

ICOM

Count on us!

IC-R7000, 25-2000 MHz, Commercial quality scanning receiver



ICOM introduces the IC-R7000, advanced technology, continuous coverage communications receiver. With 99 programmable memories the IC-R7000 covers aircraft, Marine, FM Broadcast, Amateur Radio, television and weather satellite bands. For simplified operation and quick tuning the IC-R7000 features direct keyboard entry. Precise frequencies can be selected by pushing the digit keys in sequence of the frequency or by turning the

main tuning knob. FM wide/FM narrow/AM upper and lower SSB modes with six tuning speeds: 0.1, 1.0, 5, 10, 12.5, 25KHz. The IC-R7000 has 99 memories available to store your favourite frequencies including the operating mode. Memory channels can be called up by pressing the memory switch then rotating the memory channel knob, or by direct keyboard entry. A sophisticated scanning system provides instant access to the most used frequencies. By depressing the Auto-M switch, the IC-R7000 automatically memorises frequencies that are in use whilst it is in the scan mode, this allows you to recall frequencies that were in use. The scanning speed is adjustable and the scanning system includes the memory selected frequency ranges or priority channels. All functions including the memory channel readout are clearly shown on a dual-colour fluorescent display. Other features include dial-lock, noise blanker, attenuator, display dimmer and S-meter and optional RC-12 infra-red remote controller, voice synthesizer and HP 1 headphones.

IC-R71E, General coverage receiver.

The ICOM IC-R71E 100KHz to 30MHz general coverage receiver features keyboard frequency entry and infra-red remote controller (optional) with 32 programmable memory channels, SSB, AM, RTTY, CW and optional VFO's scanning, selectable AGC, noise blanker, pass band tuning and a deep notch filter.

With a direct entry keyboard frequencies can be selected by pushing the digit keys in sequence of frequency. The frequency is altered without changing the main tuning control. Options include FM, voice synthesizer, RC-11 infra-red controller, CK70 DC adaptor for 12 volt operation, mobile mounting bracket, CW filters and a high stability crystal filter.



Helpline: Telephone us free-of-charge on 0800 521145, Mon-Fri 09.00-13.00 and 14.00-17.30. This service is strictly for obtaining information about or ordering Icom equipment. We regret this cannot be used by dealers or for repair enquiries and parts orders, thank you.

Datapost: Despatch on same day whenever possible.

Access & Barclaycard: Telephone orders taken by our mail order dept, instant credit & interest-free H.P.

Icom (UK) Ltd.

Dept SW, Sea Street, Herne Bay, Kent CT6 8LD. Tel: 0227 363859. 24 Hour.



JANUARY ISSUE ON SALE
DECEMBER 22

|15| WIN-108 Scanning Airband
Receiver



Cover Airband columnist Godfrey Manning puts the WIN-108 handheld airband scanner through its paces and reports on his findings.

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A WORD IN EDGEWAYS

Sir

Through you, may I say "Thanks for the memories, Mr Hewlett", SWM Oct 88. Tuning in the 1930's was a memorable experience. The radio waves seemed clear and fairly crackled with stations all around the world, mainly transmitting local and national programmes far more interesting than a lot of the material we hear today.

Sadly, all my pre-war QSL cards and memorabilia were lost during WWII, so the magazine segments included in the article were scanned with a magnifying glass. VK2ME, Sydney, I remember very well as I used to monitor their Sunday experimental broadcasts. From Guatemala I received a splendid QSL card and a kilo of coffee beans packed in a miniature sack. India, if I recall, had short wave stations in Bombay (VUB2), Calcutta (VUC2), Delhi (VUD2) and Madras (VUM2), with occasional programmes of hotel dances, complete with the hum of conversation and the genteel rattle of crockery.

North America was a rich vein to explore, the major networks transmitting programmes made for home consumption, complete with commercials. It was my first experience of the big bands of that era and many vocalists who were to become household names in later years. The major networks were the National Broadcasting Company, Columbia Broadcasting System and the Mutual Broadcasting System, and I remember hearing part of the Orson Welles production of H. G. Wells "War of the Worlds", plus the many newscasts which followed

IF YOU HAVE ANY POINTS OF VIEW THAT YOU WANT TO AIR PLEASE WRITE TO THE EDITOR. IF YOUR LETTER IS USED YOU WILL RECEIVE A £5 VOUCHER TO SPEND ON ANY SWM SERVICE.

The Editor reserves the right to shorten any letters for publication but will try not to alter their sense. Letters must be original and not have been submitted to other magazines.

aimed at calming down the panic stricken listeners who took it for real.

Other stations in the USA remembered include Cincinnati, Philadelphia, Boston, Miami and a rare catch - Treasure Island, San Francisco, with a programme of Latin American music played by Xavier Cugat. This station was on the air during the Golden Gates Exposition

in 1938. A Canadian station comes to mind, Montreal and CHNX St. Johns, Newfoundland.

Thanks again, Mr Hewlett. Great days and nights they were, and this old timer has derived a lot of pleasure from turning over the ashes of fifty years ago.

ALAN SMITH
DUSTON
NORTHAMPTON

Sir

In a letter from one of your readers in June's issue, I read that your review of the Matsui MR-4099 was done in September 88's issue.

Please, please, please! In future when you are going to publish next year's magazines, this year, could you do a special feature on the month's football pools results?

Hoping to retire shortly very rich, well, at least a fiver better off.

Can I just add my congratulations on what is quite an excellent magazine. You seem to be striking an excellent balance for all aspects of listening, not just SWL's.

D. B. GLOVER
NEWTON-LE-WILLOWS

Sir

Thank you for publishing my letter in the July edition of Short Wave Magazine, in which I was seeking information on some pictures that I have that were transmitted by radio in the 1928-30 period.

I was pleased to read the helpful and informative letters subsequently published from Russell Lee of Oxford and Adrian Coleman of Norfolk and would like to thank them for responding to my plea for information. I have my local library seeking the recommended book "Television Today & Tomorrow".

It was indeed pleasant to meet some of the staff of Short Wave at the National Exhibition Centre at the RSGB Rally and Conference and discuss radio topics a first hand.

ALWYN SAUL
LEAMINGTON SPA
WARWICKSHIRE

Sir

I have read Mr R. Bradley's letter of Oldham, Lancs, in this column in the Sept 88 issue of the Short Wave Magazine with interest. With regard to information he seeks for his P.C.R.3. Ex-Army radio receiver, I'd like to give some brief information, since nearly a year ago, I acquired a P.C.R.2. (I wish mine was P.C.R.3. Instead!), which I had to restore to full working order from a totally mutilated wreck condition!

I left no stone unturned to find a circuit diagram etc., but in the end I now have a full circuit diagram, notes and an article published, to do some modifications for better reception and few add-on circuits.

Anyway, the P.C.R.3. (with variations) was made by PYE, during the Second World War years, and came to surplus market in the beginning of the 1960s, along with other models, namely; P.C.R., P.C.R.2. and P.C.R.3. Originally designed to work off 12V d.c. supply, with the h.t. provided by the vibrator pack, somehow the original power supply unit did not appear to be advertised by the surplus dealers. O. S. EKINOGLU
DENTON
NEWCASTLE-ON-TYNE

WHAT'S NEW

1989 Rallies

We've been sent some advance information on rallies for 1989:

January 29: The NARSA Norbreck Radio and Electronics Exhibition (formerly held at Belle Vue in Manchester) will be held in 1989 at the Norbreck Castle Exhibition Centre, Blackpool. Details can be obtained from: Peter Denton G6CGF. Tel: 051-630 5790.

February 26: The 2nd Taw and Torridge Rally will be held in the BAAC Halls, The Pill, Bideford in North Devon. These premises are larger than last year. The doors open at 10.30am with talk-in available on

S22. There will be trade stands, a bring & buy, refreshments and a bar as well as ample parking. More details are available from: G0AYM. Tel: 0805 23776.

May 7: The Southend & District Mobile Rally will be held at Roach Way Youth Centre, Rochford, Essex. Doors open at 10am. More details from: Ted G4TUO. Tel: 0702 202129.

If you are organising a rally and would like us to publish details, send in any information as soon as possible. We must have at least six weeks notice of events to be sure of being able to mention them.

Octopus Work Holder

The Octopus fits to a work surface and has six flexible "stay-put" arms, four with crocodile clip ends, one with a magnifier and one with a magnetic head. This should enable the hobbyist to work on a variety of projects without having to ask someone else to "come and hold this a minute please".

The Octopus Work Holder costs £5.95, and could be worth considering as a Christmas present. More details from: **Freetrade (TEP) Ltd., Unit 15C, Avery Industrial Park, Garrison Lane, Bordesley Green, Birmingham B9 4QE.**

WHAT'S NEW

Snippets from Radio Sweden



RADIO SWEDEN
S-105 10 Stockholm



Burundi: The Voice of the Revolution is carrying out test transmissions from a new 100kW short wave transmitter, built with help from Libya. This station uses short wave frequencies of 3.33 and 6.14MHz.

Cuba: The BBC Monitoring Service reports that Radio Havana Cuba made extensive changes in its schedule on September 8. A new broadcast in English to Europe, the Middle East and Africa can be heard 2000-2100 on 11.775MHz.

A new 10 minute DX show for s.w.l.s called DXers Unlimited started in early September. It's on the air on Sundays at 0035, 0235, 0435 and 0635 to the Americas (Saturday evening East Coast North American time). It's broadcast on the usual Radio Havana frequencies.

Ireland: The joint Irish-Luxembourg station Radio Tara has received planning permission for its long wave transmitter site, despite protests from environmental groups and local residents. According to the head of news at Radio Luxembourg's London office, Tara should be on the air by the middle of next year on 254kHz long wave.

Israel: Kol Israel has a new broadcast in Yiddish, not listed in the schedule. It's at 0340 on 738kHz, 9.855, 11.585, 11.605, 11.655 and 12.080MHz.

Tunisia: Since September 20, Tunisian Radio's domestic service in Arabic has been monitored on short wave: 0330-0600 on 7.475, 9.675 and 12.005MHz; 0600 on 11.55, 12.005 and 17.610MHz and 1700-2200 on 7.475, 9.675 and 12.005MHz. The

external service in Arabic has not been heard since April 1988.

Sweden: Beginning October 12, most of the Radio Sweden frequencies to Asia have been changed. To East Asia at 1200-1400 they will use 15.19MHz instead of 9.565MHz. To South Asia at 1200-1600 they will use 17.81 instead of 15.43 and to South Asia between 1230 and 1400 the frequency 21.57 instead of 17.78MHz. Finally to South Asia at 1530-1600 they will be on 15.33MHz instead of 17.78MHz.

Bhutan: The Bhutan Broadcasting Service has a new address: PO Box 101, Thimphu, Bhutan. Burkina Faso: Every Friday, Radio Burkina Faso broadcasts Japanese lessons at 2130 on 4.815MHz.

China: The Zhejiang People's Broadcasting Station in Hangzhou has begun broadcasting for overseas listeners daily between 1350 and 1400. The programmes are in Standard Chinese, English and other foreign languages. Frequencies used are 810kHz, 2.475 and 4.785MHz and on f.m. 98.6MHz.

The Voice of Jinling has increased broadcasts to Taiwan. Daily from September 26 the station uses 7.215MHz from 0055 until 0300. On 4.875MHz transmissions are at 1505-1600 as before.

The Jiangsu People's Broadcasting Station is relaying some of the programmes of Voice of Jinling daily at 1500-1530 on 702kHz, 1.314 and 1.602MHz.

Finland: According to announcements in

the German Service of Radio Finland, the transmitter on 6.12MHz is now using 500kW instead of 250kW.

Panama: The radio station La Exotica in Panama City which was closed by the government on February 9 has been observed broadcasting again on 740kHz since September 25. The station identified itself as "La Exotica" but relayed programmes of Radio Alegre. Other Exotica network stations have also been observed relaying Radio Alegre: La Exotica in Colon on 850kHz and La Exotica in Provincias Centrales on 800kHz. Still remaining closed are Radio Exito in La Chorrera and La Exotica in David.

Romania: Radio Romania, which seems to be the new name of Radio Bucharest, has made two frequency changes in its English schedule: 6.105MHz replaces 9.75 during the 2100-2130 broadcast and between 0645 and 0715 11.740 replaces 11.790MHz.

USA: KVOH announces an address which differs from the one listed in the WRTH 88: High Adventure Radio, The Voice of Hope, Box 93937, Los Angeles, CA 90093, USA.

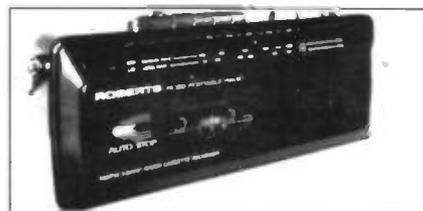
Publications: The Italian magazine DX Fanzine is published by Gruppo d'Ascolto Due Mari. A sample copy is available for one IRC, one US dollar or 1000 Italian Lire in cash or Italian stamps from GADM, c/o Carlo Pepe, Via Cesare Battisti 27, 74100 Taranto, Italy. DX Fanzine is written almost entirely in English.

New Launches from Roberts

Roberts Radio, the British manufacturers of quality radios and holders of three Royal warrants, are adding two new three-band models to their range. In their traditional style of teak and leathercloth cabinets is the model RP26 with six pre-set stations, simplicity of operation being the outstanding feature. This 265 x 195 x 80mm set can be run off mains or batteries and has a 3.5mm socket for headphones. The distinguished styling is available in five colours: black, red, blue, tan or light grey. The recommended retail price is £72.

In contrast is the black cased mono radio cassette recorder, the RC30, measuring 315 x 135 x 99mm. It weighs 1.6kg and has auto stop on record/playback, a built-in electret microphone, is mains or battery operated and comes with headphone socket. The recommended retail price is £47.

Both radios should be available from your local Roberts Radio distributor. For more details, contact: **Roberts Radio Co. Ltd., Molesey Avenue, West Molesey, Surrey KT8 0RL.**



Mains Protection

Spikemodule is a throwaway device which protects against power line overloads. It plugs into an available socket in any IEC320/CEE22 power distribution system. It can absorb lightning induced surges up to 4500A. Constant excessive surges in the line are controlled by the Spikemodule. If the surges reach an unacceptable level, a small panel on the component body changes colour, indicating that the unit is inoperative and requires replacing. Operating voltage is 250V a.c., frequency 50Hz and the maximum continuous power rating is 0.6W with a maximum peak current of 4500A. The response time is 25ns. For further information, contact: **Rendar Ltd., Durban Road, South Bersted, Bognor Regis, West Sussex PO22 9RL. Tel: 0243 825811.**



Surface Mount Switch

ITW Switches have developed a new miniature mounted slide switch for their "Mr Clean" range. The switch is available in d.p.d.f. and measures 0.5 x 0.3in with an overall height of 0.75in. If required, there is an optional anchoring pin for increased stability. The switches are supplied in 24mm tape or tube with terminal bases for automatic insertion, and are compatible with medium size pick and place machines handling standard SOIC and PLCC components. The switches are rated at 240mA at 125V a.c. dry circuit and have a life expectancy of 10 000 mechanical actuations. For more details on these switches, contact: **ITW Switches, Norway Road, Portsmouth, Hampshire PO3 5HT. Tel: 0705 694971.**

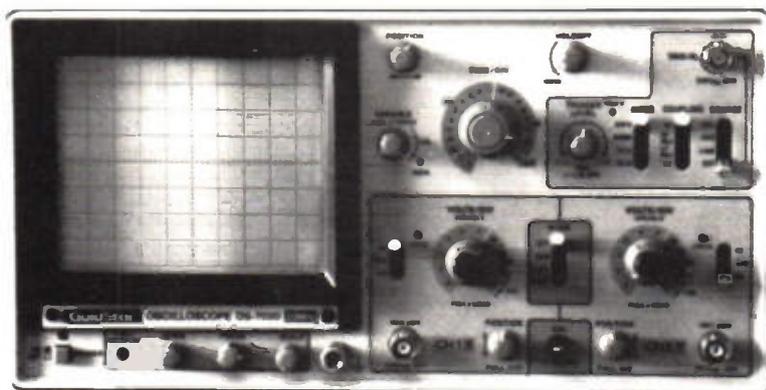
WHAT'S NEW

Gold Star 'Scope

The OS7020 has a 6in rectangular c.r.t. and is a 20MHz dual trace model. The display features an 80 x 100mm internal graticule with scale illumination, front panel trace rotation, a photographic bezel, external intensity modulation and an accelerating potential of 2kV.

Vertical deflection sensitivity is from 1mV/cm, with continuous control between the 10 calibration steps indicated with an "on" l.e.d. Dual trace operating modes also include add, subtract, alternate and chop plus a convenient X-Y mode for phase measurements. Horizontal deflection gives 19 calibrated sweep speeds from 0.2s/cm to 200ms/cm with a fastest uncalibrated speed of 20ns. Automatic and normal triggering are backed by a "hold off" control, slope selection and a TV sync separator for video signals.

The unit is supplied complete with two switched input probes, mains lead, spare fuse, operation manual and two year guarantee. It costs £289.80 plus VAT. More details from: **Alpha Electronics Ltd., Unit 5, Linstock Trading Estate, Wigan Road, Atherton, Manchester M29 0QA. Tel: 0942 873434.**



QTI-TNA

QTI-TNA, the Talking Newspaper for blind radio amateurs has now become established at a new base in Lancaster. The service provides cassette recordings of technical items selected from current radio magazines. These are sent to more than 120 blind amateurs worldwide.

It was started eight years ago, initially for about a dozen members, by John Feeley G4MRB and his wife Diz G6DIZ and run from their home in Sheffield. Through their enthusiasm and dedication this unique service has continued to grow. Their efforts have been supported and encouraged, both materially and financially, by the electronics industry and the radio press. John, as Chairman, and Diz, as honorary Secretary, resigned at the AGM on July 17 for personal reasons.

QTI-TNA has now moved to Lancaster where it is being run by Harry Longley G0JKT with the help of students from the University of Lancaster. Support from radio amateurs in the Lancaster area will be very welcome and further help with funding will be greatly appreciated. Visually handicapped persons who wish to receive the QTI-TNA recordings every fortnight may join the service by making a subscription of £3.50.

If you would like to sponsor a member, you could send a donation or a covenanted subscription. Please contact QTI-TNA through: **Harry Longley, 7 Anderson Close, Lancaster LA1 3JE.**



Sony Specialists

Sony is to nominate 100 dealers around the country as short wave specialists to lead the push into this under-developed market with a complete range of exciting products. Sony currently has a range of 10 short wave radios, priced between £69.95 and £299.95 and targeted to appeal to the business traveller and right through to the short wave enthusiast.

Special sales and technical training courses will be given to staff of the nominated dealers. Now the Sony Short Wave Centres are appointed and certificates issued you can find the names of the Centres from Sony's adverts (see SWM November pages 26/27).

Four-way Sockets

Ruggedly designed, four-way trailing mains sockets from Freetrade (TEP) are now available at £8.89 including VAT. The sockets have an attractive off-white finish and are fitted with two metres of 13A, 3-core cable and a 13A plug. Both plug and socket are fused. A red neon indicator is included on the top surface to show

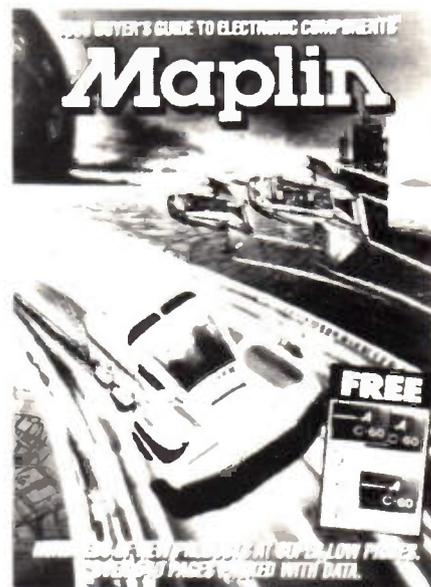
if power is applied to the socket. Freetrade (TEP) can also supply 1-way versions with the same specification at £4.95. For d.i.y. applications, the sockets are also available without cables/plugs. More details from: **Freetrade (TEP) Ltd., Unit 15C, Avery Industrial Park, Garrison Lane, Bordesley Green, Birmingham B9 4QE.**

DXAGB

The DX Association of Great Britain have send us the details of the Chairman (and acting Editor of their Newsletter). He is **E.A. Rickett, Flat 13, 63 Eton Avenue, Hampstead, London NW3.** That's the address you should write to for any information on the group.

Catalogues

With over 500 new products, the pages increased to 550 and the print run increased to 210000, the 1989 Maplin Catalogue is bigger than ever. Already available is the new Maplin "Winter Collection" brochure featuring all kinds of bargains and ideas. Also available now is the new Maplin Professional Supplies Trade Catalogue.



The 1989 catalogue is available at £1.95 from either W.H. Smith newsagents, Maplin Mail Order or Maplin stores.

BOOKCASE

THE POCKET GUIDE TO RTTY AND FAX STATIONS

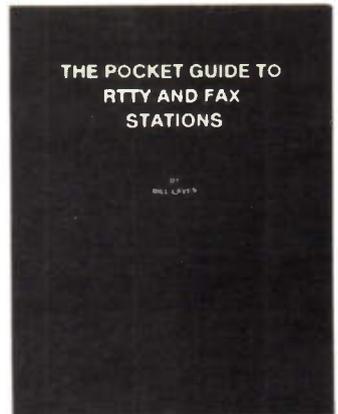
by Bill Laver

Available from Short Wave Magazine Book Service

147 x 210mm, 46 pages. Price £2.95 plus 75p P&P

ISBN 0 9512729 5

If you're wondering what kind of stations you can listen to on RTTY or watch on FAX, but don't know where to start then this book may provide that starting point. There are three columns: Frequency, Station, Mode, etc. The first is really self-explanatory and the frequencies are listed in numerical order. The second column gives the name of the station and the last column gives the mode the station uses. Where possible, it also gives detail of that mode e.g. 850/50N (850/50 is the speed of the RTTY signal and N means normal shift), the callsign, where known, is also given in this column. Obviously, in a book of this size, there isn't the detail that the more expensive RTTY guides give, but it could provide a good reference book for the beginner in the world of data communications.



PASSPORT TO WORLD BAND RADIO 1989

Published by International Broadcasting Services Ltd

Available from Short Wave Magazine Book Service

178 x 253mm, 415 pages. Price £12.95 plus 75p P&P

ISBN 0 914941 17 8

This book provides the reader with the information needed to enjoy the various radio shows broadcast from all around the world. Included in the book are schedules from the radio stations, a Buyer's Guide to more than ninety portable radios and tabletop receivers as well as articles on how to get started and what you can hear. The section called "What's On Tonight" was very interesting. It is an Hour-by-hour guide to the types of programmes being transmitted. It also highlights which transmission times are "prime time" ones and where in the world too. There's also a section detailing the broadcasts to be found in English. The "blue pages" are a quick-access guide to worldwide schedules and once you have read the first page they're easy to use.

SOLID STATE DESIGN FOR THE RADIO AMATEUR

by Wes Hayward W7ZOI & Doug DeMaw W1FB

Published by the ARRL

Available from Short Wave Magazine Book Service

208 x 277mm, 256 pages. Price £10.95 plus 75p P&P

After several years out of print, this popular book has been republished by popular demand. Amateur radio has always been a hobby where some of the participants have constructed their own equipment. This has usually been either for economic reasons, or the fact that the amateurs couldn't buy equipment with the facilities they wanted. Then there are the amateurs who build equipment because they want to enlarge their knowledge of how circuits operate, this book seems to be aimed at this group. There are chapters on semiconductors, basic transmitter design, power amplifiers and matching networks, receiver design, test equipment and accessories, modulation methods and portable gear. Emphasis has been placed on methods which are currently popular in the amateur community among experimenters and designers. The book doesn't offer a complete treatment of solid-state design principles for communication as you would need a book many times the size of this one. Instead readers are directed towards other publications if they wish to know more than is given on any particular subject.



THE ARRL ANTENNA BOOK 15th Edition

Published by the ARRL

Available from Short Wave Magazine Book Service

208 x 277mm, 705 pages. Price £14.95 plus 75p P&P

ISBN 0 87259 206 5

Antennas come in many shapes and sizes, from a simple straight wire to complex arrays, but all perform according to the same basic principles. These are explained in this book, which then goes on to help the reader choose an antenna and explain how to build, install and adjust it. Examples are given of hundreds of antennas with full constructional details, so even beginners should find projects they can tackle. Although much of the text comes from previous editions of this book, the new material is impressive. Part of this is based on computer analyses of antennas, using state-of-the-art software. This has allowed a more detailed look at antenna operation. There are also new sections not directly related to antenna hardware, such as tables of latitudes and longitudes of DX locations, information on how to point your antenna and so on.

GRASSROOTS

Lorna Mower

Southgate ARC meet 2nd & 4th Thursdays, 7.45pm in Holy Trinity Church Hall (Upper), Winchmore Hill. November 24 is demo RTTY station by club member and December 8 is their AGM/Club Awards. Brian Shelton on Winchmore Hill 2453.

Braintree & District ARS meet 1st & 3rd Mondays, 7.30pm at Braintree Community Centre, Victoria Street (next to Bus Park) December 5 is Cheese & Wine Christmas Party and the 19th is an Informal. Norma Willicombe G0FPW on Braintree 45058.

Chelmsford ARS have Fire and Rescue Communications G4MUS on December 6. Meet in the Marconi College, Arbour Lane, at 7.30pm. Roy Martyr G3PMX on Chelmsford 353221 Ext. 3815 (Office).

West Bromwich Central RC meet Sundays, 7.30pm in the Upstairs Room of the Sandwell Pub, West Bromwich High Street. Further details from Bill Oakes G1YQY on Wednesday 3183.

Derby & District ARS have a Junk Sale on December 7, their Christmas Party in the Clubroom on the 14th and a Constructors Contest on the 21st Wednesdays, 7.30pm at 119 Green Lane. Kevin Jones G4FPY on Derby 669157.

Tennis Club, Holland Avenue, Cheam. Natter Nights are 1st Mondays in the Downs Bar. December 4 is a 144MHz fixed/AFS Contest and the 16th is their Christmas Get-Together. John Puffock G0BWV on Sutton & Cheam 9945.

Reading & District ARC meet alternate Tuesdays, 8pm in the White Horse Pub, Emmer Green. December 6 is a Constructional Contest, the 13th is their Christmas Dinner and the 20th is an Informal in the bar. Mike Anthony G4THN on Reading 774042.

Thornbury & District ARC have Radio Astronomy G4ZOG on December 13. Meeting time and place from H. Cromack G0FGI on Thornbury 411062.

Vale of Evesham RAC meet 1st & 3rd Thursdays, 1st Thursdays are Formal, 7.30pm in the MEB Club, Worcester Road. December 1 is their 3rd Annual Dinner at Chequers Inn, Fladbury and the 15th is their Christmas Get-Together. Mike G4UXC on Evesham 831508.

Rugby ATS meet Tuesdays, 7.30pm at the Cricket Pavilion, outside Rugby Radio Station. November 29 is Test Gear Night and December 20 is their Sherry & Mince

7.30pm in The Norfolk Dumpling, Livestock Market, Harford. November 30 is an Informal/Committee Meeting. Craig Joly G0BGD on Norwich 485784.

Cheshunt & District ARC have Natter Evenings on December 7/21 and their Christmas Cabaret by Roy and Karen on the 14th. Wednesdays, 8pm in the Church Room, Church Lane, Wormley. Peter Davies G1KQA on Lea Valley 764930.

Bredhurst R & TS meet Thursdays, 8pm at Parkwood Community Centre, Parkwood Green. December 1/15 are Natter Nights and the 8th is Advanced Car Control Techniques G0ARB. Trevor Cannon G6YLW on Medway 32153.

Verulam ARC have their annual Rally on Sunday 27 November. December 20 is their AGM in the RAF Association HQ, New Kent Road, 7.30pm. Hilary G4JKS on St. Albans 59318.

