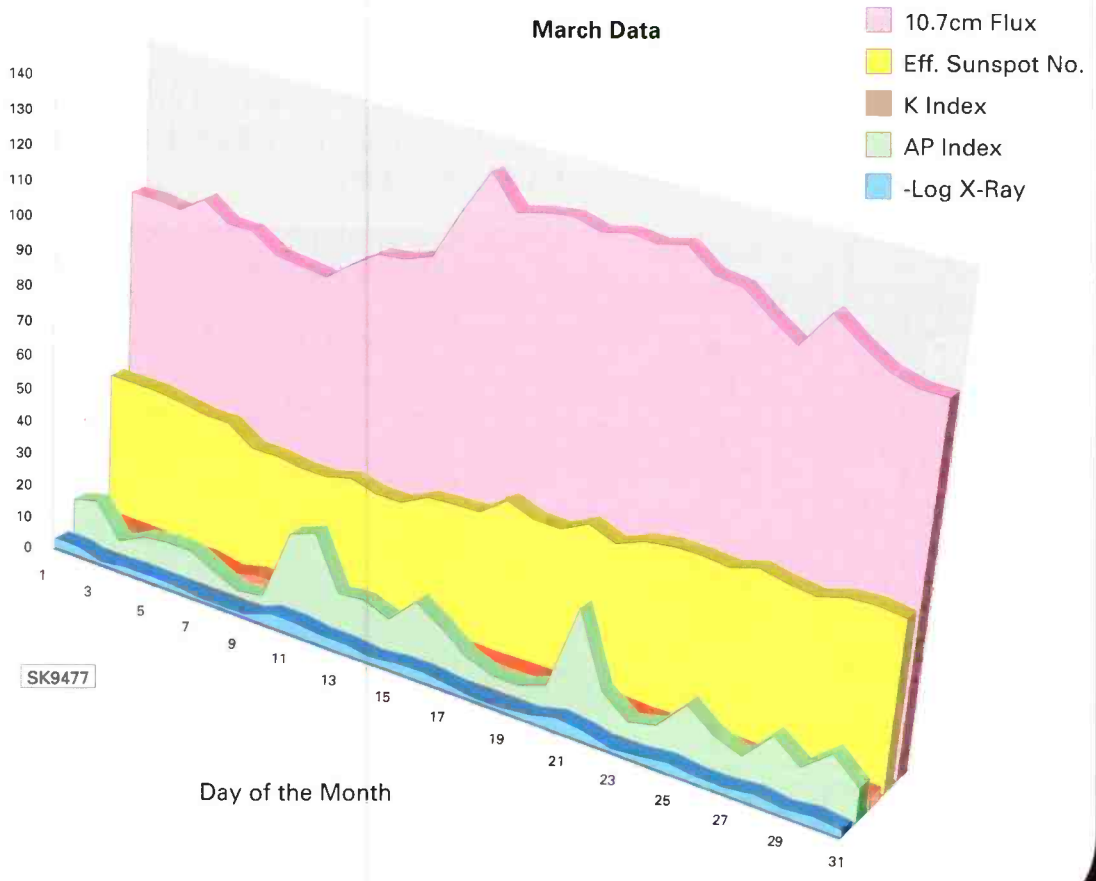


■ KEVIN NICE G7TZC, SWM EDITORIAL OFFICES, BROADSTONE ■ E-MAIL: kevin@pwpublishing.ltd.uk

Propagation Extra

Ron Ham's barometric pressure chart, taken at Storrington, W. Sussex, March 1998.





guide to the chart

The 10.7cm solar radio flux is used as an indicator of the general level of solar activity.

The K and AP indices are measures of geomagnetic activity.

The K index ranges from zero (very quiet) to nine (severely disturbed).

K values of five or greater correspond to geomagnetic storm conditions that can relate to poor propagation conditions.

The AP index ranges from 0 to 400. An AP of 30 is the threshold for geomagnetic storm conditions.

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Short Wave Column: Cost Effective?

If, for some unaccountable reason, you decide to read this months Short Wave Magazine from cover to cover in one sitting and it takes you a day to do it, the world will have spent $3,400,000 on getting its message to you. That's only transmission costs for broadcasting stations.

Add to that production costs, salaries, all the other usual commercial overheads and you can safely double it. Add in the utilities, the marine, aero and tactical, the number stations and everything else we hear between the broadcast bands and I reckon, speaking very generally, that the world's HF operations don't get much change out of $20M a day.

If there is that level of investment in sending the stuff, we owe it to ourselves to listen to it. I tried a similar sum to work out the prime-time ERP. I ran out of digits. No prizes, but if you know how many watts are in the air at any one time, do mail me at the above address.

Over the holidays, the crystal-set bug got me again. An improvised short-wave coil found me about half a dozen stations at head-phone strength. Not so good for DX, though.

Our AR7030 has to handle the world's wattage, great, small and the very, very tiny. And there are parts of the spectrum where the great and tiny are side by side. The sub-band 7000-7500kHz, for example, contains a ham-band with tiny DX signals next to power-house broadcasters.

In Europe, we have to deal with this dynamic range and AOR make this a design point. And having designed it in, all you have to do is enjoy it. With this tremendous daily investment, I see my listening as a tax rebate...

bob@aor.co.uk

PROPAGATION

Solar Flux and the SSN

The relationship explained by *SWM's* propagation expert, Jacques d'Avignon VE3VIA.

Info

Here are two definitions that have been elaborated by IPS in Australia and might be of some help:

Sunspots

Relatively cool regions in the solar photosphere that appear dark. They contain intense magnetic fields which provide the energy for solar flares. Sunspots occur in groups.

Sunspot Number

An index of solar activity related to the number of sunspots and sunspot groups present on the sun.

You often hear and read about the solar flux and the sunspot number. What are they and what is the relation between these two values?

PROPAGATION

Sunspot Number

The Sunspot Number has been observed and listed since July of 1749. No - that is not a mistake, observations have been made for some 250 years! Daily observations are made of the face of the sun and these observations are recorded. This number is not the exact number of dark spots on the face of the sun, but a mathematical approximation as the spots appear in groups. The number of groups are also included in the calculation.

The daily sunspot number, also called the Wolf number, is calculated as follows:

R = k(10g+f)

where

R is Wolf's relative sunspot number,
k is a factor that is used so that all observations are comparable to each other,
g is the number of groups of sunspots and finally,
f is the number of spots on the face of the sun.

Those of you about to rush out and see some sunspot for yourselves be warned **never look directly at the sun to try and see the spots**, believe me they do exist! Looking at the sun **will** damage your eyes. If you wish to see the spots you can refer to back issues of *SWM* or build a projection system.

Disruptions

Examining the definition of Sunspots as per IPS elsewhere in this feature, you will see that these spots "contain intense magnetic fields which provide the energy for solar flares". These flares and their after effects cause the disruptions in short wave transmissions as the ionospheric layers are influenced by the solar flares.

Over the years we have become very sophisticated, simply looking at the sun every day to try and see how many pimples it had, became rather tedious. Sometime after WWII, it was realised that the sun is in effect an immense radio transmitter. It had a good and steady signal on 2.800GHz - that's a wavelength of 10.7cm. So instead of just looking at the sun why not listen to it on its best frequency?

This new technique was implemented in February of 1947 in Ottawa, Ontario. The observatory with this task was eventually moved to Penticton, British Columbia, and every day at 1700UTC the sun is tuned in and measurements are made to find out how active its transmitter is. The same energy that is heard on 10.7cm is the same energy that can be visually observed in the sunspots. The visual observations are still continuing so as not to break the nearly 250 year long sequence of observations containing data.

Even with no sunspots the sun is not completely quiet, the lowest measurement of the 10.7cm flux has been 62.6 units and the highest has been 457.0 units.

I am positive that someone out there is to asking what units are used to measure the sun's activity! The unit in question is the 'solar flux unit' (sfu) and one sfu is equivalent to 10000 jansky.

As I stated earlier the level of activity of the sun and number of flares that ensues from this activity, are the major component of the instability in the ionosphere. If the activity level is high we are liable to have short wave conditions that are unstable and suffer from fading, polar flutter and other similar problems. Due to the response of the ionospheric layers to the sun's activity. The solar flux level can be used to predict the level of ionisation of the F-layer of the ionosphere and we can then derive the Maximum Usable Frequency. Once we know this frequency we can derive the value of the Optimum Working Frequency.

Relationship between SSN and Solar Flux

A question that I am very often asked is, "what relation is there between the flux and the sunspot number?" Over the years some simple equations have been elaborated to relate these two values together. Following, are two simple equations that can be used for going back and forth between the two units.

To convert sunspot number to solar flux:

SF = 73.4+0.62R

SF is the solar flux and **R** is the daily sunspot number.

As a test: a SSN of 5 should give you a flux of 67

To convert from flux to sunspot number the equation is not so straightforward:

$$SSN = \sqrt{(85.12+Flux)} \times (33.52)) - 408.99$$

The square root (SQRT) is of the final number. As a test for a flux of 67 you should be getting a SSN of 5.

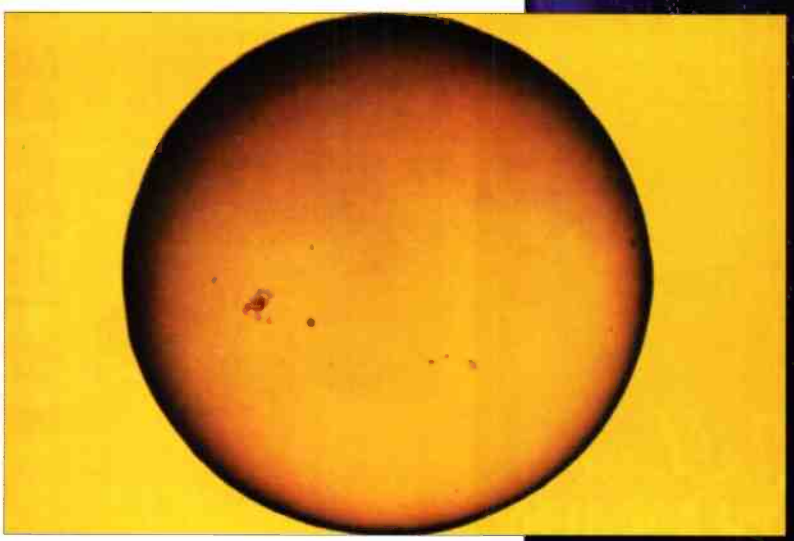

Fig.1: The surface of the sun, seen in visable light - the photosphere. Most of the sun's radiation is emitted from the photosphere in visible and near infrared light. Above this layer of opaque gas is the sun's atmosphere, which is composed of extremely hot gas. It is transparant to visible light and it emits radiation primarily in the x-ray and ultraviolet spectra. This white light photograph of the sun shows several sunspots including a very unusual spiral sunspot.
Courtesy National Optical Astronomy Observatories

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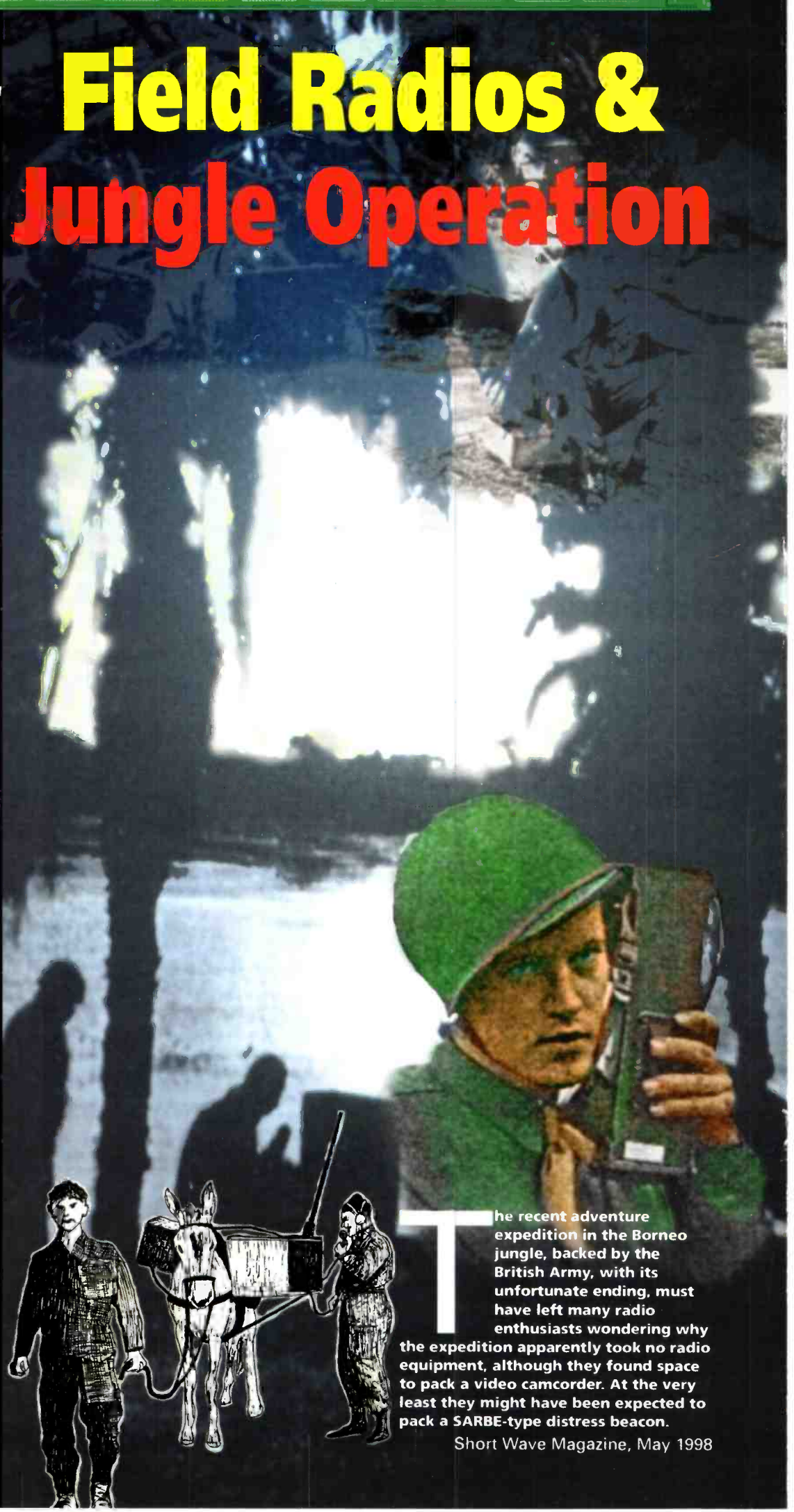
PROPAGATION

Field Radios & Jungle Operation

Mr A.J. Martin takes a step back in radio history to remember the first attempts at operating from within jungle areas during the Second World War.



The recent adventure expedition in the Borneo jungle, backed by the British Army, with its unfortunate ending, must have left many radio enthusiasts wondering why the expedition apparently took no radio equipment, although they found space to pack a video camcorder. At the very least they might have been expected to pack a SARBE-type distress beacon.

Short Wave Magazine, May 1998

Notwithstanding the difficulties of contacting outside ground stations from terrain such as the infamous Low's Gully, a distress beacon would surely have simplified the subsequent air search. As a contrast, in 1993, as part of an event staged in Eastern Malaysia, called the *Camel Challenge* for four wheel drive vehicles, a walking expedition was made to Mount Kinabalu, where contacts were reported to have been made via h.f. manpack radio from jungle surround by 1500m ridges.

It is interesting to look back into radio history at the first attempts at operating from within jungle areas, the problems of radio communication faced by the Chindits in World War Two being critical to the success of their whole campaign.

Radio Development

The first examples of field radio operation from jungle areas were way back in the 1920s on the continent of South America. It was still early days in radio development, at the time of the opening up of short wave radio for intercontinental working.

In 1925, the Hamilton-Rice expedition to the Amazon used field radio to maintain contact with its base station at Boa Vista in Brazil, and the legendary Gerald Marcuse amateur station G2NM made contact with the base station from England.

Also in 1925, Colonel Fawcett had led a three man expedition to the Amazon, and by 1927, they were presumed to have disappeared without trace. A relief expedition was organised and led by G.M. Dyott in 1928 and this expedition carried amateur radio equipment.

The transport was taken care of by 64 bullocks and ten mules, the baggage included two radio sets, h.t. batteries (for valve h.t. supply - each weighing 9kg), generators, oil and petrol. The expedition eventually transferred to canoe, for river travel was much easier than penetrating the jungle overland.

Radio contact was made back to Rio for onward relay of messages back to the USA. The radio equipment had suffered badly as a consequence of the bullock transport, the climate and rough handling continually caused it to need re-adjustment and repair, with motor generators being particularly unreliable.

Increasingly Wary

This expedition spent many months in the interior and its members became increasingly wary of the local Indians. They went for several weeks without making radio contact for fear of upsetting Indians who were spying on them.

They eventually made radio contact with another expedition, also on the Amazon, after evading their Indian followers. The expedition brought out both its field radio intact, although they had dumped much of the ancillary supplies. They had found that working the 20m band was best, but were much troubled by static, although they had managed to work to the UK.

Before World War Two, the idea that infantry would have to fight and survive in jungle conditions had not been considered a likely tactical possibility, and in any case, portable radio equipment of the early war years could only have been truly described as transportable.

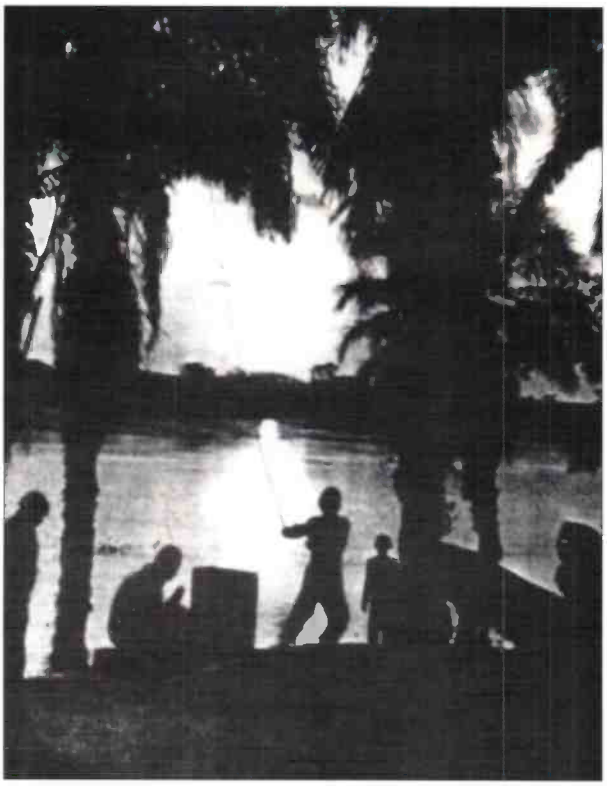
The British Army, in common with other armies of the day, had to rely on mules for transport of equipment and supplies to accompany infantry or cavalry. In the 1920s and 1930s the British Army Wireless Set No. 1 and the 'C Set' were used as mule-borne sets. The WS No. 1 could be carried on one mule and used in motion, operating in the low h.f. range, with a short vertical antenna and low power, it was essentially a short range equipment.

The 'C Set' was more cumbersome and of greater power, requiring other mules for transport of generator, fuel, etc., the station having to be erected and dismantled for operation. As the British Army mechanised in the 1930s, the mule-born sets became relegated to use in terrain where vehicles could not operate.

Great Shock

The loss of Malaya to the Japanese in 1942 came as a great shock to the Allies, the loss of Burma and other far eastern territory shortly after also added to the chaos. During the Malayan campaign, some last minute arrangements were put in hand for leaving, stay behind, parties in the jungle and one of these was equipped with radio and intended only for communication purposes.

The 'Cross Party'



US infantry operating portable from Guadalcanal in the Pacific.