Yeovil ARC meet Thursdays, 7.30pm at the Recreation Centre, Chilton Grove. December 1 is Open Wire Feeders G3MYM, the 8th is G3MYM on the New Licence Conditions, the 15th is G3MYM on Circular Polarisation and the 22nd is Mince Pies on the Air. David Bailey G1MNM at 7 Thatchem Close, Yeovil BA21 3BS.

Wakefield & District RS have a Practical Evening on November 29, members on the air v.h.f. contest on December 13 and their Christmas Social is on the 20th. Tuesdays, 8pm in Ossett Community Centre, Prospect Road. John Roberts G1XYT at 1 Pomfret Place, Garforth, W. Yorks LS25 2NL.

Grafton RS meet 2nd & 4th Fridays in the Holy Trinity Church Hall, Stapleton Hall Road. November 25 is Enamelling G4LU. Rod G0JUZ on Southgate 8154.

East Lancashire ARC have an Informal on November 29 and their AGM on December 6. 1st & last Tuesdays, 7.30pm in the Conservative Club, Cliffe Street, Rishton. Philip Drew G1OPV on Accrington 32936.

Loughton & District ARS meet 1st & 3rd Fridays, 7.45pm in Room 20 of Loughton Hall. December 2 is a Night on the Air using club callsign G4ONP and the 16th is their Christmas Dinner at Ciro's Restaurant (provisional). John Ray G8DZH on Loughton 3434 (after 6pm).

Poole RAS have a Construction Evening on December 16. Meet in the Commander's House, Constitution Hill Road, Poole, 7.30pm. Dave Mason G3ZPR on Poole 674539.

Edgware & District RS meet 2nd & 4th Thursdays, 8pm in Watling Community Centre, 145 Orange Hill Road, Burnt Oak. November 24 is a Quiz and December 8 a Junk Sale. Ian Coe G4UJZ on Hatfield 65707.

Wimbleton & District ARS have The Dip Oscillator and Its Use G3ESH on November 25 and a Social on December 9. 2nd & last Fridays, 7.30pm in St. Andrews Church Hall, Herbert Road. Tom Mansfield G3ESH on 01-942 1418.



Bath & District ARC have their Christmas Party on December 21. Alternate Wednesdays, 8pm at the Englishcombe Inn, Englishcombe Lane. Eric Otten G4GEV on Combe Down 832156.

Mid-Warwickshire ARS have their Christmas Supper Night with an RSGB Guest on December 13. 2nd & 4th Tuesdays, 8pm in St. Johns Ambulance HQ, 61 Emscote Road. P. Brown on Marton 632370.

Midland ARS have their Christmas Party on December 6. Meet Tuesdays at 7.30pm, with classes from 7pm in Unit 16, 60 Regent Place, Birmingham. Wednesdays is Morse. Thursdays is a Night on the Air. Tom Brady G8GAZ on 021-357 1924.

Wyre ARS meet 2nd & 4th Mondays. December 5 is Club Activities on Video 1988 and the 19th is their Merry Christmas Together Night, these two meetings are at the Fleetwood Sea Cadet Corps, T.S. Conqueror, Princes Way, Fleetwood. November 25 is Dinner and December 12 Lancaster University Challenge. Dave Westby G4UHI on Lancashire 854745.

Pontefract & District ARS meet Thursdays, 8pm in Carleton Community Centre, Carleton Road. December 1 is Logic Gates G4ZVB, the 8th is a Committee Meeting, the 15th is their Christmas Party and the 22nd is a Night on the Air. Eddie Grayson G6OJX on Knottingley 83792.

Biggin Hill ARC have their Christmas Party on December 20. 3rd Tuesdays, 7.30pm at The Victory Social Club, Kechill Gardens, Hayes. Geoffrey Milne G3UMI on Hayes 2689.

Farnborough & District RS have their Christmas Social on December 14. 2nd & 4th Wednesdays, 7.30pm in the Railway Enthusiast's Club, Hawley Lane. Tim FitzGerald G4UQE on Camberley 29321.

Torbay ARS meet Fridays, 7.30pm at the ECC Social Club, Ringslade Road, Highweek. November 26 is Open Forum with Dave G4BQH the RSGB Liaison Officer in attendance and December 10 is the TARS Christmas Party. Bob McCreadie G0FGX on Haytor 233.



DERBY AND DISTRICT AMATEUR RADIO SOCIETY

(Incorporating Derby Wireless Club 1911; affiliated to the B.S.S.B.)
CALL-SIGNS: G3ERD, G2DJ, G8DBY
The oldest wireless club in Great Britain

Coventry ARS meet Fridays, 8pm at Baden Powell House, 121 St. Nicholas Street, Radford. November 25 is a Night on the Air/Morse Tuition. Jonathan Ward G4HHT on Coventry 610408.

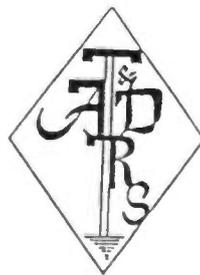
Cheltenham ARA have their AGM on December 2 and the 16th is at the Clock Tower. 1st & 3rd Fridays in the Stanton Room, Charlton Kings Library. Dave Abbott G4FRU at Holmbury, Thorncliffe Drive, Cheltenham.

Mansfield ARS meet 2nd & 4th Fridays, 7.30pm at the Westfield Folk House, Westfield Lane. November 25 is Contest Operating G31BK and December 9 is a Quiz. Keith Lawson G4AAH on Mansfield 642719.

Hasting Electronics & RC have their Christmas Social on December 21. Meet 1st & 3rd Wednesdays, 7.30pm. 1st is a Committee Meeting in Ashdown Farm Community Centre, 3rd a Main Meeting in West Hill Community Centre. Fridays are Natter Nights in Ashdown Farm. Tim Anderson G0GTF on Hastings 437513.

Pie Evening. Kevin Marriott G8TWH on Rugby 77986.

Todmorden & District ARS meet 1st & 3rd Mondays, 8pm at the Queen Hotel. December 5 is George Dobbs Annual Christmas lecture (members only) and the 19th is a Natter Night. Val Mitchell G1GZB on Todmorden 7572.



Felixstowe & District ARS meet alternate Mondays, 8pm in the Scout Hut, Bath Road, all Socials in the Grosvenor Hotel. November 28 is 10 Pin Bowling, RAF Bentwaters and December 12 is their Christmas Social. Paul Whiting G4YQC on Ipswich 642595 (daytime).

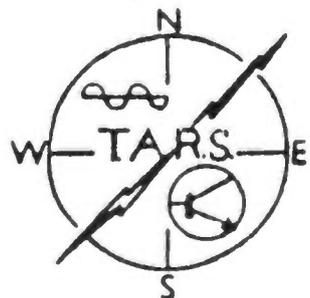
Keighley ARS meet 2nd & last Tuesdays, 8pm in the Club Room, rear of Victoria Hall, Victoria Park. November 29 is Films and December 13 is an Informal. Kathy G1IGH on Bradford 496222.

Stevenage & District ARS have a Junk Sale on December 6 and a Quiz Night on the 20th. Meet at 8pm, SITEC Ltd, Ridgmond Park, Telford Avenue. Morse tuition and practice from 7.30pm. Peter Daly G0GTE on Stevenage 724991.

Norfolk ARC meet Wednesdays,

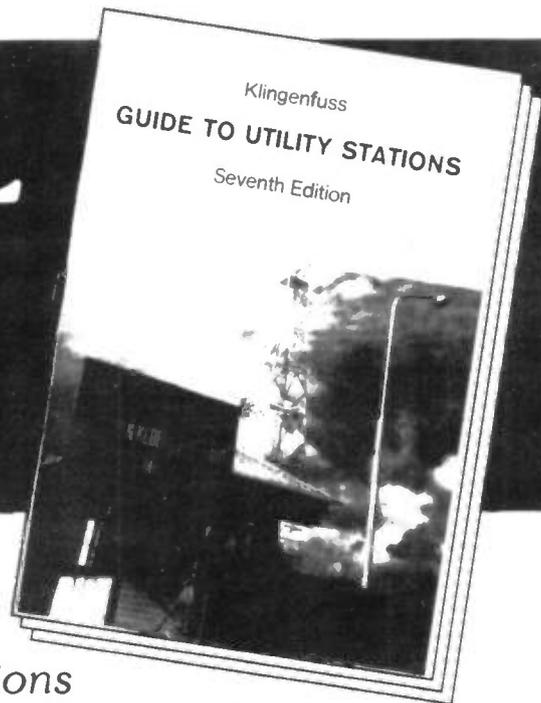


Sutton & Cheam RS meet 3rd Fridays, 7.30pm at Downs Lawn



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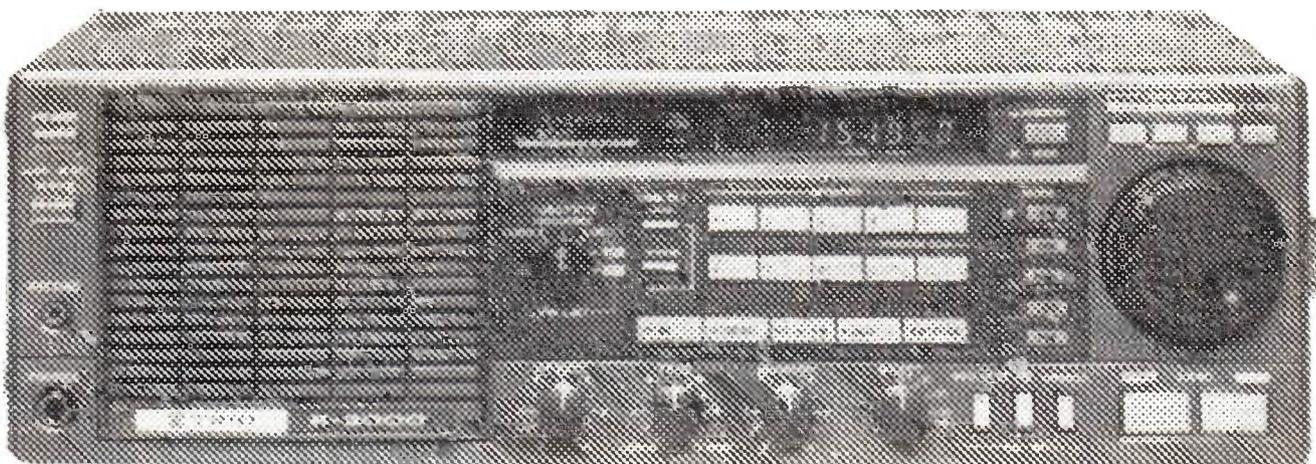
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UTILITY STATION BOOK OFFER

SHORT WAVE RECEIVERS are our speciality (and all that goes with them)



The R-2000 from Kenwood

The **R-2000** fitted into the middle of the Kenwood receiver range, between the R-600 and the R-5000. Sadly the R-600 is no longer with us, "Gone, gone, and never called me Mother" but the **R-2000** goes on from strength to strength because of its unique appeal to a wide ranging section of the listening fraternity.

The **R-2000** is the receiver which bridges that difficult gap between the user who wants to listen to world wide broadcasts from the comfort of his armchair, and the keener listener who likes to hear aircraft on HF SSB across the Atlantic, or perhaps CW from the other side of the world. The **R-2000** can truly be said to satisfy the listening needs of almost everyone.

The front panel may look daunting but Kenwood have always excelled at making complex equipment easy to use, with the result that the control layout is logical and self explanatory. If you want to tune the receiver — turn the knob. If you want to tune slowly press the button marked "slow". If you want to get somewhere in a hurry — press the button marked "fast". Do you want to change mode — simply select, using the soft touch buttons. Recall something from memory? — touch the appropriate memory button. Scan the memories? — press "M. SCAN".

And so it goes on, displaying all the years of design skill which Kenwood have concentrated in their products; listening to the users and giving you what you need.

The **R-2000** covers the frequency range from 150 kHz to 30 MHz, and receives SSB, CW, AM, and FM. There is also an optional VHF converter which can be fitted inside the **R-2000** to extend the receiver's coverage to include 118 to 174 MHz, again with all mode reception. This makes the **R-2000** an extremely comprehensive listening tool, particularly for the keen aircraft listener, because you can follow the progress of an aircraft on VHF during the take-off and climb, and then continue to listen on HF SSB when the flight is handed on to Oceanic control. I still get a kick from hearing "Speedbird Concorde" telling control that they are flying at some incredible altitude, at equally impressive speed, and with an outside air temperature guaranteed to bring tears to the eyes of the proverbial brass monkey.

The size of the speaker in the **R-2000** is evident from the photograph, and Kenwood's involvement in the high quality sound equipment field certainly shows in the audible results. The audio quality from the **R-2000** is very good indeed, and worthy of recording — for which purpose you have a tape recorder jack, and a built in digital timer, which not only switches on the **R-2000** but will control the switching of the external tape recorder. Just the thing if you want the latest American football results but you also need to be in bed at the same time.

The hobby of short wave listening really began in this country, as indeed did broadcasting itself. As a result, the UK listener has a long tradition of being able to get the best from the "all pervading luminiferous ether" (to quote a 1920s publication. The **R-2000** brings modern technology to those skilled listeners and enables them to get the most from the hobby.

A detailed leaflet is available on request, but of course the best thing to do is send for our "Listener's Guide", enclosing a modest 50p for postage, and request full details of the **R-2000** (and the R-5000, and the NRD-525 and the HF-125, and all the other things that go to make the hobby what it is.)

R-2000 receiver £595.00
VC-10 VHF converter £161.94

Also available
R-5000 receiver £875.00
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To our friends everywhere, may we wish you a Christmas marked by peace and harmony.

FREE

Send 50p to cover the postage and we will send you, by return of post, your FREE copy of "THE LISTENER'S GUIDE" (2nd edition), a commonsense look at radio listening on the LF, MF and HF bands. Its unique style will, I am sure, result in a "good read" but underneath the humour lies a wealth of experience and expertise. You will also receive detailed leaflets on our range of receivers and a copy of our current price list.

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AIRBAND

Godfrey Manning G4GLM

While attending a Safety Day at Upper Heyford recently, I was "spotted" by two private pilots who were also participating in the event. "You're the chap who writes for that magazine!" proclaimed the one who recognised me. I'm always delighted to meet readers and I know that there are several pilots amongst you. To them, I ask: **do** write in! For those of us not fortunate to hold a pilot's licence (that includes me) your experiences are especially interesting so, come on, share them out.

A Look in to the Future

Looking into the future, I wonder what you'll think when you read back over these pages in 10 years time? Last month's "Airband" included a description of the microwave landing system (m.l.s.) and I thought you'd like some more details.

Operating at around 5GHz there will be 100 channels initially with the capability of expansion to 200. Unlike the narrow beam of the present-day instrument landing system (i.l.s.) the m.l.s. works over 80° in azimuth. The ident of the experimental system on runway 27 Right at London (Heathrow) is MER. By 1998 the m.l.s. is due to have replaced the existing i.l.s. system so aircraft operators have only a decade to start planning — time has a habit of passing quickly.

Meanwhile, the i.l.s. system is under threat. It was originally agreed that the spectrum just lower in frequency (104-108MHz) would act as a guard band, no high-power broadcasters being allowed here in case they caused interference to i.l.s. transmissions. Unfortunately, broadcasters are already spreading to this new allocation.

Satellites are further off but under consideration. For example, during a north Atlantic crossing, an aircraft might relay its position to air traffic control automatically and at regular intervals by way of a satellite data link. Proposals are for uplinks in the 1545-1555MHz range and downlinks in the allocation 1646.5-1656.5MHz.

You Write

Regular **Dave Lawrence G6HXR** (Snodland, Kent) has had cause to visit some southern England airports recently. Dave asks if the Ibsley beacon near Bristol is still in use; I can find no reference to it, but does any other reader know better? (*Surely Ibsley is near Ringwood, Hants? Ed.*)

Transponder "squawk" codes are allocated in patterns, just as you guessed, Dave. Typically, each controller will allocate squawks with a particular pair of digits in the first two positions, the last pair varying between aircraft to make up the four-digit code. Examples of grouped allocations might be the inbound and

Find out about plans for future radio-navigation. Plus all the regular frequency changes and, of course, news from you, the readers.

outbound traffic at Luton; aircraft working Thames Radar; etc.

Additionally, certain codes have special meaning. 2000 is set when it is not expected that the controller has secondary radar; 4321 is the "conspicuity code" used by light aircraft and others not under a radar. In emergency, 7600 indicates a radio failure (the transponder being independent of the v.h.f. transceiver), and 7700, which sounds an alarm at the control centre, means mayday. In the case of radio failure the controller can ask "Squawk 7601" and, if this is seen to be done, can deduce that the aircraft is still capable of reception.

Dave's local airfield, West Malling, hosted a Warbirds display which included the Vulcan among others. When our photographer, Chris, reads this about her all-time favourite aeroplane she'll want to go there next year!

Retired DC-9 pilot **Leslie Greville-Smith G4SUJ** (Wolverhampton) has been researching into Richard Branson's transatlantic balloon flight (see also "Airband," September 1987). Leslie kindly sent me a plot of the route about which the following co-ordinates will give a rough idea if marked on a "school atlas." Figures are time in UTC (starting at 0810Z on 2/7/87 from Sugarloaf, Maine) with latitude and longitude, degrees and decimals (the start being 45.04N 70.19W). 0810Z 45.04N 70.19W — 0935Z 44.3N 69.9W — 1240Z 45.04N 62.1W — 1530Z 45.4N, 55.3W — 2030Z 46.1N 54.8W — 0131Z 49.7N 33.8W — 0617Z 51.4N 23.3W — landing, 3/7/88, 1551Z 55.01N 06.59W at Limavady, N. Ireland, after travelling 2672nm.

"Why is there a long-wire on BAC One-Elevens?" asks regular **Goffrey Powell** (Tamworth). This wire is plainly seen stretching downwards from the top of the fin's leading edge bullet to a point on the roof of the fuselage just behind the cockpit. Granted the One-Eleven is a short-haul aircraft but London to the Canaries is possible non-stop and, even from Mediterranean destinations, v.h.f. hasn't the range to work back to England on the company frequency. So, for operational communications (as distinct from air traffic control) the h.f. bands are used, hence the need for a long-wire antenna.

I remember seeing the h.f. set on a One-Eleven flight deck some years ago. In principle, any aircraft can carry h.f. (a six-seat twin visited the Cranfield PFA Rally having flown from N. Africa, this year; its h.f. wires were much in evidence). I'm not sure if the Boeing 757 (as used on shuttles)

is similarly equipped; can any reader answer this one?

Anthony Barrett (Newton Abbot) is a member of the International Short Wave League. He warns that at Bristol (Lulsgate) the frequency 127.75MHz has probably been replaced by 132.4MHz. In France there is apparently some form of repeater system involving 122.8MHz and 125.5MHz. Also 135.65MHz is part of another such system. Can anyone else explain what these are used for? Anthony has just enjoyed a holiday in Jersey; did you fly there, and in which case, in what?

Paddy Ryan (Brierley Hill, West Midlands) describes himself as a "beginner" to which I would like to reply "Welcome aboard!" The controllers from the London Air Traffic Control Centre can be heard by aircraft all over the southern half of the UK mainland via relay stations, such as the one at Clee Hill which is near you in Shropshire. As far as choosing particular equipment goes I regret that I can't give an answer; this depends so much on individual requirements. What's right for you may not be to the taste of someone else. The v.h.f. airband has frequencies in the 108-136MHz range and most antennas intended for this band would need to cover this allocation. There is little tendency to use high-gain antennas since they would discriminate against aircraft signals which come in from high elevation angles. Have you thought about joining a local radio club? Many are intended for amateurs and amateur band short wave listeners but the principles apply to any v.h.f. band. You could also see if your local flying club runs an awareness course, aimed at teaching you about flying and use of the radio without going all the way to getting a pilot's licence. I hope you enjoy your new hobby, and I'll try my best to answer any specific questions on flying and aeronautical radio that you might have in the future.

Frequency Changes

As usual I am indebted to the Civil Aviation Authority for their publication *General Aviation Safety Information Leaflet 9/88*. A.t.i.s. means that ever-useful automatic terminal information service. Pilots should still consult NOTAMs as I only include changes that I have heard about since the last "Airband."

Bristol: replace 127.75MHz with 132.4MHz.

Edinburgh: replace 124.25MHz with 128.975MHz when directed.

Honiley v.o.r.: new frequency 113.65MHz.

London (Stansted): a.t.i.s. new frequency 127.175MHz.

Newcastle: a.t.i.s. new frequency 114.25MHz.

Perth v.o.r.: new beacon (PTH: di-dah-dah-dit, dah, di-di-di-dit, 110.40MHz).

Next month you can test your knowledge of aviation history with my Xmas quiz. Till then — don't forget to write!

THREE-BAND SSB RECEIVER

C. M. Lindars

There are a variety of ready made cabinets ranging from the simple aluminium boxes to the exotic professional cabinets costing the earth. You can make your own simple cabinet to house the receiver from offcuts of plywood and sheet aluminium. Alternatively you could use one of Minfordd's cheap but neat cases.

The Cabinet

The drawings show the various parts of the cabinet with the position of the various holes indicated. The sides, back panel and top are cut from offcuts of 6mm thick plywood, while the bottom is of 12mm plywood. Four triangular wooden gussets are screwed and glued into the top corners to give strength and provide a fixing for the screws holding the top in place. The front panel and the intermediate screening panel are cut from 18 s.w.g. sheet aluminium. This can be bought from Whistons or try *Yellow Pages* for your local aluminium suppliers.

The layout of the front panel is based on the use of an Eddystone slow-motion dial

With all of the modules of the receiver built you will need a case to put them in. In this part we look at the construction of a simple wood and aluminium sheet cabinet.

as described in Part 1. If you are using a different type, such as the current Jackson dial then you will, of course, need to ensure that there is enough room on the front panel to accommodate it. If not you will have to re-arrange the position of some of the controls or enlarge the panel.

Control Shafts

The rotary switch, S2, used to change bands, is mounted on the intermediate screen as shown in Fig. 5.3. A length of 6mm diameter wooden dowelling is used to extend the switch shaft out to the front panel. Use the special brass collars sold for this purpose but do not use a metallic extension shaft. The main tuning

capacitor, C28 has its shaft similarly extended to match the slow-motion drive, but here you can use a metal shaft and, as shown in the photograph, a flexible coupling can be used to take up an slight misalignment.

Feed-Through Capacitors

Two feed-through capacitors are fitted to the appropriate holes in the intermediate screen to take the supply lines from the battery to the main receiver modules and then back again to the v.f.o. The modules themselves can be fitted to the bottom using Sticky-Fixers. Of course, you could use screws if you so wish.

Please note that in Fig. 4.3 (P18 Oct. 88) D2 is shown reversed. The cathode should be connected to L1 and the anode of D1.

Now you are ready to finish the wiring. If you are well enough advanced with home-construction you will be able to do this using the complete circuit diagram. However, for the beginners, a complete wiring diagram will be published in Part 6. □

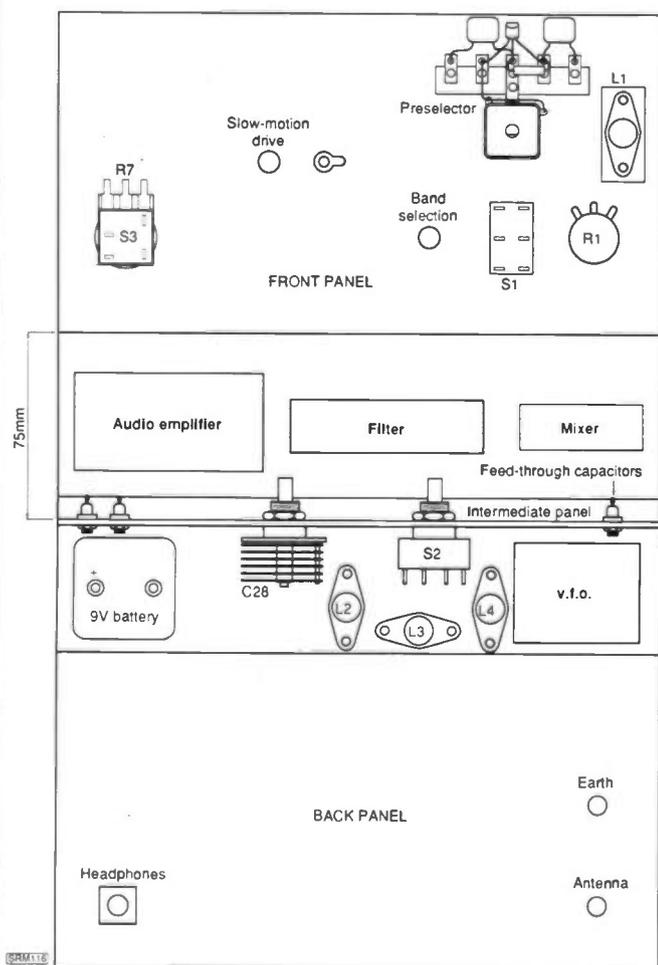


Fig. 5.1

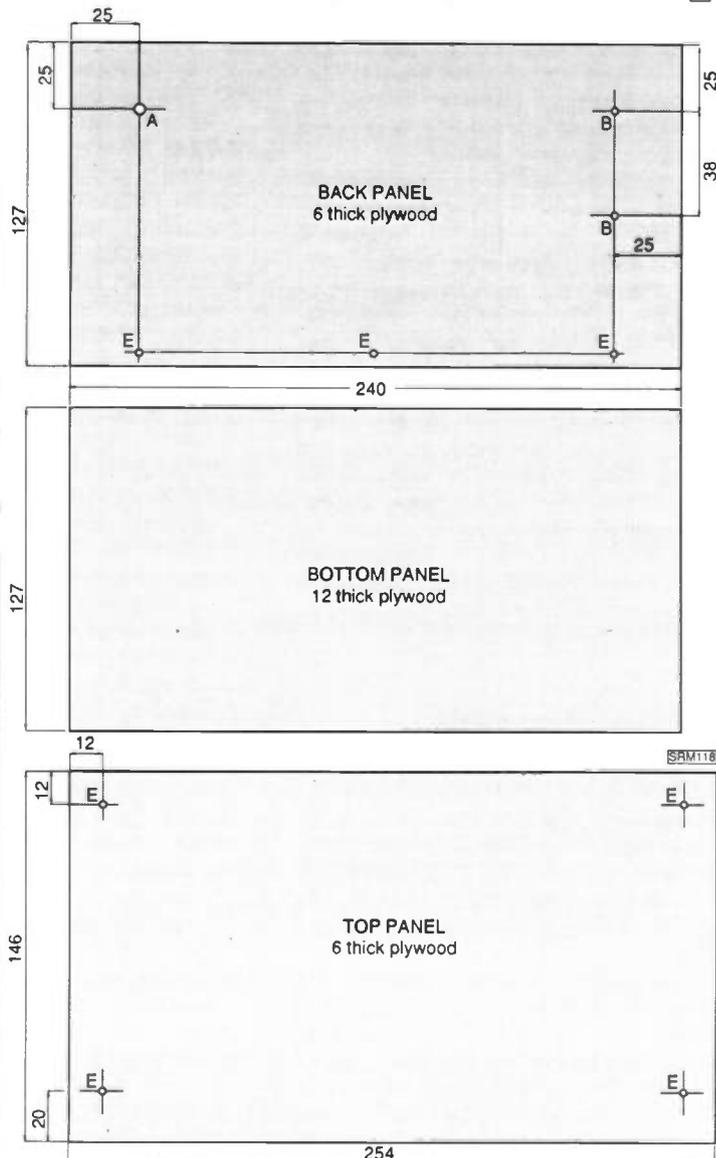
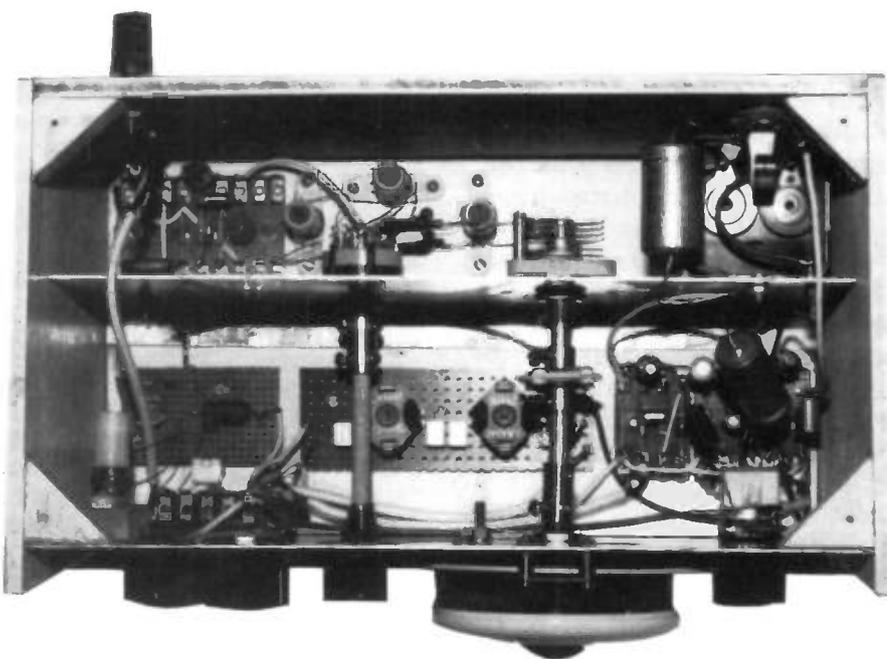


Fig. 5.2

THREE-BAND SSB RECEIVER

Part 5



YOU WILL NEED

Capacitors

Feed-through
1nF 2 C30, 31

Miscellaneous

Plywood offcuts (see text); 18 s.w.g. Aluminium sheet (see text); Wood screws; Slow-motion drive; Shaft extension collars; Flexible coupling; 6mm dia. wooden dowelling; Terminals (2); Battery terminals.