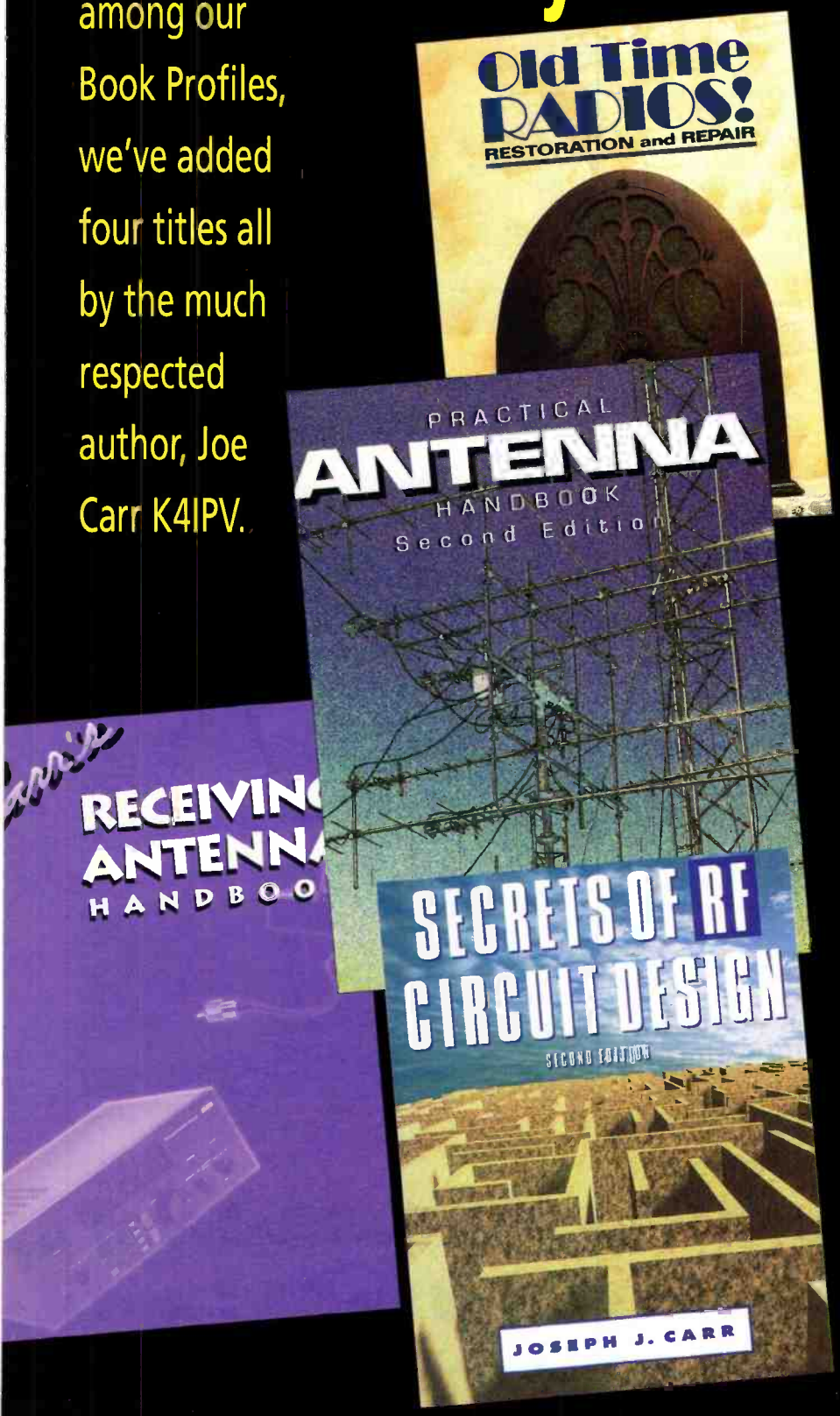
US infantry using an SCR 536 handy-talkie in the New Guinea jungle.

"In the 1920s and 1930s the British Army Wireless Set No. 1 and the 'C Set' were used as mule-borne sets".

Book Profiles

Four By K4IPV

This month, among our Book Profiles, we've added four titles all by the much respected author, Joe Carr K4IPV.



Old Time Radios! Restoration & Repair

In *Old Time Radios! Restoration & Repair* you'll find the history, theory and practical operation behind old time radio sets and the detailed instructions and schematics needed to repair or build them. Also included in this book is valuable information on power supply circuits, capacitors and other components, amplitude modulation detectors and repair of water damaged radios.

Whether you are thinking of setting up your own shop or just wanting to fix up a family heirloom, in this book you'll find a storehouse of information from the pioneer days of electronics that is increasingly hard to come by. **£19.95**.

Secrets of RF Circuit Design - Second Edition

Following on from the best selling First Edition, this revised and updated guide gives you the best ways to design, build and test today's radio frequency (r.f.) circuits. It's filled with projects and experiments that make it easy to apply r.f. principles to real-life applications. Joe Carr takes you step by step through functional projects in this intermediate-level handbook.

Included are chapters on how to design and build radio receiver circuits, r.f. bridges, amplifiers, receiver preselectors and time domain reflectometers, select, use, maintain and repair variable capacitors, design and wind inductor coils for radio circuit and more. Order your copy now for **£23.95**.

Practical Antenna Handbook - 2nd Edition

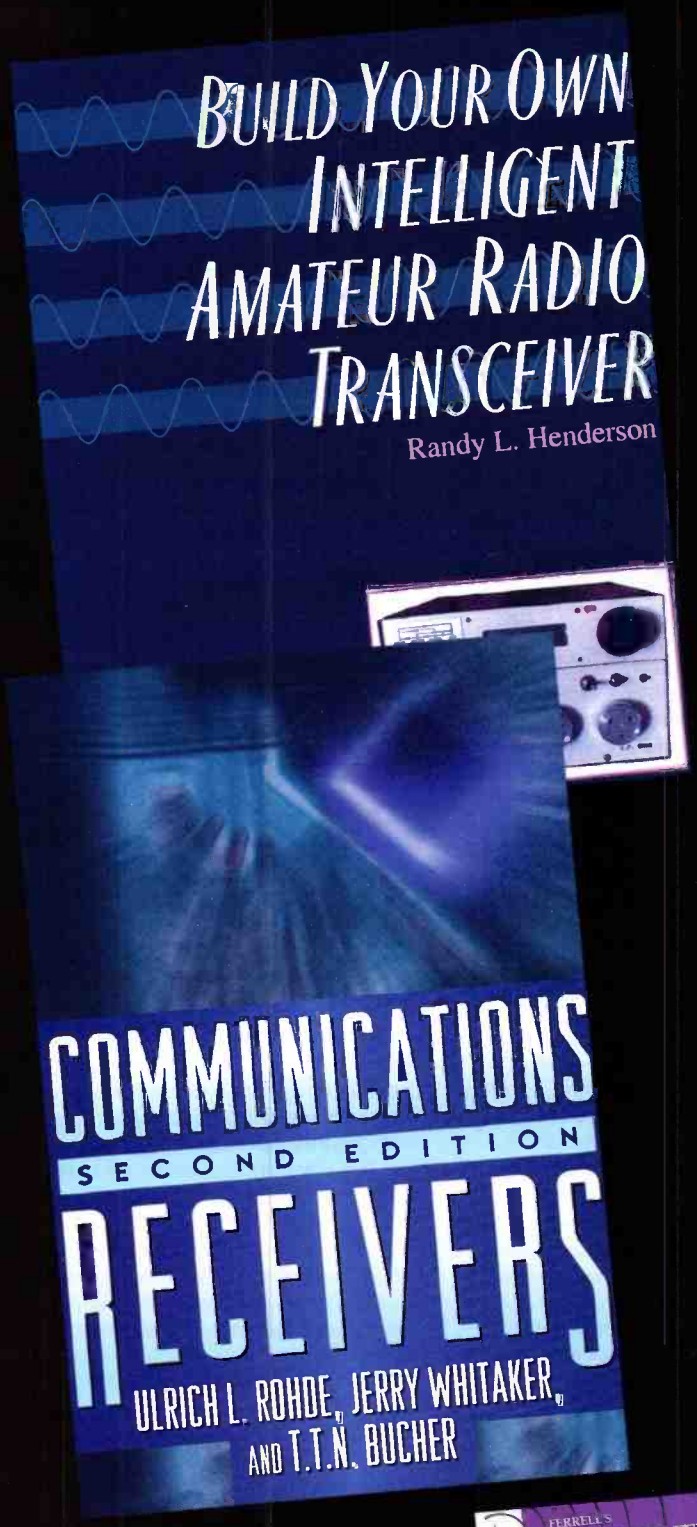
Classed as 'The Antenna Builder's Bible' this book is ideal if you're interested in learning how to design, build and install your own radio antennas. This second edition may be the most extensive volume available anywhere on communications antennas, and it's the only book you'll find that offers so many useful projects.

Joe Carr gives you all the practical, nuts and bolts information you need to make antennas work and he also tells you how to extend that work into new projects. A definite must for the bookshelf! **£29.95**.

Receiving Antenna Handbook

This handbook is a complete guide to high performance receiving antennas from long wave, all the way to the upper end of the short wave spectrum. Indeed, this handbook is a comprehensive examination of antennas intended specifically for receiving purposes.

Among the many topics discussed are: the basic theory behind all receiving antennas, how signals propagate over long distances, loop antennas for the a.m. broadcast band, safety considerations, special designs for indoor and limited space applications and so much more. You'll have to just buy your own copy to find out! **£17.50**.



Build Your Own Intelligent Amateur Radio Transceiver

With the help of this instructive volume, you can learn how to build a sophisticated, yet low-cost microprocessor-controlled radio transceiver as well as smaller devices such as a simple frequency synthesiser and a spectrum analyser. Filled with tested, hands-on projects that really work, this great reference features single-sided circuit boards that are easy to build and includes detailed circuit-board layouts and extensive parts lists.

It's all here in one unique resource - everything you need to create a state-of-the-art radio transceiver with top-notch performance. Available for **£22.95**.

Communications Receivers - Second Edition

Revised and updated to cover state-of-the-art digital and cellular technology, this new edition remains the ideal guide to the theory and design of all types of communications receivers - including short wave, military, broadcast and direction finding. The Second Edition now features material on the latest advances in cellular and digital systems, coverage of special modes such as pulse and data, details on the use of microprocessors and logic devices and lots more.

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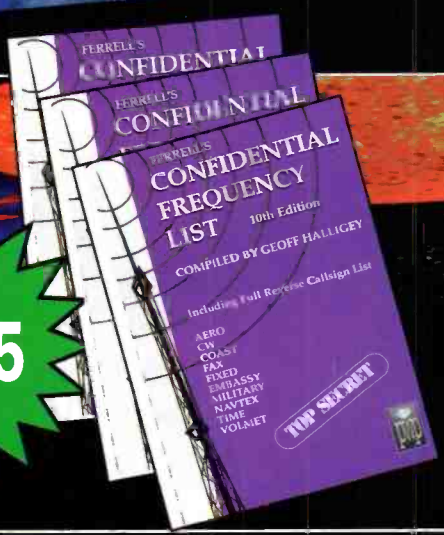

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An operator on the 1928 Fawcett Relief Expedition.

after CQMS John Cross of the Royal Corps of Signals, remained in the jungle for three years, maintaining their radio equipment in what became an epic of survival, their failure to communicate being caused by the loss of their scheduled base stations to the Japanese, and their transmitter's limited range.

Move Hideout

The Cross Party had to move their hideout several times to avoid capture, and transporting their equipment, consisting mainly of separate h.f. receiver and transmitter, batteries and generator, took in total some twenty or more men. At one time, their petrol supplies began to run out and in a masterpiece of improvisation, they dammed a stream and constructed a water wheel to run the generator.

Towards the end of their jungle stay, a con rod broke on the generator and they had to make a new one, which in turn broke, but they persevered in their repairs. In spite of their efforts, they were never able to get acknowledgements from allied radio stations which they could hear.

What makes their story even more interesting is that they eventually came in contact with an Allied Special Operations Group who had landed in Malaya to set up a radio link to the outside. The Cross Party never contacted this group by radio, for here too was a fascinating story - this latter group was not able to get in radio contact with the outside world for 18 months.

Attempting Contact

Whilst the Cross Party were listening and attempting to make contact with allied stations, the Special Operations Group based in Ceylon (SOE Far East) had initiated attempts to get a radio equipped party into Malaya. In a series of operations code named *Gustavus*, starting in May 1943, the first attempts at delivering radios were unsuccessful, although the equipment was landed, the all up weight of 220kg prevented its transport through the jungle to the camp site.

It was not until October 1943 that two of the B MkII suitcase radios were successfully delivered. These were used in Europe by SOE agents very effectively, but their use in Malaya must had been a desperate gamble, probably because there was nothing else available.

"It was not until October 1943 that two of the B MkII suitcase radios were successfully delivered".

The B MkII radios delivered about 20W of power and weighed about 15kg. The sets were not tropicalised, and the fact that they remained in working order was due to their storage in sealed tins which can be coated with pitch, fortunately, the *Gustavus* party had avoided opening the boxes until they were required, which was to be much delayed.

Linked Up

The *Gustavus* party linked up with Major Spencer Chapman, who was a survivor of one of the original stay behind parties, but their attempts at getting a radio set in operation were to prove frustrating and difficult in the extreme. The *Gustavus* party were constantly harried by the Japanese and had difficulty recovering equipment from dumps near the coast. At one time, they had batteries and a generator, then lost these to a Japanese raid, subsequently recovering the two B2 sets from the coast they then had no batteries or generator.

These circumstances forced them to improvise, and they were able to adapt a bicycle to drive a car dynamo and charge batteries which they had managed to obtain. Eventually, after 18 months, but only five days on the air, their signals were picked up, long after routine listening watch had been abandoned. Long range aircraft were able to drop supplies and reinforcements, and they continued to maintain a radio link to Ceylon, with the benefit of a steam-driven generator and wood burning boiler.

The resilience and ingenuity needed to keep

Showing the difficulties of operating in the Malayan jungle.

those stations operating is amazing, but an even more difficult task was faced by the Chindit forces in Burma. The original concept of Chindit operations has been the re-supply of infantry columns operating in jungle behind enemy lines by air-drop. These tactics demanded good radio communication, and once again the British Army found itself dependent on mules for transporting radio equipment.

Limited Operation

The first Chindit campaign in 1943 was a limited operation and the columns just managed to extricate themselves from Japanese held territory, the loss of vital radio equipment underlining its importance for future operations.

The second Chindit campaign was to be a penetration in force and a complex radio communications system was set up to service it. Command and control over the whole operation was maintained via a base station in India. Each column carried a heavy radio, batteries, generator and petrol on a string of mules, but communication with base necessitated stopping the column and erecting an antenna.

Separate radios were also carried by airforce personnel attached to the column who were responsible for calling up air support. One weakness of this system was that contact was often attempted when the column stopped overnight, just when the static was at its height. Also, charging batteries was not an operation popular with anyone other than signals personnel on account of the noise giving their position away.

Poor Contact

Another weakness of the radio system was found to be poor contact between columns. For this purpose, the columns carried the British Army No. 22 set on mules, but its limited power often meant only a 5000m range in jungle.

Eventually, columns had to communicate with each other by transmitting back to relay stations in India, but this again meant that columns could only send messages once they had stopped. At the lowest level of communications, American SCR536 handy-talkie sets were used for communication within a column.

These sets were quite small, compared to the more orthodox pack radios that had been developed, but even their limited weight of 2.5kg meant that the 'award' of one of these sets was not always popular with a recipient who would already be burdened down with a load ranging between 20 and 40kg.

Practical Experience

The equipment itself was gradually receiving the benefit of practical experience, for exposure to 90°F average daytime temperature dropping only to 70° at night, with relative humidity in jungle undergrowth never falling below 85% was a very effective stress test and unfortunately the ubiquitous carbon composition resistor was often found to be unreliable under such conditions.

The main effects of the jungle environment were rusting and corrosion of metal parts and the lowering of the insulation resistance of insulating materials. It is interesting to note that the Allies were able to counter this by better design, although most sets were tropicalised after development, the Americans did produce their AN/TRC2 medium range portable set for jungle use.

However, the Japanese Army had not depended greatly on radio communications and their equipment remained primitive and as economic conditions decline in war time Japan, restricting research and the use of newer materials, it actually got worse (the author remembers reading a report on Japanese equipment which stated that baked mud-like material has eventually been used as coil formers, but I cannot verify this).

Efficient Antenna

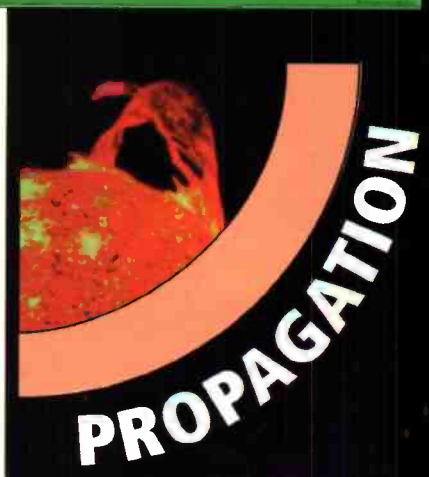
During World War Two the problem of getting an efficient antenna to operate in the jungle was always paramount and remained so until jungle warfare in Vietnam stimulated development of the compact loop h.f. antenna. The problems of poor antennas were multiplied by the high static levels.

The problem of static interference in the tropics, sometimes so bad as to allow only a couple of hours working a day, had been recognised before World War Two, but it was not until military activity increased in the Indian and Pacific areas that a group of scientists at last produced world maps of atmospheric noise levels with daily and seasonal variations.

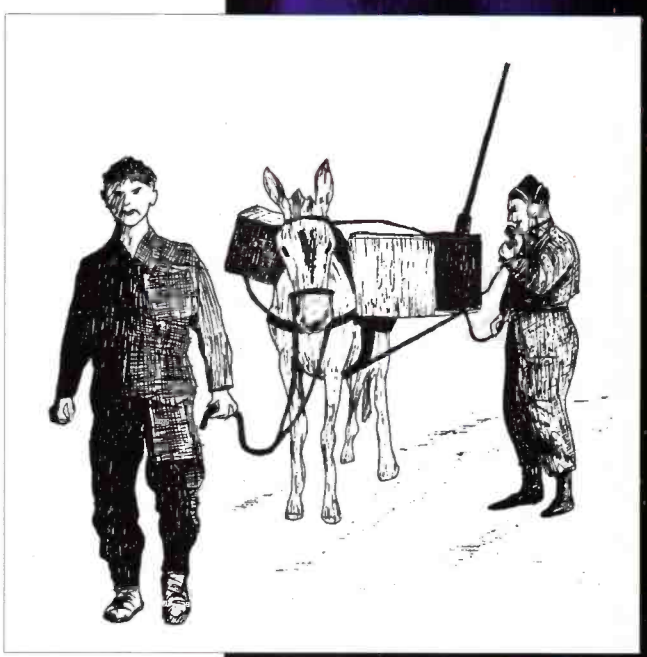
It was found that at night, a tropical storm centre could cause noise levels to be 20dB or more over temperate zone levels in the low h.f. bands used by the military and that the enhanced propagation of the nightime also brought in the longer distance static.

Back Again

In the early 1950s, the British Army was once again back in the Malayan jungle, this time fighting communist guerrillas - an ally of a few years before. The radio equipment was not vastly different, it was the heyday of portable valved equipment, though the mules had gone, for most of the fighting was done by small patrols and ambush parties. Once again, thick undergrowth blotted out ground wave propagation over any but extremely short distances.



Handie-Talkie in use.



British Army No 22 Set.

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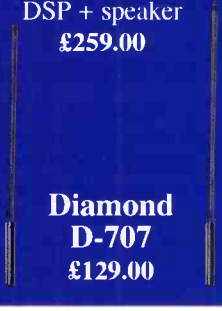

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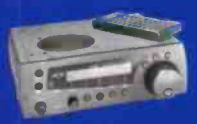

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As an added bonus, the GPS 12 also boasts a position averaging feature which diminishes the effects of Selective Availability (SA) upon position error and displays a value that reflects the estimated accuracy of the averaged position.

Include a host of advanced navigation features like enhanced moving map graphics, average and maximum speed data, and trip timers, and you have all the things that make the GPS 12 a purebred GARMIN—innovation, performance, and value.

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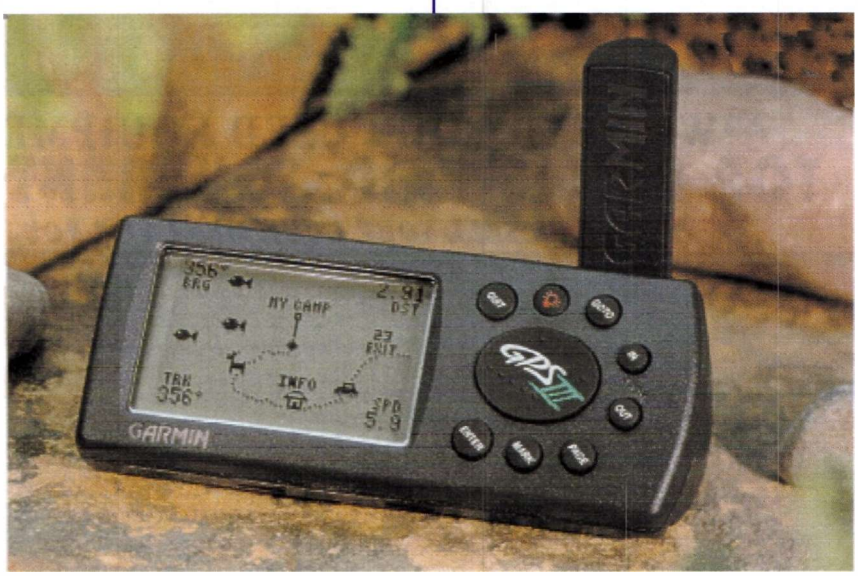

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HF Broadcasting And The Solar Cycle

PROPAGATION

As many readers of *Short Wave Magazine* will already know, the sun has a significant influence on radio propagation, particularly in the frequency range from 3 to 30MHz, but why is this so? Ian Liston-Smith G4JQT explains.

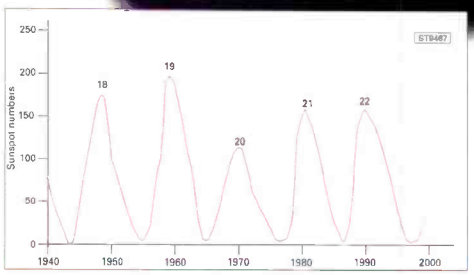


Fig. 1: Mean annual sunspot figures since 1940, covering cycles 18 to 22.