Addresses

K. R. Whiston Ltd., New Mills, Stockport SK12 4PT. Tel: (0663) 42028.
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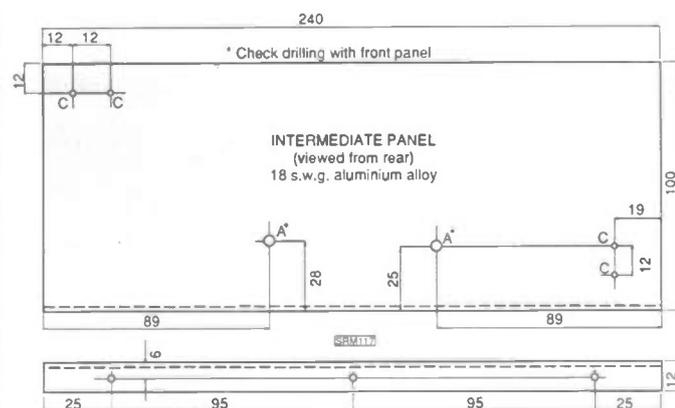
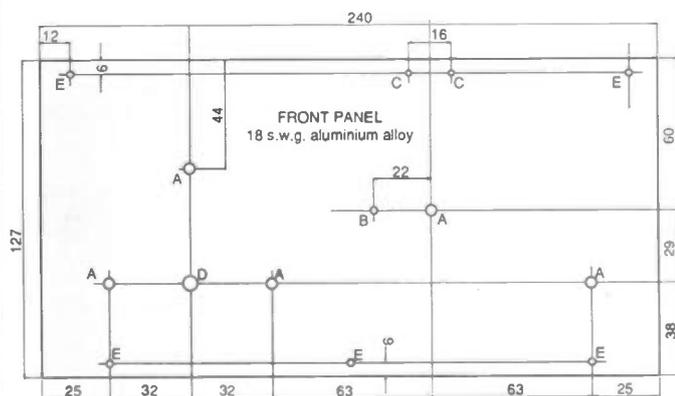


Fig. 5.3

Wiring Diagram

This part was originally planned to conclude the series. However, lack of space has meant that the complete wiring diagram has had to be held over and will now be published in Part 6.

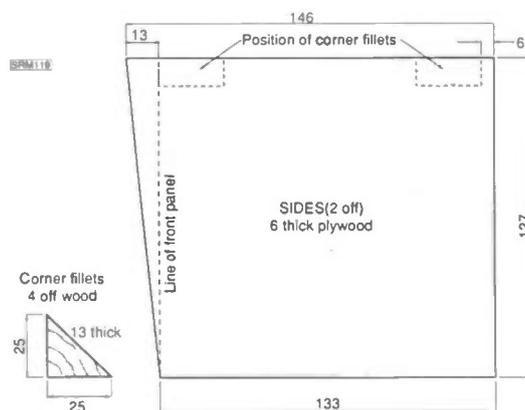


Fig. 5.4

Abbreviations	
mm	millimetre
nF	nanofarad
s.w.g.	standard wire gauge
v.f.o.	variable frequency oscillator
V	volt

Peter Laughton

Tara Gets Back on Target

Back at the end of September, at a place called Clarkestown in County Meath, protesters were ordered off the proposed transmitter site. Radio Tara wants to build an 248m mast to support the antenna, and now the courts have rejected local residents complaints. The plan is to broadcast to Britain on 254kHz l.w. The programme format is still a secret, though it will probably be rock music of the type similar to Laser Radio.

Tara's choice of l.w comes at an interesting time. Across the UK, the BBC currently has many posters advertising the fact that its national pop music network, Radio One, has "found a new band" i.e. f.m. Even the term "v.h.f. Radio" has been discontinued.

Still, the people at Radio Tara don't believe they are facing a losing battle. The backers are RTE and Radio Luxembourg. For that reason, Radio Tara is seen as a daytime only service, so as not to conflict with the "great 208" in the evening.



Religion Towards the Middle East

There are currently two stories concerning off-shore broadcasting. It seems a Greek vessel is currently being fitted out at Haifa with a 10kW m.w. transmitter and an antenna. A religious organisation called Gush Amunim plans to broadcast off the Israeli coast, after being refused airtime on landbased legal stations.

In the last couple of weeks the good-ship *Sarah* has finally slipped out of Boston Harbour. Alan Weiner was the man behind the Radio New York International project of last year. The radio ship was flying the Honduran flag, but after a short test transmission, the vessel was boarded by officials from the Federal Communications Commission, and the equipment was disabled. The FCC cited the ITU regulations that forbids broadcasting from a vessel, though other ITU regulations are also broken on a daily basis without such drastic measures being taken. The Radio New York International people say they'll be on the air in around 30 days on 1620kHz.

You may remember the saga of Laser Radio that broadcast from the North Sea a few years back. The station manager at one time was the American radio consultant John Catlett. He became quite a figurehead when the ship decided to come ashore when on-board generators failed. Catlett has now moved on to other land-based legal projects, and is now a consultant to the Radio Tara long wave project.

Relay of the Month

There had to be one. Look back at past Bandscans and you'll see the growing number of stations that are swapping air-time these days. The focus is on the BBC this month, which has just started to relay their signal via a transmitter belonging to Radio Bras in Brazil. A narrow-band telephone circuit is being used as a temporary measure to get the studio signal from London to Brazil, which is why the audio quality is only fair at present. The BBC frequency via Radio Bras is 6185kHz from 0900-1100UTC in English, and 1100-1130 in Spanish. The beam is towards Chile.

New Radio Delayed

Persuading the f.m. orientated youth to discover other parts of the dial is something that's being discussed in the United States at the moment. Recently programme makers at the National Association of Broadcasters met in Washington DC. They had spent a great deal of money advertising a new super-radio, designed to "revolutionise the market". However, it was not until the final hours of the conference that the sample was unveiled, looking like a standard f.m. radio tuner, although the cabinet was somewhat larger.

Due to a fault, the super-radio did not work on m.w. That was a shame since the entire launch had been designed to give a.m. a boost. It is hoped to iron out the problems by November, but the concept was clear.

First, a m.w. plastic loop is used for a.m. reception, along with a 10kHz bandwidth filter. Many stations in the US put out a lot more fidelity that can be tolerated in the crowded European bands. Secondly, the radio has no a.m./f.m. switch. When you reach 1700kHz, it jumps to 87.5MHz f.m.

The reverse happens when you turn the dial the other way. In other words, it is hoped that the younger generation will bump into m.w. without noticing. Incidentally, the NAB table-top super-radio does not have synchronous detection, which surprised many engineers.

AFRTS Nearly Off HF

October 1 was the last day that many of the s.w. transmitters carrying the US Armed Forces Radio and TV Service were heard. As from October 1, AFRTS transmissions from Voice of America transmitters in Bethany Ohio and Delano California USA ceased, along with a relay via Munich, West Germany.

Transmissions from the Philippines stopped two years back. Melvyn Russel, Assistant Director of AFRTS in Washington DC, said that for a third of the cost of s.w., AFRTS will hire a channel on the INMARSAT satellite system. This will start on November 1 for the Pacific, and 1 March 1989 for the Atlantic. This will allow high quality audio to US Navy ships at sea.

Satellites are already being used to feed material to large US military bases in Europe, through AFN in Frankfurt and the Far East Network in Tokyo. In fact, because many of the AFN stations share a similar frequency in Germany, listening in the UK now is marked by different low power transmitter sites transmitting audio with a slightly different satellite delay. 1107kHz is a case in point.

AFRTS had a loyal s.w. following, especially amongst American civilians abroad. The Voice of America, after all, is not chartered to serve them.

All is not lost though. AFRTS Antarctica is currently being heard in the Pacific at the moment on 6012kHz at 0800UTC, until blocked at 0900UTC. There is a chance of propagation in Europe during the winter months, though you will need a selective receiver. The transmitters beamed eastwards to China from the Far East Network Tokyo are on the air again after a short maintenance period.

If you want to contact AFRTS to comment either way on the demise of their s.w. operation, the address is 601 North Fairfax Street, Suite 360, Alexandria Virginia 22314 USA. Personally I will miss this chance to hear news as Americans hear it.

Abbreviations

AFN	American Forces Network
AFRTS	Armed Forces Radio & TV Service
a.m.	amplitude modulation
BBC	British Broadcasting Corporation
FCC	Federal Communications Commission
f.m.	frequency modulation
INMARSAT	International Maritime Satellite Organisation
ITU	International Telecommunications Union
kHz	kilohertz
kW	kilowatt
l.w.	long wave
MHz	Megahertz
m.w.	medium wave
NAB	National Association of Broadcasters
s.w.	short wave
UTC	Co-ordinated Universal Time (= GMT)
v.h.f.	very high frequency

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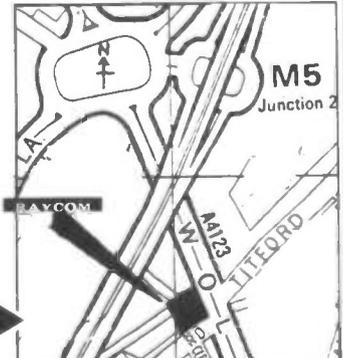
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KENWOOD ICOM

KENWOOD R5000 £875.00

The frequency range is continuous from 100kHz to 30MHz and its modes of operation are USB, LSB, CW, AM, FM and FSK. An optional VHF converter (VC20) extends the frequency range to include 108 to 174 MHz.



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AR 2002 £487.30

The frequency range is from 25 to 550 and from 800 to 1300 Mhz. Modes of operation are wide band FM, narrow band FM and AM. The receiver has 20 memories, memory scan and search mode which checks frequencies between user designated limits and a push button keypad for easy frequency entry and operation. A front panel knob allows the listener to quickly step up or down in either 5, 12.5 or 25kHz steps from the frequency initially chosen. A socket for the optional RS232 interface (RC PACK) is provided on the rear panel.

LOWE HF-125 £375.00

Coverage is continuous from 30kHz to 30 MHz and operating modes are AM, USB, LSB and CW with an optional FM and synchronous AM board. A comprehensive range of bandwidth filters are standard: 2.5, 4, 7 or 10kHz. There is a 400Hz audio filter for CW reception. Controls are very



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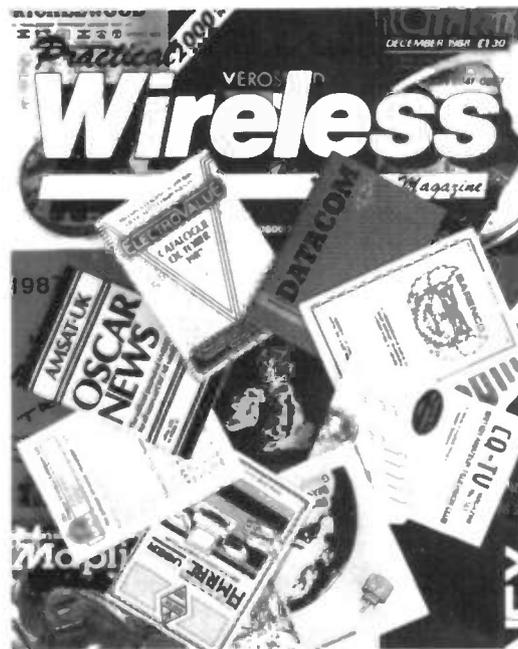


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THE WIN-108 AIRBAND RECEIVER

Godfrey Manning G4GLM

This is a dedicated v.h.f. receiver covering the navigation band (108-117.95MHz) in 50kHz channels and communications 118-135.975MHz in 25kHz steps.

Arriving well packaged and complete with helical (rubber) antenna and earpiece (but no batteries) the Japanese-made set is attractively hand-sized. It measures 33 x 68 x 162mm (340mm with antenna) and weighs 340g (including antenna and the necessary four AA size batteries).

There is a simple manual, written in genuine (sometimes facetious) English but devoid of a technical specification. No carrying strap is provided and the manual omits to mention the two M3-tapped hardpoints at the rear to which I'm sure a strap could be attached. External appearance is mainly black plastic but it doesn't look like it could stand up to rough handling. Internally there is one main circuit board and a subsidiary board for the keypad.

Construction is acceptable mass-produced quality. One critical area (possibly the local oscillator) has been encapsulated in silicone rubber.

Facilities on Offer

The top panel has the usual off/on/volume and squelch knobs plus a 3.5mm earpiece jack (for 8-16Ω). The antenna socket is a BNC type. The batteries go in a compartment with a sliding cover at the back, above which is the serial number plate. The right side has the liquid crystal display (l.c.d.) backlight button. Illumination is disappointing, the display being just about readable from a left oblique angle but certainly not face-on when in total darkness.

Use of the backlight only increases current consumption by less than 15mA so it seems as though the light only dissipates less than 90mW which is not a lot! Also on the left is a power socket requiring a 2.1mm short reach plug, 6V d.c., negative tip.

Insertion of the plug disconnects the internal batteries. The manual makes it seem unlikely that there is any reverse polarity or over-voltage protection whether batteries or external power are in use. With full volume in the speaker and backlight on, the set drew just short of 100mA and when quiescent (scanning or not, backlight off, squelch closed) just under half of this figure; you might get nearly 15 hours out of a set of MN1500 batteries depending on conditions. A BATT warning comes on in the l.c.d. when the supply voltage is too low.

The front panel has the l.c.d. across the top with a red l.e.d. just below and to the left to indicate squelch open (hopefully when a signal is being received). Down the right are 16 push-buttons in two equal columns and below these are four slide switches each with two positions. One switch, KEY LOCK, prevents the buttons

What impression does the WIN-108 handheld airband receiver give its user? Godfrey Manning answers the question.

from having any (unintentional) effect when it is placed in its ON position. A 30mm speaker hides behind the lower left area of the panel.

Functions

Three modes of operation permit **direct** tuning of frequency (and entering frequencies in the memories); **scanning** of any or all of a group of memorised channels; and **searching** any continuous section within the band to see if any signals are present. The MOD key cycles from one mode to the next at each press.

Direct entry of the required frequency (in DIRECT mode) is easy: the first five digits are tapped out and then the EXE (execute) button is pressed. Until pressing EXE the set continues with the old frequency and will also revert to this if there is a long delay during key-tapping (e.g. if you get muddled and don't want to change frequency after all). There is no decimal point button and the sixth digit is deduced by the radio.

As with most functions, a single bleep indicates success and two bleeps signals an error. The bleeper is a separate piezo transducer and is neither heard in the earpiece nor cut out when the earpiece jack is inserted.

"**Tuning the dial**" is actually accomplished by pressing the + or - keys. Brief taps on the buttons advance one channel at a time; press, hold, then release leaves the set churning through each successive frequency until an occupied channel is found. If the band edge is encountered, the frequency flips back to the other end of the band and tuning continues. As with all signal-search functions, the DELAY/HOLD slide switch affects the outcome of locating a busy channel.

Once the signal has gone off, the set will wait a couple of seconds (so as not to miss any reply or further signal) before resuming its search assuming DELAY has been selected, but with HOLD in use instead, the search stops altogether as soon as a signal opens the squelch and the receiver remains on frequency until told to do otherwise. This arrangement has a major problem; the set will lock on to a busy channel where the gaps between transmissions are always less than the DELAY waiting time. In the meantime, other frequencies might have traffic on them but the set won't go and look at them. This is a more serious problem with scanning (see below). What is needed is



an option to neither HOLD nor DELAY but rather to continue the scan as soon as the signal goes off.

The PRIORITY channel can be activated by putting its switch to ON. No matter what frequency is displayed, the set listens briefly and at rapid intervals to a predetermined priority channel. When this happens at a time when the priority channel is quiet there is no obvious effect on scanning but there is a momentary interruption to any signal that's already being received. However, if there is a signal on the priority channel then the set drops what it was doing and now receives this new transmission. The DELAY/HOLD has its usual effect once the priority signal ceases. PRIORITY works during DIRECT and SCAN modes. The PRIORITY frequency is actually held in memory zero.

Accessing the memories is the last function available in DIRECT mode. There are two sets of 10 memories, only one set capable of being used at any one time as determined by the MEMORY switch with its A or B settings. Remember that the PRIORITY channel will be indicated by the currently selected memory 0, be it from group A or group B.

With a frequency tuned in, the memory number to be loaded (0 through to 9) is

THE WIN-108 AIRBAND RECEIVER

chosen by pressing the appropriate button whilst simultaneously holding down the ENT (enter) button. To recall a memory, the sequence is to press RCL (recall) and then the appropriate 0-9 number. But beware: holding RCL and simultaneously pressing the number button has a different effect: it locks out the memory for scanning even when DIRECT mode is in use! This takes a little learning and is unnecessarily fiddly.

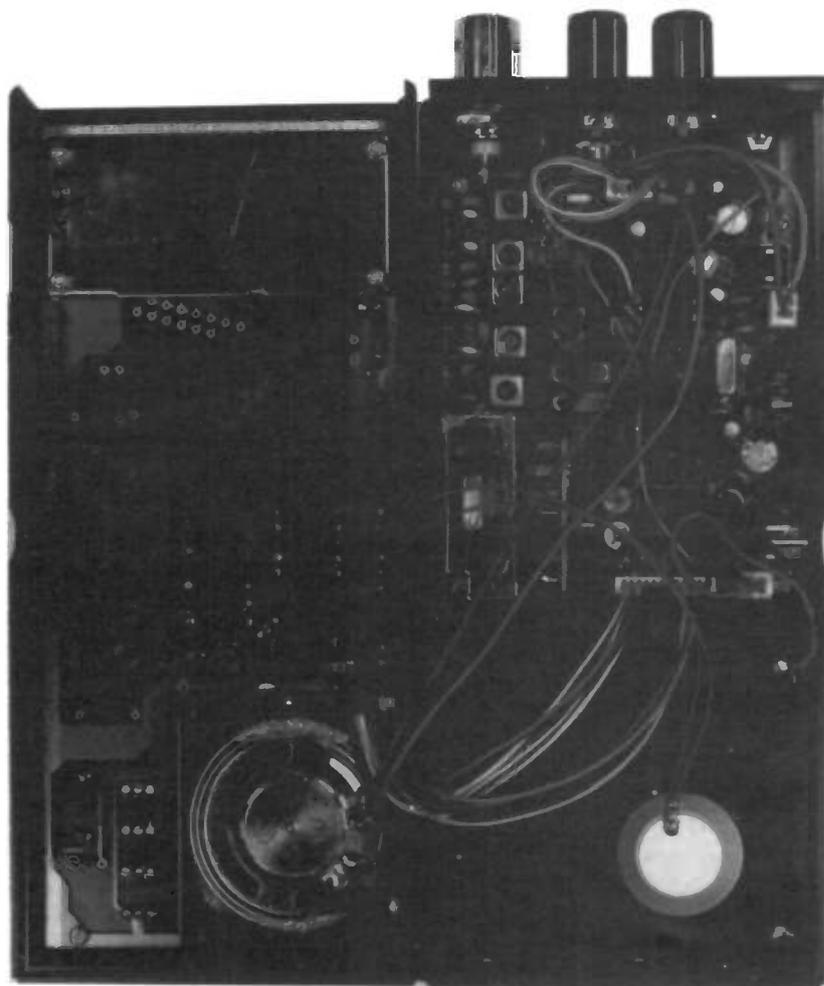
Memories are held during battery changes provided you restore power in about four minutes (although I made it last out a quarter of an hour!). Memory keep-alive drain was about $16\mu\text{A}$ (with the set switched off) which would take three times the shelf life of an MN1500 battery to drain it! Memory is also retained on external power when the set is switched off and batteries are removed.

I found all of the buttons much too close together for my ordinary-sized fingers and any simultaneous keystrokes were rather difficult. The buttons themselves are a cheap rubber type and tend to jam under the front panel because they slide a little sideways when pressed.

Having set up a group of 10 frequencies of interest, it is possible to **scan** through them and either DELAY or HOLD whenever a signal is found. The + and - keys again step through the memories when tapped or scan continuously if held down for a moment. Current memory is indicated by a number in the l.c.d. If any channel is unwanted in the scan it can be omitted (locked out) as mentioned above; its channel number now flashes in the l.c.d. Only the PRIORITY channel 0 is immune from locking out.

It is here that the lack of a "non-delay" option will be apparent. Suppose a tower, an approach and a ground movements frequency are being scanned in three memories. The tower is so busy that the DELAY will ensure that the scan never moves off this frequency. The infrequent ground movement calls will be missed. If there were no delay, scanning would continue in the brief gaps between tower calls and there is a good chance of catching a ground movements transmission at that moment. Of course, ground movements could be put on PRIORITY so that it will be checked but that doesn't solve the problem of also listening to approach because there can only be one and not two priority channels in use at a time. I think that this deficiency will prove to be quite a nuisance under many conditions.

Finally comes the **search** mode. A lower and an upper frequency bound are chosen and all frequencies between them are checked in order. The lower frequency is tapped in followed by EXE and then entered in to its special memory by holding down ENT and hitting the - button at the same time. The upper limit is entered in the same way except that the + button is



used instead. Then searching begins: the + and - buttons determine the direction of search by being held a moment then released. DELAY/HOLD is operative but PRIORITY is not. On hitting one of the boundaries, the search flips over to the opposite limit and continues again.

Using the Receiver

Putting a signal into the set shows the selectivity to have a pleasing value; adjacent 25kHz channels are adequately rejected but it should be possible to receive co-channel offset stations such as most VOLMET broadcasts. Sensitivity (signal-to-noise ratio) is subjectively a little lacking, background noise being rather more than hoped for at all times. The audio quality is very scratchy through both the internal speaker and the earpiece.

It was hoped to obtain some improvement by using an external speaker and although the earpiece output will drive such a speaker the sound quality is still thinner than expected.

If the fiddly buttons are overcome, the scanning works as advertised. Testing this is easier if a signal is imitated by manually opening the squelch. When using any scanner remember that detection of an occupied frequency relies on the squelch being opened and not on a signal being present.

General Impression

The scanning facilities are comprehensive and work. It is unfortunate that the tiny "cost-reduced" keypad and the awkward distinction between activating channel lock-out and memory recall make operation more difficult than necessary. The inability to cancel the DELAY on finding a busy channel will prove to be a serious handicap under some conditions. It's a shame that a recently-introduced receiver does not include the 1MHz extension to the airband that seems likely next year.

Sensitivity and audio quality are disappointing. The manual hopefully suggests that the set may be used as a "professional monitor" but I don't think that it's Civil Aviation Authority approved for use as a standby receiver. The 6 volt power requirement needs attention if running from a vehicle battery. The small size is attractive for portable use.

Any choice of commercial equipment is a compromise and boils down to cost-effectiveness in the final analysis. **Lowe Electronics Ltd., Chesterfield Road, Matlock, Derbyshire DE4 5LE. Tel: (0629) 580800**, who are thanked for the loan of the review sample, have clearly positioned the receiver at the cheaper end of the scanner market since it retails at £175 including VAT. □

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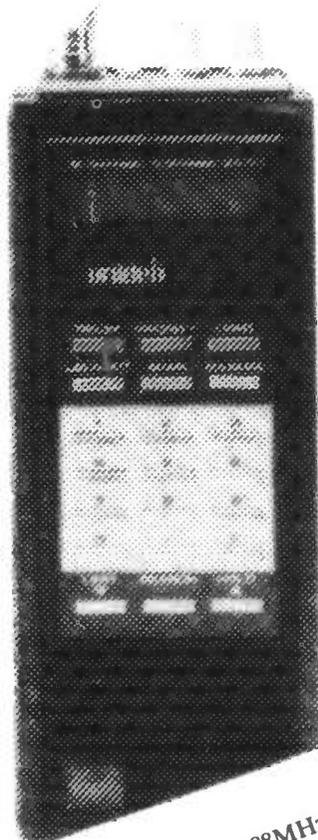
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INTRODUCTION TO DX-TV

Keith Hamer and Garry Smith

Part 15

With the TV-DX hobby fast gaining status among many radio amateur enthusiasts it is not uncommon to discover TV receiving equipment alongside the usual amateur gear in the shack. The latter place is always considered a place of cosy retreat by enthusiasts. Apart from allowing the hobby to follow a more professional approach, it also provides a means of escape from the rigours of household chores such as getting roped into yet another weekend of MFI furniture construction.

Unfortunately a garden shed isn't the kindest of places for the operation and storage of valuable equipment, such as colour TV receivers and video recorders, especially with the soaring crime rate of today. The antenna cables entering the shed or shack only emphasise where the valuable equipment is at hand.

Long distance reception can occur at virtually any time of the year but unless you are really dedicated, there is little incentive, especially during the winter months, to clamber out of bed and shovel away the snow to clear a pathway to the shed at 6am, only to discover that the bands are completely empty!

Neither is it a good idea to use the domestic receiver in the corner of the lounge as a DX monitor. You can guarantee that as soon as an exotic test card of Arabic origin flutters into view, the head of the household will promptly announce that it's time for her to watch *Neighbours*.

Ideal Home

Many homes have a utility room going begging, which when cleared of the usual collection of junk, such as unwanted prize bingo wins and Majorcan donkeys, makes an ideal retreat for the hobby. Failing this, a corner of the lounge, dining room or even the bedroom will suffice. The latter option does have lots of attractive advantages, such as DXing from the warmth and snugness of the Slumberland.

Seriously though, some thought as to where your DXing activities can comfortably take place will ensure that you can DX and be getting on with other things at the same time without disrupting family life too much. With compact DX-TV receiver set-ups now gaining popularity, the equipment need not take up much space than an average-sized desk-top word processor.

A little thought will be necessary if you intend to operate more than one TV receiver as most enthusiasts do. This will mean resorting to the use of distribution amplifiers for the various signal feeds to each receiver. The biggest headache is concealing mains and coaxial cables. The latter, especially if of the low-loss type with its springy behaviour, is not the easiest of things to hide and keep tidy.

Despite what you may think, long-distance TV reception is still possible throughout the gloomy winter months. In this part we take a look at ways of organising a comfortable shack for monitoring DX-TV reception and also examine the modes of propagation encountered during the winter.