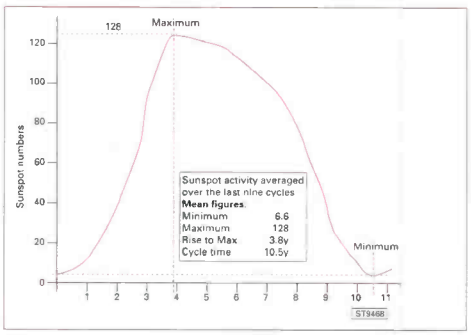


Fig. 2: Sunspot activity averaged over the last nine cycles.

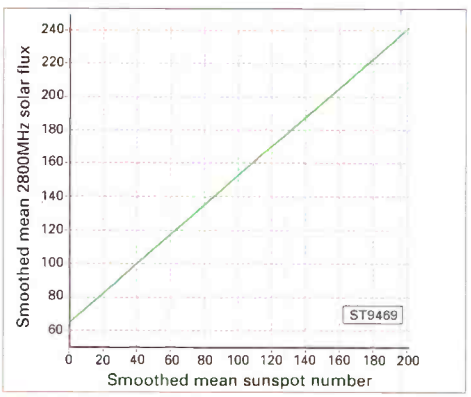


Fig. 3: Relationship between Solar flux and Sunspot numbers.

In broad terms, the sun's x-ray and ultra-violet radiation gives the atoms in the earth's rarefied upper atmosphere an electric charge. We know this as the ionosphere. Peaks in ionisation, sufficient to modify the path of radio waves passing through them, occur at various heights and are known as the D, E, F1 and F2 layers or regions. The D layer is the lowest, lying at about 100km or so above the earth's surface and the highest is the F2 layer (the most significant ionospheric layer regarding h.f. radio) at 300km or more. As we will see, the sun's approximate 11-year sunspot cycle varies the amount of solar radiation which in turn affects the earth's ionosphere.

The Ionosphere

Radio signals passing through the ionosphere are bent (refracted) by the increasing velocity of the advancing radio waves as they meet a rising ionisation within a layer. With the right combination of frequency, ionisation and angle of incidence, the waves will bend round towards the earth.

The stronger the radiation from the sun, the more intense the ionisation of the ionosphere. This means that it will bend, or 'reflect', higher frequencies back to earth that would otherwise escape into space, thus allowing a wider range of higher frequencies to be used over a given path.

When more bands are 'open' to a given target area, broadcasters can spread their transmissions throughout a larger range of propagating frequencies. This reduces the mutual interference which otherwise results from the overcrowding when only the lower bands propagate.

The use of higher frequencies has another significant advantage - that of reduced noise. Atmospheric noise becomes less prevalent as you listen to the higher frequency bands. Higher frequencies are also absorbed less in the ionosphere

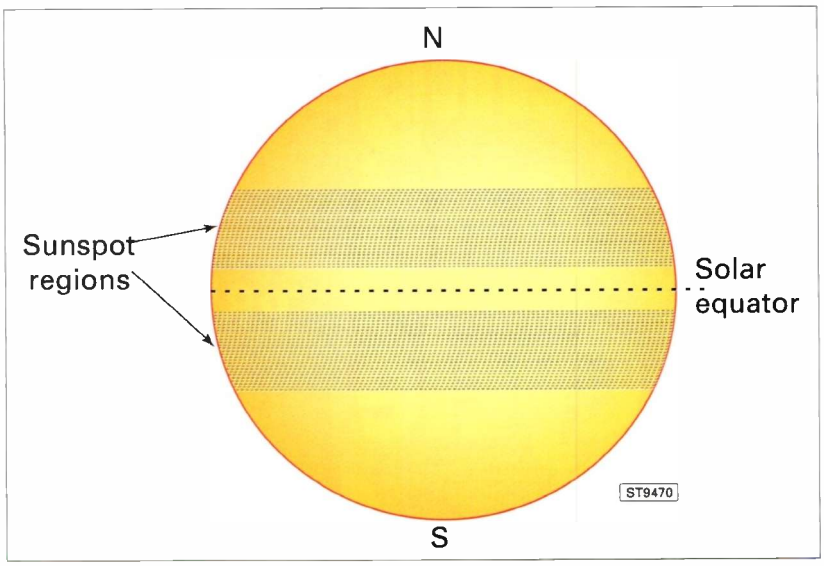


Fig. 4: New spots tend to appear at the most northerly and southerly edges of the sunspot regions. As the cycle develops, spots form nearer to the equator. At the end of the cycle, the old spots are forming closer to the equator, while new spots start to form at higher latitudes again.

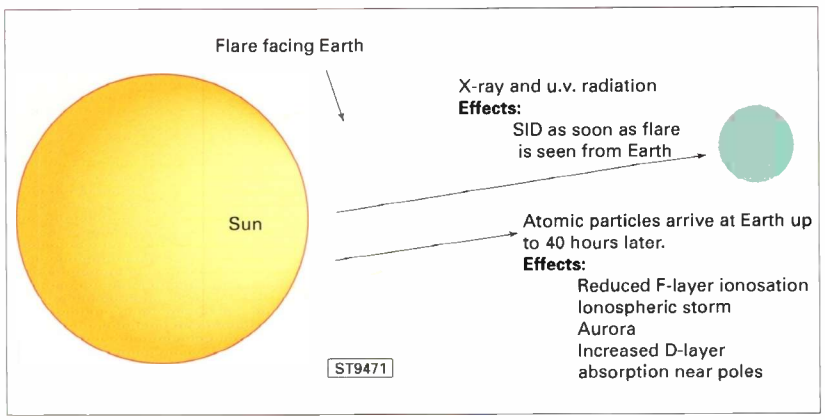


Fig. 5: Summary of main effects of a solar flare.

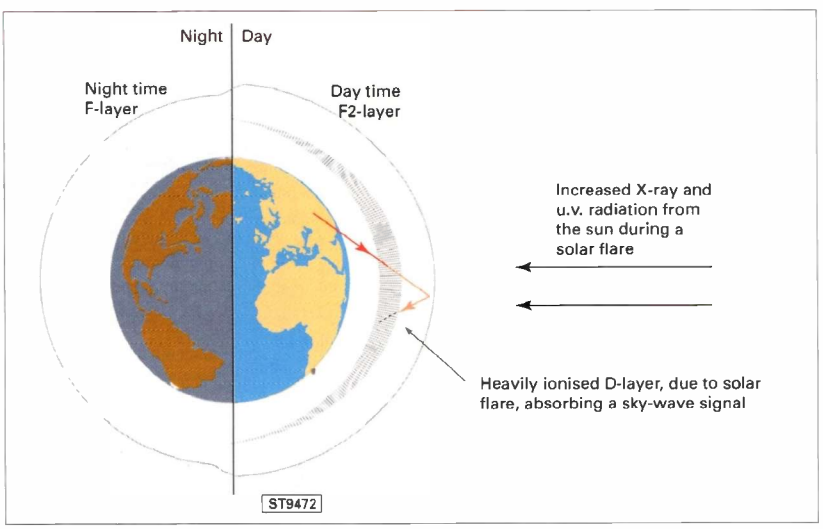


Fig. 6: The cause of a Sudden Ionospheric Disturbances (SID).

(the D-layer is responsible for most of this absorption) so signals tend to be stronger, and therefore even less susceptible to noise.

It is essential that users of the h.f. spectrum know some months in advance which frequencies will provide the most reliable signals to their target areas. They can then plan ahead, and in the case of h.f. broadcasters, publish schedules for their listeners.

As yet there is no accurate method of predicting sunspot numbers - and the condition of the ionosphere which they will generate. However, smoothed or averaged numbers from previous months and empirical observations generally provide satisfactory predictions six months or so in advance.

Practical Consequences

The practical consequences of ionospheric changes for the broadcaster are as follows:

If, for example a European broadcaster wanted to transmit programmes to the Middle East in summer daylight hours during sunspot minimum, the 9 or 11MHz broadcast bands might well be the only ones which are suitable.

But during a summer sunspot maximum, the more intense ionosphere supports propagation of higher frequencies. In this example the 13, 15, 17 and 21MHz broadcast bands are all likely to be appropriate, bringing the advantages described earlier.

This stronger ionisation also persists during the winter and hours of darkness, so that proportionately higher frequencies are available here too.

Incidentally, there is little if any evidence to suggest that the occurrence of sporadic-E has anything to do with the solar cycle. To fully describe this form of propagation is an article in itself. Suffice it to say that it occurs at various times throughout the year (particularly between May and September in the northern hemisphere) regardless of solar activity.

Solar Activity

Variations in solar activity greatly modify the properties of the ionosphere. Approximately every 11 years the activity on the sun's surface reaches a peak, although the level of this activity varies significantly between cycles as can be seen from **Fig. 1**.

The time between peaks may be as short as nine or as great as twelve and a half years. In fact, very few cycles actually have a period of eleven years, the most common length of most recent cycles being about ten and a half years. This activity is asymmetrical around the peak as it usually rises to a maximum three to five years after the minimum. Averaged solar activity from the previous nine cycles is represented in **Fig. 2**.

Solar activity takes the form of sunspots and flares. Sunspots are cooler stormy areas and flares are great ribbons of hydrogen gas thrown into space. One method of gauging the activity of the sun is simply to observe the number of spots on its surface. The more spots, the greater the x-ray and ultra-violet radiation emitted by the sun and the more intensely ionised the earth's ionosphere becomes.

In 1849, Rudolph Wolf developed a consistent method of measuring the number of sunspots. This is still used today by solar observatories. Measurement of the 10.7cm solar flux (solar noise on 2.800GHz) is a more convenient indication, since it does not rely on optical detection. It corresponds well with the sunspot number as shown in **Fig. 3**.

The number of spots varies from day to day with about half of them lasting less than two days. Large active groups however, may last several weeks, appearing for more than one 27-day solar rotation. These numbers must therefore be averaged or 'smoothed' for a true picture to emerge, the monthly and yearly averages being the most useful.

The monthly average can vary significantly with respect to the plotted yearly average, but the yearly average shows more clearly the upward or downward trend in solar activity. But where in the solar cycle are we now?

Most solar physicists generally agree that we are into the early stages of Cycle 23 (Cycle 1 being that

which started in the year 1755). But detecting where one cycle ends and the next starts is not an easy matter.

A minimum can only be defined from the 12 month smoothed sunspot number because of the previously mentioned daily and monthly variations. The minimum of Cycle 22 was therefore not apparent until subsequent months have also been averaged out, when the occurrence of the true minimum became clear.

An additional complication is the appearance of spots from the 'next' cycle occurring before the minimum of the current one. The first spots with indications that they probably belonged to a new cycle commonly emerge one to two years before the end of the previous cycle. They are identified by their different magnetic structure and usually appear at higher latitudes on the sun's surface. Unfortunately, the very first ones are sometimes too small to be clearly identified by their characteristics and don't always appear in the expected solar latitudes.

As the cycle progresses, the spots migrate towards the solar equator, thus the old and new spots appear in different places (**Fig. 4**). After the old cycle spots die out, the new ones become more numerous and the active zone rapidly expands.

The start of a new cycle is defined by various aspects of solar activity, not just the number of visible spots, or the appearance of new ones. It could also be said that the two cycles co-exist for some months. This is one reason why no definite date is ever given for the start or end of a cycle.

Now that all of these observations have been assimilated, it appears that Cycle 23 actually started about 18 months ago in May 1996. Since then there have been a steadily increasing number of clearly defined new-cycle spots and rising x-ray and 10.7cm flux levels.

The New Cycle

So how might Cycle 23 develop? Unfortunately, we can only speculate. The processes are not well enough understood to derive accurate models to predict sunspot numbers. But as additional solar data arrives in the coming months, more accurate predictions will be made. However, there are a number of factors to consider that could give a clue to the level of future activity.

For example, in the declining phase of the previous cycle, there are indicators to the size of the imminent solar peak. The occurrence of coronal holes (the corona being the very hot outer 'atmosphere' of the sun) and the strength of the solar wind (the stream of particles escaping from the sun) are both useful indicators of what is to come. The strength of the sun's magnetic field is also a sign of future activity.

Additionally, it has been observed that odd-numbered cycles tend to have higher peaks than their preceding cycle. If this is the case then it is possible that Cycle 23 will have a higher peak than that of Cycle 22, which reached a maximum smoothed sunspot count of about 160 in July 1989. This was the fourth known largest. It also had the fastest rise time ever recorded of only 2.8 years and one of the shortest cycles at only 9.7 years - a clear example of the variability of the length of solar cycles.

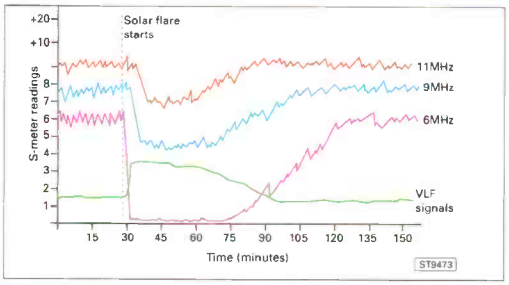


Fig. 7: Typical strengths of broadcast signals before, during and after a SID. VLF signal enhancement is also shown.

On the strength of all this evidence, it appears that the next cycle may indeed exceed Cycle 22. It has been suggested that a peak close to that of Cycle 19 is possible (which, incidentally, was the highest ever recorded, reaching a smoothed maximum of 200 in late 1957). Unfortunately, much of this is contradicted by the relatively slow rise in solar activity to date. A slow rise is often indicative of an average or below average peak. Nevertheless, by the time you read this, we may well be within the rapidly rising phase of Cycle 23 - but we'll have to wait and see!

The best 'guesstimates' to when the smoothed maximum will occur are between January 1999 and June 2001 with March 2000 looking most likely at present.

Two Edged

Many of us are looking forward to the greater solar activity and generally much better propagation conditions that it will bring, but increased solar activity is a two edged sword. On the one hand DX signals will be audible more often when the higher bands are open. Yet on the other hand the occurrence of ionospheric disturbances will increase.

We can expect the period of greatest risk from these poor conditions to be between 1999 and 2005 as we approach the peak and pass through much of the decline. These poor conditions will generally be of two types. Sudden ionospheric disturbances (also known as SIDs or Dellenger fade-outs), and ionospheric storms.

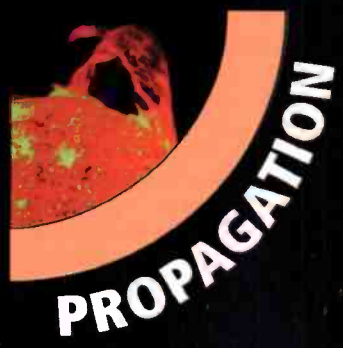
Fortunately the causes of these disturbances are reasonably well understood. (**Fig. 5**)

Sudden Ionospheric Disturbances

Short wave communication generally relies upon reflections from the F-layers, and signals must therefore pass through the lower D-layer at least twice when the entire path is in daylight. As shown in **Fig. 6**, the absorbing effect of the D-layer becomes greatly increased very shortly after a solar flare due to the much stronger solar x-ray and ultra-violet radiation.

Within one or two minutes of a flare occurring, the range of completely attenuated frequencies is rapidly extended upwards. This prevents signals of up to 20MHz or more from passing through the D-layer over the sunlit side of the earth. During periods of high solar activity, more that one SID per day is relatively common.

At frequencies below about 100kHz, the D-layer and the earth's surface act as a wave guide. This provides a relatively low-loss propagation path. During SIDs, the increased D-layer density improves this effect, enhancing v.l.f. signals over daylight paths.



Propagation Data

For completely up-to-date propagation bulletins, WWV on 10.000, 15.000 and 20.000MHz (when audible in the UK!) is a good source of data. Bulletins are also available (in Morse Code) over DK0WCY on 3.558 and 10.144MHz. Propagation news on Sunday mornings from the RSGB's GB2RS on 3.650-3.660 is also available.

For anyone with access to the Internet, a huge variety of detailed and frequently updated propagation information is available, too many sites to list here. Nevertheless here are a few of the most comprehensive ones:

ftp://solar.ulcth.ca/pub/solar/Indices/wwv.txt

http://www.access.digex.net/~cps/propagation.html

http://www.rsgb.org.uk/news/gb2rs.htm#propagation

http://www.ips.gov.au/asfc/current/

Recovery of the D-layer to its previous state after an SID is a gradual process. Depending on the severity of the flare, normal D-layer conditions may take an hour or two to return. The first sign of recovery is the slow increase in strength of the higher frequency signals. As the SID absorption weakens, all attenuated signals return to their pre-SID strengths, the lowest frequencies returning last.

Typical signal strengths before, during and after an SID appear in **Fig. 7**.

Ionospheric Storms

Ionospheric storms frequently occur some hours after a solar flare. The intense x-ray and ultra-violet radiation together with the charged particles ejected from the sun's surface from an active region during a flare penetrate all levels of the ionosphere. The effect of the sun's electromagnetic radiation, particularly on the D-layer (causing an SID), is immediate. But the arrival of the particles (usually within 40 hours, although occasionally within one hour), cause further significant disturbances in the ionosphere. If there are sufficient high energy particles, an ionospheric storm begins.

A short-lived improvement in propagation conditions is often an indication of the arrival of these charged particles. However, this only lasts for a few hours, after which propagation conditions deteriorate severely. The particles then have the effect of reducing F-layer ionisation which may remain depressed for some days.

Other effects of the charged particles, once attracted to the earth's magnetic poles, are to bring fluctuations to the earth's magnetic field and to cause auroras. The aurora may or may not be visible, but in either case they are frequently reflectors of v.h.f. and occasionally Band IV u.h.f. signals. In the polar regions another effect is enhanced D-layer absorption. Unlike SIDs, this type of absorption may last for many hours or sometimes days.

After an ionospheric storm, the ionosphere usually returns to normal within a few days. However, due to the 27-day solar rotation, an active region may face the earth again, possibly bringing more disturbances a month or so later.

The k-index uses observations of fluctuations in the earth's magnetic field as an indication of propagation conditions. The index has a scale of zero to nine. Quiet magnetic conditions are represented at the low end and severe storm conditions at the high end. The ionosphere becomes disturbed enough to significantly affect propagation with a k-index of five or greater.

Solar activity is not just important to h.f. broadcasting. The temporary instability of the earth's magnetic field during a severe ionospheric storm induces voltages in long power lines, particularly to those at extreme northerly and southerly latitudes, causing trips to operate and bringing power failures.

Satellite electronics are also susceptible to damage by the bombardment of high energy particles. Additionally, low earth orbit satellites experience drag from the atmosphere as it expands slightly during these conditions. This drag can reduce the working lifetime of their orbits.

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A Well Kept Wartime Secret

Eric Westman tells the story of the short existence of the AEF Programme.

"We are initiating today a radio broadcasting service for all members of the Allied Expeditionary Forces, to be identified as the AEF Programme". This surprise announcement to the British, American and Canadian Forces invading occupied Europe was broadcast by their Supreme Commander, General Dwight G. Eisenhower, in the early dawn of D-Day+1, 7th June 1944. It unveiled a closely guarded secret.

Helen Jepson.

As the battleworn, but appreciative, troops listened, the General told them, "It is to be a service prepared especially for you...to link you to your homes with news broadcasts from the United Kingdom, the United States and Canada...to bring you up-to-date with the progress of the War, and to provide you with a diversion. The BBC, the American Forces' Network and the Canadian Broadcasting Corporation will bring you the best entertainment that can be summoned from our allied nations".

Short Wave Magazine, May 1998

Helen Hayes.

Helen Traubel.

Bert Gordon.

Identification Signal

Eisenhower's announcement was followed by the introductory playing of the new station's identification signal - the *Oranges and Lemons* tune from the popular nursery rhyme. Then Britain's Franklin Engelman - later popularly known as 'Jingles' - detailed the AEF Programme's schedule.

The station would broadcast every day from 0555 hours Double British Summer Time (= UTC + 2) continuously until 2300 hours. Its special feature would be a regular morning programme called *Rise and Shine* hosted by Dick Dudley of the United States Army and Aircraftsman Ronnie Waldman of Britain's Royal Air Force.

When Engelman had finished listing the day's programmes, there followed the new station's signature tune *Rise and Shine* played by Abe Ryman and his orchestra, and the AEF's introduction to its Allied listeners was complete.

Closely Guarded Secret

The forthcoming creation of the new station had been a closely guarded secret restricted to Service and Broadcasting personnel, in particular the BBC at London's Broadcasting House. It had been vitally important to prevent the news leaking to the Nazis that a new broadcasting station for the Forces was to open on a certain date, for by linking it to reports reaching them of massive troop concentrations in the South of England, the enemy would easily pin-point the date of the awaited Allied invasion of Europe.

The idea of the AEF Programme originated in March 1944, only three months before the invasion was to take place. During a meeting with his senior staff to put the finishing touches to the invasion plans, the General raised the problem of nationalistic rivalries between the troops of the three main allies and the necessity of creating a real team spirit embracing them all.

Exclusive Radio Station

The answer, the General decided, was to set up their own exclusive radio station to provide them with information and entertainment in their spare moments from fighting. The number of programmes allotted to each of the allies was to be proportional to the size of their invading forces, 50% American, 35% British and 15% Canadian.

He ordered Senior Officer Major General R.W. Barker to approach the BBC about inaugurating such a service. However, the BBC's reaction was so obtrusive that Eisenhower angrily contacted Winston Churchill, the British leader, who immediately presented his Minister of Information, Brendan Bracken with an ultimatum to pass onto William Haly, the Director General of the BBC.

Either the BBC co-operated in the setting up of the AEF Programme or the project would be handed over in its entirety to SHAEF (Supreme Headquarters Allied Expeditionary Forces). Haley, forced to adopt a more co-operative attitude, thereupon delegated Maurice Gorham of the BBC's Overseas Service as the BBC's chief representative to the project to work with his American and Canadian counterparts.

Eisenhower appointed Gorham as the boss and he immediately began gathering key personnel for the project. There were only just over two months in which to compete the arrangements and in the most intense secrecy.

Experienced Producer

Gorham speedily signed up Cecil Madden, an experienced producer who, after the War, would be the main figure in setting up the BBC television service. From the BBC's General Forces' Programme he recruited Margaret Huddle and Jean Metcalfe as announcers, together with the Army officer Franklin Engelman. They were told that they would be operating a new radio audience for a specialised audience and were made to sign the *Official Secrets Act*.

A top secret meeting of all concerned, including senior members of the Services and the BBC was held on 6th April 1944 in the Broadcasting Council Chamber of the BBC. Major General Barker presided to monitor progress for General Eisenhower, and arrangements were made to distribute many thousands of medium wave radio receivers to the troops.

The British were to get battery powered sets, but the Americans had opted for mains operated receivers and should have to be provided with suitable generators. Misgivings were voiced about the effectiveness of transmissions after dark over the minimum distance of 300 miles (480km) stipulated by Eisenhower.

Also to be taken into account was the jamming of lower medium wave transmissions by the Nazis. To counteract this, it was decided to set up two transmitters, at either end of the South coast, one in Kent and the other in Devon. They would broadcast on 285.7m (1050kHz) clear of the German jammers, using the former West Regional Programme's wavelength.

Virginia Clark.

Franklyn MacCormarck.

Col. Major Jack.

Programme Policy

During the discussion of programme policy, the BBC were mortified when the Americans and Canadians condemned the BBC's presentation of News and Current Affairs as "dull, boring and poorly produced". As a result, it was decided that each country would provide its own editor and presenter for news from home, though general news would be supplied by the BBC's World Service.

This arrangement complied with General Eisenhower's decree that the Service should be run jointly by the three main allies. Since Eisenhower had the final say of any dispute and could veto any programme he disliked, the disgruntled BBC had to grin and bear it.

To obviate any quibbles about any participating nation having a larger slice of the broadcasting cake than the others, it was agreed that the British and American chaplains would alternate in presenting the religious service at the start of each morning's transmission as they did with the Sunday half hour religious service from home.

The Canadians' slice of the cake was slightly smaller, but they did get one service a week in the French language from Quebec for the benefit of French Canadian soldiers. A similar compromise applied to the national anthem played at the close of each day's transmission, the British and American anthems would alternate.

Continuity Studio

The British and Canadian programmes were to employ a continuity studio in Broadcasting House, while the Americans would use their existing AFN studios in London. A two-way landline would be laid to connect them together. Emergency

Miss Patti Chapin, songstress.

Hollace Shaw.

arrangements were made, so that if Broadcasting House were destroyed by one of the new V1 flying bombs soon to fall on London, other facilities could be used. And should any conflict arise at the American Forces' Network studio between their two programmes, the AFN would be obliged to give the AEF Programme priority.

To conclude the first meeting of the AEF Programme planners, the next meeting was fixed for Sunday 29th May 1944. Unknown to them, it would take place only eight days before D-Day itself. This second - and, as it happened, final - meeting was presided over by the Director General of the BBC.

Other participants were the Controller (News) and Controller (Overseas Service) and, representing General Eisenhower's SHAEF Headquarters, General Barker, Colonel Dupuis and Colonel Kirby. It was agreed that the title of the new programme would be The AEF Programme of the BBC and no mention of it would be allowed until the evening of D-Day itself, when details would be given on both the Home Service and General Forces' Programmes of the BBC.

AEF News programmes would be broadcast on the hour, with News flashes breaking into other AEF programmed when required. Both sides, BBC Management and SHAEF senior officers, declared themselves satisfied with the plans and Maurice Gorham pronounced his broadcasters ready for a series of 'dummy runs'.

The Real Thing

Eight days later it was no dummy run, but the real thing. Early in the morning Eisenhower made his introductory speech and in the evening the BBC broadcast details of the new programme. Thereafter the AEF Programme operated for 147 days, during which time it transmitted many of the most popular programmes from America and Britain.

Typical of these programmes were the *Harry James Show, Bob Hope Show, Kay Kaiser's College of Musical Knowledge, Canadian Army Show, Navy Mixture* and *Singing with Bing.*

The finest bands and singers - mostly American - performed, as did such famous BBC variety and comedy shows as *Variety Bandbox, Itma, Vera Lynn's Starlight Show* and *Sunday Serenade for Scotland.* Major Glenn Miller and his American Band of the AEF broadcast frequently until his mysterious disappearance, and on Wednesday nights, there were performances by the British Band of the AEF conducted by Sergeant Major George Melachrino.

Guest appearances were made by major stars, including Bing Crosby, Marlene Dietrich and Jessie Matthews. Every morning at 0700 hours, Margaret Huddle introduced the Best Of British, which brought on such famous artist's as Noel Coward, Gracie Fields, Tessie O'Shea, Jack Hylton, Joe Loss, Will Fyffe and John McCormack.

Resounding Success

Eisenhower's brainchild proved to be a resounding success, bringing entertainment and links with home to the British, Canadian and American invaders during the whole of their 11 month campaign and for three months after the German surrender. On July 28th 1945, its task completed and to the great regret of its listeners, the Allied Expeditionary Forces' Programme vanished as suddenly as it had appeared.

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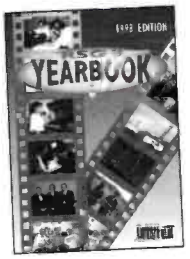

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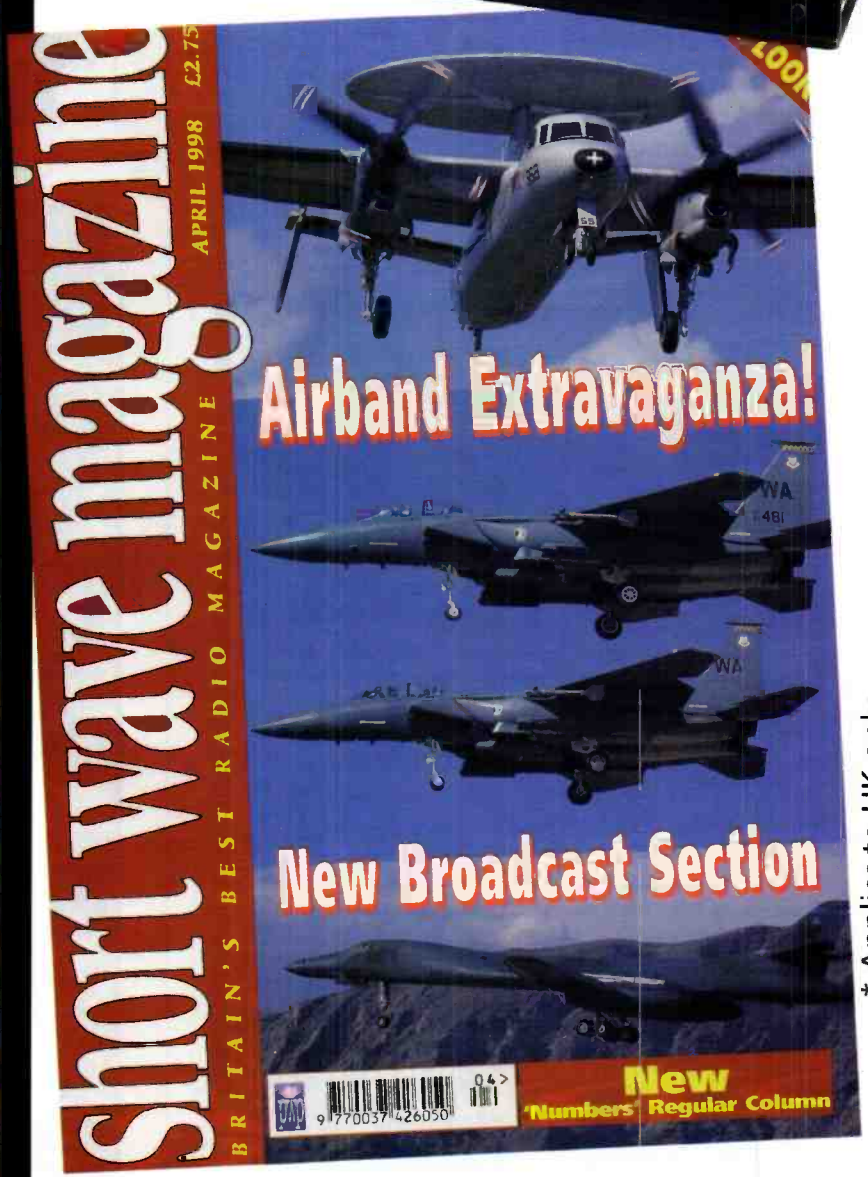

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A Half-wave UHF Antenna For Hand-Held Scanners

Andrew Howlett G1HBE favours an impedance matched λ/2 antenna over a more typical λ/4. Here he explains how you can try one too.

If you own a hand-held scanner, I'm sure you will have noticed that reception of weak signals suffers whenever you place the receiver in a convenient spot. It can be most irritating!

I live only a couple of miles from our local 70cm repeater GB3WP, but its signal is only moderate, even on my outdoor beam, due to the screening effect of the local hills. On my hand-held, which uses a quarter wave 'floppy', the signal is barely usable, and the above mentioned effect is very noticeable.

The problem is due to the poor matching of the quarter-wave antenna to the 50Ω input of the receiver and when one stops and thinks about it for a few minutes, it becomes obvious why the match is so poor.

Earth Currents

A quarter-wave antenna has its high impedance point at the 'free' end (of course), and its low impedance point where it joins the connector, and if this were all that was required the antenna would work fine, but in order to deliver the r.f. current into the receiver it needs something to 'work against', and this is where the ground plane comes in.

All current-fed monopoles need some form of ground plane, whether this is a car roof, earth mat (a favourite on top band), or a set of three or four 'radials' stuck out from the base of the antenna. Unfortunately, the body of your scanner does not provide much of a ground plane on its own, but it does improve a little when you add your hand to the equation!

We could simply solder a few lengths of stiff wire to the connector, but this makes rather a mess and you may even poke yourself in the eye, so this is not recommended!

What we need is an antenna that will work without a ground plane. Enter the half wave, being (believe it or not) twice the length of the quarter wave. Again, the high impedance point is at the 'far' end, but this is repeated at the connector end, the low point (high current) being in the middle.

But surely this would lead to a serious mismatch if it were plugged straight into the scanner? Yes, but a small matching transformer at the antenna's base does the trick.

Take a look at **Fig. 1**. It can be thought of as two circuits, one consisting of all of L1 and its tuning capacitor C1, (high impedance to match the half wave whip), the second being simply the bottom 'tapped' bit of L1. This part is low impedance to feed current to the receiver.

This modest complication is a small price to pay for what can be an impressive boost in reception.

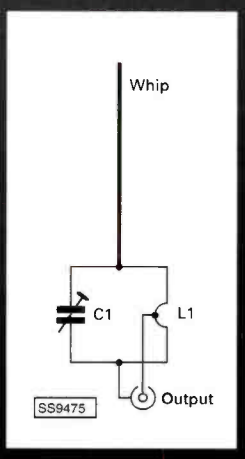


Fig. 1: Circuit of matching transformer.

Easy To Build

Construction couldn't be easier. Find a piece of single-sided, copper-clad board, preferably fairly thick, and cut it into a rectangle approximately 50 by 15mm.

About half way along its length, make a shallow saw cut just deep enough to break the copper. Now saw out a pair of matching 'shoulders' at one end, as in **Fig. 2**.

The neck part of this should be about 10mm in length, and 8mm wide, but this last dimension will depend upon the type of BNC plug you intend to use. More about this later.

Now use a craft knife to isolate a strip of copper which should run up the middle of the neck to within 5mm or so of the previous saw cut. From now on I'll call this bit of copper the 'feed'. A picture is worth a thousand words, so another glance at **Fig. 2** should make this clear.

At this point it is well worthwhile applying your ohmeter or continuity tester to the board to make sure the three sections of copper are properly isolated. Now to make the coil L1.

As we are dealing with u.h.f., this is no more than about 25mm of fairly thick tinned copper wire formed into a shallow staple shape. Ignore the tapping for now, just take the wire in your pliers, and bend 5mm at each end through 90°, then solder it in position as shown in the diagram, so it stands up like a set of goalposts.

Note that I have shown L1 at an angle. I did this to bring the tap as close to its 'feed' as possible, in order to preserve the match and reduce spurious resonances. Take another piece of thick wire, and solder it from the end of the feed to a point one third of the way up L1.

The trimmer C1 goes on next. The small yellow 10pF trimmers made by Mullard/Philips are my favourite for jobs like this, as they have two earth legs for a sturdy job. Remember to solder the two common legs to the lower part of the board, and the single leg to the upper part.

Nearly done now, just find an old resistor or capacitor lead and solder it to the plug end of the feed so that about 10mm of wire protrudes from the end of the board. For the whip itself, I suggest a length of 18s.w.g. tinned copper or enamelled copper wire.

The length for a half wave on the 70cm band is 340mm, and the wire is soldered to the top section of copper. Use a big, hot iron for this, as the wire will conduct the heat away from the joint.

Now back to the BNC plug. By far the easiest solution is to buy a 'quick fit' screw-on type, as they have a long, sturdy body with a screw thread running down the inside. Get the type intended for thick coaxial cable, as the type made for RG-58 has only a

small hole.

Once you've got a suitable plug, carefully file the neck of the board so that it is a tight screw fit. The wire protruding from the feed should neatly push home into the pin of the plug. Check with your meter that the earth copper is in good contact with the body of the plug.

Setting Up

Now to tune the antenna. First fit the antenna to your scanner and find a strong local signal.Using a proper trimming tool, adjust C1 for maximum quieting, then find a more distant, weaker signal and give a final tweak.

I found that the half wave gave a massive boost. My local repeater is now of comfortable strength all over the house, and signals that were previously almost inaudible are quite readable. Once you are satisfied that your antenna is working properly, you might like to pour some epoxy glue or potting compound into the body of the plug to give the assembly some extra strength, and maybe slide some rubber or plastics sleeving over the whip.

Remember that this antenna is designed for the u.h.f. band around 400 to 460MHz, so its performance falls off quite quickly outside this range.

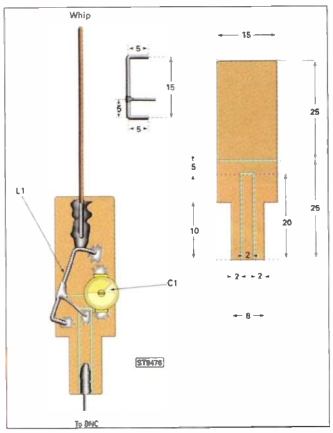


Fig. 2: The physical layout.

■ PAUL ESSERY GW3KFE, NEWTOWN, POWYS SY16 1ZZ ■ E-mail: gw3kfe@pwpub.demon.co.uk

Amateur Bands

Letters

We open the batting with a letter from **Jimmy Conroy** up in Tyne & Wear. He picks up on a point, saying that although he is left-handed it is not a handicap in any way. Thirty years ago, Jimmy built his own receiver from a design in *Practical Wireless*, but nowadays prefers something he can just switch on. I think Jimmy was mis-reading me. A right-handed person will normally write in the log with the right hand, tune and operate the receiver with his left That being so, a right handed person wants to have the controls fall naturally to his left hand. If they don't, the loss of operator efficiency is noticeable. I've only ever once got 'everything right' and the improvement in the 'operability' of the station was very pleasing indeed. Being left-handed is not a handicap, as Jimmy says, but there can be no doubt that a receiver designed by a left-hander is more pleasing in use to the left-handed owner and *vice versa*.

Coming Events

Between May 6 and 17, look out for Agalega and St Brandon activity; the USKA group will be on Cargados Island in the St Brandon Archipelago.

Yours Truly has still not sorted his h.f. antenna arrangements - but it is quite surprising what can be done with an AOG (Act of God) wire antenna. So far I've managed to persuade it to accept signals on all bands from 145MHz down to 136kHz - the latter after local GW3JSV pointed out that the TS-440S transceiver is quite good on that band. The trick is to have for each band some means to transform the antenna's reactance into pure resistance, so that power (i.e. signals) can be transferred from antenna to receiver. That trick is to add an antenna tuner - whether commercial or home-brew - to the station for all the bands of interest. In general terms, one can usually get by adequately with a single box to cover 1.8-30MHz. For v.h.f., one usually uses a beam, as they are so small and easy to install. On the new 136kHz band, though, even a half-wave dipole would be around a half-mile long, and in wavelength terms almost lying on the ground. So, a normal QTH requires a different approach.

One thing to try is a screened loop, having sides of, say, 1.5m long, and resonated on to the band with a variable capacitor. The frame is simple woodwork - make it strong though! - the loop itself made in the classical manner with coaxial cable having the braid cut and separated at precisely the mid-point. Even a loop made of ordinary unscreened wire will show some results if it is properly tuned, though, of course, the screened version will be far more useful at rejecting noise. Either way, you will benefit from a preamplifier giving, say 20dB. This pre-amp will have its input tuned by the loop, and its output can be fed almost all-same audio to the receiver at low impedance. The pre-amp needs screening - fit it, with battery inside a Colman's Mustard tin. So far, apart from Derek GW3JSV, the log for this band shows entries for EI0CF and in the opposite direction some Europeans.

Obviously, on a band as low as this, much will depend on your location. *Chez* GW3KFE, the first thing was that the normal earthing arrangement was bringing unwanted noise to the receiver! Signals that are perfectly readable on the loop disappear into the noise on the end-fed.

But - and I think this is the real point - I've had more fun getting on to the band than I've had for years! And, there's more entertainment to come while I make something that will generate a signal on 136kHz. Once that's done, yet more entertainment will come when I try to make an antenna that will radiate a useful signal within the confines of a garden some eight metres square.

QSLs

Many readers will have sent QSL cards to DX stations via W3HNK. At the time of writing Joe is recovering in hospital from major surgery - a matter of eight weeks. So - please don't send him any 'chasers' until he has had a chance to recover and to attack the backlog which will have piled up. I'm sure we all wish W3HNK a full and complete recovery.

Up in Barnsley **Colin Dean** listens to the telephony bands, and on 3.5MHz he offers A61AO, DU1KT, HB0HTA, J39JS, J6/W2LU, K6, K7, OD5OA, TA3D, UK9AA, VK1, VK3, VU2SD, WP4A, YC1, YC2, YC0, YS1RRD, ZL2JR, 4L8A, 9J2AM, 9K2MU, and 9Y4NW and a '4JA9RI' which turns up again in Paul Goodhall's log below. Up a band to 7MHz Colin mentions A45ZN, BV2RS, HL3ERJ, HL3QVZ, HS1NGR, JA2, JA3, OD5NJ, R1ANZ, SU3AM, TA7HA, TK5EP, UN7PGG, VK1MJ, VK8AV, WP3R, YC1LGP, 4L1DX, and 9K2SQ. Twenty is clearly not Colin's favourite since he merely records 9M0C before cranking up to 18MHz and AP2JZB, HZ1AB, K4TZ/AM around 48°N - 27°W, KP4UA, UA0AMM, and ZL2BJ. Ever daring, Colin went on further, to 21MHz where he booked in PZ1DR, P40K, P4/I2UIY, TG9IGI, ZF2NE, 9J2BO, 9K2/N6LUI, and 9K2/SP5UAM.

Nice to hear again from **Karl Drage** in Kettering who starts by mentioning a Internet mailing list set up by VE7TCP, designed solely for listeners to the amateur bands; to subscribe send an E-mail to **majordomo@VE7TCP.AMPR.ORG** with 'subscribe SWL' in the main body of the text; the message line can be left blank. On the actual listening, Karl has started a degree course at Nene College in Northampton, which has cut into the listening somewhat. Nevertheless he notes on 3.5MHz 8Q7AA A61AO, ER2GR. On 7MHz RTTY JH4IFC, K3MM, K5ZD, NO2T, ZA1MH were augmented by sideband from 4X6RA, 8P6FN, 9H1EU, A61AQ, CE0ZIS, DS5USH, TA2LZ, V47XK, VU3FAB and ZL1BMW. Sideband on 10MHz made it to G3HDJ, G3NXS, and HB9XA, and 14MHz RTTY found AA7A, IS0YTA, K6CT, K7WM, P40X, WB5B before changing to upper sideband for 3D2AO, 4X50FB/SK, 5B4ES, 9K2ZZ, A61AM, BA1CO, CE2VWW, CE3CDV, CT98DTO, D2BB, HS1AFN, JH7XPQ, JU2DX(via JT1KAA), PT7WA, RA0WR, RN9HM, RW0AY/9, UA0SJ, V73EQ, VK4JT, ZL2HU, ZL2NM, ZL2REX and ZL3RG. 18MHz next, for 5B4JE, 9K2MU, A92GE, DU7/KB2FB, K4TZ/AM at 45°29N 23°45W flight level 350, from Madrid to JFK New York - obviously not the same flight as the one Colin Dean noted, but probably on the same route - KH2/WH6ASW, S79MX, SV8EP(IOTA EU-052), T77M, TT8JWM, VK1TX, and VK3EQ. The 'ritty' on 21MHz stumped up 6W6JX, CT3BX, HH2PK, and PT2BW, but sideband gave 3B8CF, 4X50BO, 6D2X, 8P9DO, 9K2MU, 9K2QQ, 9K2SQ, 0K2ZZ, 9X0A, 9Y4GR, AP2GH, C6AGR, E21CJN(?), ET3BT, FR5ZQ/T(Tromelin), HK3SGP, HS2CRU, TG9IGI, TT8AM, VK2LES, VK2VUB, VK3JBH, VO2IL in Zone 2, VP5/WQ7X, VR2MM, WP3A, YI1AK, YS1RRD, Z22JE, ZD8T, ZS6AL, ZS6ESU, ZS6WRL/Lions.