Bench System

One of the authors operates at least five monitors and the number of cables and accessories would normally be unsightly if it wasn't for the way in which the storage system was designed. In its basic form it consists of a floor-standing cupboard/bench system construction from Contiboard sheets — see Fig 1. The bench top is constructed of two lengths of similar Contiboard sheeting but not permanently affixed to the structure. This means that they can be slid forward a couple of inches without removing or disrupting the receivers to allow the various cables to be passed into the main cupboard where the distribution equipment and mains supply strips are housed. With this arrangement, no holes have to be drilled to feed coaxial and mains leads through to the receivers — a practice not recommended from the safety point of view. Consequently, any of the receivers can easily be removed complete with mains plug. Also, additional cables can be introduced at any time should extra receivers need to be pressed into service. The sliding cupboard doors allow easy access to the auxiliary equipment such as filters, etc., and when

closed these neatly hide all the cables, etc., thus making the system look presentable to the non-technical eye but at the same time remaining functional. Small portable TV receivers can be conveniently housed inside a boxed shelf system made from a Contiboard sheet. The box is better left open at the back for access to the various receiver timebase controls such as the vertical hold and line hold. An open back will allow access to the various cables and help solve the problem of ventilation at the same time.

Safety Note

A word of safety regarding the condition of mains leads is perhaps called for at this stage. Always check that the insulation is not damaged in any way before fitting a mains plug. And always fit a plug. Don't think that because you understand electronics and appreciate that a TV receiver chassis can be live you are immune from accidents, especially if you remove the rear cover to carry out internal adjustments. Even modern television receivers with a so-called half-live chassis are a source of danger. One of the authors managed to successfully annihilate a TV i.f. strip and a SECAM decoder when the earth lead of a 3-core mains cable just happened to brush the live connection when the bare ends were trapped in the mains socket by means of another plug.

If the various bits and pieces of electronic gadgetry are plugged into an extension mains socket strip there should be few problems with overloading. Mast-head power supply units, antenna rotators and portable receivers draw very little in the way of power but don't expect the socket strip to cope with the demands of an electric kettle and a 2kW electric fire for the benefit of your comfort.

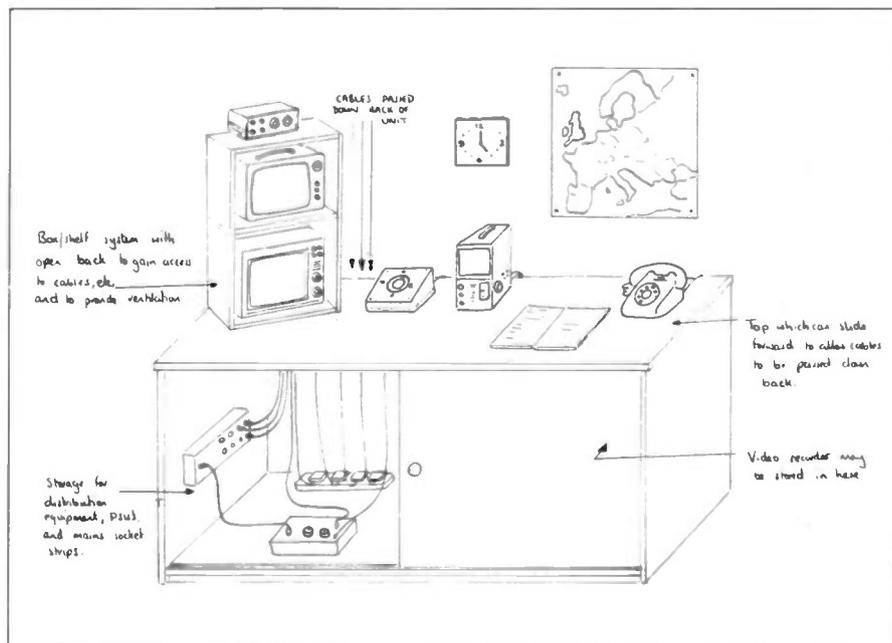
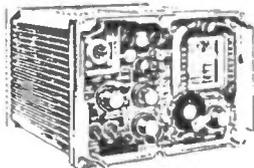


Fig. 1: Versatile bench and storage system for housing DX-TV equipment.

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Reception Log

Keeping a log book containing your DX reception is all part of the hobby and can be invaluable when comparing reception with fellow enthusiasts. The main things to note are the date, the time of reception, the channel and what you have received. In the case of a test card, jot down the full identification rather than a shortened version. The reason for this is simple: occasionally the broadcasters change the test card identification by adding or abbreviating names. If you develop the habit of logging the identification accurately you will be able to spot any slight differences which are often looked upon as a kind of milestone by enthusiasts during test transmissions. Does anyone remember when the BBC-1 Test Card D developed a couple of white dots either side of the letter "D" way back in 1967? This actually marked the inauguration of BBC-2 colour on December 2!

It is useful to differentiate between the various types of programmes such as feature films, cookery programmes, children's programmes, etc., although this can become tedious if you're not careful. One TV-DXer recently remarked that he was no longer keeping a log because while he was writing things down he was missing signals!

An accurate clock is useful not only for referring to when making entries in the log but it also helps you to be aware of possible programme endings. Many programmes begin on the hour or half hour and are therefore the most likely times for identification captions to be shown by the broadcaster. Whether you keep the clock set to UK time or GMT is a matter of personal choice, but ensure that other

DXers are aware of your preference when comparing logs.

The more dedicated enthusiast often has an active interest in weather trends, and the use of a barometer will indicate increasing pressure which may warn of impending tropospheric reception. On the other hand a falling reading may well indicate that the signals are about to disappear!

Essentials

Nowadays a video cassette recorder, rather than a still camera, is considered an essential tool by the enthusiast for accumulating examples of DX reception. It is best to have one solely for the hobby rather than have the domestic one commute between the lounge and the DX room every time you feel something worth recording may appear. As we mentioned in an earlier article, some of the early Beta machines such as the Sanyo 9300 are capable of giving outstanding results with all types of DX signals thanks to the stability of the servo system employed. Some of these models can be bought second-hand for virtually next to nothing because no-one in their right mind would want such a heavy and ugly brute on show for domestic use!

A 'phone extension next to the DX equipment is a high priority where the long-distance TV enthusiast is concerned. It ensures that you aren't miles away from the screen when someone rings to tease you about how a programme with Chinese subtitles keeps coming up out of the noise.

Another, but perhaps obvious suggestion, is to have various reference books handy such as test guides and station lists, etc. This will enable signals to

be speedily identified. Other additional accessories for the DX room are an ample supply of pens, scrap paper for sketching test cards if you cannot record them, and perhaps a reliable fire extinguisher should the equipment start getting a little overheated with all the excitement!

Joking apart, a smoke detector represents a sound investment and many models are available at a cost of under £10. Most of us are guilty at leaving equipment switched on unattended for lengthy periods so it seems a sensible precaution to take.

Winter-time Viewing

The sporadic-E season is all too short — a familiar complaint voiced by most long-distance TV enthusiasts. Most newcomers to the hobby are delighted by the results obtained from sporadic-E DX reception between May and September, but despite the season reigning for some four months, the days flit by so quickly and the end is nigh before one realises it. To the DXer the onset of autumn not only means the threat of leaves falling from trees — it also means a dwindling supply of DX signals. Unfortunately, there's very little we can do to extend the life of this natural phenomenon and once the sporadic-E season has well and truly finished the feeling can be likened to returning from your annual holiday abroad and realising that the fun is over for another year! While winter-time DXing can be very boring to some DXers, to others it presents a greater challenge!

The 1988 sporadic-E season seemed noticeably short and reception gently declined from about mid-August. In other years, intense sporadic-E openings have continued well into September. Within recent years good conditions have returned during October and in 1987 it was exceptional with examples of intense and long duration openings on many days.

Now What?

So once we've witnessed the last of the sporadic-E reception what do we do then? Once accustomed to signals being present almost every time the set is switched on during the summer the newcomer may be tempted to give up the hobby once the season is over. It can be extremely disheartening to painstakingly examine every channel while desperately rotating the antennas all to no avail.

The reception of foreign signals in Band I is possible on a daily basis. Indeed, the authors carried out an experiment between 1973 and 1983 and found that signals were present every day of the year although it must be stressed that there were one or two occasions where it was touch and go. Admittedly, many signals were of very short duration (mere

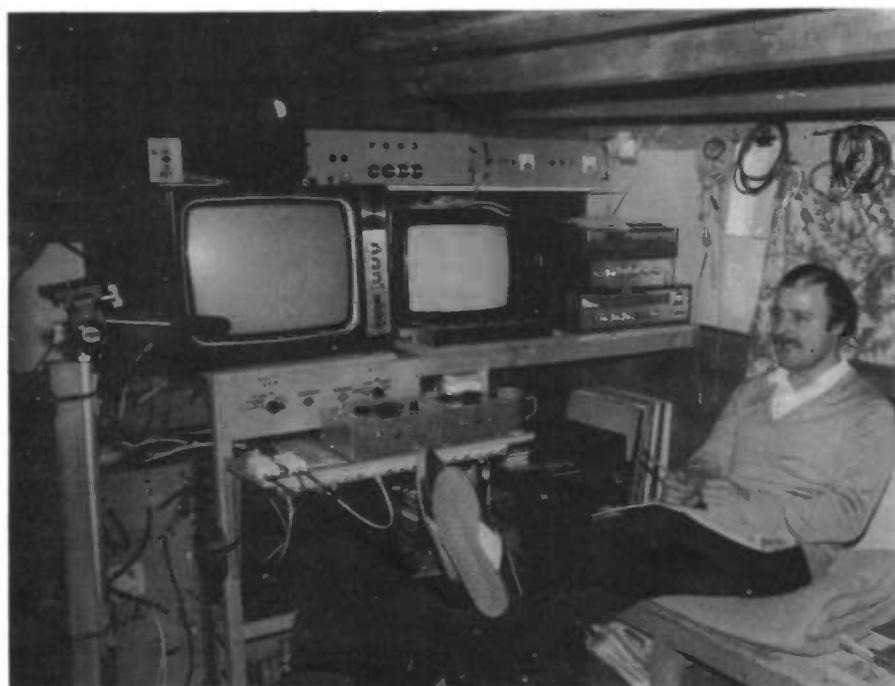


Fig. 2: Are you sitting comfortably? A DXer relaxes to watch a bank of ten monitors in his shack!

INTRODUCTION TO DX-TV

seconds) and sometimes the signal levels were so low that the received images were only just detectable on the screen. Nevertheless, daily reception was possible and a log was kept to show this achievement.

Constant Monitoring

Dedicated enthusiasts leave at least one receiver running all day tuned to one of the lower Band I channels such as R1 or E2 in their search for winter-time signals. It isn't necessary to stare at the screen, or screens, the whole time although some DXers do! If a small-screen set is used for signal monitoring there is no reason why this could not be left running next to the domestic set so one can keep on eye open for DX while watching the Sunday afternoon horror movie.

If you happen to own a scanner, or the "de-luxe" version of the D-100 DX Converter System with sound take-off, it is possible to tune it so that any vision carriers are audible, rather than leave the TV receiver flickering away for long periods. Some enthusiasts have even devised DX alarms. In its crudest form an arrangement based on a signal-strength meter is used, consisting of a tuning system, i.f. and detector, to monitor specific DX channels, usually in Band I. The idea is that once a signal appears it will activate external circuitry when a predetermined signal level is attained. Of course, this type of system does have its drawbacks. With widespread computer interference, bugging devices posing as baby alarms, illegal cordless telephone systems and other r.f. itinerants in Band I, such a system would invariably alert the DX enthusiast to this unwanted garbage! The more sophisticated designs rely on detecting the line sync pulses of an incoming television signal to activate some form of alarm circuitry.

Out-Of-Season Sporadic-E

There are various forms of propagation which are capable of rejuvenating the interest of the hobby throughout the harsh winter months. All of these have their own brand of behaviour, which can be unpredictable at times. Although

sporadic-E is mainly regarded as a summer-time phenomenon, signals do occur occasionally throughout the winter period but the duration and intensity of the openings are not generally as impressive as those normally associated with the main season. Very often, a flurry of sporadic-E activity occurs around Christmas with signals from all over Europe. Of course, patience is required in order to witness many of these openings which could appear without warning when you least expect them! Should it be impractical to monitor the band continuously, then regular checking is the answer.

Tropospheric Enhancement

This is another well-known form of propagation which can occur at any time of the year. During the depths of winter it can provide very strong and stable signals for the TV DXer, very often of entertainment quality.

Although we have covered tropospheric reception in some depth in a previous article it may be best to briefly recap on its various characteristics. Tropospheric propagation is influenced by anticyclonic weather conditions associated with areas of high pressure. The presence of foggy weather, which is associated with such conditions, can also provide enhanced reception conditions. Sometimes, reception can last for several days with signals maximising during the evening but rapidly deteriorating towards mid-morning. However, this is not always the case — at the time of writing this article a tropospheric opening was present without too much deterioration during the course of the day.

Pay Attention

An increase in signal level from a normally weak semi-local transmission source is a good indication that such conditions are improving. Enthusiasts with sensitive antenna systems, even in central areas of the United Kingdom, can usually detect weak continental transmissions in Band III and sometimes at u.h.f. on a daily basis. Any increase in signal level from

transmitters at these distances should certainly be taken note of.

From a typical site in the central area of the UK, tropospheric DX reception can be expected from France, Belgium, the Netherlands and West Germany. The better openings will provide additional signals from East Germany, Denmark, Switzerland and Scandinavia. A rare super-duper opening could mean the appearance of Polish, Austrian and Czechoslovakian transmitters in Band III or at u.h.f. Band III and u.h.f. frequencies are affected more than Band I.

Tropospheric signals are usually stable with slow fading — a vastly different behaviour to sporadic-E reception. At u.h.f. co-channel interference can mar the local transmission as well as the DX signal at times, but occasionally pictures are clear and as good as you would obtain from the local transmitter. Whether you simply log the stations or view them for amusement will largely depend on your attraction to the hobby.

Meteor-Shower (MS) Reception

Meteor showers can also assist DX signals. In fact, reception is possible every day of the year via ionised meteor trails. Much of the reception will be of short duration, sometimes lasting only a second or two. It is possible that many DXers have experienced this form of reception without appreciating that it is a mode of propagation which is completely different from sporadic-E. On the other hand they may feel that the results obtained are so short-lived and so insignificant that this type of propagation is not worth bothering with.

These bursts or "pings" are due to signal refraction from an ionised trail generated when meteor particles burn up on entering the earth's upper atmosphere. Pictures may appear briefly or in quick succession, but often their origin can be quickly deduced, especially if a recognisable test card or caption is received. It goes without saying that the receiver timebases must respond and synchronise instantly and you must know



Fig. 3: A lounge set-up this time. A storage system similar to the one described is used to house and conceal the various pieces of equipment.

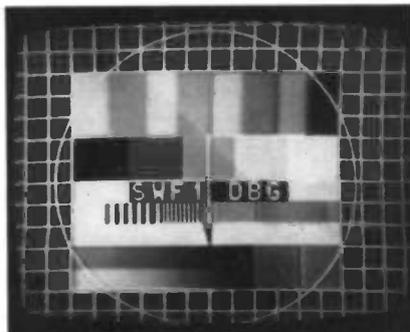


Fig. 4: Mid-winter reception via tropospheric enhancement in Band III from the West German transmitter at Dillberg.



Fig. 5: Sporadic-E reception is still possible even in the depths of winter as this photo shows, taken in January 1988. Russian TV Channel R1.

INTRODUCTION TO DX-TV

exactly where to locate the various channels. FM radio signals can also be propagated by the same means. Unfortunately, their short duration means that identification will be virtually impossible unless you are an active f.m. listener and can recognise snippets of the various programmes. A radio with a digital frequency readout is a must for accurate logging and identification of f.m. signals.

Peak Dates

On certain dates of the year, meteor-shower activity can reach a peak. These dates are reasonably predictable and reference can be found in many books dealing with the subject of astronomy. Note that the dates are not always the same every year although usually very close. Sometimes, peak activity is limited to a couple of hours on the appropriate day when the frequency or number of "pings" will reach a maximum. Some enthusiasts have commented that the activity of certain meteor showers varies every year. There are two explanations for this. Firstly, peak activity might occur during the early hours when the DXer is not monitoring. Secondly, the shower will not

necessarily peak over Europe — it could peak somewhere else in the northern hemisphere, over Canada for example.

Some meteor showers are insignificant and are not worth getting excited about in advance. On the other hand, some peaks are more active than others and deserve a mention in your diary. Two excellent peaks occur during the winter. The Geminids produce activity during mid-December and on checking through the logs of previous years, the 14th seems to be the most active date. The Quadrantids peak in early January, normally on the 3rd or 4th. The Perseids is another excellent one which peaks between August 9 and 13. All of these showers can generate sustained activity throughout Bands I and II producing a deluge of simultaneous signals, not unlike patchy sporadic-E reception rather than short solitary bursts. In fact, it is all too easy to confuse the two types of propagation during active showers!

Band III Affected

Reception is also possible at Band III frequencies, particularly on the lower channels E5, E6 and R7. Reception

distances will be roughly the same as for sporadic-E propagation, i.e. approximately 700–1200 miles. Several years ago, at the beginning of January, one of the authors saw the Finnish test card flutter up on channel E9 for a few seconds. This year, another enthusiast noted this particular station on E9 and also the Swedish test pattern on channel E8. Russia, Czechoslovakia, Norway, Sweden, Finland, Italy, Denmark, Austria and Rumania have all been identified in Band III via meteor-shower propagation over the years by various enthusiasts.

Some of the more significant meteor showers and approximate peaking dates are listed below:

Meteor Shower	Approx. Peaking Dates
Quadrantids	January 3–4
Lyrids	April 22
Eta Aquarids	May 3–5
Omicron Cetids	May 14
Perseids	August 12–14
Orionids	October 21
Taurids	November 13
Geminids	December 12–14
Ursids	December 21

RADIOACTIVE IN DUBLIN

Shane Halpin EI4GE

Dublin amateurs came out of the woodwork and not just in EI but also in Dublin Australia, New Zealand, Virginia, Pennsylvania, Texas, New Hampshire, Georgia and even Dublin village on Banana Island off Sierra Leone.

Dubliners were united and the reason being is that Dublin is celebrating 1000 years since its foundation as a city.

A special millennium group from the Irish Radio Transmitters Society re-activated the callsign EI1000, (it was last used to bring in the millennium year on January 1) and began its 24 hour operation at 12 midnight. The entire event took months to plan and considerable research and correspondence as well as detailed propagation forecasts were needed to facilitate the operation.

The station which consisted of a Yaesu FT-707 and 757GX and two linear amplifiers were located on the top floor of an office block which has since been built on the ancient Viking City. A Mosley 3-element Yagi towered over the surrounding landscape.

Another station which was open to the public was operational from the General Post Office in O'Connell Street where a live v.h.f. to h.f. patch system to the main station worked well.

Finally a third station was operational

Activity the like of which is seldom seen or heard in EI abounded in the capital city of Dublin last St. Patricks Day March 17.

from Fingal Radio Club on v.h.f./u.h.f.

The Lord Mayor Carmencita Hederman arrived at the GPO to pass on best wishes

to the IRTS and congratulate the group on a fine effort.

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The next event planned for the millennium will take place on July 10 and it is hoped to run a portable special event station in the Phoenix Park in the centre of Dublin to coincide with an Amateur Radio Emergency Network exercise.



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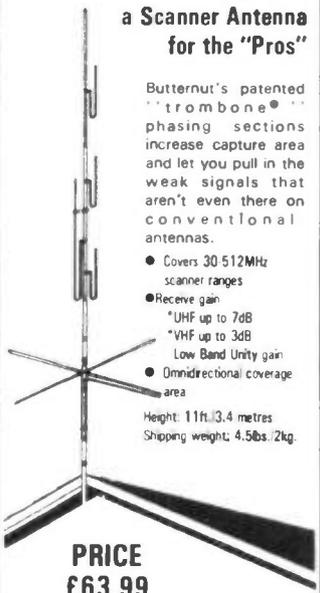
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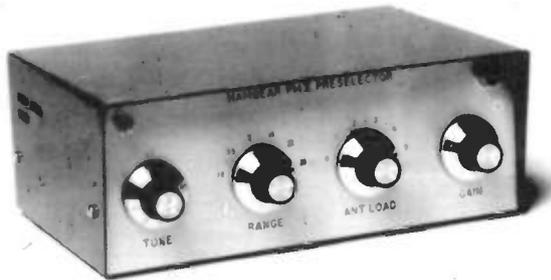
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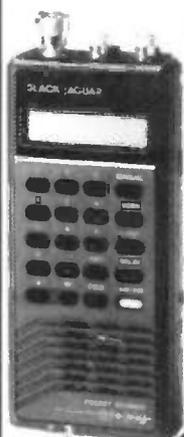
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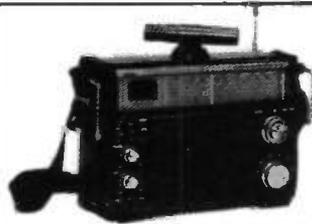
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PANASONIC RF-B10

Dick Ganderton

The RF-B10 is a neat little receiver, ideal for carrying around as it is small enough to fit into a pocket or even the wife's handbag. The case is moulded in the now almost *de rigour* matt black plastics with half of the front face being taken up by the tuning scales.

Controls

The controls are very simple — there are three push-bars under the dial, two select between FM and MW-SW and also act as the ON switch, whilst the third turns the set off. On the left-hand edge are the VOLUME control and TONE switch as well as the 3.5mm headphone jack socket. The other end carried a HOLD switch — used to lock the set either on or off for travelling purposes — a DX/LOCAL attenuator switch, and the tuning knob. A slider on the top of the case, directly over the dial functions as a wave-change switch for selecting the six s.w. bands and the m.w. band. The band selected is indicated in a small window at the top of the dial.

The set is powered by two UM-3 (AA) size dry cells carried in a compartment in the back. There is no provision for using any form of external power supply.

The Dial

The dial is split into eight vertical columns, one for each of the bands covered by the set. Turning the tuning knob moves a horizontal metal bar up or down the scales, all of which, except for the m.w. scale, are "calibrated" in MHz. Calibrated is probably too generous a term as the "scale" consists of a few irregularly spaced frequencies without the benefit of any form of markers. About two and a half turns are needed to move the pointer from one end of the scale to the other. Although this may sound to be rather coarse I found no real difficulty in tuning in to a broadcast station on any of the bands. A small red l.e.d. at the bottom left of the dial gave an indication when a station was correctly tuned.

Short wave receivers seem to be getting smaller and smaller while still retaining a creditable performance. The Panasonic RF-B10 is small enough to be taken on holiday and has a performance belying its size.

Antennas

For use on the m.w. band an internal ferrite rod antenna provides the signal whilst for the other bands covered a telescopic antenna, 530mm long, is provided mounted on a swivel on the top of the set. The antenna fold down flush with the top of the set, clipping into place so that it can be fitted into the neat, suede, carrying case. This case has a Velcro fastener for the "lid" and should protect the set really well. The wrist strap, which is permanently attached to the set, is fed through a hole in the side of the case. Unfortunately, the design of the case means that the set has to be removed completely before it can be operated and this is a rather fiddly task. Putting the set back into the case is even more awkward! There is also no provision in the case for the earpiece supplied with the RF-B10.

The TONE control is a two position slide switch and for listening to v.h.f. stations I found that I preferred the Low setting, the HIGH position reducing the bass a little too

Abbreviations

a.m.	amplitude modulation
d.c.	direct current
f.m.	frequency modulation
g	gram
l.e.d.	light-emitting diode
MHz	megahertz
mm	millimetre
m.w.	medium wave
mW	milliwatt
s.w.	short wave
V	volt
v.h.f.	very high frequency

much. For listening on short waves the switch can be set to either position depending on the brightness of the sound required, the Low setting reducing the rather tiring "hash" considerably. The other control of note is marked SENS and is another two-position slide switch operating the attenuator. The two positions are DX and LOCAL and the latter setting is useful for preventing powerful stations overloading the input. The instruction manual suggests using the DX position for normal listening changing to LOCAL if reception is impaired or interfered with by powerful stations.

The handbook provided with the RF-B10 is a small, 48 page booklet written in several different languages. There is only the barest of operating instructions with no real information on how to get the best from the set. I think that a fair proportion of potential buyers of the RF-B10 will not have any idea of how to listen on s.w. and that any instruction book should offer some sort of help in this direction. I appreciate that it helps to reduce the printing costs of instruction books if they are multi-language but is it worth it if the result is of little use?

Performance

I was very impressed with the performance of the set, managing to tune the same broadcast stations as my Eddystone 940 on a long wire. Obviously it will only cope with a.m. broadcast stations so that it has limited appeal to the serious short wave listener. However, for someone who wants to keep up with the news whilst on holiday or abroad on business the RF-B10 is ideal and at about £60 will not break the bank either. My thanks to **Panasonic (UK) Ltd, 300-318 Bath Road, Slough, Berks SL1 6JB. Tel: (0753) 34522** who supplied the review sample.

Specification

Frequency coverage:	MW 520-1610kHz SW1 5.95-6.20MHz (49m) SW2 7.10-7.30MHz (41m) SW3 9.50-9.90MHz (31m) SW4 11.65-12.05MHz (25m) SW5 15.10-15.60MHz (19m) SW6 17.55-17.90MHz (16m) FM 87.5-108MHz
Sensitivity:	m.w. 100µV; s.w. 4µV; f.m. 3µV
Audio output:	200mW into 4 ohms
Power source:	3V d.c. 2 x UM-3 batteries
Dimensions:	110 x 70 x 23mm
Weight:	145g (without batteries)



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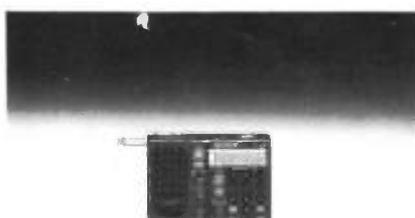
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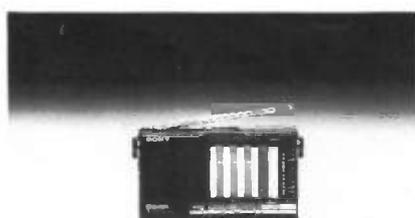
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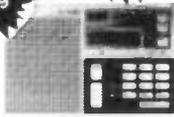


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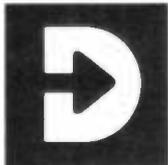
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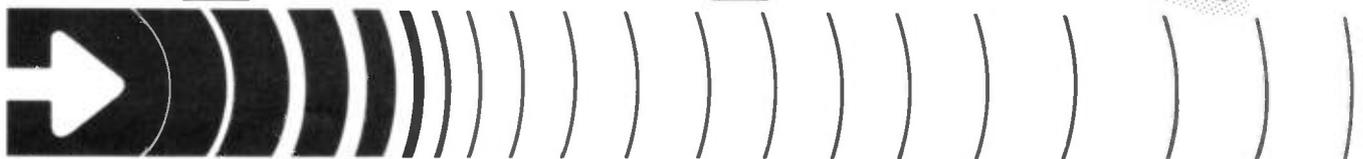
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SCANNING

Alan Gardner

Another New Hand-held

News reaches me of another hand-held scanner shortly to become available from AOR. The final specification of the European version has not yet been finalised but it is expected to have all the features of the current model — the AR800E — plus one or two extras. These include five banks of 20 memory channels and five sets of programmable search limits, priority channel monitoring and an improved blue/green display backlight for night-time operation.

Rumour has it that it may include coverage of 225-400MHz in place of the more usual v.h.f. low-band range. If this is true, it should appeal to the many u.h.f. aircraft band listeners who may be looking for a hand-held receiver. The price? — I would think just under £300 — keep your eyes peeled for the first sightings!

Antenna Improvements

On the subject of hand-held scanners, reader **Dave Hicks**, has been experimenting with his new Bearcat BC200XL and finds that the performance can be improved by replacing the supplied helical antenna with a more suitable one. One solution is to use a telescopic antenna as suggested by **Ian Smith** in the September column. Dave however found that the antenna from his dual-band 144/430MHz hand-held amateur transceiver gave good performance on both the v.h.f. and u.h.f. bands as well as 934MHz.

In the interests of science I have tried a few different antennas on my hand-held scanner and have found much the same as Dave, the best type depends on the frequencies you most wish to listen to. If you just tend to monitor one band, for example the v.h.f. aircraft band then a ¼ wave whip or helical antenna tuned to the centre of the band may still be your best choice. However, I have found that the Yaesu YHA-27 dual-band antenna is about the same size as the supplied antenna and gives almost the same performance on 70,128 and 144MHz. However, on 430MHz it gives almost 6dB improvement and on 934MHz more than 10dB.

If you can tolerate a slightly longer antenna at 380mm the Comet CH-72S gives better performance on the lower v.h.f. bands, but less of an improvement on 934MHz. Beware of some types of dual-band antennas which have narrow band matching networks built-in, as these tend to only work over their specified frequency ranges.

A quick way of checking is to measure the d.c. resistance with a multimeter between the centre pin and the outer of the connector on the base of the antenna. If this produces a reading on the meter the chances are the antenna contains some form of matching network and is not suitable.

A mixed bag this month in which Alan takes a look at hand-held scanners and turns his thoughts towards Christmas.

As a final point Dave wonders if anyone has discovered a modification which will provide manual a.m./f.m. switching on the BC200XL — I will pass on any information that is sent to me.

Hand-held Performance

A couple of readers have asked about the level of performance to be expected from hand-held scanners and what common problems they should look out for.

The first item to check is the frequency range of the scanner — will it cover the bands you are interested in? As far as I am aware, no hand-held scanner offers continuous coverage from 25-950MHz. However, many offer coverage of the more interesting parts of the spectrum.

Will the scanner tune in different frequency step sizes and can you manually switch between a.m. and f.m.? These are two of the most frequent points to trap the unwary. Generally sensitivity is not a problem with most current designs, the limiting factor as I mentioned before tends to be the supplied antenna.

A few scanners will operate outside the frequency bands specified by the manufacturer, however, the sensitivity outside these limits is usually poor. The reason for this is that the manufacturer must build some degree of tolerance into the design in order to allow for the spread in component values and alignment which normally occurs during production. For example, a receiver may be required to give a certain level of performance over a particular frequency range. In order to achieve this the designer actually provides tuning over a much larger range than is actually required in order to ensure that the specification can be met.

In most designs, tuning outside the specified ranges is prevented by the control circuits. However, with some designs the user may find a larger than expected frequency range but with reduced performance outside the

specified limits. This should be looked upon as a bonus, providing the user is aware of the limitations.

The other problem which may occur with any scanner is one of spurious responses or "birdies". This tends to be worse in hand-held designs as a lot of circuitry has to be squeezed into a small space. The main problems occur on the v.h.f. bands where harmonics of the switching signals, produced by the microprocessor/controller, tend to cause interference to received signals.

One other source is harmonics produced by the various crystal oscillators present in the receiver. These only occur on spot frequencies and as such are annoying but generally unavoidable in such wide frequency range designs.

A good test with any scanner is to disconnect the antenna and set the search limits to cover the entire range of each band. Make a note of the frequency each time the search stops and repeat this process until you have logged all the internally produced signals. Take a quick look down the list — you may be surprised at the number you have written down, it is quite common to log 30-40 with some receivers. Look at the difference between frequencies and you may see a pattern emerging of around 10 or 20MHz between signals. These are probably harmonics of the i.f. conversion oscillators. If however they occur in small blocks of consecutive frequencies it is more likely that they are produced by the control or display circuits. Reducing the level of these spurious signals is both difficult and expensive so, in most cases, the manufacturers do the best they can for the price.

The same is true of another common design problem, how to reduce unwanted image responses. These are generally worse on the u.h.f. bands where the tuning of the r.f. circuits is much broader than at the lower frequencies. A more detailed description of how image responses occur was given in the June 1988 column but to summarise — it is possible to receive signals at twice the first i.f. away from the frequency to which the receiver is tuned, which can cause interference to the wanted signal.

Most modern designs offer a reasonable degree of image rejection usually by choosing 21.4MHz as the first i.f. instead of the 10.7MHz used in many earlier designs. This also helps to ease the r.f. stage design requirements.

Christmas Time

Turning our thoughts towards Christmas I thought that it may be a good time to take a quick look at a few items which would make good presents. You get the idea — leave the magazine lying around the house after high-lighting the relevant item with the brightest Day-Glo marker you can find, while hoping that Father Christmas's scanner may just detect it!

Abbreviations

a.m.	amplitude modulation
dB	decibel
d.c.	direct current
f.m.	frequency modulation
i.f.	intermediate frequency
m	metre
MHz	megahertz
r.f.	radio frequency
s.a.e.	stamped addressed envelope
u.h.f.	ultra high frequency
v.h.f.	very high frequency

SCANNING

Starting off with the inexpensive items first, how about some headphones — not only useful in reducing the annoyance caused to the rest of the family each time the squelch opens, but they also help to improve the intelligibility of noisy signals. Don't bother with really expensive types as they tend to reproduce low frequencies too well, masking some of the more important mid-range frequencies. Try some of the cheap lightweight types intended for use with personal hi-fi.

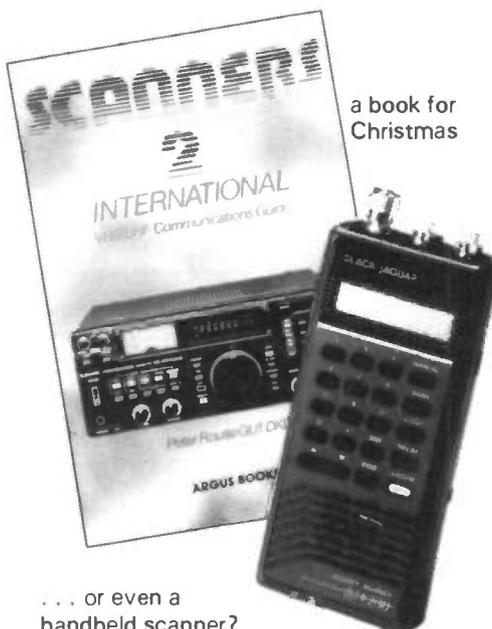
I have seen some of these selling for as little as £1.50, so try a pair and hear the difference. They also come in useful if you have a hand-held scanner, as most people assume you are listening to a strange looking personal hi-fi.

Along the same lines, how about an external speaker for the scanner? Most receivers have very small internal speakers fitted, a vast improvement in quality can usually be made by connecting a reasonable size forward facing external speaker. Again this need not cost a lot, some of the "pod" speakers intended for parcel shelf mounting in cars are good for this purpose.

Slightly more upmarket are the models with built-in tone controls which allow you to "tailor" the sound to your own requirements. Car hi-fi "booster" amplifiers with built-in "graphic equalisers" can also be used for this purpose producing improved intelligibility.

Of course, books are always a favourite gift — great for settling down to after the Christmas pud! The *SWM* book service can help out here with a wide range of radio related titles. The two books by Peter Rouse, *Scanners* and *Scanners 2* occupy prime position on my bookshelf as I find they are not only a good introduction to the hobby for the newcomer, but they also provide a handy reference for the more experienced listener.

Failing that — how about a years subscription to *SWM*? Just think of all that hassle you will save — going to the newsagents and finding that the last copy has just been sold!



a book for Christmas

... or even a handheld scanner?

Next on the list might be a cassette recorder. I find this invaluable for logging activity on a new-found frequency. If you have a squelch driven relay output on your scanner, or alternatively a cassette recorder with a built-in voice operated switch, you can leave the combination to automatically record signals. On returning you can play the tape back at your leisure, compressing several hours activity into just a few minutes. Try and get a model with a fast search facility if you can as this speeds the process up still further. I have also found that having some form of digital tape counter is an advantage.

Looking at slightly more expensive items — why not give those weak signals a boost by replacing that cheap coaxial cable you have been using? I know it's not the sort of thing you tend to normally change without good reason, but why not give your scanner a treat. It's quite surprising the difference good quality cable makes, particularly at u.h.f. where the losses tend to be more noticeable.

Antennas also make a big difference, so why not replace that temporary system you have been using since you first got the scanner with something a bit more professional (nearly every antenna system I

have seen can be improved in some way). If your antenna is mounted inside the house, how about mounting it outside. Not only will this improve the strength of signals being received, it will also help to reduce pick-up of electrical interference generated by household appliances, particularly on the lower frequency v.h.f. bands.

Finally, if you are wondering what to do with the spare cash you have left over from trading in the "Rolls", how about the most important item — a scanning receiver? Prices range from less than a hundred pounds for a hand-held model to — well, the sky's the limit for some of the more upmarket professional models.

Information Exchange

Several readers have written to me asking if it is possible to contact other readers in order to exchange information and experiences related to scanning in general. I am at present trying to devise a means of achieving this. If you are interested in such a scheme and don't mind such information being passed to other readers, perhaps you could drop me a line, giving me an idea of the sort of equipment you use and your particular interests. These will be included in the list. Enclose an s.a.e. and after I get a reasonable number of replies I will return a list to you.

I am not too happy about including full postal addresses in such information so perhaps one way around this would be to initially just include the area in which you live and a telephone number. If you have any alternative ideas let me know.

On the subject of letters, I believe that some letters sent to me around the time of the postal dispute may have become "misplaced" — if you have not received some form of confirmation to a letter sent around that time please write again.

As usual all letters to PO Box 1000, Eastleigh, Hants SO5 5HB. Until next month — good listening and Happy Christmas!

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STARTING OUT

Brian Oddy G3FEX

Some of these undesirable effects are not new, in fact Marconi encountered one of them during his experiments with simple spark transmitters and detectors in the early days of radio. He found that the lightning activity associated with thunderstorms resulted in intermittent crashing sounds from the telephones attached to his coherer detector — it made the reception of weak signals extremely difficult and almost defeated his attempt to bridge the Atlantic with a spark transmitter!

Natural Sources of RFI

The atmospheric noises which Marconi encountered in those early days still trouble the modern listener. Thunderstorms occur in almost every area of the world and result in a natural form of r.f.i. known as **atmospherics** or **static**. When lightning discharges take place from earth to cloud, or from cloud to cloud, electromagnetic radiations are set up which cover a wide band of radio frequencies. The power in a single flash is enormous — often enough to light a whole city for a year, so a brief but intense burst of radiation is produced, which may well travel for hundreds of kilometres.

Because the resulting bursts of radiation cover such a wide band it is not possible to tune them out at a receiving point, however the distribution of energy in each burst is greatest at low frequencies, so their effect becomes less noticeable as the frequency of reception is raised. Not all of the random electrical discharges which occur during a thunderstorm are of sufficient intensity to cause a visible lightning flash, nevertheless numerous low intensity discharges do also take place. When they occur close to a receiving site they contribute a crackling effect to the receiver background noise which serves as an accompaniment to the main static crashes.

The intensity of the atmospherics received from distant thunderstorms is affected by the propagation characteristics at different frequencies. Below 300kHz they may be audible at all times of the day or night and a pronounced increase in their intensity will be observed as the frequency of reception is reduced. Between 500kHz and 2MHz they are of very low intensity during the daytime, because the skywave component is absorbed by the highly ionised D layer of the ionosphere — see "Starting Out", *SWM* May '87. At night however, the skywave component will be propagated efficiently and the effect of distant static will be appreciable. In the h.f. region (3 to 30MHz) the static from distant thunderstorms may be propagated to other areas of the world via the ionosphere.

In all areas of the world the static levels are higher during the summer than in the winter. A particularly high level of lightning activity exists near the equator,

One of the biggest problems encountered by a listener these days is r.f. interference (r.f.i) — a simple name for a multitude of effects, all of which are likely to spoil the pleasures of DXing.

consequently the average static level in the tropical areas is some 15dB higher than in the cooler temperate zones, while in the much colder arctic regions the level may be 25dB lower.

Each droplet of rain or hailstone that falls from an electrified cloud will carry a charge and any that strike an outside antenna will place a charge on it. In doing so, it will set up another form of natural r.f.i. known as **precipitation static**, whereby reception will be marred by a rapid ticking noise or even a hiss during heavy rain. If no easy path to earth exists, a very high potential can build up on the antenna and a distinct crackling noise and sparks may be produced at the point where it discharges to earth. In such circumstances it could be dangerous to touch the antenna, so always remember to earth an outdoor antenna before a storm or when not in use.

Although atmospheric noise predominates on frequencies up to about 20MHz, another form of natural r.f.i. called **galactic noise** extends from about 15MHz upwards. This stems mainly from our nearest star, which we call the sun, but some of the other stars also produce noise. Some areas of outer space which have few visible stars have also been found to produce noise. Sunlight agitates the molecules of our atmosphere and results in yet another form of natural r.f.i. known as **sky noise** — this becomes evident at frequencies above about 500MHz.

Man-Made RFI

Although natural forms of r.f.i. play a part in preventing reception, a far more serious problem arises from **man-made** r.f.i. Almost anything which man has designed to run by electricity can create r.f.i. in one form or another. In order to ensure that one item of electronic equipment can operate without disturbing another item of electronic equipment it is necessary to take specific measures to suppress unwanted radiations.

The r.f.i. from man-made sources can reach the listener's receiver and other items of equipment by either **radiation**, **conduction** or **induction**. One of the most common forms of interference stems from the action of breaking an electrical circuit — this causes a **spark discharge** to occur, which produces both visible light and a short burst of **radiated** r.f. energy. When this burst of r.f.i. is detected in a nearby receiver a sharp click is heard from the

loudspeaker if the contact break was quick and clean, but a device with contacts which open slowly, such as a thermostat, usually produce a characteristic "bzzt, bzzt". In fact many of the r.f.i. sounds from a receiver can give a clue to their origin!

Some of the common sources of radiated r.f.i. include light switches, electric fences used by some farmers, electric motors and d.c. generators which utilise commutation, buzzers and electric shavers which employ vibrating contact points, leakage across the insulators of high voltage power lines, neon advertising signs, trolley buses, electric trains and the spark ignition systems used with petrol engines in cars, motorcycles and lawn mowers. In fact any item of electrical equipment in which a spark is produced, however minute, will result in radiated r.f.i. unless steps are taken to suppress it at the source.

Fortunately for all of us, some legislation was introduced a few decades ago which requires the manufacturers of certain types of electrical equipment to take steps to ensure that adequate r.f.i. suppression is incorporated into their designs. Not many years ago, ignition interference used to plague the DXer and the TV viewer, but adequate suppression is now compulsory and this form of interference has been greatly reduced.

Although some forms of r.f.i. have been alleviated as a direct result of legislation, many others still remain. Unfortunately very few manufacturers of electronic equipment such as TV and radio receivers, hi-fi equipment, electronic organs, video recorders and microcomputers are willing to incorporate sufficient protection devices into their designs to prevent them from either causing, or being affected by, r.f.i. The truth is that the cost of doing so is likely to place them at a disadvantage with their competitors.

One of the most common problems which listeners and DXers have to contend with these days is the interference caused by direct radiation from the "line timebase" oscillator and amplifier circuits used in television receivers. The line oscillator generates a sawtooth waveform on 15.625kHz which is rich in harmonics and multiples of that frequency are radiated as r.f.i. The harmonics from the line timebase of a nearby television set may well be audible on the long, medium and short wave bands of a portable receiver which uses built-in antennas.

In built-up areas, where large numbers of TV sets are in use during the evening, this form of r.f.i. can pose a serious problem for the DXer — in some cases this may prove to be insurmountable. Some improvement in s.w. reception may be obtained by erecting an outdoor dipole antenna as high up and as far away as possible from the nearest TV set. A convenient length of 75ohm balanced twin feeder may be used between the

antenna and a 1:1 balanced to unbalanced transformer (balun) mounted at ground level. Any length of 75ohm coaxial cable may then be used to link the balun to the coaxial antenna socket on a well screened receiver.

Some types of interference may travel along the mains wiring in a building or via supply cables from another area by means of **conduction**. The most effective way of dealing with this type of r.f.i. is to prevent it from leaving the source by installing a simple filter consisting of r.f. chokes and disc ceramic capacitors close to the point of origin — see Fig. 1a. Some improvement may also be obtained by installing a **mains filter** in the supply lead to the receiver — see Fig. 1b. Note that a mains filter will be ineffective if the r.f.i. is also being radiated by the power wiring.

Listeners who have high voltage power lines running close to their property can experience r.f.i. problems caused by **electrostatic induction**. Very strong electric fields surround these lines and they can induce a charge on nearby metal objects. The induced voltage will be proportional to the capacitances between the line and the metal object and also between the object and earth. Although these capacitances may be very small, the induced potential may be quite high due to the high impedances involved. When any of these charged metal objects make intermittent contact an electrostatic discharge may take place and r.f.i. results. Typical causes are loose joints in metal gutters and drain pipes, or loose corrugated iron sheets used on some garage roofs and outbuildings. A cure may be effected by bonding the joints so that potential differences cannot arise.

Fig. 1a

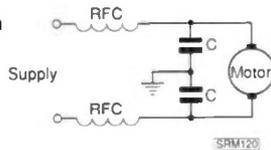
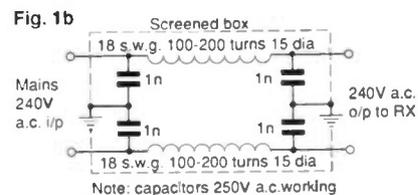


Fig. 1b



Abbreviations

a.c.	alternating current	MHz	megahertz
a.f.	audio frequency	r.f.	radio frequency
dB	decibel	r.f.i.	radio frequency interference
d.c.	direct current	RX	receiver
h.f.	high frequency	s.w.	short wave
i.f.	intermediate frequency	s.w.g.	standard wire gauge
i/p	input	TV	television
kHz	kilohertz	V	volt

Noise Reduction

The level of man made r.f.i. in remote rural areas is often quite low or even non-existent, but a very high level exists in most major towns and cities which can easily mask the weaker radio signals. In theory the best place to eliminate it is at the source, but that may not always be practical and in many cases the origin of the interference may be unknown to the listener. An alternative approach is to incorporate additional circuits in the receiver which are capable of limiting or rejecting the noise resulting from certain types of r.f.i.

In the more congested areas some types of r.f.i. result in **impulse noise**. One type produces a "hiss" from the receiver which may prevent all but the most potent

signals from being heard. It stems from the overlapping r.f.i. pulses generated by an unsuppressed commutator in an electric motor. Another type takes the form of an annoying "pistol shot" effect. It originates from a single spark discharge which produces a high intensity r.f.i. pulse. A series of spark discharges result in a "machine gun" effect which may seriously disrupt reception.

The effects of impulse noise may be reduced by employing a **noise limiter** after the detector in a receiver. One of two basic configurations may be used, namely **series** or **shunt**. The circuit of a series limiter is shown in Fig. 2a. A forward biased diode (D1) acts as a gate and only permits signals below a certain amplitude to pass to the audio amplifier stages. When a high amplitude noise pulse comes along it will reverse bias the diode, causing it to cut off momentarily, thus the interfering pulse will be effectively replaced by a small hole in the wanted signal. The human ear is much less disturbed by brief holes in a signal than by peaks of noise, so the subjective effect is a noticeable improvement in reception!

Two diodes (D1/D2) are used in the shunt limiter shown in Fig. 2b. The variable resistor (R3) enables the reverse bias applied to the diodes to be set so that they do not conduct when normal audio signal levels are present. When a high amplitude noise pulse arrives, its positive and negative excursions will cause the diodes to be driven hard into conduction, thereby momentarily shorting the audio to earth. Some improvement in the performance of a shunt limiter can be obtained by installing it across the primary winding of the last i.f. transformer rather than in the a.f. stages of the receiver.

There are a number of more advanced techniques which can be employed in a receiver to limit the effects of impulse noise — these will be outlined in this series next month.

Fig. 2a

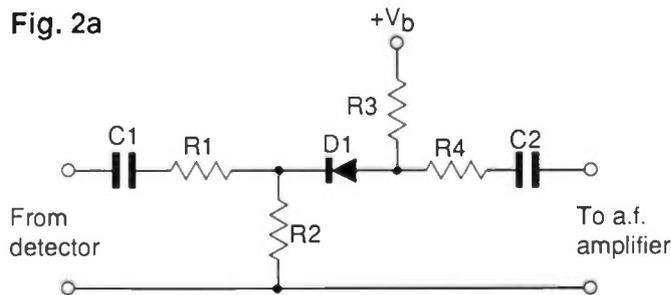
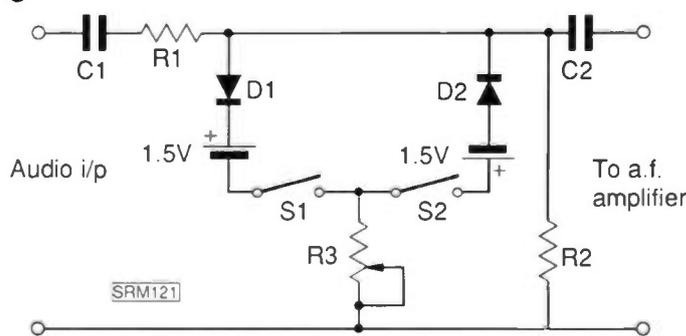


Fig. 2b





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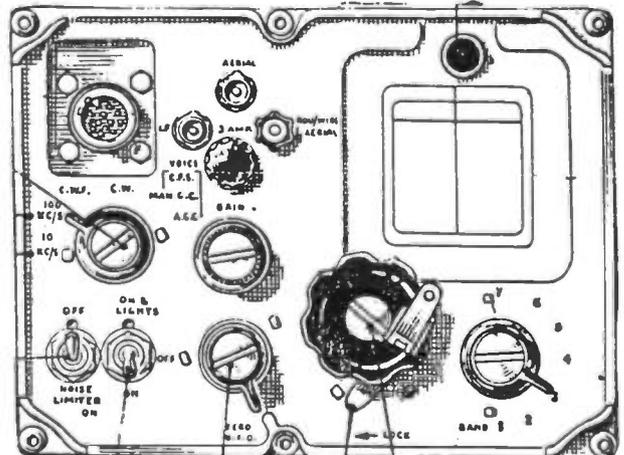
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The question of which band to use when hunting DX is always of interest. Those of you who have "genned up" on the why and how of antennas will be aware that, say, a 14.5MHz and a 14MHz dipole will yield an identical pattern at their resonant frequency given only that each is the same number of wavelengths above an ideal ground. However, that means that on the one hand the 14.5MHz dipole would be at about 0.965m above ground, while the 14MHz one must be some 10 metres up.

Most of us are "stuck with" our antenna height, by reason of the constraints of a residential area site. Considering the last paragraph, it becomes pretty clear that if we replace the 14MHz dipole with a 28MHz one, we have increased the effective height from a half-wave length to one wavelength, with a resulting improvement in the proportion of low-angle radiation. In the practical case of a real site, it therefore follows that every little bit of height you can gain is useful on the lower frequencies in particular, and it is still worth the trouble to elevate the antenna a bit more even at 28MHz. It is worth noting that the extra height also helps to get one out of the noise field which is so noticeable within the average home.

A second point to come out of the study of these drawings of antenna patterns is that if you are lumbered with a low antenna there is even more usefulness in beaming the signal than there is for the high antenna. A low dipole antenna — a quarter wave or less high — spits most of its pattern straight up in the air and very little out sideways. A beam at the same height will give NO improvement in the angle of the lowest-angle lobe (the one we want for DX), but what it will do is to largely suppress the straight-up-in-the-air lobe and hence give the practical impression of much more gain than is theoretically possible.

However, a loft-mounted beam can be a snare for the incautious. First of all, there is no possibility of just cutting it up and hanging it: long odds it'll need up to a foot of each end off before it comes to resonance. Secondly while some loft beams work well after properly tuning-up, others, for various local reasons just totally refuse to play. In this case, you are better off by far to forget the beam idea in favour of a dipole, alone, or even a Best Bent Wire.

Letters

Let's make a start with **Phil Mead G6RJZ** (Ickenham). Phil has been Reading the Rules, and having difficulty making head or tail of 'em. Oh, dear!

First, DXCC prefixes means "prefixes emanating from any country which appears in the DXCC Countries List." In effect this means that you can use the Geoff Watts list as your standard, since any such prefix will be noted there. If the prefix is a brand new one, then we will accept it if it is in Geoff Watts list by the time the claim is made. It is assumed you have verified your hearings by QSL cards, and so we may — and normally will — ask to see a selection of the QSLs as part of our processing of the Award. As to the question of how much to log for any

given contact, the essentials are time UTC, band, frequency as near as you can measure, signal strength report he was dishing out to the station he was in contact with, and similar details for the contacts before and after this one if possible. Hearing a station calling CQ will be acceptable provided that the QSL confirms your report was on his CQ call. In fact, as much information as you can offer, especially if your man is a "special" of some sort. Above all, I have to read the darned thing, so make me happy by writing it legibly! If it is a computer print-out, give it a new ribbon if it needs it — most of these are so "thin" and can be very difficult to read.

Also there are no separate awards for each band or mode. So a claim can be made up of contacts heard on any band using any mode, but if you hear an HB9 station on 14MHz you can't claim it again when you hear him on 28MHz.

The Bronze and Silver Awards should be relatively easy to claim, especially over a contest weekend, but hopefully the Gold should prove a bit of a challenge. Mind you, don't rush to send in your claims too quickly — don't forget I could be asking to see some QSL cards! If they haven't arrived when you make your claim and I ask to see them, the award is held up until they arrive. I hope that makes things a bit clearer. Any further questions that pop up, I'll answer in forthcoming months.

N. Melville (Edmonton) found the VKs, ZLs, JAs, but no W6/W7 over the period — odd since I noted several W6/W7, but, alas, in the evenings away from their "normal" time.

Now to **R. G. Williams** of Borehamwood, who is still sending in prefix lists to Justin Cooper! However, he raises an interesting point with N1EQS/AA. I believe — can anyone confirm? — that this is in fact a suffix used when an American amateur upgrades his licence, until such times as the paperwork can churn its way through the computer; it is rather confirmed by the frequency on which he was operating, too.

Tony Dobson started in February with a Realistic 2004, then bought a converter for it and now has gone the whole way by persuading "she-who-must-be-obeyed" that a Kenwood R2000 is the right thing. It is coupled to some 21m of wire stretched out along the eaves and spaced off by "outriggers". The receiver was bought on August 26, and by 2100 clock the wire was up, the first log entry coming at 2230; alas, the unaccustomed exercise was too much and Tony almost fell asleep over the receiver, so he called it a day! For a question, Tony wonders whether an a.t.u. is worth while. I would think it very much worth the effort; brew one up for a single band first; a few turns shunted by a tuning capacitor, with the feed to the receiver and the antenna both tapped on to the coil. Fiddle until you get a "peak" of signal and continue adjusting turns until

you have the tuning capacitor giving a reasonably "flat" peak (implying that if you need a slow-motion drive it's too sharp) with, very roughly about 1.5pF for every metre of wavelength as judged by eye. Then compare the signal with the antenna directly coupled, and through the a.t.u.; you should expect to find a couple of S-points or even more. After you have the single-band a.t.u. up and running, you can try a multi-band version. If all else fails, you can easily buy one; but it is much nicer to be sure before you buy that you do in fact need an a.t.u. — there are one or two cases where it would be a waste of time. As a change of topic, Tony wonders just how well he has done; to which I have to answer "Pretty Well!"

Graham Johnson (Coventry) sends an interesting list of stations heard, plus a couple of queries. First, J42IFT who could well have been a "special" prefix from Greece; and turning to KE1Y, either he was not in Switzerland or Graham only got part of the call sign. Basically KE1Y is an American call, hailing from the W1 call area. Were he in fact in Switzerland one would have expected him to sign HB9/KE1Y on a reciprocal licence. Graham's logs were for August and September.