ATUs Again

Having got that off our chests, let's look at **Paul Goodhall's** loggings. Starting at the top end of Eighty, around 3.790-3.8MHz Paul logged G0NVD working RX1CQ/1, SM5ASQ, VE3MSK, DL4ABD PI4KGL, before moving down to 3.790 TR8IG worked ED8BYR and DL2TX. Then he moved out of the 'DX' portion of the band for LA3SFA and PA3GZK both working into G. On 7MHz, UX0LZ, was noted working YC6MIY, then 4X50KJ/SK peeled off UA6LPN and a string of Europeans, ending up by moving a little up the band to take in ZL/G0JPX/M. Up at 18MHz SU1SK was doing the business for EA7HAF and a crop of Euro-stations. On 21MHz we find W1, W2, W3s, W4, W5, W9, out to K0MQ, W6AA and W7YW, VE3BSA, all taking advantage of the early-afternoon conditions to work into Europe while WA1HMN was working V26NR. and ZF2JL knocked off KE8BW and N5UHT. That leaves us 14MHz, where Paul spent most time. N4AR, W4BA, K4MZW, WA3PRC, W2ONV, W2NHA, W2BGI calling TF3FW1NT, VE3QF, 4X50ZB, KD3BKW, ON50GTM, KA3UNQ, SU0ERA, W7ZQ, AW6ZR, W7HK, TA3BN, 5B4AGC, N2SS, 4X50AS, WZ1Y, S51AG/MM at 40N, 13W, KE2SO, AK1L, KD1XD, A71BY, 9M0C, VK7CAZF1UK, WA2OQM, OH0KMG VE1XT, VO1BV, WY5I, ZS4JD,W1CK, CT98ETL, VA2ZZ, W6CVK, K1AMG, KE8J, 9M6CT, 4X50FR, ZB2JO, AA2KD, VU2DK tackling a pile-up of Ws, HL1CG, UA8LA, VK5AL, VK3AAD, VK2DD, and 4JA9RI - has anyone any more detail on this last one?

QSL Addresses

Some from Ted Trowell, such as HF0POL, via SP3BGV; 5N3CPR via SP5CPR, CO8ZZ via HI3JH; D68YN via HB9CYN; and CN2IB via OM1PD.

Finale

That's it for another month. I need your input as always, by the first of the month please. The address is PO Box 4, Newtown, SY16 1ZZ.

KEITH HAMER & GARRY SMITH, 17 COLLINGHAM GARDENS, DERBY DE22 4FS

DX Television

Keep On Writing!

Please send TV and f.m. reception reports, news, off-screen photographs and information to arrive by the first of the month to:- **Garry Smith, 17 Collingham Gardens, Derby DE22 4FS, England.**

Service Information

Hungary: MTV-2 is no longer available via terrestrial transmitters. MTV-1, TV-2 and RTL-KLUB are the current national networks. Low-power u.h.f. stations currently operating in Budapest include:- TV-3/X-TV Channel R26, FÖNIX-TV R31, BP-TV R39, ALFA-TV R47 and TV11 R3.

Egypt: DXers hoping to receive the 900W Band I relays at Dumyat on Channels E2 (ETV-2) and E4 (ETV-1) will have a long wait. The outlets have now closed, presumably due to interference from the new Syrian 2nd network high-power outlet on E2.

The above information was kindly supplied by **Gösta van der Linden** (Netherlands) and **Laszlo Kozari** (Hungary).

Obituary

Sadly, we recently learned of the death of **Bob Brooks** (South Wirral) who passed away not long after his 87th birthday. During retirement, Bob became involved with TV DXing and *SWM* readers will have read of his successes over the years.

Short wave listening was also one of Bob's pastimes. His son, Roger, has advised that there are several items of equipment which need a good home, including a three month-old Sangean ATS-818 digital all-band receiver. For details of equipment available please contact Roger on **0151-334 8647** (FAX: **0151-343 0575**).

February was another quiet month for Band I reception with only a short-lived Sporadic-E opening from Spain on Channel E3 on the 22nd during the morning. Meteor-Shower 'pings' were noted throughout the month on E2 and RI by Simon Hockenhull (Bristol) and on Italian Channel A by Peter Barber (Coventry).

Peter Barclay (Sunderland) noticed the build-up of high-pressure by studying the weather maps but despite the weather patterns, tropospheric activity was scarcely noticeable. In the south, some tropospheric activity did occur and Peter Barber noted the usual crop of French and Belgian Band III signals. At u.h.f., distant UK stations to the north were visible.

February Log

The following signals were all received via enhanced tropospheric propagation except for the 22nd.

8: Belgium:- RTBF-1 E8 (Wavre); VRT TV1 E10 (Wavre).
14: Belgium:- RTBF-1 E8.
15: Belgium:- RTBF-1 E8; VRT TV1 E10.
18: France:- Canal Plus L6 (Cherbourg), L7 (Rouen) and L9 (Caen).
Belgium:- RTBF-1 E8; VRT TV1 E10.
22: Spain:- TVE-1 E3 via Sporadic-E between 1245 and 1248UTC.

Great Balls Of Fire

Peter Barber has sent information which may be of interest to Meteor-Shower (MS) DXers. On September 23rd between 0755 and 0757UTC, a large fireball was seen moving east to west across Scotland and on December 1st at around 2025 a fireball was seen over the North Sea moving north to south off Northumberland. On December 9th, a large meteorite hit southern Greenland and a search is in progress for 50 tonnes of material.

Video Muting Problem

Automatic sound-muting when weak signals are encountered has been around for many years and can be inconvenient for the DXer. The muting can also come into effect when co-channel signals are present, according to **Nick Brown** (Rugby).

Many recent TV receiver and video recorder designs incorporate another horror feature - video muting. This also comes into effect when the signal strength falls below a certain level.

Some makes, Hitachi for example, have a delay so even if the signal improves briefly it is not guaranteed to be seen. Needless to say, this type of receiver would be unsuitable for Meteor-Shower work. Peter Barber comments that his domestic receiver has a video-mute facility and when muted the receiver displays a bright blue raster.

Unless the muting can be disabled, this type of receiver is totally unsuitable for DXing, so beware when choosing your next TV or video recorder. There is something to be said for using the older traditional types of TV and video recorders without all the problems modern-day technology has to offer!

North Sea Path

Peter Barclay (Sunderland) uses a Ferguson TX Series receiver for colour DXing. Most of these are now dated somewhat although they are capable of giving good results. Other 'traditional' receivers include the Philips range, especially the KT3/KT30 models, and sets produced by Panasonic.

Incidentally, Peter uses a Maxview amplified set-top antenna and although indoor antennas are usually frowned upon, many interesting catches have been possible with u.h.f. reception distances in excess of 750km across the North Sea.

Transmissions from the NDR region of Germany and stations in Denmark dominate the u.h.f. band when tropospheric reception is possible; these tend to obliterate Swedish signals. At least three quarters of the Danish transmitters have been identified over the past three years including the first network DR-TV on Channel E57 which is the low-power Mosbjerg (Vendsyssel) relay.

Quad Band III Antenna

Peter Barber has successfully constructed an array for Band III based on a design featured in the November 1997 issue of *SWM*. A centre frequency of 200MHz has been chosen and it appears to work well so far. Peter comments that it is more sensitive than his previous modified commercial six-element array and its forward lobe is sharper with reduced side lobes.

Cable TV Leakage

Leakage from cable TV distribution systems can be a nightmare for the DXer, even though the interference sometimes offers watchable freebies! **Dave Lauder** (Hertfordshire) has been examining r.f. leakage of various cable distribution systems around the country.

Some of these are notoriously badly planned to say the least and cause unacceptable interference on various amateur frequencies. Some of the converter boxes used by Telewest in Chelmsford apparently create noise on the 50MHz amateur band.

A system in Plymouth is reported to be leaking carriers modulated with data just above 50MHz. Bell Cablevision in Peterborough uses a vision carrier of 144MHz for the QVC shopping channel, which means interference over the picture is guaranteed when an amateur transmits on the 2m amateur band, even when transmitting at only a few watts.

To make things worse, BT are hoping to use frequencies up to 10MHz for high-speed data transmission (VDSL) using existing telephone lines and Norweb plan to send data via the mains supply!

Simon Hockenhull was receiving stray satellite pictures in Band I

Fig 1: The Dutch PM5544 test card photographed by David Small (Cannock).

Fig 2: Breakfast TV from the Finnish TV-4 network photographed by Pertti Salonen (Finland).

and sound channels on the f.m. band due to leakage from an installation in Bristol. Following a number of telephone calls, the cable company has investigated the problem and has reduced the leakage level, producing clear DX channels and no interference on the f.m. band.

Since January Ist, COMTEL (a cable operator in Coventry) has rearranged their transmission carriers according to Peter Barber which means having to learn which Cable TV signals to expect in Band III, and where, and to subsequently ignore them. Local leakage varies with the weather, especially in Band III.

Not all systems are badly planned, though. **Janet Bridgman** (Derby) once subscribed to the former local Nynex cable system and despite using indoor antennas for DXing, no trace of any cable carriers could be found. Band III is used for some satellite channels while BBC-1, BBC-2, ITV and C4 are relayed at u.h.f. on the lower Group A channels.

Fig 3: Les Touillets TV transmitter, Guernsey, photographed by Roger Bunney (Romsey).

Fig 4: Croatian second-network FuBK test card received at u.h.f. by Riccardo Marriotti (Italy).

FM Reports

Laszlo Kozari (Hungary) advises that DAB (Digital Audio Broadcasting) has been broadcast in the Budapest area since 1995 between 57 and 58MHz. Frequencies around 225MHz (TV Channel R12) will be used in the future. The 1st Network transmissions (Kossuth) on the old OIRT f.m. band will end in 1999.

Tim Bucknall (Congleton, Cheshire) suggests that Mike Gaskin's possible transatlantic f.m. reception on 87.80MHz last July 10th (see November 1997 column) might be more interesting than we first thought.

Fig 5: Unidentified 'REF' colour-bar pattern radiated from a UK transmitter. This is probably an internal test pattern which was radiated accidentally.

Apparently the lowest f.m. frequency used in the USA is 88.1MHz because of the closeness of the sound carrier of TV Channel A6 at 87.75MHz. Presumably, the f.m. band in Canada also commences at 88.1MHz. Could Mike's reception have come from an AFRTS base somewhere?

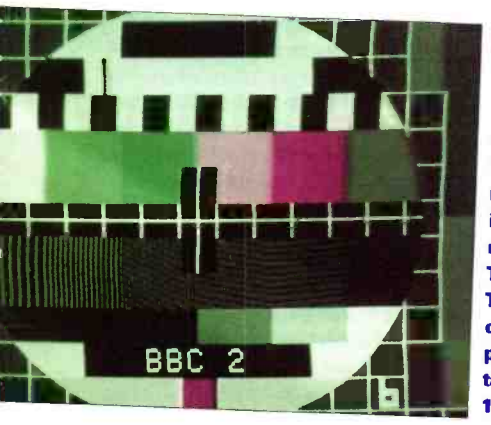


Fig 6: This month's visit to Memory Lane. The BBC-2 Colour Test Card "G" with the countdown clock in the lower right-hand corner to indicate the minutes remaining of the Trade Test Transmission. The off-screen photograph was taken in December 1976.

■ MIKE RICHARDS G4WNC, PO BOX 1863, RINGWOOD, HANTS BH24 3XD
■ E-mail: decode@pwpub.demon.co.uk ■ Web: http://www.btinternet.com/~mikespage

Decode

It seems the more I talk about how to get started the more questions I get. For this month I've had E-mails and letters from a number of readers who want a more detailed explanation of how to get some of the common decoding packages to work on their computers. As my old *FactPacks* on this subject are now well out-of-date (and out-of-print), I'll provide some guidance here. Now there's one very common theme that runs through most of the decoding packages and that's the use of a demodulator that connects to the computer's serial port. This simple device is required to convert the audio signal from your receiver into a nicely 'squared-up' signal of the right voltage levels for the computer to process. This action is carried-out by a device known as an operational amplifier.

This is probably one of the most common types of integrated circuit around and can be bought very cheaply. To perform this conversion the op-amp is wired-up with just a few resistors and capacitors. In fact you will find the diagram for this interface in the disk manual that's supplied with most programs. If you would like to try your hand at some home construction this interface makes a good starter project. A look through the adverts in *Short Wave Magazine* should reveal one or two suppliers selling kits to help you build your own interface which makes construction even easier. For those that would rather not take the risk my personal favourite source is Pervisell. Not only are their products extremely well built, but they can supply genuine registered versions of popular shareware and they offer a money back guarantee! You can find their full contact details from their ad - it's page 82 in this issue.

One of the important points about the use of this comparator interface is the way in which it uses the computer's serial port or COM port. This port was originally designed to handle standard serial communications such as signals from a modem or maybe data to a serial printer.

In these systems there is one wire to send the data, another to receive and a selection of what are known as control lines. These are used to carry signals like DSR which converts to Data Set Ready or CTS which is Clear To Send. As their names imply, these are signals which allow the computer and the serial device to talk to each other to ensure that data is only sent when the receiving equipment is ready. Now the authors of the programs we want to use such as *Hamcomm*, *JVFAX* and *RadioRaft* use the serial port in a rather different way.

Info

A look through the adverts in *SWM* should reveal one or two suppliers selling kits to help you build your own interface.

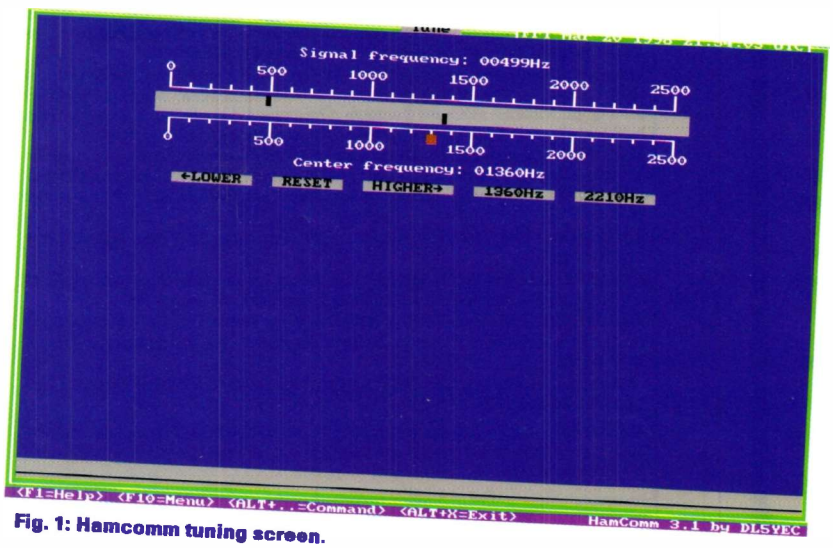


Fig. 1: Hamcomm tuning screen.

For a start, they don't use the normal data send and receive wires. Instead they use the DSR line to handle the converted audio signal from the receiver. The main reason for doing this is the need to bypass the chip in the computer that deals with the normal data signal. This is because all the computer is required to do is to count the time interval between what are known as zero crossings of the signal. To do this you need a line on the serial port that can be configured to operate one of the internal timers. Hence the use of the DSR line. One other neat trick is to take advantage of the very low power consumption of the operational amplifier and use some of the other serial port lines to supply the power. The two lines used for this are RTS and DTR. It's this non-standard use of the serial port that often gets new users confused when trying to get their program running.

Basically you can forget all the normal rules for using the serial port. This special use of the serial port is also the reason why these programs do not run successfully under *Windows*. In order to get reliable results, the decoding software needs exclusive control of the internal timer I mentioned earlier. Unfortunately, *Windows* is unable to take this demand into account and so causes the timing to go astray with usually catastrophic program crashes. Don't worry too much if you haven't understood all of this. The main points you need to appreciate are that these decoding programs use your serial port in a non-standard way and you should avoid trying to run the programs under Windows. Now if you've just splashed-out on a smart new computer with *Windows95* you're probably beginning to get a little worried.

However, all is not lost as *Windows95* includes a facility where it can be configured to run with *MSDOS* applications, which is what most decoding packages are. The way to do this is quite straightforward and I'll run through the details here. First of all you need to install the desired program onto your hard disk. Depending on the program you have this may well be done with a simple Install program on the supplied floppy disk. However, in some cases you may have to manually copy the programs over to the hard disk. If you are doing this manually, the first job is to create a new directory which you can call whatever you like. Once this is done you can then copy the files over using the Windows Explorer. One precaution that I would advise you to take at this stage is to create a *Windows95* emergency start-up disk.

This is dead easy to do and can get you out of a fix. Go to the Start menu select settings then control panel. From here hit Add/Remove programs and select Start-up Disk. You then just follow the instructions to make your emergency disk. Getting back to the point, with your selected decoding program copied to the hard disk you need to highlight the '.exe' file using Windows Explorer. Now press the right-hand mouse button and choose 'create short-cut'. Once created you can then drag this to the desktop. Once you've completed this you need to right click on the desktop icon select Properties and go to the Program tag. Now check 'Close on exit'. It's also worth, in the Run box, selecting 'maximised'. Doing this will ensure the program takes-up the full screen area. At this point you can also choose a different icon for the short-cut if you want to liven-up your desktop! Next, select 'Advanced' and click on MSDOS mode box and check the 'Warn before entering MSDOS mode'. For most programs and set-ups that should really do the trick. However, if you do have problems you may need to refer to the manual for your decoding package to see if they make any recommendation for parameters that need to be added to the 'config.sys' and 'autoexec.bat' boxes. If they do then enter them in the appropriate boxes on this screen. Next you need to click on 'Configuration' and then select any other features that are required. If you're just running *Hamcomm*, *JVFAX* or *RadioRaft* you should be able to ignore this. Once you have exited from this process you should find that you can run your program simply by double left clicking on the short-cut icon.

RadioRaft

This is a truly excellent decoding package from Francois Guillet and represents exceptional value for money. As with the other programs I'm dealing with here it uses the simple comparator interface. You will first need to follow the instructions in the 'Readme' file to basically install the software. Once complete you then need to configure the program to work with your system. The first thing you need to know is which serial or COM port you will be connecting the interface to. In most cases it will be COM 2 as you will usually find that mouse is already occupying COM 1.

Next you need to set the demodulator type. I know from readers letters that this has often been a source of confusion. However, for use with a comparator interface the correct setting is 'AF Interface' from the 'Settings' menu. That really is just about all there is to setting-up this program. In order to see the fruits of your work try setting your receiver to 4.583 or 7.646MHz using s.s.b. and see if *RadioRaft* can detect the 50baud RTTY weather broadcast from Hamburg. This station operates pretty well 24 hours-a-day and if you've got everything right you should see five-digit number groups appearing on the screen.

Hamcomm

There is a little more work to do in setting-up *Hamcomm* but you needn't be daunted because it's very straightforward. With the software copied to a suitable directory on your hard disk you again need to make sure you know which COM port you're intending to use for the interface. If you are running all three programs then you can use the same COM port each time. Telling *Hamcomm* which port you're using is a little more complex and involves editing *Hamcomm*'s configuration file. The way to do this is first of all make a back-up of the file (HC.CFG) - just save it and call it HC.OLD. Now open-up HC.CFG using a basic text editing program such as *Notepad* in *Windows95* or *Notebook* in *Windows 3.x*. Once it's open, you need to scroll down until you get to the line that says 'select port com1'. You now need to change this to read 'select port comx' where x is your COM port number. Whilst you're editing this file you might like to make a couple of other changes to optimise the program for use by listeners as opposed to radio amateurs. Scroll down till you see the line 'set timediff -3600' if you live in the UK change this to 0. Now find this line: '# Example: set mode baudot' and change it to read: 'set mode baudot', i.e. delete the first part of the line. Next move on to 'set baud 45' and change the 45 to 50. Now go to 'set afshift 170' and change the 170 to 400.

Finally locate 'set txwindow on' and switch this to off. What you've done here is to not only select the correct COM port but also set-up *Hamcomm* so that when you start-up it will use the maximum screen size for received data and will begin trying to receive RTTY using the most common format of 50baud with a shift of 400Hz. That's really all there is to setting-up *Hamcomm* for simple reception. However, you will have noted that the configuration file contained lots of settings and you should feel free to experiment with these to set-up the program just how you want it. The only guidance I would offer is to make sure you regularly save a back-up copy of the configuration file or you can get in a right mess. You will also note that you can open new configurations from the File menu. So you could have a number of different set-ups to suit different types of listening. If you feel you have put together a particularly attractive configuration file why not send me a copy so I can pass it on for everyone to use.