T. Galt (Arden, Glasgow) wonders what the letters RAIBC mean; Radio Amateur Invalid and Blind Club. On a different tack, to receive s.s.b. on a Vega or similar receiver lacking a b.f.o., one needs another receiver. Put the second receiver alongside the Vega, switch both on. Imagine the Vega switched on to 14MHz. In order to get a beat, the second receiver can be tuned to 14MHz minus the intermediate frequency. For an i.f. of 465kHz, then, this second receiver is tuned around 13.5-13.6MHz. Tune the second receiver around until it is heard in the first one. Now tune them both in step. Adjust the physical spacing of the two receivers (and maybe the angle too) so that the signal from the second receiver doesn't "smother" the Vega. With care, all c.w. and s.s.b. signals can be resolved.

D. R. Degg (Stoke-on-Trent) has collected up quite a crop of queries. Many countries divide up into "call areas". For example there's the USA, Canada, Australia, and so on. In such countries, rather than use the /P when out portable, the station will sign with a suffix comprising the number of the call area in which he is: for example W4WFL/6 would be W4WFL operating portable somewhere in W6-land, which is California. Thus, IK1LA/4 is in the fourth call area of Italy, SP9EJ/3/A is a similar thing, just as we use /A and /P; and AB4JB/P1 is merely making it QUITE clear that he is both operating from the first call areas AND is portable; maybe he's hoping for a few more QSOs in a contest! The 411TU was almost certainly a miscopied 4U11TU. UB5WE/P/RO I can't answer to; but UB5WE is a well-enough known call,

and a suffix such as this could mean something if I knew whether the last symbol was a letter O or a figure zero — if the latter then UB5WE was heard in the far eastern end of USSR. As for Y43CE, this is the modern version of the old DM call. Y plus two digits plus suffix is invariably East Germany.

On we go to **D. Peat** (Mansfield) where I am pleased to note David has enrolled in a local RAE class. That should bump up the local amateur activity a little, and no doubt David will come into contact with the local club if he hasn't done so already; on the other hand, the textbooks will put a crimp in the listening maybe, especially as exam-time comes up! David also hopes the course will enable him to find why the kit a.t.u. he built doesn't function on his half-size G5RV. If one builds a kit up, one should always assume first of all that it has been wired wrongly if it fails to "perk" on completion. Compare the wiring against the instructions and the instructions against the circuit, after which you can compare the wiring against the circuit. If you ask someone else to check your work it helps (no-one can reliably check his own work for some reason!); if you must check for yourself, do it after the project has been in limbo for long enough for your mind to come to it again fresh so you don't fall into the same problem again. Look also for "dry" soldered joints.

Dry Joints

Start from the assumption that any joint which looks at all "blobby" is a dry one. A fairly certain check for the goodness of a soldered joint is to look at it under a magnifying glass; if the solder blends down almost imperceptibly to the wire AND the tag all is probably well. If the solder rises abruptly or steeply from the tag you should assume it's a dry one. Refloat the joint carefully, adding a bit of flux and solder. The correct procedure is to have a hot iron, with a clean and tinned bit, put a bit of the cored solder to the iron as you bring it to the joint so when it arrives there is flux and solder available. As soon as the iron reaches the tag, offer the cored solder to the side of the tag opposite the iron until the solder flows and covers the tag and the wire. Most dry joints are caused by using a dry, untinned, hot iron so the heat can't flow into the workpiece, or, worse, by the habit of holding a wire to a tag and "sticking" it with solder. Even if one of the latter "takes" OK, the shake in your hand as it cools guarantees a dry joint — compare the look of the solder when it has cooled, alongside a known good joint, and you'll see the difference! The dry joint will look far less shiny, more crystalline in appearance, arising from the movement of the wire while the solder is in the plastic state. It is quite important to realise that there is with almost all alloys a difference between the temperature at which it melts and the temperature at which it solidifies, and when soldering the aim is to get everything up into the truly liquid range so it flows properly, and to follow by having everything still until the solder is totally solidified. Above, remember soft solder is just that — it doesn't have very much physical strength at all, so laid-on joints are likely to break if subjected to vibration.

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- 13.597MHz FAX 120/576 JMH4
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- 14.510MHz RTTY 50/425 RIC75
TASS Moscow
- 20.056MHz RTTY 50/425 5AQ88
Tripoli Libya
- 20.736MHz FAX 120/576 LSA600
Buenos Aires
- 19.7475MHz RTTY 50/425 6VU79
Dakar Aero

Jan Nieuwenhuis has written with a few snippets of information which have been received via QSL cards. First concerns Pretoria Meteo callsign ZRO which runs FAX on the following frequencies: 4.016MHz, 7508MHz, 13.538MHz and 18.238MHz. RTTY broadcasts from this station can be found on: 4.018MHz, 7.512MHz, 13.542MHz and 18.240MHz. I don't as yet have a full schedule for this so if you know the details please write and let me know. The second item from Ja. is that Italcable Rome are operating on 18.1715MHz using the callsign IRQ21.

Guide to Utility Stations

Whilst writing this column, my review copy of this popular guide has dropped through my letterbox so I think a brief summary is in order!

This 1989 seventh edition contains some 16280 frequencies which is some 478 more than the 1988 edition and according to the back cover 5045 changes have been made since last year. One additional feature of this latest version is a ten page section covering some of the background and equipment requirements for monitoring utility stations.

After a quick read through, this latest version indicates that the usual high standard of Klingenfuss publications has been maintained and the serious listener will find it of great benefit. For a more complete view of this useful guide keep an eye on the book page.

And Finally

What about c.w., some of you are asking. It has been policy with this column to only cover RTTY and FAX based transmissions, but there is a lot of c.w. being sent and this is generally



QSL CARD

AGENCE FRANCE PRESSE

CONFIRMING RTTY RECEPTION :

DATE 19 May 1987 TIME 1935 TU XMT.CALL
LOCATION : 48.02 N - 02.00 E. FTK.61
POWER 35 Kw BEAMED 102°

Bert dx and
73

THANKS FOR REPORT

QSL received
by Jan Nieuwenhuis

regarded as a "utility" mode. Would you like me to include c.w. in this column? Please write and let me know your feelings on this subject, as the column is here to serve you!

Post your next reports early to avoid the Christmas rush!

INFO IN ORBIT

Pat Gowen G3IOR

17 Heath Crescent, Hellesdon, Norwich, Norfolk NR6 6XD

New Weathersats

It has been an exciting month for satellite enthusiasts. Since the good news last month on OKEAN-1, we have three more weather satellites to study. The first of these is the new Chinese satellite mentioned in last month's column (then with some degree of speculation). This earlier tentative information can now be confirmed and we are able to give the full data.

Feng-Yun-1

The Chinese have come into the commercial space launch business only relatively recently, but their progress and degree of success has been quite spectacular. Your columnist well remembers hearing the first Chinese "SINCOM-1" satellite, with its high frequency playing of the tune *The East is Red* announcing its dramatic presence. Many of us in those days, including government experts, spent many hours attempting to decipher the telemetry that followed the song. The change expected between eclipse and sunlight that would suggest battery and

temperature changes could not be found, and it was only by pure accident that when a tape was being rewound slowly during repeated attempts at analysis it was discovered the "telemetry" was in fact the audio tape of the song being rewound!

The success of the Chinese over the past two years with their "Long March" rockets have now led to a superb weather satellite erected from a new launch site south of Beijing on 6 September 1988 into an almost perfect orbit. It is called Feng-Yun, which roughly translated, means "weather-sky".

For those with computers, the Keplerian element set follows:

Epoch Year: 88
Epoch Day: 265.83490459
Drag Factor/Decay: 2.5E-6
Inclination: 99.1293
Right Ascension of Ascending Node: 234.1276
Eccentricity: 0.0016206
Argument of Perigee: 2.6389
Mean Anomaly: 357.0781
Mean Motion: 14.00343668
Orbit No. or Rev.:
Epoch: 210

The NASA Catalogue number for Feng-Yun-1 is 19467, and it is object number 88-080A. Readers who put into their programs the actual date and time, e.g. AMSAT-81 users, will need to place the Epoch Julian Day and decimal day given in as 21 September 1988 at 20 hours, 02 minutes and 16 seconds.

Those without computer tracking may refer to Fig. 1, which gives a complete list of all passes over the East Anglian region of the UK by Feng-Yun from November 26 to 28 inclusive. The columns read date, time of acquisition of signal, time of loss of signal, then time of maximum elevation, followed by the maximum elevation degrees

above horizon at that time. It will immediately be noticed that the passes re-occur at almost the same place at nearly the same time every day, thus removing the need to pre-calculate for coming passes in the days ahead.

Those followers who use plotters, as originated by G2AOX, can produce a cursor for a 103 minute orbit (half hemisphere 51.5 markings) set at 99 degrees to the equator.

The frequency first quoted was 137.800MHz, but was later noted to be on 137.040MHz and even later stated as being on 137.140MHz. It is not known if this satellite, like the METEOR series, is shifting frequency or if some confusion has come about between it and NOAA-11 and even other speculated Japanese weather satellite launches, but a little determined checking at the correct pass times should resolve this anomaly. A further complication is that it is not always turned on when over Europe, but is invariably active on passes out to the north west.

Our regular correspondent Lawrence Harris of Plymouth was one of the first to spot the new Chinese satellite. He had learned that an APT satellite was

planned and had been waiting for the tests to start. "On September 29, I picked up a NOAA type picture on 137.04MHz which I, at first, thought to be a simultaneous broadcast from NOAA-11, but the picture was inconsistent," writes Lawrence. "Later on, I got the Keplerian elements for Feng-Yun-1 and was thus able to confirm that it originated from that satellite". He further explains, "Feng-Yun-1 sounds just like the NOAA's, transmitting two visible adjacent pictures — presumably the electronics were bought from the Americans. I expect that a second picture — perhaps infra-red — will be added soon".

NOAA-11

Yes — at last it is in orbit! It finally lifted off after a really long wait on 24 September 1988, to become object number 88-09A and NASA catalogue number 19531 in space.

The latest Keplerian element set for this satellite is as follows:

Epoch Year: 88
Epoch Day: 270.73336221
Drag Factor/Decay: 1.028E-5
Inclination: 98.9064
Right Ascension of Ascending Node: 210.5138
Eccentricity: 0.0011251
Argument of Perigee: 255.5823
Mean Anomaly: 104.4066
Mean Motion: 14.10625041
Orbit No. or Rev.:
Epoch: 32

A set of passes for East Anglia are given in Fig. 2 for the same week-end as your *Short Wave Magazine* arrives, i.e. 26 to 29 November inclusive. It will be seen that each successive day brings the satellite pass some ten minutes earlier than the previous, and the slight change of increment resulting gives a marginal daily shift, as with the other

Fig. 1.

DATE	TIME	MAX ELEV	MAX ELEV DEG	
26NOV	0208	0201	0914	13
26NOV	0349	0405	0357	68
26NOV	0530	0545	0530	20
26NOV	0713	0720	0710	07
26NOV	0854	0859	0855	01
26NOV	1031	1038	1035	02
26NOV	1207	1220	1213	12
26NOV	1345	1402	1354	45
26NOV	1525	1542	1534	47
26NOV	1714	1723	1719	06
26NOV	0208	0220	0215	13
27NOV	0349	0405	0357	68
27NOV	0531	0546	0538	28
27NOV	0713	0723	0718	07
27NOV	0854	0859	0857	01
27NOV	1032	1038	1035	02
27NOV	1208	1220	1214	12
27NOV	1346	1402	1354	47
27NOV	1526	1544	1536	48
27NOV	1714	1724	1719	05
28NOV	0208	0221	0215	13
28NOV	0349	0405	0357	69
28NOV	0531	0546	0539	28
28NOV	0713	0724	0718	07
28NOV	0854	0859	0857	01
28NOV	1032	1039	1035	02
28NOV	1209	1221	1214	13
28NOV	1347	1403	1355	47
28NOV	1526	1544	1536	48
28NOV	1715	1724	1719	05

Fig. 2

DATE	TIME	MAX ELEV	MAX ELEV DEG	
26NOV	0055	0114	0106	28
26NOV	0240	0255	0247	58
26NOV	0421	0434	0427	17
26NOV	0603	0609	0606	03
26NOV	0917	0925	0921	04
26NOV	1253	1307	1300	20
26NOV	1232	1248	1240	54
26NOV	1415	1428	1422	19
26NOV	2312	2314	2313	01
27NOV	0049	0103	0056	24
27NOV	0230	0245	0237	68
27NOV	0411	0424	0417	17
27NOV	0552	0559	0556	03
27NOV	0908	0915	0911	04
27NOV	1043	1057	1050	17
27NOV	1222	1230	1230	7
27NOV	1404	1419	1411	22
27NOV	0039	0053	0045	20
27NOV	0220	0235	0227	60
27NOV	0401	0414	0407	19
27NOV	0542	0558	0546	04
27NOV	0858	0905	0902	03
27NOV	1034	1047	1040	15
27NOV	1212	1228	1220	62
27NOV	1354	1408	1401	65
27NOV	1541	1547	1544	06
29NOV	0029	0043	0036	17

SEEN & HEARD



Fig. 3

NOAA weather satellite series. It is therefore simple to plot these on a day-by-day graph with the time on the horizontal axis and the days on the vertical to predict future passes.

Lawrence Harris writes, "My first contact with NOAA-11 came on September 25 at 1428UTC on a westerly pass. I knew that it had not been on for the previous passes since I had been scanning all day. It is on 137.62MHz and has a similar orbit to NOAA-9, but passes over England during the middle of the day — far more convenient than NOAA-9! It is due to have infra-red added to the telemetry shortly."

MET 3/2

Lawrence also tells us of METEOR-3/2, which he first picked up during an overnight September 14/15 survey on 137.850MHz. He found his tape full of infra-red data containing the Russian telemetry format, and thus knew that the way had been cleared for the new satellite to come on, as he had last logged METEOR-2/15 on August 1. Lawrence says that it transmits visible pictures in daylight including grey scale and phasing bars, some 15 or so in number. When in eclipse it has sometimes sent out an infra-red image with fewer phasing bars and without grey scale. He writes, "It is the first time, as far as I am aware, that the Russians have successfully operated a satellite of this type. On many previous launches the satellites start transmitting infra-red, but only for one or two orbits, after which they normally revert to 'visible' frequencies." Lawrence continues, "MET 3/2 transmits a wide format picture, so I have been able to see Cyprus, Syria, Iraq and the whole of Turkey for the first time, thanks to this new satellite. My previous views of these regions were from METEOSAT only!"

Space available does not permit us to give you the Keplerian elements and pass times in this month's column, but we hope to accomplish this next month, possibly with some good pictures from the new METEOR-3/2 and others.

Lawrence, shown at just part of his well-equipped station on our Fig. 3,

sends us a listing of the current active APT satellites, i.e. those that he finds to be in regular operation.

Satellite	Frequency
NOAA-9	137.620MHz
NOAA-10	137.500MHz
NOAA-11	137.620MHz
Feng-Yun-1	137.040MHz
(but see column)	
MET 2/16	137.400MHz
MET 2/17	137.300MHz
MET 3/2	137.850MHz

Occasional transmitting satellites include COSMOS-1766 on 137.400MHz and OKEAN-1 on 137.400MHz also.

COSMOS-1900 — The Epilogue?

Our last few months column content dealing with the potential hazard from this RORSAT and its nuclear fuel power supply payload approaching re-entry, was taken up by the media and many readers as the day of reckoning neared. Tracking and estimation of the time and likely points of fall-out was closely followed by numerous sources and the police and County Emergency Planning Officers were ready with contingency plans to deal with the possible emergency situation that could result.

As it transpired, just prior to the most likely projected re-entry time (the last two days in September) first given in our earlier news, the Soviet news agency issued a re-assurance on the safety aspect, by pointing out that additional safeguards had been incorporated into the internal command unit of the satellite.

Nico Janssen PA0DLO, was one of those carefully studying the COSMOS-1900 behaviour as it descended. He found that the Keplerian Elements on Epoch Day 88 274.496, e.g. 30 September 1988 at 1154:14 were given a Mean Motion of 16.3821081 orbits per day. At 88 274.740, e.g. the same day at 1745:36 the mean motion had changed to 16.38987141 orbits per day. The drag factor in the same period of 5 hours, 51 minutes and 22 seconds had increased by a factor of more than ten, from 6.9E-3 to 7.3E-2, giving a clear indication that the altitude was reducing at a rapid rate, and that re-entry was imminent.

It appears that the spacecraft was in fact under complete internal sensor computer control, which enabled initial stabilisation followed by a fully automatic attitude manoeuvre, as the body turned through over 90 degrees! This placed COSMOS-1900 into the

position giving maximum decay rate, and undoubtedly at the orientation required for the motor firing. At 2045UTC the satellite split up into two sections, one being the RADAR and electronics module, the other being the section with the main platforms plus the reactor and its fuel. The automatic on-board rocket firing then took place, which left the actual platform in lower orbit, but took the reactor nuclear contents to a 720km high circular orbit, where it should stay for at least the next 300 years before re-entry.

The platform, left in low rapidly descending orbit, decayed quickly, and burned out completely over the North Atlantic between Canada and Greenland just after midnight on the ascending node. The electronic and RADAR unit, already earlier left in low orbit following separation, finally decayed at 2215UTC the following day on the descending node over the South Atlantic. This took place several hundred kilometres out from West and South West Africa, when only some 3 per cent of the structure failed to vaporise and came down as solid material into the sea.

Thus, we can conclude the story of COSMOS-1900 for a few generations at least.

Shuttle

Leslie Sargent of Runcorn writes in to tell us how much he enjoyed the live broadcast of the STS-26 Space Shuttle *Discovery* on September 30 and October 1. "I managed to hear the communications while *Discovery* was over Hawaii on the evening of Friday September 30 at 2156UTC. One of the astronauts called 'Pinky' was giving out information on the Hawaii patch, talking about the motion status, the payload bay, the transponder and the module sequence. The broadcast from WA3NAN on 14.295MHz u.s.b. was re-transmitting live coverage of both the astronauts and the ground control at Houston in Texas".

WA3NAN is the amateur radio club station of the Goddard Space Flight Centre at Greenbelt, Maryland, the original site of WWV before they moved to Colorado. Your author has operated this station when at AMSAT meetings, and found that it is indeed an excellent radio site, with low noise and superb coverage. When any special space mission is in progress, particularly when AMSAT and amateur radio are involved, the club has the resources and are able to re-transmit the communications of the ground launch, the tracking, telemetry and the live audio from manned missions, and give

an exciting running commentary of the sequences of a mission to the world amateur radio community.

The frequencies normally used are 3.860MHz i.s.b., 7.185MHz i.s.b., 14.295MHz u.s.b., 21.395MHz u.s.b., and 147.450MHz v.h.f. f.m. The 14 and 21MHz frequencies are normally those best heard in the UK. The next *Atlantis* Shuttle mission on November 17 will not be broadcast, but many future missions such as those given in our last months column may well be, and can be enjoyed by all who listen. Those with suitable receivers may care to listen on the Shuttle v.h.f. frequency of 270.000MHz for direct access, although the Tracking Data and Relay Satellites take the bulk of the communications. The TDRS destroyed on the previous launch tragedy was replaced by a new one placed up by STS-26, so even less use of the v.h.f. frequency supplied is now likely.

Following the success of the long awaited *Discovery* mission (slightly further delayed by the lack of high altitude winds for a further day) the USA now plans to attempt to launch 14 Shuttle missions per year, perhaps accomplishing 12 in actual practice.

MIR

On November 21, two Russians and one French cosmonaut will go to the Soviet permanent orbiting space station. It is expected that the cosmonauts and the French visitor will return after a week or so, leaving the current pair Titov and Manarov plus the medical doctor to stay aboard until the Spring to accomplish a full years stay. A new module is now being prepared to launch to MIR via the PROTON rocket, for permanent docking, to make room for which PROGRESS-38 will be undocked soon now.

The MIR "Ham in Space" mission is imminent, and should be activated by mid-November. Already the crew have been outside the space station to erect a 145MHz ground plane antenna on the spacecraft exterior body, and the 2 watt 145MHz f.m. transceiver has been sent up by the auto-docking PROGRESS supply vehicle. Cosmonaut Musa Manarov is currently taking his RAE equivalent instruction by radio from five USSR amateurs as he flies over their horizons, and should pass by the time you read this column. The callsign will be U1MIR, probably working split frequency, and later UOMIR with a powerful transceiver available when the new crew takes over with a new operator next year. A full listing of frequencies will appear in the next column.

BAND II DX

Ron Ham

Faraday, Greyfriars, Storrington, West Sussex RH20 4HE

For the next few months we must rely on the troposphere to provide the bulk of the DX in Band II, because it is unlikely that any intense Sporadic-E disturbances of any reasonable duration will occur again until next April or May. With this in mind, I suggest that we add another angle to our interest in v.h.f. DXing by keeping an eye on the prevailing weather patterns.

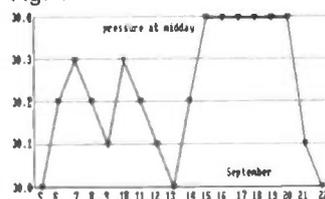
Apart from our own local observations, such as recording the atmospheric pressure, rain fall and temperature, more detailed information

covering a wide area can be seen on television or on maps featured in some national newspapers. Readers with a standard barometer can plot some interesting graphs by taking daily readings at midday and/or midnight and compare these with the reception of known stations that only appear when tropospheric conditions are good.

After seeing the dates of DX in your letters this time and from my own checking of Band II, I decided to plot the noon pressure for the periods September 5 to 22 (Fig. 1) and October

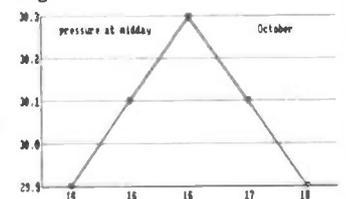
14 to 18 (Fig. 2), which covers several lifts in September and the opening on October 16.

Fig. 1



For the benefit of computer buffs, Figs. 1 and 2 were made using the

Fig. 2



graphics section of the Mini-Office Professional program on my Amstrad PCW.

Obviously the trace would be smoother if more daily plot-points were used, however the trend can still be seen, so give it a try and let me know how you get on.

Reports

Kevin Phillips (Bexhill-on-Sea) uses a Kenwood KT660L digital tuner and a 5-element rotatable antenna for Band II. Kevin reports that he receives signals from BBC Radios 1 from Crystal Palace, Holme Moss and Sutton Coldfield, Essex, London, Norfolk, Oxford and Solent and ILRs Capital, Chiltern, County Sound and Ocean Sound. He frequently hears the BBC in

Bedfordshire and Bristol and sometimes Ireland's RTE2 on 92.7MHz when Radio 3 transmitters close down.

In Basingstoke, **John Woodcock** has a Technics tuner with a loft dipole and has one channel preset for BBC Radio Bristol on 95.5MHz. "This can just be heard normally," said John, "but during the improved conditions for a few days around September 7, the channel was swamped by a French station (possibly Brest on 95.4MHz) which even locked in the stereo". He also heard a few other European stations on a Grundig portable.

Referring to September, **Ken Lancaster** (Rotherham) wrote, "I reckon it was the best f.m. DX month of the year. I logged that many continentals and UK locals that it was

nearly impossible to log them all and, apart from that, they were nearly consistent for the best part of three weeks." Ken found the peak around the 8th when his barometer reached 1040mb (30.75in) and his best catch was Severn Sound which serves Gloucester on 102.4MHz. Ken is pleased with the performance of his home-brew 5/8 ground-plane antenna, which stands some 26m a.g.l.

"A wide range of f.m. stations were noted from Eire on September 16; Norway, Sweden and Denmark on the 18th; while the 19th and 20th produced France, Benilux countries, West Germany (WDRs, NDRs, BFBS and AFN) and East Germany. Many of them were in stereo," said **Simon Hamer** from New Radnor. At 0830 on

October 16, I logged a variety of strong continental signals, predominantly French, between 87 and 102MHz.

Post early to avoid the Christmas rush
Your deadlines are: December 19, January 16 & February 13.

TELEVISION

Ron Ham

Faraday, Greyfriars, Storrington, West Sussex RH20 4HE

Readers often report receiving pictures from the French network Canal+ and **Ian Smith** (Paisley) kindly sent one of their "sticker" logos, Fig. 1. The circle behind the name is in a variety of colours.

In Bexhill-on-Sea, **Kevin Phillips** uses a D-100 converter for DXTV and he recently added an Extra Gain, 14-bay, wideband antenna to his existing rotatable arrays for Bands I and III. Kevin has been DXing since the age of 10 and he remembers tuning to TVS before going to school one morning when he lived in Shropshire. Kevin's DX score includes pictures from Iceland, Norway and the USSR in Band I, Belgium and France in Band III as well as Belgium, S4C from Presely and HTV from Mendip in the u.h.f. band.

I had the pleasure of showing **George Garden** from Edinburgh around the radio exhibition at The Chalk Pits Museum, Amberley, Sussex (Fig. 2) on September 25. George is a keen DXer with a special interest in operating portable from the top of Cairn O' Mouth, near Lawrencekirk and his

results frequently appear in the tropospheric section of this column.

Band I

During the last few weeks of the 1988 Sporadic-E season, from August 12 to September 29, **Edwina** and **Tony Mancini** (Belper) identified pictures from Austria (ORF FS1); Czechoslovakia (CST, RS-KH); Denmark (DR); Finland (YLE-TV1); West Germany (ARD1-logo, Grunten, SWF/BDN and ZDF); Holland (PTT-NED-1); Hungary (MTV1); Iceland (RUV Island); Italy (RAI); the Norwegian Regionals (Bagn, Bremanger, Gamlem, Gulen, Hemnes and Kongsberg); Poland (TVP1); Portugal (RTP1); Spain (TVE 1/2); Sweden (SVT Kanal1); Switzerland (+PTT SRG1); the USSR (TSS) and Yugoslavia (JRT). In addition they saw clock-captions from Holland, Hungary and the USSR, a programme about cats from Portugal, cartoons, folk dancing and a quiz show from Spain as well as HOBOTN (news) from the USSR. They also found periods of Sporadic-E on October 3, 4 and 5 when

test cards from Europe, Scandinavia and the USSR were seen. During more brief events on days 9, 10 and 12, signals from Denmark, Czechoslovakia and Poland came up.

Edwina and **Tony** have added a Citizen TC53, v.h.f./u.h.f. pocket colour receiver, to their collection of sets. They report, "It's ok for u.h.f. and the telescopic antenna really pulls some in". However, they are eagerly awaiting a good tropo or Sporadic-E to see how it performs under DX conditions.

September 4 proved a good day for **Bob Brooks** (Great Sutton) who logged test cards from Italy and Yugoslavia (JRT-Belgrade and Zargreb and MTV-Ljubljana), news and logos from Italy and programmes on cookery and religion from unidentified stations between 0845 and 1530. He also received test cards from Austria, Czechoslovakia, West Germany and Spain on the 1st and the USSR on the 2nd.

Bob sent a couple of photographs from his DXTV archives of the caption

and logo he received in 1986 from Spain (TVE) Fig. 3 and West Germany (Westdeutscher Rundfunk) Fig. 4.

Most Band I tuners are scribed



Fig. 1

E2---E3---E4, which represents an approximate frequency range of 48 to 68MHz. During a Sporadic-E opening on September 28, **Simon Hamer** (New Radnor) tuned through the band and logged pictures from Sweden (SVT) on Ch. E2 (48.25MHz); Czechoslovakia (CST), Poland (TVP) and the USSR (TSS) on Ch. R1 (49.75MHz); Italy (RAI) on Ch. IA (53.75MHz); Iceland (RUV) on Ch. E3 (55.25MHz) and Finland (YLE) on Ch. E4 (64.25MHz).



Fig. 2



Fig. 3 Spain



Fig. 4: West Germany

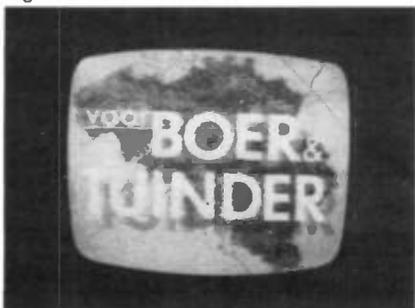


Fig. 5: Belgium



Fig. 6: Holland



Fig. 7: West Germany

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DcRx Kit (all versions): £15.60 each

Assembled PCB: £21.50

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AA2 kit: £7.50

Assembled PCB: £11.50

Just three of our new kits are outlined above, we also have receiver kits from £14.80, and amateur transmitters from £13.80, plus a whole range of accessories (ATU, side-tone, calibrator, converters, transverters, filters, etc), so there should be a project to interest you in our new catalogue.

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P&P is £1.00 per order.

73 from Dave G4KQH, Technical Manager.





Fig. 8 USSR



Fig. 9 India



Fig. 10 India



Fig. 11 India



Fig. 12 Pakistan



Fig. 13 Pakistan

Although DX in Band I is rare between now and the start of the 1989 Sporadic-E season next April or May, it is worth tuning around position E2 on your dial during the early mornings and at midday for short lived events.

Tropospheric

During the period of high atmospheric pressure the Manclns received pictures from Belgium (BRT-TV1 and RTBF1) on September 10, 20, 21, 23 and October 10; France (Canal+) on days 3, 4, 6, 7, 8, 9, 10, 18, 19, 20, 21, 23, 26 to 30, October 4, 5, 8, 9 and 10; East Germany (DFF) on the 19th and Ireland (RTE 1/2) on days 6, 8, 9, 17, 18, 19 and 30. They watched cartoons, a quiz show and Meteosat weather from France and cartoons, films, football, horse-racing, news and the Olympics from Ireland. They said, "the tropo didn't come to much except for September 19 when the French really came in, especially on u.h.f."

Bob Brooks received Canal+ from 0711 to 1230 and RTE all day on the 7th and Canal+ again at 0733 on the 16th. Simon Hamer logged Band III pictures from Denmark (DR Danmark),

Norway (NRK) and Sweden (SVT Kanal1 Sverige) on the 18th; France (TDF), West Germany (ARD1) and Luxembourg (RTL+) on the 19th and Belgium (BRT1), East and West Germany (DFF1 and ARD1), Luxembourg (RTL+) and Switzerland (+PTT-SRG1) on the 20th. Simon's big haul of DX was in the u.h.f. band when he received pictures, often on many channels, from Ireland (RTE 1/2) on the 16th; the new Danish second network with the "TV2-KBH VEST" test pattern ("KBH VEST" means "West Copenhagen", explains Simon) and Sweden's TV2 Sverige on the 18th; France (TDF), West Germany (ARD1, ARD/BR111, NDR3 or NDR111 HMBG6 and WDR3 displaying "WEST 3" and ZDF) and Switzerland (+PTT-TS1) on the 19th and Belgium (BRT1/2), East and West Germany (DFF2 and ARD1, BR3, HR3 and ZDF) and Holland (NED1/2/3) on the 20th. Also on the 20th he identified the 525-line transmission for the American Forces in Holland (AFRTS) on Ch. A80.

In Godalming on October 16, Les Jenkins noted that his barometer was high at 1442mb (30.75in) and a check

on Band III revealed pictures from Canal+ and Luxembourg (RTL), in colour, for about nine hours. Les uses a Salora receiver with a Maxview, wide-band, pre-amplifier. At 0830 on the 16th, I received strong negative pictures from France on Ch. 5.

During similar short-life openings I have watched programmes from Belgium Fig. 5. Holland Fig. 6 and West Germany Fig. 7 were seen by David Glenday in Arbroath and Peter Lincoln in Aldershot.

News from India

From his home in Meerut, Lt. Col. Rana Roy observed Sporadic-E disturbances in Band I on 12 occasions between July 13 and September 9. He logged pictures from China during the early afternoon of August 16 and 28, and between 1600 and 1730 on days 5 and 12 and on September 9. Dubia TV, with Teletext in Arabic, appeared for a couple of hours at 1715 on July 27. Cartoons, films and orchestral music were among the programmes received from the USSR on July 13, 15, 24, 27, 30 and August 28. While checking Chs. R1/2 at 1725 on July 25, Rana

saw multiple pictures with flashes of a football game on R2 and at 1740 a list of players appeared, Fig. 8, followed by an interview on the football field.

In addition, he received pictures, in Band III, from Agra, Bhatinda TV (caption, Fig. 9), Bawalpur TV (announcer, Fig. 10), Delhi's low power transmitter, Jalandhar (news caption, Fig. 11), Kasauli, Lahore TV (announcer and caption, Figs. 12 and 13), Masoorie TV and Pakistan TV during tropospheric openings on 15 days between July 23 and September 12. Among the items seen were test cards and Breakfast-TV from Agra, Bhatinda, Jalandhar, Kasauli and Lahore and commercials and news in Punjabi and Jalandhar. On August 4, Breakfast-TV from Lahore started with prayers and included exercises, news, cartoons, a short play and dental advice.

SSTV

Between 1415 and 1556 on October 10, Fred Pearce (Harlow) received very good slow scan television pictures, on 14MHz, from stations in Denmark, Hungary and Switzerland bringing his countries score up to 10.

LONG MEDIUM & SHORT

Brian Oddy G3FEX
Three Corners, Merryfield Way, Storrington,
West Sussex RH20 4NS

Long Wave DX

Note: l.w. & m.w. frequencies in kHz; s.w. in MHz; time in UTC (= GMT).

Several of the regular l.w. reporters have been checking the band in new places.

A holiday in Gran Canaria provided Neil Wheatley (Newcastle-upon-Tyne) with a good opportunity to explore the l.w. scene with his Sangean ATS-803 portable. He stayed at Puerto Rico on the south side of the island and found reception conditions quite unlike those at home. The l.w. signals were much weaker than expected and even Medi-1 Nador, Morocco 171 (1200kW) was faint. The BBC Radio 4 broadcasts via

Droitwich 198 (400kW) were audible after dark, but the signal was very weak.

Using a Sony ICF 2001-D portable, Ian Bond (Wirral) checked the band in S. France near Grenoble and Orange. He was disappointed at being unable to hear the BBC via Droitwich 198 and found this rather bewildering, because a year ago he heard their signals in the western Pyrenees, albeit faintly, when using an old car radio. Philip Rambaut (Macclesfield) compiled his log while in Agde, Hérault, S. France. He rated BBC Radio 4 via Droitwich 198 at S10 222 at 2150 and noticed a broadcast in Arabic under their signal which must

have stemmed from Quargla, Algeria 198 (2000/1000kW).

A holiday in Hamilton, Scotland enabled George Millmore (Cowes) to check the l.w. band from the northern end of the UK for a change. He was amazed to find that the signals from Allouis, France 162 (2000kW) and Junglinster, Luxembourg 234 (2000kW) were much stronger than those from the BBC Droitwich transmitter 198. No doubt the shorter sea paths accounted for the signals from Montala, Sweden 189 (300kW); Oslo, Norway 216 (200kW); Kalundborg, Denmark 245 (300kW) being far better than in Cowes, but the

broadcasts from Saarlouis, W. Germany 183 (2000kW) and Moscow, USSR 263 (2000kW) could also be heard more clearly than at home, which was unexpected. It is interesting to note that during these checks George found reception indoors on a Vega Selena portable inferior to that obtained with a Sharp four-band car radio in his car.

While in Leatherhead, Steward Russell (Forfar) has been checking the l.w. band. During daylight he could hear eight stations, but five more became audible after dark. Using a Trio R2000 receiver with a random wire antenna strung around the attic, Fred Pallant made similar comparisons in

SEEN & HEARD

Storrington. He heard thirteen stations during daylight, but four of them became inaudible at night: Medi-1 Nador, Morocco 171 (1000kW); DLF Munich; W. Germany 207 (500kW); Tipaza, Algeria 254 (1500kW); also Moscow, USSR 263 (2000kW). Four additional stations were heard after dark.

In Shawforth, John Evans says he ventured onto the l.w. band for the first time. Most of the stations were received with a Sharp ST1122 tuner, using a home made G2VF type l.w./m.w. loop instead of the built-in ferrite rod antenna, but he also tried his Vega 206 portable which proved to be inferior.

MW Transatlantic DX

Reception conditions are gradually improving as the hours of darkness increase. The earliest signals to cross the Atlantic on a fairly regular basis stem from CJYQ in St Johns, NF 930 and WINS in New York 1010.

In Grimsby, Jim Willett picked up the broadcasts from CJYQ at 0030 rated as SIO 333. He used his RCA AR77 receiver during several nights and logged eighteen stations. His list included two stations which have not been mentioned before in this series: CBG in Gander, NF 1400, rated as SIO 222 at 0230 and WWGT in Portland, ME 1440, rated as SIO 222 at 0220, both are subject to confirmation by QSL.

In Bristol, Tim Shirley has been checking the band at all hours of the night and he had heard WINS New York 1010 as early as 2230, but he says their signal is usually audible by 0030. On two occasions he heard WCAU in Philadelphia 1200 around 2300, but noted that the majority of the stations became audible later. Tim has also been checking the band around dawn and logged CKAC Montreal, PQ 730; Caribbean Beacon, Anguilla 1610; also CJYQ in St Johns 930, so it may be worth checking the band then if you prefer to make an early start to the day.

Writing from Slough, Mike Bennet has been busy building a large loop antenna and he is hoping to log some transatlantic DX with it. The frame measures 1020mm square and seven turns of wire form the main winding. A single turn placed centrally over the

main winding provides the coupling to the receiver. He was unable to obtain a 500pF air spaced variable capacitor, but he did buy a very small 650pF variable capacitor. Surprisingly it tunes the loop from 540kHz to 1600kHz. Mike has a Codar general coverage superhet and an RCA AR88D communications receiver.

Other MW DX

Using a "Sooper Loop" ahead of his receiver, Stewart Russell picked up three broadcasts from N. Africa at night: Bechar, Algeria 576 (400kW); Alger, Algeria 891 (600kW); also Sfax, Tunisia 1566 (1200kW). Several of the relatively low power broadcasts from Spain were noted including RCE-2 via Madrid 657 (20kW); SER via Madrid 810 (20kW); Radio Intercontinental, Madrid 918 (20kW); RCE via Madrid 954 (20kW); SER San Sebastian 1260 (20kW). Three stations in Portugal also were heard: Radio Porto, Miramar 783 (100kW); RRESeixal 963 (10kW); also Prog 3, Lisbon 1035 (120kW). The RNE-1 broadcasts from Madrid 585 (200kW) have been reaching Leo Barr in Sunderland — he rated them as 44344 at 2010.

Some broadcasts from N. Africa reach Jurgen Thiel in Moraira, Spain via ground wave paths during daylight. Around noon he logged Les Trembles, Algeria 549 (600kW); Oujda-1, Morocco 594 (100kW); Tunis-Djedeida, Tunisia 630 (600kW); Ain el Hamam, Algeria 693 (5kW); Oujda-2, Morocco 828 (100kW); Alger, Algeria 891; Alger, Algeria 981 (600/300kW); also Alger-3, Algeria 1422 (50/25kW). All rated 45555 or better.

Listening at night, Jurgen heard several broadcasts from the UK including BBC 648 via Orfordness on 648 (500kW), rated as 44434 at 2100; BBC Radio 2 on 693, logged as 43333 at 0330 — this frequency is shared by Burghead (50kW); Droitwich (150kW); Stagshaw (50W); StartPoint (50kW) and lower power relays. Also BBC Radio 2 on 909, noted as 44444 at 0350 — shared by Brookmans Park (140kW); Clevedon (50kW); Moorside Edge (200kW); Westerglen (50kW) and lower power relays. BBC Radio 1 on 1053, rated as 34433 at 0143 — shared by Burghead (20kW); Droitwich

Freq kHz	Station	Country	Power (kW)	DXer
153	Bechar	Algeria	2000	E*,H*,J,K*
153	Brasov	Romania	1200	E*,H,L*
153	DLF Donebach	W. Germany	500	B,C,E,F*,G,H*,J,J,M
153	Ufa	USSR	100	H*
162	Allouis	France	2000	A*,B,C,D,E,F*,G,H,I,J,K*,L,M
171	Kaliningrad	USSR	1000	B*,E*,G,H,I*,L*
171	Medi 1-Nador	Morocco	1200	E*,F*,I,K*,L*
177	Oranienburg	E. Germany	750	B,E,G,L*,M
183	SaarLouis	W. Germany	2000	A*,B,C,D,E,F*,J,J,M
189	Motala	Sweden	300	D,E*,F*,H,L*
189	Caltanissetta	Italy	10	I
198	Ouargla	Algeria	2000	F*,I,K*
198	BBC Droitwich	UK	400	A*,B,C,D,E,F*,G,I,J,K*,M
207	DLF Munich	W. Germany	500	B,E,G,I,J,L
207	Kiev	Ukraine	500	I*
209	Azizal	Morocco	800	I,K*,L*
216	Roumoules	Monaco	1400	A*,B*,C,E,F*,J,I,L*
216	Oslo	Norway	200	D,G*
216	Baku	USSR	500	H*
225	Konstantinow	Poland	2000	B*,E*,F*,G*,I*
234	Junglinster	Luxembourg	2000	A*,B,C,D,E,F*,G*,I,J,M
234	Kishinev	USSR	1000	B*
245	Kalundborg	Denmark	300	A*,B,D,E,G*,J,L,M
254	Tipaza	Algeria	1500	E,F*,G,I,L
254	Lahti	Finland	200	A*
263	Plovdiv	Bulgaria	500	L*
263	Burg	E. Germany	200	A*,G,J
263	Moscow	USSR	2000	C,D,E,G*
272	Topolna	Czechoslovakia	1500	A*,B*,C,E,I*,L*

Note: Entries marked * logged during darkness. All other entries were logged during daylight.

(150kW); Stagshaw (50kW); Start Point (100kW) and lower power relays. Also BBC Radio 1 on 1089, logged as 43444 at 0440 — shared by Brookmans Park (150kW); Moorside Edge (150kW); Washford (50kW); Westerglen (50kW) and lower power relays. He also heard BBC Radio London 1458 (50kW), rated as 54544 at 0500 and ILR Capital Radio, London 1548 (97.5kW), noted as 44434 at 2000.

While in Palma, Majorca, Cyril Kellam (Sheffield) heard BBC Radio London 1458 at 1930; BBC Radio 1 on 1089 at 2030 (shared frequency) and ILR Capital Radio 1548, rated as SIO 333 at 2050. Neil Wheatley checked the band while in the Canary Islands, but there was no mention of UK m.w. broadcasts in his report. The local broadcasts stemmed from Santa Cruz, Tenerife on 621 (100kW), 720 (20kW) and 1341 (20kW); La Laguna, Tenerife 882 (20kW); Las Palmas, Gran Canaria on 747 (20kW), 837 (10kW) and 1269 (20kW); Santa Cruz, Palma 1098 (5kW).

While checking the band in Gran Canaria at night, Neil logged a number of interesting stations including Les Trembles 549 (600kW) and Alger 891 (300kW) in Algeria; Conakry, Guinea 1404 (100kW); Porto Santo 531 (10kW) and Ariciro 603 (10kW) in the Madeira Isles; Sidi Bennour 540 (600kW), Laayoune 657 (50kW), Rabat 819 (25kW), Agadir 936 (600kW), Sebbaa Aioun 1044 (300kW), Tahdart 1053 (600kW), Tangier 1233 (200kW) — all in Morocco; Norte, Portugal 1062 (100kW); Dakar, Senegal 765 (400kW); Sevilla on 684 (250W) and 792 (20W) and Madrid, Spain 810 (20kW).

Using a Philips D1835 portable in Molepolole, Botswana P. R. Guruprasad listens to VOA via Selebi-Phikwe, Botswana 621 rated 55555. He also hears Radio Metro 576 rated 55454 at 1905; Capital Radio 604 as 35344 at 1230; Radio Lotus 648 as 55354 at 1618; Radio Toriando on 1035 as 45534 at 2105; Swazi Radio 1400 as 54454 at 1815.

In Bungay, Ron Pearce has been trying out an old receiver using a bright DXers:

- A: Tim Shirley, Bristol.
- B: Jim Willett, Grimsby.

DXers:

- A: Colin Diffell, Corsham.
- B: John Evans, Shawforth.
- C: Ciaran Fitzsimons, Chertsey.
- D: George Millmore, Hamilton.
- E: Fred Pallant, Storrington.
- F: Philp Rambaut, Agde, France.
- G: Stewart Russell, Leatherhead.
- H: Tim Shirley, Bristol.
- I: Jurgen Thiel, Moraira, Spain.
- J: Phil Townsend, London.
- K: Neil Wheatley, Canary Isles.
- L: Jim Willett, Grimsby.
- M: Martyn Williams, Sunningdale.

emitter valve, see Fig. 1. He says the set functions quite well on medium wave, in fact it will drive the vintage cone speaker when it is tuned into one of the more powerful stations. Using this receiver, Ron listened to a programme of country and western style music broadcast by AFN via Frankfurt, W. Germany 873 (150kW) at 2120.

The broadcasts from AFN have also been heard by Ciaran Fitzsimons in Chertsey. Using a SW2000 receiver he rated their broadcast via Frankfurt 873 as 54444 at 2101 and via Munich 1107 (40kW) as 21442. Two of the more distant stations were noted in his report: Lvov, Ukraine 1404 (30kW) rated as 54555 at 2049 and Vatican Radio, Rome 1530 (150/450kW), noted as 54454 at 2024.

Several broadcasts from Germany were logged by Martyn Williams in Sunningdale. They stemmed from Muhlack* 576 (300kW); AFN via Frankfurt 873; Wolfsheim 1017 (600kW); AFN via Munich* 1107; AFN via Stuttgart* 1143 (10kW); Neuminster 1269 (600kW); Heusweiler* 1422 (600kW); Langenberg* 1593 (400/800kW). Those marked * were heard at night.

Using a Lowe SRX-30 receiver, John Evans has been testing a new home built l.w./m.w. loop based on the G2VF design. Instead of building the recommended oblong or triangular



Fig. 1

Freq MHz	Station	Location	Time (UTC)	DXer
USA				
650	WSM	Nashville, TN	0130	A
660	WNBC	New York, NY	0100	A
1010	WINS	New York, NY	0200	A,B
1030	WBZ	Boston, MA	0300	A,B
1050	WFAN	New York, NY	0230	B
1210	WCAU	Philadelphia, PA	0200	A,B
1260	WWDC	Washington, D.C.	0200	A
1440	WWGT	Portland, ME	0220	B
1540	WPTR	Albany, NY	0300	B
Canada				
540	CBT	Grandfalls, NF	0600	A
580	CFRA	Ottawa, ON	0300	A,B
590	VOCM	St. John's, NF	0330	A
730	CKAC	Montreal, PQ	0530	A
920	CJCH	Halifax, NS	0240	A,B
930	CJYQ	St. John's, NF	0030	A,B
1220	CKCW	Moncton, NB	0240	B
1400	CBG	Gander, NF	0230	B
1510	CJRS	Sherbrooke, PQ	0400	B
1570	CKLM	Lavel, PQ	0300	B
1580	CBJ	Chicoutimi, PQ	0400	A
C. America & Caribbean				
750	XEKOK	Las Cruces, Mexico	0300	B
1570	Atlantic Beacon	Turks & Caicos IIs	0100	B
1610	Caribbean Beacon	Anguilla	0230	A,B
S. America				
570	R. Rumbos	Venezuela	0330	B
1220	R. Globo	Rio, Brazil	0300	B

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frame, he used a short length of half metre diameter sewage pipe. The results obtained were marginally better than when using his "Sooper Loop", but adding a Sooper loop type pre-amplifier to the G2VF loop produced a remarkable improvement. Broadcasts noted in his log stemmed from Solvesborg, Sweden 1179 (600kW), SIO 333 at 2115; Kvitsoy, Norway 1314 - 444 at 1515; Kaunas, USSR 1386 (1000kW) - 444 at 2130; Lushnje, Albania 1395 (1000W) - 322 at 2130; Monte Carlo, Monaco 1467 (1000/400kW) - 444 at 2230; Wolvertem, Belgium 1512 (600kW); Mainflingen, W. Germany 1539 (700kW) - 444.

A first report from Simon Holland in Douglas, IOM, included Stargard, Poland 1503 (300kW), their signals reach him via sky wave paths at 2010. During the day two of the official broadcasts from S. Ireland can be received via ground wave paths: RTE-1 via Tullamore 567 (500kW) and RTE-2 via Athlone 612 (100kW). He has also been listening to BBC Radio Ulster via Lisnagarvey, N. Ireland 1341 (100kW).

The broadcasts from RTE-1 via Tullamore 567 and RTE-2 via Athlone 612 have also been received by Phil Townsend in London via ground wave paths. He rated them as SIO 222 during the morning. Between 1145 and 1645 he picked up the ground wave signals from several continental stations including BRT-2 via Wavre, Belgium 540 (150/50kW), rated as SIO 344; DLF via Beyreuth, W. Germany 549 (200kW) - 222; FIP Paris 585 (8kW) - 244; Hessischer RF via Frankfurt, W. Germany 594 (400kW) - 233; RTBF-1 via Wavre, Belgium 621 (300kW) - 344; Hilversum 3 via Lopic 675 (120kW) - 333; Hilversum 2 via Flevoland 747 (400kW) - 344; Hilversum 5 via Flevoland 1008 (400kW) - 344.

While in Hamilton in the Clyde valley, George Millmore checked the m.w. band with his Vega Selena portable during daylight. Although he could hear Hilversum 2 via Flevoland 747 (400kW) and BRT via Wolvertem, Belgium 1512 (600kW) as clearly as at home and Solvesborg, Sweden 1179 (600kW) sounded like a local, there was no trace of the French stations. By looking at a map it will be seen that the path from virtually anywhere in France to the Clyde valley is almost entirely over land, whereas clear sea paths helped the signals he heard to reach him.

MW Local Radio DX

The BBC are anxious to obtain a wider listening audience both in and outside London, so their local radio broadcasts from Radio London on 1458 have been replaced with a new service called Greater London Radio (GLR). Their transmissions on 1458 are being well received in many areas. No doubt they will welcome reports from listeners. The broadcasts from the new BBC Radio Gloucestershire on 603 are also being well received in many areas. They welcome reports from listeners and confirm them with an attractive QSL card.

The delay in receiving QSL cards from local radio stations was mentioned by two listeners this time. Martyn Williams says, "Two months have now passed since reports were sent to ILR Southern Sound and ILR Chiltern Radio. I was hoping for QSLs or information, but none have arrived yet. How about a QSL table for local stations on m.w. They could be ranked in average

Freq kHz	Station	ILR BBC	Power (kW)	DXer
585	R. Solway	B	2.00	D,E,N,R
603	R. Gloucestershire	B	?	B,G,H,I,U
603	Invicta Sound	I	0.10	D,J*,L,O,P*,S,T,U*
630	R. Bedfordshire	B	0.30	C,D,E,J,N,D,P,Q,S,T,U*
630	R. Cornwall	B	2.00	R
657	R. Clwyd	B	2.00	C,I,D,I,N,O,U
666	DevonAir R.	I	0.34	D,I,L,O,U
666	R. York	B	0.50	C,I,N,O,U
729	BBC Essex	B	0.10	E,I,J,L,O,P,Q,S,U
756	R. Shropshire	B	1.00	D,I,L,U
765	BBC Essex	B	0.50	I,J,L,O,P,Q,R,S,T,U
774	R. Kent	B	0.70	E,I,J,L,O,P,Q,S,T,U
774	R. Leeds	B	1.00	I,N,O
774	Severn Sound	I	0.14	D,I,U
792	Chiltern R.	I	0.27	D,N,O,P,Q,S,T,U*
801	R. Devon	B	2.00	D,F,I,L,P,T*
828	2CR	I	0.27	D,L,R*
828	R. Aire	I	0.12	C,N,R*
828	Chiltern R.	I	0.20	J,O,P,S,T,U
837	R. Furness	B	1.00	N,R
837	R. Leicester	B	0.70	D,J,L,O,T,U
855	R. Devon	B	1.00	L
855	R. Norfolk	B	1.00	J,O,P,S,T,U
855	R. Lancashire	B	1.00	I,N,R
873	R. Norfolk	B	0.25	J,L,N,S,T,U
936	GWR	I	0.18	D,I,J,L,O,Q,U
945	R. Trent	I	?	C,I,L,N,O,T*,U*
954	DevonAir R.	I	0.32	J,L
954	R. Wyvern	I	0.16	D,I,U
990	R. Devon	B	1.00	D,L,R,T*
990	Beacon R.	I	0.09	O,R*,U
990	Hallam R.	I	0.25	N,R*,U
999	Red Rose R.	I	0.80	C,N
999	R. Solent	B	1.00	D,J,L,Q,T,U
999	R. Trent	I	0.25	R*,U
1026	R. Cambridgeshire	B	0.50	D,O,Q,S,T,U
1026	R. Jersey	B	1.00	L
1035	R. Kent	B	1.00	I,O,Q,S,T,U
1035	Northsound R.	I	0.78	C
1035	R. Sheffield	B	1.00	I,N
1107	Moray Firth R.	I	1.50	D
1107	R. Northampton	B	0.50	J,L,O,T*,U
1116	R. Derby	B	0.50	D,O,U
1116	R. Guernsey	B	0.50	J,L,Q
1152	BRMB	I	3.00	D,I
1152	R. Broadland	I	0.83	I,O,T*,U
1152	LBC	I	23.50	E,J*,P,Q,S,T,U
1152	Piccadilly R.	I	1.50	N
1161	R. Bedfordshire	B	0.08	O,P,U

Note: Entries marked * logged during darkness. All other entries were logged during daylight.

response time and whether postage is required." Writing from Cork, Patrick Healy says he has just received a QSL from BBC Radio Stoke-on-Trent after waiting 1327 days! He also had to wait 369 days for a QSL from ILR BRMB Radio.

It might be possible to add a QSL column to the local radio chart, but I am not sure that it would reflect the true picture, as much depends on the quality of the report. Broadcasters are under no obligation to send a QSL letter or card in response to any report from a listener, but a well presented report will usually bring a reply. Ideally your report should be of real value to both programme production department and the engineering department and it should cover more than one listening period if possible. It must be clearly understood that most local radio stations operate on a very small budget, so sending an s.a.e. with your report is essential. Log keeping and report writing were detailed in my "Starting Out" series - see SWM October '87. Back issues are available from *Short Wave Magazine* in Poole at £1.45.

In Hamilton, George Millmore logged BBC R. Solway 585.; ILR West Sound 1035; ILR R. Clyde 1152; ILR R. Forth 1548. On his way home he stopped 3km west of the Cat and Fiddle Inn on the A537 between Macclesfield and Buxton and heard BBC R. Leeds 774; ILR R. Aire 828; BBC R. Lancashire 855; BBC R. Derby 1116; ILR Piccadilly R. 1152; ILR Signal R. 1170; ILR Pennine R. 1278; BBC R. Stoke-on-Trent 1503; BBC R. Nottingham 1521.

George says, "If one could spend several hours in this area a quite a sizeable log could be compiled".

Writing from Leeds, Chris Nykiel says, "I use the logs which are published in SWM to predict what stations I ought to be able to receive in Leeds given excellent reception conditions. I deliberately try to find those stations which other DXers in the north and Midlands have logged, but which I have not recorded." Using this method he added ILR Chiltern Radio 792; BBC Radio Furness 837; ILR Radio Trent via Derby 945 and BBC Radio Stoke-on-Trent 1503 to his growing list of DX.

Without doubt the type of antenna used by the local radio DXer is a key factor in obtaining good results. Leo Barr says, "Once again the 'Sooper Loop' proved to be of great value. I was able to separate three stations on 1530kHz - a strong signal from Vatican Radio and weaker signals from ILR Pennine Radio in Huddersfield and Halifax and Radio Wyvern from Worcester. Without the loop the radio just gave out noise". Using a "Long Arm Loop" in Grantham, Leslie Hollis is able to listen to any one of three stations on 603kHz: ILR Invicta Radio (0.1kW); BBC Radio Gloucestershire and BBC Radio 4 via Newcastle-upon-Tyne (2kW).