JVFAX

This is perhaps the most daunting program to set-up, but if you follow this simple guidance you will soon be on the air. As with the other programs the first step is to get the program installed on your hard drive. Once this is complete you can run the program to start the configuration. Don't forget this is still a *MSDOS* program

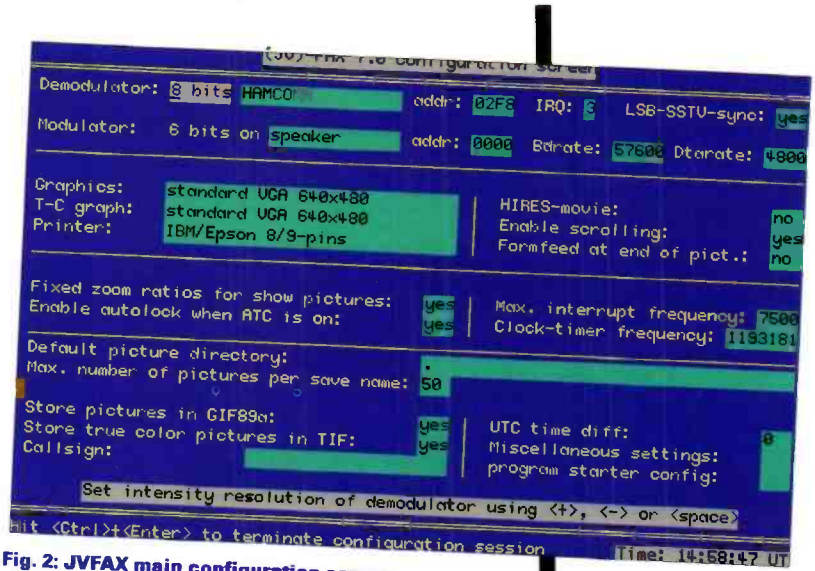


Fig. 2: JVFAX main configuration screen.

as are the others I've described here so you need to run it directly from *'DOS* or an *MSDOS* box under *Windows95*. If this is the first time you have run the program you will find that it automatically starts in the Configuration screen.

If you've run the program before then you just need to press 'C' from the main menu. Once you're in the configuration screen you can use the TAB key to move between the various fields and the Space Bar or '+' and '-' keys to change values. The first item to tackle is the demodulator as the default setting of '8 bits on serial port' won't work with the simple interfaces. This needs to change to '8 bits on Comparator'. Next comes the scary bit where you have to specify the address and interrupt number - don't fret, it's quite straightforward. The combinations to use link directly to the COM port you're using as follows: COM1 Address = 03F8 Interrupt = 4 COM2 Address = 02F8 Interrupt = 3 Next you need to move on to the Graphics section.

If you'd rather, you can leave the settings as they are, but if your system supports 800 x 600 resolution I would recommend you change the Graphics setting to match. Now move onto the printer and select the model closest to the one you have. If you're not sure just leave it set to IBM/Epson for now.

That just about completes the basic set-up but there are a few other changes you can make to tailor the program to better suit the short wave listener. To do this you first need to go back to the configuration screen and tab down to the 'Misc settings' right near the bottom. Press ESC to enter this next screen and tab down to the 'Initial RX Mode' box and press the space bar until the indicated mode shows '1 Wefax 576'. When you've done this press both CTRL and Enter to close that screen and save the changes. Next you need to press M from the main menu to enter the Mode Editor. Use the Tab key to move to the 'Deviation' box and press the space bar to change the setting to 400Hz rather than the default 150Hz. Next move on to the 'Intensity Levels' and change the value from 4 to 256. This will give you the finest grey scale but will demand more processing power, so don't change this if you're running a slow PC. In its default state *JVFAX* will display the received FAX image running from left to right starting at the top of the screen. If you would like to change this you can do so from this screen. That just about finishes the *JVFAX* set-up so why not get started straight away.

Set your receiver to s.s.b. and tune to approximately 7.880MHz and press A - if you're in luck you should see some weather pictures from Hamburg Met. That about concludes this tutorial but if you have any questions for the column or maybe some useful hints just drop me a line.

■ GRAHAM TANNER, 64 ATTLEE ROAD, HAYES, MIDDLESEX UB4 9JE ■ E-mail: ssb.utils@pwpub.demon.co.uk

SSB Utilities

A Viking T.1 glider of the Air Training Corps, which appears on thier QSL cards

Following the recent items about *Concorde*, I have received a large number of letters, either containing lists of v.h.f. frequencies, or requesting copies of them. Many thanks to those who sent in lists, I have sent copies of these to Bill Hillier who originally asked about them, and I have also spoken with Godfrey Manning about them. Godfrey says that he will use them in his 'Airband' column sometime in the next few issues, so keep your eyes peeled.

In the last but one issue I mentioned an Internet address which contained some data about *Concorde* flights across the Atlantic to New York. It seems that between me finding the address and it appearing in *SWM*, the address has either changed, or been removed. When I found the pages originally, I had simply done an Internet search for 'Concorde' and followed some of the links. I have since tried again, in an attempt to find the pages again, but to no avail. Sorry 'bout that! However, all is not lost, as there are still hundreds of pages on the Internet devoted to the world's one-and-only supersonic airliner, so there is still plenty to search for.

Godfrey Manning managed to help me out with a little bit of *Concorde* trivia - the lat/long of the 'acceleration point' in the English Channel used by the Air France *Concorde* flights. Godfrey says that it is known as 'SL4' and is at 49°32'N 000°04'E - this is just offshore from the town of *Le Havre* on the northern coast of France. From there, the flights travel north west to a point in the middle of the Channel, then they turn west until they reach Cornwall where they briefly contact London Control before transferring to Shannon. At about this time the flights can be heard on the h.f. frequencies given two months ago, as they organise their routes across the Atlantic.

LARS

By now, another successful London Amateur Radio Show (LARS) has come and gone, and once again I was 'working' on the *SWM* stand. It was interesting to meet some of you and chat, some for the first time, and some for the umpteenth time. It was a busy weekend, and I hope that everybody managed to find just what they were looking for. For myself, I bought some items for my computer, and also some more antennas to play with.

For me, the highlight of the weekend was the chance to sit-in on, and participate in, the Air Training Corps Sunday morning h.f. net. I arranged this with the ATC Officers on the stand, and spent more than an hour listening to ATC cadets from all over the UK chatting to each other and passing messages. Unfortunately, we had problems receiving some signals due to QRM from other nearby h.f. transmitters, but we did manage to join in the net with a few calls and messages. At one point, I was allowed to place a call to other stations (under guidance from the Cadet radio operator), so if you were listening during the morning of Sunday 8th March and heard the special-event callsign 'MRV92', you may well have heard my dulcet tones on h.f.

I have agreed not to mention the exact frequency that we were using, but I can say that it was 'the usual one', which is very busy each Sunday morning. I was surprised to see that our callsign was 'MRV92', as I had always thought that this was only used by the ATC at the Royal Tournament each Summer. It seems that this special-event callsign can be activated for many different events all year round, so it could crop up virtually any time. I understand that the ATC will be using this callsign during this years Royal Tournament (held at Earls Court in London between 21 July and 2 August), so keep listening around this time. Last year they had a lot of success in getting various commercial airliners to pass messages to the cadets, and I understand that they will be attempting to do the same this year.

My thanks go to **Malcolm Woods** and the other Officers and Cadets on the LARS ATC stand for the chance to sit-in on their net, ask lots of questions, and meet the 'faces' behind the 'voices' from the Sunday morning ATC Net.

Questions

Whilst at LARS, I had the chance to speak with many readers of both *SWM* and *PW*, and a few people asked some very interesting questions. One question which set me thinking was the subject of 'log-keeping', and what kind of information should you record in your own logs.

Well, the simple answer is that you should 'record as much as you feel is useful', however this may vary between a full log of everything that was said, to a simple note about the date, time, frequency and callsigns used. I think that most people would probably choose somewhere between these two extremes, and the logs that I receive would seem to prove this.

As a minimum, you need to record the date and time of the transmissions, and remember that the time is always recorded as UTC (which, for our purposes, is the same as GMT), which may also be reported as 'zulu' by some stations. In late March the clocks change, and the UK moves forward one hour to British Summer Time (BST) - but UTC stays exactly the same. It is quite surprising the number of people who fail to realise this when they send in reports and logs. For this reason alone, it is worth keeping a second clock beside your receiver (or even the in-built clock), with the time set constantly at UTC.

The next most important item to record is the transmission frequency (or even both frequencies if you are listening to a 'split-frequency' operation such as some Marine channels). Some receivers are able to display frequencies to tens of or even single hertz, but in most cases you will only need to record a frequency to the nearest kilohertz. It does not matter whether you note the frequency in megahertz (MHz), e.g. 5.680MHz or in kilohertz (kHz), e.g. 5680kHz, so long as you pick one method and stick with that method for all your loggings.

Next comes the callsigns used by the stations transmitting. Sometimes this will be the name of a ship or shore station, or maybe an airline flight callsign for instance a British Airways flight using the callsign 'Speedbird', or a military flight with some form of pseudo-cryptic callsign. Some ships may use their vessel-name, and some use their callsign - some even use both, which is a useful set of information you to collect and collate.

The rest of the information that you record in you log is purely down to whatever you are interested in, or what you have time to note down during the transmissions. If you listen to an entire conversation, you can usually pick out a lot of information about the callsigns, the operator of the vessel, aircraft, or ground station), and locations can be narrowed down by recording position reports. These position reports are also useful for working out just where a station is located. I have seen logs which detail what 'X' said to 'Y' - which in most cases is much too detailed. There is no 'correct' amount of information to record in your log, but if other frequencies are mentioned, these are always useful for future use, especially if they mention another frequency and a designator for it

One of the most useful things that you can do with your loggings is to look back through them when you hear stations again, and then you can compare the information, and maybe even work out patterns or schedules, or piece together a frequency list. This is true whether you listen to aircraft, ships or ground stations. If you are into QSLing, then the details that you put into your report will determine how much information you put into your log when you listen to a contact. If anyone has any thoughts about what to include in a typical log, and what to exclude, I would be glad to hear from you so that I can share it with others.

That's all for this month, see you all again next time around.

■ ROGER BUNNEY, 35 GRAYLING MEAD, FISHLAKE, ROMSEY, HANTS SO51 7RU

Satellite TV News

The horizon-to-horizon (h-to-h) motor on the back of my dish, exposed to the weather.

A Southampton company is now making protective covers for satellite motors, mine is in smart green with plastics ties.

Early March and the 'phone rang, it was Dave Gilroy, St. Albans. "Had I seen *PAS-5* down at 58°W?" I had thought 58°W was below our fence level but I dialled in 11.558GHz vertical and motored the dish to the west - up poped *PAS-5* - a strong signal and noise free on my mono receivers, a little sparkly in NTSC colour. That was a new bird in my log and showed that I could get down that low, in fact half my 1.2m dish at 58°W is looking into a wooden fence. I'd noticed that the vertical/horizontal polariser skew wasn't working as well as it did. An examination of the LNB head assembly established it was loose, a closer look found that the plastics clamping ring holding the LNB at the focal point had melted together with the Chaparral feed tube cap - it now has an open hole with dribbles of hardened plastics hanging down like an antique candle! I'm amazed that the dark green dish was able to reflect enough of the sun's energy to produce that level of heat at the focal point. As soon as spare time permits, an aluminium clamp is to be fitted.

Domestic calamities aside the past few weeks have been very active in the satellite analogue reception arena. The weekend of February 28th and the march of the UK Countryside Alliance, preceeded by a nationwide beacon firing on the evening of the 26th. I came across the SNG ident "UKI 120 DGSP" originating from an Irish based satellite truck and that evening they were sat on a cold and dark hilltop in Northern Ireland. At about 1815 the beacon was lit, as were more distant beacons. This event occurred over the whole UK to mark the start of the Countryside Alliance protest. 'DGSP' used *Telecom 2C* @ 3°E for this news magazine live insert - 12.599GHz vertical. A few days earlier DGSP motored 'south of the border' to Dublin Castle and offered live news inserts relating to the Multi Party Alliance/Sinn Fein discussions, again via *Telecom 2C*, for the evening news.

A remarkable computer demonstration - a corporate feed - was noticed at 0800 onwards ex USA linking into Munich at 0800 hours via *Intelsat K* (21.5°W) on March 4th. What was unusual were the rehearsals, at one point the floor manager staggered across the stage and on a nearby computer a generated figure exactly mimicked the floor manager's actions. At least it was more exciting than the *World Satellite Congress on Hypertension*, another *Intelsat K* medical entertainment - 11.623GHz horizontal on March 5th @ 1830UTC - accepting live 'phone calls from around the world.

The Winter Olympics, Nagano, Japan are over. The sports enthusiasts who are satellite activists had a field day. Most of the outbound Japanese feeds were digitally carried via Intelsat, here in Europe, *Eutelsat II F4* @ 7°E was very active distributing the various incoming events - or VTR playout of earlier events - on EBU leases. You'd see captions inlaid over snow scenes or the Olympic flames as 'EBU Multi 1 (2, 3 or 4) feed from IBC Nagano'. These were all PAL clear offerings, though were distributed with SIS (sound in syncs). EBU rumoured ending SIS and going digital end July.

Welcome back an old friend 'EBU NEW YORK', always seen in years past on Intelsat 27.5°W with news items inbound to Europe. It's now popped up on PAS-3R (43.5°W) at 12.606GHz horizontal.

Eutelsat's *Hot Bird 4* successfully flew late February and was parked into a 29°E parking slot early March for tests and also to maintain their 'squatters' rights' to that disputed slot - SES Astra have already claimed a 28.2°E operational orbit by leasing bandwidth from DFS *Kopernikus*. At least two transponders were downlinking with test transmissions, one on a PM5544 test card and another with Eurosport and scrolling caption.

Dean Rogers (London SE2) spends msot of his time tracking sports action and found that the past few weeks have carried football and more football. His high spot was the Five Nations Championship Rugby ex Paris into the UK's ITV Sport. His main hunting ground seems to be *Telecom 2C* @ 3°E and *Eutelsat II F4* @ 7°E.

It's nearly 18 months since we last heard from **Alex Smith** (Thailand) - his letter went to my old house. Alex has been globe trotting and writes from South Africa. He visited Bulawayo, Zimbabwe recently and his friends there watch AstraSat, a South African programme package from PAS-4 @ 68.5°E using a 1.2 metre dish - it's actually spill over from the main South African beam. Several of the Astra channels have been discontinued (March 1st) in favour of the SABC 1-3 services and Bop TV, these unscrambled and free to view. The service is intended for the more rural areas where terrestrial is difficult, there's a rural TV package that includes a dish, receiver, TV, rechargeable and solar panel.

On the Isle of Wight there are at least four sat-zappers grouped together and main spokesman **Roy Carman** in Sandown comments on a very busy past four weeks, with many analogue signals viewed. A couple of queries arose over a horse pageant via *Intelsat K* on February 22nd with local folk dressed in period costumes, etc., Roy identified this as originating from Sardinia at 11.590GHz vertical. Within the hour another feed via Orion-1 @ 37.5°W via WTN News New York, ABC news were advising US citizens **not** to travel into Iraq! Thirty minutes later via *Eutelsat II F2* @ 10°E a Baghdad news report into the RAI, Italy featured the local Iraqi population being mobilised and trained in active defence and fighting units, weapon training, etc. (11.159GHz horizontal). Moving to the 23rd and the sudden increase in news feeds ex Kuwait, Iraq and the Gulf in general showing both the defensive and offensive preparations for war in Iraq - almost if it was a war of propaganda between the two sides.

Medical conferences and corporates are usually transmitted in the clear, February 25 featured a medical a 'teleconference' on high and low blood pressure (*Eutelsat II F3* @ 16°E, 11.161GHz hor), probably more interesting than my 'Hypertension' sighting early in the month! And we finally welcome a new sat-zapper - **Peter Pollard** from Rugby who uses a 600mm tracking dish with Grundig 0.7dB noise LNB into a Pace MSS 508IP receiver. He's hopeful of upgrading the system to a 900mm dish shortly.

Orbital News

Space Wars has flared up dramatically early March with the arrival of Eutelsat's *Hot Bird 4* at the 29°E slot which immediately went into test transmissions - the craft launched Feb 27th. SES Astra need this slot for their delayed launching *Astra 2A* and as a temporary measure have moved *Astra 1D* into the 29°E slot to start the announced digital TV service. With *Hot Bird 4* and announced Eutelsat intentions for future permanent capacity at 29°E and

Good to see the EBU New York feeds back on the North Atlantic circuit.

Table 1.

Frequency (MHz)	Band
30 - 40	Q
40 - 50	V
50 - 60	U
60 - 70	W

transmitting in the same bandwidths as SES Astra, an interesting political situation is unfolding. Eutelsat originally wanted their *Europesat-1* project to slot at 29°E and they state the orbital slot is still theirs! Clearly more talks are ahead to resolve the problem, at stake are the future UK satellite broadcasts. The present tests (early March) identify as 'Europesat-1 network' and their press release of March 12 indicates that they're here to stay and co-existance with SES Astra at 28.2°E is "under study". SES Astra, meanwhile, are predicting the Spanish satellite market growing at 10% annually until 2010, currently over 1 million dishes are installed, rising to two million by 2002.

The three French digital platforms, ABSat; CanalSatellit and TPS, are also successful, with 1.5 million subscribers in 21 months. All three maintain they are operating to predicted budgets, despite operating at a loss.

The Swedish TV6 satellite channel, which up to the present has been free to air, will be changing to subscription PAY-TV imminently. To attract - or maintain - viewers the programme schedule is being revamped for both family and male (!) viewers, the latter group will enjoy both sport and action movies after 9pm. Free-to-air satellite programming is on offer across Africa from a new 24-hour Portuguese language channel offering sports, news and general entertainment.

Recent contracts between ACTEL and Telesat Canada will result in the construction of two major teleports, one in South Africa and the other on Gibraltar. These stations will control ACTEL's network of satellites due up over the next five years. Modifications to stations at Chilworth UK and Ontario are also included.

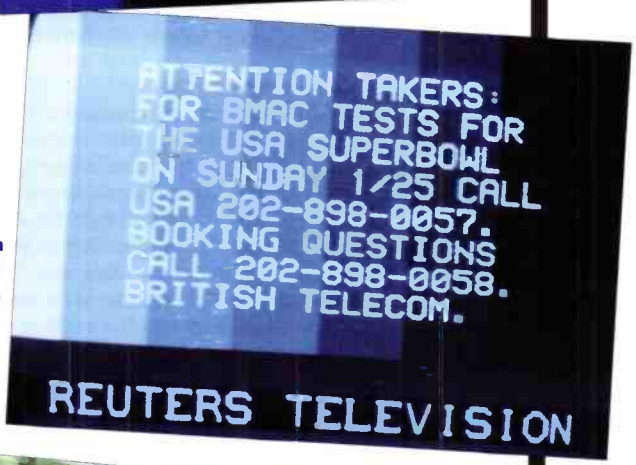
Fuji TV Network open a 3-channel TV service late April '98 on the JSkyB digital platform. The merger between JSkyB and PerfecTV, also due in April, will create Japan's largest digital satellite operation. Down the coast and AsiaSat plan to launch their replacement *AsiaSat-3R* within 18 months to 105.5°E - *AsiaSat-3* failed to reach correct orbit on Christmas Day and was written off.

Intelsat's 806 satellite launched successfully February 27th and will slot at 40.5°W, offering high level C-Band signals (40dBW) for DTH into Central/South America on 1.8m dishes. North America and Europe are also accessed through the on-board transponder loading. An additional no-charge facility is the double illumination downlink where an uplinked European signal can be simultaneously beamed into both North and South America.

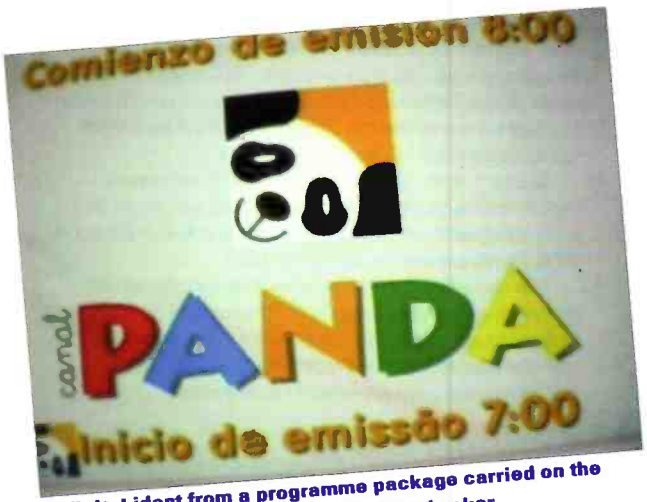
The future planning of V-Band is still under discussion, with the American FCC receiving applications for exploiting the 30-70GHz band. Though some overlap is apparent, the basic nomenclature, as detailed in the *FCC Bulletin No. 70 July '97* is shown in **Table 1**.

Dean Rogers (SE2) snapped the opening transmissions on Thor-2 @ 1°W.

3) An Intelsat K NTSC feed into Europe.



Seen via Intelsat K (21.5°W) on the Reuters lease.



A digital ident from a programme package carried on the Spanish Hispasat-1 bird @ 30°W. John Locker.

John Locker caught this live transmission from MIR via Eutelsat @ 13°E.

■ GODFREY MANNING G4GLM , C/O THE GODFREY MANNING AIRCRAFT MUSEUM, 63 THE DRIVE, EDGWARE, MIDDLESEX, HA8 8PS

Airband

Frequency & Operational News

Now to those *AIP* amendments that Martin sent, as I've already mentioned. Starting with aerodromes. Northolt route Whiskey is withdrawn. Odiham's control is linked to Farnborough's radar frequency but Odiham itself has a Flight Information Service (on the old Odiham Approach frequency).

Controlled airspace. London Gatwick has a frequency change to 134.125 (was 129.075MHz) for KENET, Seaford and Southampton SIDs. In the North Sea, east abeam of Edinburgh, the TUBOT reporting point (on UL7) has been removed. New point CUTEL is close by. Route UR23 now goes via CUTEL and GIRDO (at the Upper Information Region international boundary) instead of TUBOT and the now-withdrawn GORDO.

Of the Danger Areas, D149 Chattenden has been replaced by a small arms range. It would still be safer to give it a wide berth and I'll illustrate my point. During the Gulf War, jet-engined Tomahawk cruise missiles penetrated enemy territory and followed known roads in order to navigate to their targets. When the enemy realised this, they lay in the road and, with rifles, shot the missiles down as they flew overhead. Remember the new issue of the danger area chart is now out (ENR 6-5-1-1 and ENR 6-5-2-1, see Airband Factsheet for supplier).

I'm writing this during Winter in March (well, that's the scene outside the window!). You'll be reading this with spring well underway (I hope) and the promise of aeronautical activities ahead. I hope to try two new aircraft types this summer, visit two new airports and (briefly) a country to which I've never previously been.

Balloons & Airships

Thanks to John Griffiths, our 'Scanning' columnist, for bringing to my attention a request for airship frequencies (March *SWM* page 58) from **Gordon Howe** (Prenton). Apart from the company frequency that John gave in his column, balloons and airships are controlled on the same channels as all other traffic. This makes sense, after all, they share the same airspace!

Balloons, hang gliders and possibly some small airships also have a frequency intended for co-ordinating with ground retrieval crews. Balloons in particular can't double back to their starting point, they go where the wind takes them! The art of ballooning is to find a height at which the wind is blowing in a favourable direction. Altitude wind is invariably different in direction to surface wind.

So, 129.9 was available but 122.475 should replace it in the UK; European balloonists are given 122.25MHz. Some small airships are hot-air balloons with engines. I don't know how often these unusual craft need to transmit on the balloon-to-ground frequency.

ACARS

This stands for Aircraft Communications Addressing and Reporting System. Like amateur packet radio, it sends quick bursts of data (in this case, between aircraft and ground). Data can be received on a printer in the cockpit (see the accident report in February's 'Airband').

Now, a reader with a KT postcode has written in with some inside information. I've decided not to reveal the reader's name as I suspect that the person involved is closely associated with an airline and I don't want to cause any trouble with the employer!

Summarising some of this information, the ACARS ground network is operated by an organisation on behalf of all airlines. A failure can thus affect all subscribing users.

I've noticed that all technology can be used to advantage or, alternatively, inappropriately. This is nothing new, I'm sure that Nobel (as in prize) would agree with me following the purposes to which his development of explosives were put to.

Well, with ACARS, airlines needn't calculate final load figures at the gate. They can be sent on by data link whilst the aircraft is still taxiing to the runway.

My parents went on a short flight last autumn and the take-off queue was chaotic. Our reader asks us to think about what happens when it's our turn to take off at last, only for us to discover that the final figures still haven't been received. We couldn't calculate at what speed to rotate, etc., unless we knew the actual aircraft weight.

I'm not sure why airborne printers are noisy, as reported by our reader. Are inkjet and thermal printers unsuitable in rarified air?

Anyway, one solution is noise-cancelling headsets. They pick up ambient noise, turn it 180° out of phase, then mix some of it in with the radio or intercom signal. This reduces the background noise as heard by the pilot, providing both earphones are worn. I'm one of those with the bad habit of slipping one earpiece back so as to hear the other crew speak directly!

Some of these headsets, though, need batteries. An airline the size of British Airways could consume 10 000 batteries a week. Also, you rely on your battery remaining in good condition throughout the flight!

I should point out that ACARS only works on v.h.f. at present. Our reader is among the many who hope that satellite communications will replace h.f. on distant routes (e.g. over the North Atlantic) making the pilot's life easier and enabling wider coverage by ACARS.

I'm also asked if commercial (hobbyist) ACARS receivers can select which messages they print out, either by airline or even by airline and airport to which the message is addressed. There is no technical difficulty about achieving this but I don't have sufficient details about commercial software to know if the facility is actually provided.

More generally on the subject of v.h.f., our reader notes the introduction of 8.33kHz channel spacing in part of the communications band. I'm asked if the necessary receiver bandwidth will be too restrictive to allow reception of co-channel offset relays.

Well, I don't know of a proposal for such relays on channels where so little bandwidth is available. It would be possible for receivers automatically to switch in wider filters when operated on part of the band not subject to narrow spacing. We'll have to wait and see.

Local News

We depart for Sheffield where **Andrew Green** tells me that Air UK (I think that's the same as KLM now) operated to Amsterdam for the first time (in February). This was Sheffield's first passenger flight.

Departure was runway 28, ahead to 1500ft, track to Upton. As this is outside controlled airspace (apart from the Aerodrome Traffic Zone) I don't imagine an SID will be promulgated. I'm not sure which Upton was intended (there is more than one) but there's a built-up area and high ground to the west so a sharp about-turn towards Worksop must have been made.

Our next sector, into Luton, will pass overhead **B.F. Westwood** when 7nm from the 08 threshold. In fact, this is Dagnall, a village in the Luton zone just right of the centreline. The Compton 1B SID also comes close to Dagnall and it's hard to see how any new departure could get any nearer. Daventry SIDs off 26 make a sharp 270° left turn and close to just less than 5nm of Dagnall.

Also from 26, the Compton and Dover SIDs turns towards Henton when approximately over Markyate and pass almost 2nm south of Dagnall above 1500ft altitude (Dagnall is itself at about 300ft). I'm not aware of any new SID for Luton.

BFW also asks about radar headings. The controller tells the pilot which compass heading to fly and then watches the actual track on radar. If wind causes drift away from the track that the controller requires then a new radar heading is issued and the process repeated by the ever-watchful radar controller.

Information Sources

Thanks again to **Martin Sutton** (CAA) who kindly keeps us informed with the ever-useful amendments to the *Aeronautical*

Fly Baby 1A. *Christine Mlynek*

Information Publication (AIP). This is the official document by which the state promulgates all you need to know to fly in its airspace. For example, it describes the airways, routes and all frequencies for civil purposes. Every licensed aerodrome is listed. Also included are rules of the air, etc.

I don't recommend you buy one, though, as it will set you back something like the price of a scanning receiver! Then there's the amendment service, since changes occur all the time. Remember, each state has its own *AIP* and the one I'm referring to only covers the UK. Older readers will remember it by its original name of *UK Air Pilot.*

If you really want detailed, official information from this original source then you could try to refer to someone else's copy. Your local aerodrome or flying club/school is bound to possess one. Do ask courteously, if you show a genuine interest then you're likely to be allowed access.

When it comes to having reliable information on your own bookshelf, there are official vendors who supply summaries of *AIP* information under their own brand names. These are less detailed but far easier to find your way around, as well as being an order of magnitude cheaper!

I've listed the main ones that I know of on my *Airband Factsheet.* If any vendor provides a product that I haven't listed then please get in touch (or, better, send a review sample).

To obtain the *Factsheet,* send a reply-paid self-addressed envelope, capable of holding two A4 sheets, to the Broadstone Editorial Office. There is still some confusion about this despite my saying this nearly every month. For example, a reader in Alfreton sent a request to me for one. I repeat that I can't oblige, for the simple reason that I don't have a photocopier!

I don't usually recommend 'third party' frequency lists as published with the hobbyist in mind. If the official vendors are second-hand information, and they sell to the public by mail order, then why go for something that might be third-hand? Having said that, there are sometimes advantages in buying certain specialised hobbyist publications especially if they give wider coverage of u.h.f. and military allocations.

If you're starting out, though, I'd buy the appropriate *En Route Supplement* (for your part of the world) from Aerad (civil) and the RAF (military) and some local radio-navigation charts (Aerad again).

Swallow *Christine Milynek*

The next three deadlines (for topical information) are May 11, June 8 and July 7. Replies always appear in this column and it is regretted that **no** direct correspondence is possible.

Abbreviations

CAA	Civil Aviation Authority
ft	feet
h.f.	high frequency
kHz	kilohertz
MHz	megahertz
nm	nautical miles
SID	Standard Instrument Departure
u.h.f.	ultra high frequency
v.h.f.	very high frequency

■ PETER BOND c/o EDITORIAL OFFICES, BROADSTONE ■ E-mail:milair@pwpub.demon.co.uk

Mil Air

West Freugh

Andy A. writes to me regarding the activities at the airfield at West Freugh just south of Stranraer in Scotland. This base is under the control of the Defence Evaluation and Research Agency and apart from one based Jetstream, has no other resident aircraft. A selection of different aircraft types, temporarily deploy here to use the Luce Bay range and the adjacent Danger areas. One of the main tasks of these trials aircraft is the testing of new air launched weapons. In the past there were rumours of stealth aircraft being based at both West Freugh and Machrihanish for test purposes, whilst I suppose this was possible I shall still remain a sceptic until more positive evidence of this emerges.

Andy comments that, local news reports have suggested for some time that this airfield may be targeted for closure in the future. With that in mind, he also notes that they appear to have two brand new crash trucks worth a considerable amount of money. This may therefore indicate that closure is not as imminent as the local papers would suggest! Are there any readers in the Stranraer area who can enlighten us? A few local frequencies to note: West Freugh Tower **122.55** and **337.925**, Approach **130.05** and **260.025**, Radar **130.725** and **259.0**. Luce Bay Range, **358.825** and **376.525**.

My thanks go to Carl who offers a solution to the question of the Hercules formations, posed in March's 'MilAir'. He suggests that these C-130s probably contain paratroopers who are often deployed as part of larger exercises. To simulate a real mission they take off and remain airborne for about three hours before making a pass over the drop zone and deploying their cargo.

One specific mission in mid January was Exercise *Lanyard*, which took place on Salisbury Plain. Five, C-130s took off from Lyneham and then split into two formations of three and two aircraft. The three ship then headed Northeast and flew across East Anglia to Blakeney Point in Norfolk where they where noted by Carl. The aircraft used the callsign LEOPARD FORMATION with Marham Radar on frequency **362.75**, and the lead aircraft also used the callsign GATEPOST for other communications. It is interesting to note that Carl reports that the formation used the frequency **123.1** for air-to-air contact. This is a NATO Search and Rescue frequency and is normally used paired with the NATO u.h.f. SAR frequency **282.8**.

By coincidence, a second **Karl** has also sent me an E-mail regarding these formations. He was fortunate to visit Lyneham in March of last year and flew on a Hercules mission. He asked about these formations and it was explained that they were missions designed for low level formation flying and navigation training. The aircraft climb to a normal transit altitude when leaving Lyneham and then descend to low level for training in the prescribed low fly areas.

Incidentally, if anyone wants to listen in to exercises on Salisbury Plain, the primary frequencies to try are **122.75** and **282.25**. It is best to listen in when you are aware that the military Danger areas are active, as there can be long periods with no traffic on these frequencies.

Manston

A further newspaper cutting from **JP** in Kent tells us of changes to the airfield at Manston. The members of the RAF Manston History Club are to move their collection of military memorabilia to a new site in the near future. The forthcoming withdrawal of the RAF from Manston has meant that their current premises may no longer be available. This will not be the first time they have had to change premises and whilst the move will be awkward, in the long run it may be fortunate. The club is to move to the old transport building, which is close to the Spitfire and Hurricane Memorial museum. When I said it was fortunate, it now means that this larger building will be able to house their Gloster Meteor NF.11, which would not fit into their current premises. The club hopes that the new premises will be open by Easter and anyone with an interest in the historical side of aviation should find a visit most informative.

Mildenhall

As there had been no further news on the alleged closure of Mildenhall after the Air Fete, I decided to investigate myself and went direct to source. A call to the base has now given me some positive information. Although there is ongoing airfield maintenance planned for this year, as far as they are aware the airfield is not to close. So for those of you who were thinking of a trip to Mildenhall during the summer, it looks as though it's operations as normal. Incidentally, if you who intend to visit the airfield in the days before the Air Fete to watch the show arrivals, it may be worth keeping an eye on Lakenheath. I understand that Lakenheath may possibly have some interesting aircraft on delivery, passing through during that week.

Air Defence Radar

This month I shall start to review some of the information that you kindly sent in regarding ADR. An anonymous reader has sent in information, which relates to changes at Boulmer. RAF Boulmer turned off its radar for the last time in September and ended 45 years of Air Defence Radar operations at this site. The Type 91 radar has now been removed from the site and has been re-deployed for use somewhere else within NATO. All is not lost though, as a new Type 93 radar system, has been installed on a hill at Brizlee Wood, which is near the town of Alnwick. By my guess this would place it about 7km west of RAF Boulmer. According to my correspondent, the white radome is illuminated at night and is visible for some distance on a clear evening.

Also unveiled during 1997, was Boulmers new Mobile Air Defence Radar unit. This new system is an AR327 Commander system, (Type 101), which provides digital 3-D screening and automated tracking of aircraft. Whilst controlled from Boulmer this new system is normally located at Brunton airfield when not on mobile operations. Operated by the reformed Number 1 Air Control Centre, this new system cannot only be deployed within the UK, but can be mobilised anywhere in the world within 72 hours.

Airband Antennas

K.M. from Nottingham asks if any of our readers know of a source of ex military v.h.f./u.h.f. airband antennas. He has tried various sources but with no luck. He tells me that he currently uses an AIR-44N, but thinks that an ex-military antenna may improve his reception. I know of no such source of second-hand equipment, do any of our readers have any suggestions? Having used an AIR-44 in the past, I found it was quite effective on the airbands and he may do better to stick with this antenna. Perhaps re-locating the antenna to a higher position or using a better quality low loss cable might be an easier solution?

One of the regular visitors to Mildenhall. Seen climbing out on departure is a C-141B Starlifter.

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Info in Orbit

My apologies to those who had expected to read the feature on the quadrifilar helix antenna which I had planned to include in last month's column. A rush of timely information persuaded me to move it to this month's edition instead.

Antennas are amongst the few items which the weather satellite experimenter can build with a reasonable expectation of early success. This edition includes a look at the main types of antenna, and provides access to construction details supplied by two antenna experimenters who kindly provided d.i.y. instructions for those who want to 'have a go'.

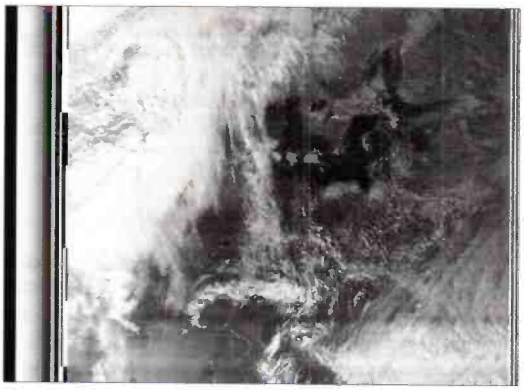

Fig. 1: METEOR 3-5 1443UTC on 10 March.

Fig. 2a: NOAA-14 22 February (raw image) from Harry Wagg.

Fig. 2b: NOAA-14 visible-light section enhanced.

Spring WXSATS

METEOR 3-5 commenced transmitting again on 10 March (on 137.85MHz as scheduled) following a rest period while its orbit precessed across the twilight plane in late February. I heard its first signal at about 1259UTC on 10 March during the first easterly, low elevation pass over Britain after sunrise. The following pass at 1440UTC was high enough to receive a good signal strength, and my first image indicated that its sub-carrier was drifting. The main image - see **Fig. 1** - was obtained after setting the software for 'unsynchronous' decoding. People are reporting hearing a tone superimposed on the audible signal, which is causing interference. I finally heard the tone on 12 March.

The ice covering the upper section of the Gulf of Bothnia shows clearly in this image, and close examination reveals that large ice sheets are also in the lower section.

How much the visible-light images from *NOAA-14* have improved since December. A number of new readers who started decoding images during early winter understandably wondered whether settings were not correct with their equipment. Questions about image enhancement were common. During February, images from NOAA-14's daytime passes were showing a little more land detail in the raw (un-enhanced) images, as seen in **Fig. 2** from **Harry Wagg** of Merseyside.

I did a little mild enhancement of the visible-light section of Harry's *NOAA-14* to show just how much detail is present.

As the sun's elevation increased in the north, so Iceland became visible in NOAA visible-light images. **Alan Jarvis** sent an image of Iceland as it peeked through the clouds during the mid-day *NOAA-14* pass on 6 March. Alan describes his antenna as "the copper corkscrew" - which sounds suspiciously like a quadrifilar - see later!

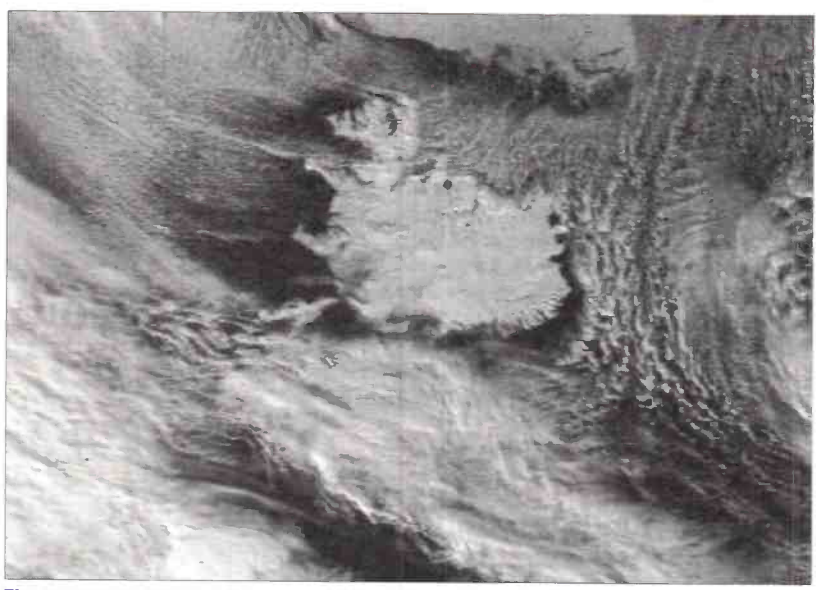

Fig. 3: Iceland NOAA-14 pass on 6 March from Alan Jarvis.

SICH-1 & OKEAN-4

SICH-1 has been transmitting images during February and March, after what seems to have been a long absence. I observed a brief transmission on 17 February - too short for inclusion here - but others, particularly people living to the east of Britain, have reported more transmissions. **Mark Broddin** lives 10km south-east of Antwerp in Belgium, and uses a Timestep receiver and the Windows *Prosat* software. His antenna is a crossed-dipole mounted on a Yaesu 5400 rotor which he believes gives better results because of the reflector. His next project is to try a crossed Yagi to obtain even better results for low passes of both *OKEAN-4* and *SICH-1*. Mark's image shows the countries around Greece, as seen in this visible-light image. Mark tells me he is also building an h.r.p.t. receiver (for receiving high resolution images), apparently designed by the Dutch group 'De Kunstmaan'.

All the images from *SICH-1* and *OKEAN-4* that I have seen reported, have been visible-light only. Both satellites carry radar-imaging facilities, which is the main reason for their launching, so hopefully we will see further transmissions.

METEOSAT 2nd Generation (MSG)

The European Space Agency issued a press release on MSG as the deadline for 'Info in Orbit' arrived. The structural and thermal model for the first spacecraft of the MSG programme will be presented to the media at ESA/ESTEC, the European Space Research and Technology Centre in the Netherlands, on Tuesday 24 March 1998 before undergoing thermal testing in the Large Space Simulator test facility.

MSG-1 is scheduled for launch in autumn 2000 and will carry an advanced radiometer and a radiation budget instrument as main payload.

MSG-2 and *MSG-3* will then provide continuity of observation and are scheduled for launch in 2002 and 2007.

Satellite Antennas

Many books have been written on the subject of antennas and the different types available for general monitoring. For those wishing to decode WXSAT telemetry for the purpose of picture production, the choice reduces to those which can receive the right-circularly polarised signals from the *METEOR* and *NOAA* WXSATS. Even so, there are several possibilities, although few are commercially available. For those willing to do some home construction, the choice is wide, and many of the more experimentally minded build and test different types of antenna. Some correspondents have written to me with details of their work, so I am pleased to be able to publish some results. First, particularly for beginners, here is short summary of the types of antenna available. Remember, it is even possible to receive a.p.t. signals on a length of wire while your main antenna is being repaired!

Discone

This is strictly a wide-band antenna (advertisements claim it can respond to signals on frequencies between about 25 to 1300MHz). In the field of WXSATS, it can only be used for monitoring - hearing - signals. It is quite unsuitable for producing a signal of adequate quality for image production.

Dipole

A simple dipole consists of two separate but identical wires, connected to a feed - see **Fig. 6.** If it is for reception of satellite transmissions in the 137MHz band, the dipole should have an overall (combined total) length of 1.145m. In this mode it is being used as a 'half-wave' dipole. When used in the vertical polarisation mode, the dipole should 'hear' the WXSATS, and several nearby non-WXSAT frequencies. Such a simple antenna - although tuned to 137MHz - will hear several satellites using the 150MHz band, hence its value for testing receivers.

The inner ends of each element are connected to the inner and outer conductors of the feeder cable, as shown in the picture. The elements - often made of copper wire - are normally supported by fixing to a long, non-conducting rod. The central section is usually fixed to a support plate. The simplicity of its design makes it ideal for test purposes.

Crossed-dipole

By combining two simple dipoles with a suitably cut and fitted phasing harness, right-circularly polarised signals from the WXSATS can be received - see **Fig. 7.**

It is normal practice to add a second set of dipoles at a specific distance below the top set - see **Fig. 8.** The lower set are reflectors, designed to improve the overall gain and directivity of the antenna. This is probably the most commonly used antenna for this purpose. The actual receiving dipoles are the top set in the picture.

Lindenblad

This unusual design has been successfully used by some WXSAT enthusiasts. It consists of four dipoles spaced around a circle of 0.3 wavelengths diameter, each dipole being tilted out of the plane of the circle, in a clockwise direction (for right-circularly polarised signals). According to the specifications for this type of antenna, its reception characteristics favour lower elevations, so as the satellite rises (and gets nearer - giving an increased signal), the signal level remains fairly constant.

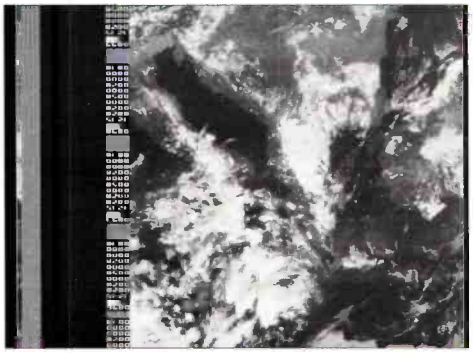

Fig. 4: SICH-1 transmission on 26 February from Mark Broddin.

A Quadrifilar Helical Antenna (QFH) Project

Bill Sykes G2HCG and **Bob Cobey G0HPO** sent a copy of their notes for the construction of a quadrifilar helical antenna. Articles on such antennas have been published in the *Journal of the Remote Imaging Group* (edition 37) by Mark Pepper, and Chris Van Lint (edition 44). The original work on the QFH was apparently done by NASA and was featured in the ARRL (American Radio Relay League) *Antenna Handbook*. Bill and Bob have experimented to produce their own version, together with d.i.y. instructions for those wishing to complete the construction.

Based on the NASA design, the tubing to be used at 137MHz (the WXSAT a.p.t. band) works out to be 19mm. A far more convenient size for use in Britain, is 8mm (which is the size used for microbore central heating pipe) - but it is not just a matter of scaling the dimensions. The successful operation of the antenna depends on a precise relationship between the currents in the two loops of the QFH; this is achieved by making one loop slightly shorter, and the other slightly longer than the calculated resonant length. By connecting the two loops in parallel, a circular pattern can be achieved, and the correct resonance then occurs in each loop. An incorrect resonance results in a 'double-dip' response, and a 'figure-of-eight' polar diagram, instead of the required circular polarisation. After construction, computer modelling and actual measurements of the antenna prototype (which was constructed by Bill and Bob) have produced very good results.

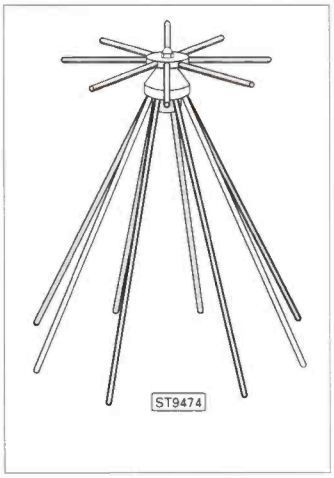

Fig. 5: The discone antenna.

The problem of weatherproofing the connections at the top and bottom of the helix was eventually solved after much computer analysis of various options. A piece of PC board was used and this gave good mechanical and electrical connections.

During construction, difficulties were experienced when bending the copper tubing; the use of copper elbows improved the appearance but prevented access by the RG-58 cable. A choke balun solved all the problems, and enabled the construction of the antenna to become straightforward, and its performance to match that of the NASA design.

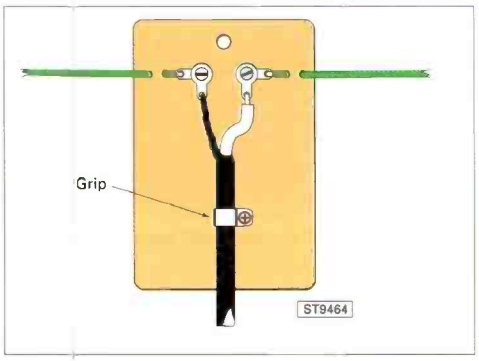

Fig. 6: Dipole connection.

Finally, if you want a copy of the construction article (three A4 pages) please send me a return-addressed, stamped envelope and secure 50p coin towards the time and cost of copying. The article lists the parts as costing within £15. My thanks to Bill and Bob for providing these detailed instructions, and to Peter Wade of Sevenoaks who wrote to me about his success in building one of these antennas.

My thanks to everyone who forwarded QFH images as a response to my request on the Internet. **Figs. 9** and **10** are just two of many received.

WXSATS Site Update

One of the most intriguing web sites which I have found during searches is that of 'OKEAN analog':
http://meteo.netgate.it/image/okean-analog/

The site carries both visible and radar images from OKEAN-4,

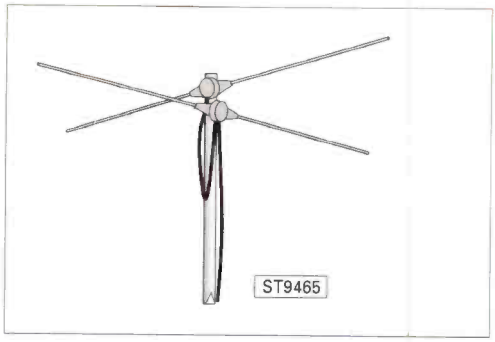

Fig. 7: Single-set crossed dipole.

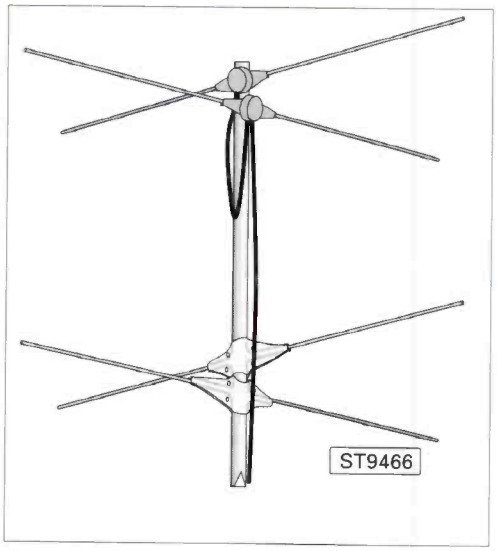

Fig. 8: Standard crossed-dipole.

presumably obtained at this Italian site, but I have been unable to contact the webmaster.

A more comprehensive WXSAT site is that of the R&D Center Scanex homepage at: **http://scanex.ss.msu.ru/**

The Research and Development Center ScanEx was established in 1989 and works in the field of the development and production of personal ground stations for meteorological and environmental satellites.

The home page provides full access to a space image gallery, a satellite image archive, the ScanEx news board, a user support page, feedback form, and information about personal ground stations. The image gallery contains selected images from *NOAA-14*, RESURS-(01-3 two instruments), METEOSAT and GOMS from 1997. Access to the archive allows the ordering on payment for Earth surface images of 35m and 150m spatial resolution, received from *RESURS-01-3* satellite with ScanER stations. The user support page provides not only a selection of useful WXSAT links, but also the schedule for the transmission of *OKEAN-4* images - our new source on the Internet!

The page about 'Personal ground stations' includes hardware and software systems for receiving and decoding data from NOAA (a.p.t. and h.r.p.t.), METEOSAT, GOMS and RESURS spacecraft and I hope to obtain more information on these systems for a future column.

RIG Conference

This is your final reminder that this year's residential conference of the Remote Imaging Group is held in Newport, south Wales on 1st, 2nd and 3rd May. Subjects to be covered include the GOES satellites, advances in h.r.p.t. systems, home-brew hardware, amongst other WXSAT topics. A number of well-known experts, such as Geoff Perry, will be giving presentations. For last minute information, contact the organiser Dave Cawley on **(01440) 820040**.

Shuttle

STS-90 *Columbia* was scheduled for launch on 16 April into a 39° inclination orbit for deployment of *NEUROLAB*, the Space Life Sciences Laboratory.

STS-91 *Discovery* is scheduled for launch on 28 May for the 9th *MIR* docking mission to supply the *Space-Hab* Single-Module.

UHF Shuttle Frequencies

Ron Parise, WA4SIR, reminds monitors that the following u.h.f. frequencies are available on the shuttle transceiver:
296.8MHz - Used during launch/landing, and EVA (extra-vehicular activities) 3-way duplex operations.
279.0MHz - Used during EVA for 3-way full duplex communications between suit-1, suit-2, and the orbiter.
259.7MHz - Launch/landing, EVA 3-way duplex operations.
243.0MHz - Standard u.h.f. emergency frequency.

A comprehensive listing of all *Shuttle* flights and payloads, together with associated information is available from me as the *Shuttle Pack*. Please include a £1 and stamped s.a.e. for the A4 booklet.

Kepler Elements

1) For a print-out of the latest WXSAT elements, *MIR*, and the *Shuttle* (if in orbit), send a stamped addressed envelope and secured 20p coin or separate, extra stamp. Transmission frequencies are given for operating satellites. This data originates from NASA.
2) I also send monthly Kepler print-outs to many people. To join the list please send a 'subscription' of £1 (secured, plus four self-addressed, stamped envelopes) for four editions.
3) You can have the data as a computer disk file containing recent elements for the WXSATs, and a large file holding elements for thousands of satellites. A print-out is included, identifying NASA catalogue numbers (for the WXSATs, Amateur Radio satellites, and others of general interest), ideal for automatic updating of your tracking software. Please enclose 50p with your PC-formatted disk and stamped envelope.

Fig. 9: TE-QFH courtesy of Dave Cawley of Timestep.

Fig. 10: QFH.gif picture from Rich Griffiths.

Fig. 11: Columbia under refit before launch.

Frequencies

NOAA-14 transmits a.p.t. on 137.62MHz
NOAA-12 transmits a.p.t. on 137.50MHz
NOAAs transmit beacon data on 137.77 or 136.77MHz
METEOR 3-5 uses 137.85MHz
OKEAN-4 and SICH-1 use 137.40MHz
METEOSAT-6 (geostationary) uses 1.691 and 1.6945GHz for WEFAX
MIR uses 143.625MHz for voice.

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Shackware

The Unmentionable Mentioned

Yes, the Internet. A name bandied almost continuously in the past few years and one which you're probably all heartily sick of, but the continuing requests for help in my mail bag have galvanised me into action, and it's now time to present you with a potted guide to getting on-line web-wise.

This being *SWM* however, we can dispense immediately with all that boring 'history of the Internet' rubbish the computer press insists on publishing and press straight on to what the 'net can do for you: provide many, many hours of enjoyment browsing some of the most in-depth listening intelligence this side of *Short Wave Magazine*, access to downloadable archives of the best radio software from around the world (and direct contact with the authors), and discussion forums where you can 'chat' with listeners from around the globe.

The Internet is best thought of as simply a big network of computers, some connected via telephone lines, some via hard-wired cables, which offers three distinct 'services' to anyone able to connect their machine to the network

Welcome to the first of the new bi-monthly 'ShackWare' columns, complete with illustrations. Being bi-monthly means more space to devote to the occasional illustration where previously, I had to cram my one quarterly page with as much text as possible!

Several hugely interesting missives passed through my letter box recently, one of which was prompted by my discussion of pocket stations in the February column. David Cripps G7IDB (d-cripps@dircon.co.uk) penned a comprehensive description of what he calls his "decoding station in a pencil case" and, though lengthy, being bi-monthly affords me the opportunity to publish it's interesting contents in full...

"I was interested in your comment on pocket stations because I'm also trying to get the 'ultimate' pocket station together, and mine is based on the HP200LX. I'm fortunate that I have a 20MB flash card that acts as the A: drive so I'm not so restricted on disk space."

For listeners unfamiliar with flash card technology, it can be thought of as simply another disk drive, though with no moving parts and created from silicon. Flash cards enable palm- and laptop users to gain access to valuable storage without the toll on space and battery power demanded by traditional drives.

"My first piece of software was *Scancat Gold* (version 6) which I use to upload and download memory channels to my AR8000 scanner, via a homemade RS-232-TTL converter (powered from the HP). Next I got a copy of *Hamcomm* (version 2.2) which worked well, and I've recently upgraded to *Hamcomm 3.1* which also seems to be working fine. *JVFax 5.1* is another recent addition (I tried version 7.0 but that kept crashing the system) though I don't seem to be having much luck with 5.1, so I'm looking for version 4.1 mentioned in 'ShackWare'. Both *Hamcomm* and *JVFax* are being fed via one of Pervisell's demodulators."

David's problem with *JVFAX 7.0* is probably because it supports only VGA and better displays while his HP200LX (a truly excellent machine for this kind of application) offers CGA. However, both versions 5.1 and 4.1 work in CGA. David continues...

"The base radio I use is a Lowe HF-225, although I'm now playing with a Sony SW100 to try and get portable s.s.b. I tried POCSAG decoding with *PD2.03* but unfortunately, this hung my machine. However, I contacted author Peter Baston, who sent me an earlier version (1.02) which, after an initial problem – 1.02 expects a signal on CTS and not the normal DSR, requiring a quick solder blob between pins 5 & 6 within the demodulator – all now works and decodes fine.

"The last addition was to get on the air and TX myself (call sign G7IDB). I sent off to Tigertronics in the states for one of their BayPac Multimode, BP-2M, packet modems. This is a fantastic piece of engineering, built inside the headshell of a 25-pin plug and can be configured as a packet modem for Baycom's packet software or as a demodulator for *Hamcomm* and *JVFax*.

"The BP-2M modem interfaces between the HP and an Icom IC24SE for both 2m and 70cm packet operation, which regularly connects to my local DX cluster (GB7DXH) with 5W into a λ/4 whip. The only downside to the BayPac is that it only outputs on DSR so I still require the Pervisell demodulator to get a signal on CTS for POCSAG . POCSAG aside, my total portable set-up consists of an Icom IC24SE, Sony SW100, HP200LX, BayPac BP-2M modem, *Hamcomm 3.1*, *JVFax 4.1*, *PD1.02* and *Baycom 1.04* – a whole decoding station in a pencil case!

"To try and get even smaller I'm looking at the Yaesu VX-1R, but can't get my hands on the tiny 3.5mm 4-pole interface it requires, so I'm sticking with the Icom for the time being. True QRP decoding."

One of the better sites on the World Wide Web: Marius Rensen's HF-FAX devoted to all things

David closes with the challenge: "Has anybody got a smaller station?"

If they have David, I'd certainly like to hear about it! Many thanks for your interesting letter which I hope might act as a 'how-to' for others interested in miniature stations.

Sorry I didn't have space for more letters this time around. Keep your questions and tips coming, but do remember to include a s.s.a.e. for a personal reply.

Intel Outside

Perhaps surprisingly, many of you continue to use computers very much outside those created by the almost omnipotent beings who pass under the names of 'Bill Gates' and 'Intel', and while this presents the odd problem for their owners, there is actually some excellent radio-oriented software available for these 'other' machines.

One such is *FaxCode* from ST enthusiast **Dave Miller**. Dave sent me a copies of his programming efforts last year and I was very impressed. Recently, Dave contacted me again to tell me he'd updated the software, ironed out a bug or two and, in the process, created some very usable ST FAX and RTTY decode software.

"Here's the latest version of the *FaxCode ST* software [writes Dave]. I was hoping to have the final release ready but there is just one thing I haven't got working yet: the open log file in RTTY mode. If you try it the computer hangs! I have re-written most of the FAX routine which has removed a lot of bugs (some fatal), changed the tuning display to a spectrum type, added a fax status display to the status line, a help page to RTTY mode and made the tuning consistent for all FAX speeds. It's working well – I picked up Kyodo in Singapore for the first time yesterday during testing.

"I haven't quite decided what to do about distributing *FaxCode*, though I thought I might release it as shareware at about £6 with a free upgrade to Version 2 (to include c.w.) for registered users. I would like to upload it to some Atari FTP sites and I will try to get it in some Atari PD libraries."

FaxCode works with even the most basic ST, copes with IOCs of 288 and 576, drum speeds from 60r.p.m. to 240r.p.m., and offers simple on-line help. At a projected shareware fee of just £6, it's a bargain. Dave acknowledges that he's yet to determine a method of distribution but (the author's permission notwithstanding) I'll be happy to provide the released version to ST owners who send me a s.s.a.e.

For further details (and to show your appreciation of his fine effort), contact **Dave Miller at 33 Springfield Park, Twyford, Reading, Berkshire RG10 9JG** or E-mail him at **davemiller@zetnet.co.uk**

The books listed have been selected as being of special interest to our readers. They are supplied direct to your door. Many titles are overseas in origin.

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LISTENING GUIDES

Airband

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AIRBAND RADIO GUIDE 3rd Edition. Graham Duke. ....96 pages. £6.99
AIR TRAFFIC CONTROL 6th Edition. Graham Duke. ....112 pages. £6.99
AIRWAVES 98. ....100 pages. £8.95
CALLSIGN 98. ....156 pages. £8.95
INTERNATIONAL AIR BAND RADIO HANDBOOK. David J. Smith. ....192 pages. £9.99
UNDERSTANDING ACARS
3rd Edition. Aircraft Communications Addressing and Reporting System. Ed Flynn. ..80 pages. £9.95
VHF/UHF AIRBAND FREQUENCY GUIDE & CALLSIGN GUIDE ....280 pages. ..£12.50
WORLDWIDE AERONAUTICAL COMMUNICATIONS FREQUENCY DIRECTORY
2nd Edition. Robert E. Evans. ....260 pages. ..£19.95

Datamodes

FAX & RTTY WEATHER REPORTS. Philip Mitchell ....88 pages. ..£11.50
GUIDE TO UTILITY STATIONS. 16th Edition. Joerg Klingenfuss. ....588 pages. ..£35.00
GUIDE TO WORLDWIDE WEATHERFAX SERVICES. 17th Edition
Joerg Klingenfuss ....436 pages. ..£25.00
INTERNET RADIO GUIDE. 2nd Edition. Joerg Klingenfuss ....350 pages. ..£22.00
WEATHER REPORTS FROM RADIO SOURCES. Philip Mitchell ....32 pages. £7.50
RADIO DATA CODE MANUAL. 15th Edition. Joerg Klingenfuss ....604 pages. ..£28.00

DXTV

DXTV FOR BEGINNERS. Simon Hamer. ....31 pages. £3.95
GUIDE TO DX-TV. Keith Hamer & Garry Smith. ....36 pages. £3.95
GUIDE TO WORLDWIDE TV TEST CARDS ....60 pages. £4.95
THIS IS BBC TV - FIRST 30YRS OF TV GRAPHICS. Keith Hamer & Garry Smith.38 pages. £4.95
THE FIRST 30 YEARS OF BBC-2. Keith Hamer & Garry Smith ....60 pages. £4.95
THE STORY OF BBC COLOUR TELEVISION. ....36 pages. £5.95

Frequency Guides

1998 SHORTWAVE FREQUENCY GUIDE. Joerg Klingenfuss. ....584 pages. ...£23.00
1998 SUPER FREQUENCY LIST CD-ROM. Joerg Klingenfuss. £25.00
* FERRELL'S CONFIDENTIAL FREQUENCY LIST 10th Edition. ....450 pages. ..£19.95
GLOBAL RADIO GUIDE 1998 ....112 pages. £3.95
PASSPORT TO WORLD BAND RADIO 1998 ....528 pages. ..£15.50
RADIO LISTENERS GUIDE 1998. ....112 pages. £4.50
SHORTWAVE INTERNATIONAL FREQUENCY GUIDE ....176 pages. ...£12.95
VHF-UHF SCANNING FREQUENCY GUIDE. Bill Laver ....192 pages. ..£12.95
WORLD RADIO TV HANDBOOK 1998. ....608 pages. ..£18.95

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PRO-2045 scanner, 200 channel, hyperscan rotary tuner, as new, boxed, cost £199, sell for, £110 o.n.o. Tel: Malvern (01684) 576989.

Racal RA1772 receiver, complete with operator manual and maintenance manuals, buyer to collect, £550. Tel: Pontypridd (01443) 204180.

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Trio R-1000 communications receiver, 150kHz to 30MHz, a.m., s.s.b., c.w. with AT-1000 a.t.u., v.g.c., £150 o.n.o. D. Buckley G3VLX, 1 Roundel Way, Marden, Kent TN12 9TW, Tel: (01622) 831582.

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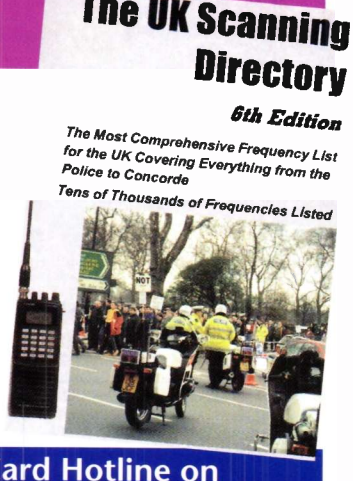

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