An interesting rotary m.w. ferrite rod antenna has been built by Geoffrey Powell and installed on his house in Tamworth. The ferrite rod was removed from an old transistor radio and then mounted in a small radar type

Freq kHz	Station	ILR BBC	Power (kW)	DXer
1161	GWR	I	0.16	D
1161	R. Sussex	B	1.00	J,L,Q,T
1161	R. Tay	I	0.70	P*
1161	Viking R.	I	0.35	N,O,P,U
1170	R. Drwell	I	0.28	D,P,U
1170	Signal R.	I	0.20	I
1170	Swansea Sound	I	0.58	P*
1170	Ocean Sound	I	0.12	L,P,T
1242	Invicta Sound	I	0.32	I,J*,L,O,P,Q,T*,U
1251	Saxon R.	I	0.76	I,J,L,O,P*,U
1260	GWR	I	1.60	D,F,J,L
1260	Leicester Sound	I	0.29	J,O,U
1278	Pennine R.	I	0.43	D,L,N
1305	R. Hallam	I	0.15	U
1305	Red Dragon R.	I	0.20	D,J,L,N,O
1323	R. Bristol	B	1.00	D
1323	Southern Sound	I	0.50	J,L,P,Q,S,T
1332	Hereward R.	I	0.60	J,L,U
1359	Essex R.	I	0.28	S,U
1359	Mercia Sound	I	0.27	E,U
1359	Red Dragon R.	I	0.20	D
1359	R. Solent	B	0.25	L
1368	R. Lincolnshire	B	2.00	N,U
1368	R. Sussex	B	0.50	E,J,L,Q*,T
1431	Essex R.	I	0.35	J,O,S,U
1431	Radio 210	I	0.14	E,J,L,P,T
1449	R. Cambridgeshire	B	0.15	J,L,O,U
1458	Greater London R.	B	50.00	E,G,H,L,M,O,P,S,T,U
1458	R. Newcastle	B	2.00	N
1458	Radio WM	B	5.00	D,O
1476	County Sound	I	0.50	E,J,L,P,T,U
1485	R. Humberside	B	1.00	C,N,O,U
1485	R. Oxford	B	0.50	O,U
1485	R. Sussex	B	1.00	L,P,Q
1503	R. Stoke-on-Trent	B	0.50	A*,L,N,O,P*
1521	R. Mercury	I	0.64	E,J,L,O,P,T,U
1521	R. Nottingham	B	0.50	U
1530	R. Essex	B	0.10	O,U
1530	Pennine R.	I	0.74	A*,N
1530	R. Wyvern	I	0.52	A*,D,L
1548	R. Bristol	B	5.00	D
1548	Capital R.	I	97.50	E,J*,K*,L,O,P,S,T,U
1548	R. Cleveland	B	1.00	N
1557	Northants 96	I	0.76	A*,O,U
1557	Ocean Sound	I	0.50	J,L,P
1584	R. Nottingham	B	1.00	L,N,O,U
1584	R. Shropshire	B	0.30	O
1602	R. Kent	B	0.25	E,L,O,P,S,U

DXers:

- A: Leo Barr, Sunderland.
- B: Edward Broadsmith, Worcester.
- C: Alan Curry, Stockton-on-Tees.
- D: Colin Diffell, Corsham.
- E: Ciaran Fitzsimons, Chertsey.
- F: Colin Godwin while in N. Devon.
- G: Simon Hamer, New Radnor.
- H: Francis Hearne, Ilford.
- I: Leslie Hollis, Grantham.
- J: Sheila Hughes, Morden.
- K: Cyril Kellam while in Majorca.
- L: George Millmore, Wotton IDW.
- M: John Nash, Brighton.
- N: Chris Nykiel, Leeds.
- O: Christian Pritchard, Cambridge.
- P: Stewart Russell, Leatherhead.
- Q: Mark Selby, Aldershot.
- R: Tim Shirley, Bnston.
- S: Phil Townsend, London.
- T: Martyn Williams, Sunningdale.
- U: David Wratten, Cambridge.

enclosure to protect it from the weather, see Fig. 2. The ends of the original m.w. winding around the rod are connected via slip rings to an indoor a.t.u. so that the antenna may be tuned to resonance. A small 12 volt motor with built-in gearbox is mounted below the enclosure, so that the antenna can be turned through 360 degrees. A



Fig. 2



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rheostat in the motor supply enables the speed of rotation to be varied, thus making it a simple matter to "peak-up" or "null-out" a station. Geoffrey uses a Trio R2000 receiver with this installation and he is pleased with the results. Note: the vertical elements depicted in Fig. 2 are his v.h.f. antenna.

Short Wave DX

There are now five broadcasters active in the 25MHz (11m) band: Radio Free Europe/Radio Liberty 25.690 (Russ 0800-1500, often jammed by the USSR); RNI Oslo, Norway 25.730 (Norw to Africa 1200-1250); 88C via Daventry 25.750 (Eng 1100-1515); RFI Paris, France 25.820 (Fr 0900-1200); Radio Denmark, Copenhagen 25.850 (Dan to Asia, Australia 1200-1255). As yet there is no 11m activity from Radio Moscow, but it may be worth monitoring 25.620, which is the frequency they used during the peak years of the last solar sunspot cycle.

All of these broadcasts have been reaching Alan Roberts in Quebec, Canada. Using a home built receiver developed from the "Epsom" design published in *PW* Sept '74, he logged RFE/RL as SINPO 14311, only audible between 1113 and 1450; RNI as 15311, audible 1158-1247; 88C as 35333, audible 1114-1515; RFI as 25322, audible 1050-1154; also R.Denmark as 25322, audible 1225-1250. So far, no reports have reached me from other countries, but John Ratcliffe has written to say that he will monitor these frequencies with a home built reflex receiver in Queensland, Australia.

In many areas of the UK these signals may be relatively poor or even non-existent, since they are intended for other areas. Listening in Brighton, John Nash logged RNI 25.730 as 34232 at 1200 and RFI 25.820 as 44333 at 1150. In Southampton, Richard Radford-Reynolds rated 88C 25.750 as 35444 at 1352; Phil Townsend (London) logged them as SIO 433 at 1500 and in Northampton Alan Smith rated them as 55555. Philip Rambaut (Macclesfield) noted RNI as SIO 222 and R.Denmark 25.850 as 111 at 1242. Cyril Kellam (Sheffield) logged RFI as SIO 333, RNI as 433 and R.Denmark as 333 at 1200. Up in Wallsend, David Edwardson rated RFI as 24432 at 1040 and R.Denmark as 24432 at 1225. Over the border, Kenneth Buck (Edinburgh) logged RFI/RL 25.690 as 42222 at 1318; RNI as 35433 at 1218; 88C as 35444 at 1200; RFI as 25433 at 1130 and Radio Denmark as 25423 around noon.

Although there have been periods when bursts of solar activity (flares) have disturbed the reception conditions prevailing on the 21MHz (13m) band, in general the reception from many areas has been very good here.

A number of broadcasts are beamed to Europe during the day in a variety of languages. They stem from Radio Japan via Moyabi, Gabon 21.695 (Eng, Jap 0700-0830) 45444 at 0700 by John Nash; UAE Radio Dubai 21.605 (Ar, Eng 0615-1400) logged by Bill Griffith in London as 55555 at 1000; Voice of Israel, Jerusalem 21.675 (Eng, Fr, Heb 1000-1530), noted by Christian Pritchard (Cambridge) as 44444 at 1030; Radio RSA Johannesburg, S. Africa 21.590 (Eng 1400-1600) 55444 at 1416 by Mark Selby in Aldershot; Radio Japan via Moyabi Gabon 21.700 (Eng, Jap 1500-1700) SIO 333 at 1500 by John Evans; WHRI in South Bend, USA 21.655 (Eng 1500-1700) 35444 at

Freq MHz	Station	Country	UTC	DXer
2.310	ABC Alice Springs	Australia	2200	B,G,L
2.325	ABC Tennant Creek	Australia	2030	B,G
2.485	ABC Katherine	Australia	2030	G
3.205	R. Ribeirao	Brazil	0330	P
3.215	R. Orange	S. Africa	0530	L
3.215	R. San Salvador	Bolivia	2300	P
3.220	R. HCJB Quito	Ecuador	0230	P
3.230	ELWA Monrovia	Liberia	2100	P
3.230	R. Nuevo Continente	Peru	2300	P
3.230	R. El. Sol Los Andes	Peru	0330	P
3.230	R. RSA	S. Africa	2100	L,P
3.250	R. Luz Y Vida	Honduras	0300	P
3.320	R. Orion	S. Africa	0300	L
3.330	R. Kigali	Rwanda	1933	A
3.355	RFO Noumer	New Caledonia	0800	N
3.365	GBC Radio 2	Ghana	1840	K
3.365	R. Papua	New Guinea	1200	N
3.915	BBC Kranji	Singapore	1705	H,K
3.955	BBC Daventry	England	2015	D,H,L,R
3.965	RFI Paris	France	2010	D,I,K,L,R
3.980	VOA Munich	W. Germany	1920	H,K
3.985	SRI Berne	Switzerland	2050	K,R
4.025	R. Pakistan	Pakistan	1720	J
4.557	Voice Salvation	N. Korea	1531	J
4.680	R. Nac. Espejo	Ecuador	0200	P
4.740	R. Afghanistan	via USSR	1915	K
4.775	Caracol Neiva	Columbia	0629	A,F,O
4.755	Sani Radio	Honduras	0347	A
4.760	ELWA Monrovia	Liberia	1915	K,L
4.765	R. Moscow	via Cuba	0555	O
4.770	FRCN Kaduna	Nigeria	1900	K,L
4.780	V. Carabobo	Venezuela	0350	A
4.790	R. Atlantida	Peru	0352	A,J
4.790	Azad Kashmir R.	Pakistan	1841	A,H
4.800	LNBS Lesotho	Maseru	1941	A,L
4.810	R. Yerevan	USSR	2040	A,D,K,L,P
4.815	R. diff TV Burkina	Ouagadougou	1840	K
4.820	R. Botswana	Botswana	2015	C,L

1545 by David Wratten in Cambridge. At 1845 Fred Pallant heard Radio RSA Johannesburg, S. Africa 21.530 (Eng 1800-1900) SIO 455. Listening in Nuneaton at 1933, Graham Johnson heard WYFR via Okeechobee, Florida 21.615 (Eng, Ger, Fr 1600-1945) as 44344.

Some broadcasts to other areas were heard. During the morning John Nash logged Radio Bucharest, Romania 21.665 (Eng to Australia 0645-0715) as 33343 at 0705; Mark Selby heard RFI Berlin via Nauen, GDR 21.540 (Eng, Ger to S. Asia 0745-0945) 54554 at 0822; Sheila Hughes (Morden) heard Radio Prague, Czechoslovakia 21.705 (Eng, Cz to SE. Asia 0730-0930) 44444 at 0830; David Wratten logged Radio DW via Julich, W. Germany 21.650 (Eng to S. Asia 0900-0950) 35343 at 0910; Bill Griffith listened to RNI via Fredrikstad, Norway 21.565 (Norw, Eng, Sp to W. Africa 1000-1045) 55555 at 1000; John Evans noted Radio Nederlands via Madagascar 21.480 (Eng to Asia 1130-1225) SIO 344 at 1145; Philip Rambaut logged RFI via Moyabi, Gabon 21.520 (Ar. to Africa, Middle East 1100-1200) 333 at 1155.

During the afternoon, in George, S. Africa Dick Moon listened to the BBC World Service via Daventry, UK 21.470 (Eng to E. Africa 1030-1515) 43333 at 1200. At 1255 Philip Rambaut logged VOA via Greenville, USA on 21.580-21.610 (Sp to S. America 1100-1400) SIO 222/111. An s.s.b. (u.s.b.) broadcast from Radio Sweden via Varberg 21.555 (Sw to Africa 1100-1600) was monitored by Colin Diffell in Corsham. At 1316 Kenneth Buck heard REE via Noblejas, Spain 21.575 (Sp to Middle East 0930-1930) SIO 555. At 1410 John Nash listened to RNI via Fredrikstad, Norway 21.700 (Norw, Eng, Sp to E. Africa 1400/1445) 43443. John Evans heard Radio DW via Wertachtal, W. Germany 21.600 (Eng, Swa, Fr to E. Africa

Freq MHz	Station	Country	UTC	DXer
4.830	Africa No. 1	Gabon	2000	C,D,E,F,H,K,L,M,O
4.830	R. Tachira	Venezuela	0200	E,L
4.832	R. Reloj	Costa Rica	0550	E,L,O
4.835	RTM Bamako	Mali	2040	K
4.845	ORTM Nouakchott	Mauritania	2030	C,K
4.850	R. Yaounde	Cameroon	1820	K
4.850	R. Capotal, Caracas	Venezuela	0430	L,O
4.865	V of Cinaruco	Columbia	0450	E
4.865	PBS Lanzhou	China	2200	E
4.870	R. Cotonou	Benin	2040	K
4.880	SABC Radio 5	S. Africa	2000	G,L
4.890	ORTS Dhaka	Senegal	1910	K
4.895	AR. Ashkabad	USSR	2040	K
4.905	R. Nat. N'djamena	Chad	0441	A,E
4.905	R. Reloj, Rio	Brazil	1900	K,K
4.915	R. Ghana, Accra	Ghana	2030	C,K,O
4.915	Voice of Kenya	Kenya	1730	C
4.920	R. Quito	Ecuador	0505	E
4.930	R. Moscow, Tbilisi	USSR	2030	K
4.934	Voice of Kenya	Kenya	1850	O
4.940	R. Kiev	USSR	2030	D,H,K,O
4.950	R. Nac. Luanda	Angola	1948	A
4.960	R. Baku	USSR	1853	O,P
4.975	R. Uganda, Kampala	Uganda	1915	A,K,L
4.990	FRCN Lagos	Nigeria	2300	F,K,L,S
4.990	R. Yerevan	USSR	2100	K
5.005	R. Nacional, Bata	Eq. Guinea	2030	A,K,O
5.010	R. Garoua	Cameroon	2230	A
5.015	R. Moscow Arkhangel'sk	USSR	2045	K
5.030	R. Impacto	Costa Rica	0611	A,E,F,L,O
5.035	R. Bangui	C. Africa	2045	K
5.040	Vos del Upano, Macas	Ecuador	0440	A
5.040	R. Tbilisi	USSR	2015	K,O
5.045	R. dif. Presidente	Brazil	0615	O
5.050	R. Tanzania	Tanzania	1955	A
5.055	R. Catolica Nacional	Ecuador	2045	H
5.057	R. Tirana Gjirakaster	Albania	2047	F,H,K,O
5.075	R. Beijing	China	2103	K

1500-1750) SIO 333 at 1515; Christian Pritchard listened to Radio Prague, Czechoslovakia 21.505 (Eng, Cz, Ar to Africa 1430-1825) 33443 at 1530. Listening in Chichester at 1605, Peter Hall heard SRI via Schwarzenburg, Switzerland 21.630 (Eng, Fr, Ger to Middle East 1515-1700) SIO 323. In Tunbridge Wells, Darran Taplin logged WCSN via Scotts Corner, Maine 21.640 (Eng, Fr, Ger to Africa 1600-1755) as 54444 at 1606.

Later, Philip Rambaut logged RAI Rome, Italy 21.690 (It to Africa 1700-1745) as SIO 333 at 1728; Fred Pallant heard Radio RSA Johannesburg, S. Africa 21.460 (Fr to N. Africa, Europe 1800-2000) SIO 455 at 1800. In Botswana, P. R. Guruprasad heard Radio Prague, Czechoslovakia 21.505 (Eng, Cz, Ar to Africa 1430-1825) 44444 at 1745; also VOA via Monrovia, Liberia 21.500 (Eng to C. Africa 1800-2200) 54444 at 1815. Using a one valve (ARB) receiver, Ron Pearce picked up Radio Nederlands via Bonaire, Ned. Antilles 21.685 (Eng, Fr to Africa 1830-2025) at 2019.

Many potent signals from several continents have been evident in the 17MHz (16m) band. Solar flares have disturbed reception from time to time, but their effects have been relatively short-lived.

The broadcasts from Radio New Zealand, Wellington 17.705 (Eng to Pacific areas 2345-0145 and 0330-0730) have been reaching the UK at remarkable strength around dawn. In Prenton, Kenneth Reece rated their signal as 55444 at 0616. He has been monitoring their transmissions most mornings and says that he has never heard signals from New Zealand like this before. David Edwardson has also been hearing them, he rated them as 23322 at 0040 and as 33333 when they signed off at 0729.

During Saturdays and Sundays the time gap between 0145 and 0330 in the RNZ schedule is closed. Tim Shirley

DXers:

- A: Ian Baxter, Blackburn.
- B: Richard Bealey, Exeter.
- C: Robert Cowell, Blackpool.
- D: Alan Curry, Stockton-on-Tees.
- E: David Edwardson, Wallsend.
- F: Bill Griffith, London.
- G: Simon Harner, New Radnor.
- H: Sheila Hughes, Morden.
- I: Cyril Kellam, Palma, Majorca.
- J: Dick Moon, George, S. Africa.
- K: Fred Pallant, Storrington.
- L: Christian Pritchard, Cambridge.
- M: Richard Radford-Reynolds, Southampton.
- N: John Ratcliffe, Queensland, Australia.
- O: Kenneth Reece, Prenton.
- P: Tim Shirley, Bristol.
- Q: Alan Smith, Northampton.
- R: Phil Townsend, London.
- S: Neil Wheatley, Gran Canaria.

picked up their transmission at 0200 and sent them a reception report. Tim was delighted to receive one of their attractive QSL cards in confirmation. It is important to note that three IRCs must accompany a reception report to RNZ if a QSL is required.

Some of the 16m broadcasts from Radio Australia to Asia and the Pacific areas are also reaching the UK quite well. The latest report from George Hewlett, who monitors many of their broadcasts from 0400 on a daily basis in Torquay, details their transmissions as follows: 17.715 via Carnarvon (Eng to S. Asia 0100-0915) usually around 0700, but it has been jammed recently. 17.750 via Darwin (Eng, Chin to E. Australia, C. Asia 0000-0900) is not heard very often, a jammer usually arrives at 0600. 17.795 via Shepparton (Eng to C. Pacific, W. USA 2200-0630) SIO 332 at 0400, but rapidly improves to 433 and then 434. A jammer is audible at 0530, but it causes little trouble. David Wratten has been listening to their 17.715 transmission at 0900 and noted it as 34333.

The broadcasts to SE. Asia from Radio Japan via Yamata, Japan 17.810 (Eng, Jap to SE. Asia 0100-1100) have also been reaching the UK. Using a Trio R5000 receiver, Kenneth Reece rated their signal as

SEEN & HEARD

33333 at 0617. The broadcasts to E. Asia from KYOI in Saipan, N. Mariana Islands 17.780 (Eng 0200-0800) have been attracting the attention of Alan Smith, noted as SIO 333 at 0713.

Many broadcasters beam programmes in a variety of languages towards Europe during the day. Those noted stemmed from Radio RSA Johannesburg, S. Africa 17.755 (Eng 1400-1600) SIO 444 at 1512 by John Evans; UAE Radio Dubai 17.865 (Ar, Eng 0615-1645) 54554 at 1642 by Richard Radford-Reynolds; Radio Surinam Int. Paramaribo via RNB Brasilia, Brazil 17.875 (Du, Eng 1700-1745), heard by Edward Broadsmith in Worcester; RCI via Sackville, E. Canada 17.820 (Russ, Fr, Eng, Pol, Ger, Hung, Cz 1330-1800) SIO 423 at 1715 by Ian Bond; Radio RSA Johannesburg, S. Africa 17.790 (Du 1600-1900) SIO 233 at 1810 by Peter Hall; RCI via Sackville, E. Canada 17.875 (Eng, Fr 1830-2100) SIO 455 at 1848 by Kenneth Buck; VOFC via Okeechobee, Florida 17.845 (Chin, Fr, Ger, Eng 1900-2300) SIO 322 at 1955 by Fred Pallant; Radio HCJB, Quito, Ecuador 17.790 (Fr, Ger, Eng, Sp 2200-2230) 54444 at 2210 by Robert Cowell in Blackpool.

There are numerous broadcasts in a variety of languages to other areas. Some were logged during the day; Radio Prague, Czechoslovakia 17.840 (Eng, Cz to SE. Asia 0730-0930) 43333 at 0830 by Sheila Hughes; VOA via Monrovia, Liberia 17.715 (Eng, Fr, Ha to C. Africa 0815-0845) 33333 at 0830 by David Wratten; Radio Afghanistan via Tula, USSR 17.655 (Pa, Eng, Tu to SE. Asia 0430-1230) 32333 at 0905 by Alan Curry in Stockton-on-Tees; AWR via Moyabi, Gabon 17.890 (Eng to W. Africa 1200-1300) SIO 222 at 1215 by Jim Willett; Radio DW via Kigali, Rwanda 17.800 (Eng, Ha, Fr to W. Africa 1130-1350) SIO 222 at 1316 by Philip Rambaut; Radio Cairo, Egypt 17.670 (Ar to N. Africa 1200-1800) SIO 333 at 1430 by John Evans; BBC via Limassol, Cyprus 17.740 (So, Eng, Swa, to E. Africa 1430-1600) 55454 at 1445 by P.R. Guruprasad in Botswana; VOA via Greenville, USA 17.785 (Eng to W. Africa 1600-2200) 55455 at 1601 by Ciaran Fitzsimons; RTM Tangier, Morocco 17.595 (Fr, Eng to Middle East, N. Africa 1400-1700) 55444 at 1633 by John Nash; RFI via Issoudun, France 17.845 (Pol, Fr to Africa 1600-1800) SIO 555 at 1700 by Kenneth Buck.

In the evening Ciaran Fitzsimons heard Radio Nederlands via Bonaire, Ned. Antilles 17.605 (Eng, Fr, Du to Africa 1830-2125) as 55345 at 1852. Fred Pallant listened to VOA via Greenville, USA 17.785 (Eng to W. Africa 1600-2200) SIO 444 at 1940 and he also picked up their transmission to W. Africa via Bethany, USA 17.800 (Eng 1600-2200) SIO 232. At 2100, John Nash heard KVOH Los Angeles, USA 17.775 (Eng to C. America 2030-0100) at 24242. Later, Mark Selby listened to the Voice of Turkey, Ankara 17.760 (Eng, Tu to S. Asia, Australia 2200-0350) 54455 at 2230. Listening at 0500, Tim Shirley picked up Radio Mexico International, Mexico City 17.765 (Sp to C. America 0300-0500).

From time to time solar flares have also disrupted reception in the 15MHz (19m) band, but many broadcasts from several continents have been reaching the UK at remarkable strength during most days.

Several frequencies are used by Radio Australia to reach listeners in the Pacific areas via Shepparton, but the good conditions have enabled most of these transmissions to be heard in Europe too. Some of them have been reaching the UK before midnight. Listening at 2100, Ian Curry Stockton-on-Tees logged 15.160 (Eng, Fr 2100-0700) as 32222. At 2200, David Wratten noted 15.240 (Eng 2100-0730) as 33443.

The report from George Hewlett indicates that 15.160 is generally SIO 433 at 0400, but falls to 322 by 0700. 15.240 peaks 434 around 0400, but co-channel interference from Radio Berlin Int. arises at 0600. 15.315 (Fr, Eng 0500-0700) rates as 322 at 0500 due to co-channel interference from Radio Moscow, but improves to 433 at 0530. 15.320 (Eng, Fr 2200-0500) rates as 322 at 0400 due to co-channel interference from Radio Moscow. Listening at 0843, Philip Rambaut logged their broadcast to E. Asia via Carnarvon, W. Australia 15.395 (Eng, Fr, Chin 0400-0900) as SIO 111.

Many broadcasts are beamed towards Europe at sometime during the day. They include Radio Japan via Moyabi, Gabon 15.235 (Russ, Sw, It, Jap, Ger, Fr 0500-0700) 34433 at 0500 by Christian Pritchard; UAE Radio Dubai 15.435 (Ar, Eng 0615-1645) SIO 433 at 1629 by Alan Smith; Radio Korea Seoul, S. Korea 15.575 (Ar, It, Eng, Sp, Pol, Ger 1545-2200) 45544 at 1703 by David Edwardson; RFI via Nauen, E. Germany 15.145 (Swa, Eng 1645-1815) logged by Julian Wood (Buckie) as SIO 312; VOA via Tangier, Morocco 15.205 (Eng 1700-2200) SIO 545 at 1845 by Ian Bond; WYFR via Okeechobee, Florida 15.440 (Sp, Ar, Fr, Eng 1600-2045) 33333 at 1920 by Sheila Hughes in Winchelsea; Voice of Israel, Jerusalem 15.485 (Eng, Fr 1900-1955) SIO 334 at 1930 by Peter Hall; WINB Red Lion, USA 15.185 (Eng 2000-2245) 55444 at 2000 by Robert Cowell; Radio Damascus, Syria 15.095 (Ger, Fr, Eng 1835-2105) 33243 at 2016 by Leo Barr; Voice of Vietnam, Hanoi, 15.010 (Eng, Russ, Viet, Fr, Sp 1600-2130) 45343 at 2046 by Graham Johnson; WRNO New Orleans, USA 15.420 (Eng 1700-2100) SIO 222 at 2055 by Martyn Williams; RCI via Sackville, E. Canada 15.325 (Ger, Hung, Cz, Pol, Eng, Fr 1630-2200) 54444 at 2115 by David Wratten.

Many broadcasts to other areas were noted including the Voice of Malaysia, Kuala Lumpur 15.295 (Eng, Mal, Chin to S. Asia 0555-1230) SIO 222 at 0800 by Jim Willett; AFRTS via Ismaning, W. Germany 15.265 (Eng to Middle East 0700-1300) 54444 at 0825 by John Nash; BBC via Kranji, Singapore 15.360 (Eng to E. Asia 0800-1130) SIO 333 at 0840 by Philip Rambaut; VOA via Tinang, Philippines 15.160 (Eng to E. Asia 1100-1500) 43443 at 1454 by Kenneth Reece; Radio Yugoslavia, Belgrade 15.240 (Eng to S. Asia 1430-1500) 53344 at 1444 by Ciaran Fitzsimons; RNI via Fredrikstad, Norway 15.310 (Norw, Eng, Sp to E. USA 1700-1745) 33433 at 1725 by Darran Taplin; BBC via Ascension Island 15.400 (Eng to Africa 1515-2030) 4333 at 1830 by Ian Curry; REE via Noblejas, Spain 15.375 (Eng, Fr to Africa 1900-2100) 454 at 1900 by Kenneth Buck; Radio Algiers, Algeria 15.215 (Fr, Sp, Eng to W. Africa 0700-0005) SIO 433 at 1910 by John Evans; AIR via Bombay, India

15.360 (Eng to E. Africa 1800-2000) 55444 at 1925 by P.R. Guruprasad in Botswana; Africa No. 1. Moyabi, Gabon 15.475 (Fr, Eng, to W. Africa 1700-2100) 54544 at 1954 by Richard Radford-Reynolds; WCSN Scotts Corner, Maine 15.300 (Eng, Fr, Ger to W. Africa 2200-2255) 55343 by Mark Selby; Radio HCJB Quito, Ecuador 15.155 (Fr, Eng to N. America 0000-0500) 33333 at 0330 by Robert Cowell.

The 13MHz (22m) band is becoming quite crowded. Some broadcasts which may be heard during the day stem from Radio Austria Int, Vienna 13.730 (Esp, Ger 0800) 43444 at 0850 by Leo Barr; WCSN Scotts Corner, Maine 13.760 (Eng, Fr, Ger to Europe 1400-1555) 55444 at 1400 by John Nash; SRI Berne, Switzerland 13.685 (Eng, Fr, It to Middle East 1515-1700) logged at 1545 by Phil Townsend; Radio Prague, Czechoslovakia 13.715 (Cz, Eng, Ar to S. Asia 1430-1825) 44444 at 1625 by Darran Taplin; Radio Pakistan, Karachi 13.665 (Tur to Middle East 1645-1745) SIO 323 at 1657 by Philip Rambaut.

During the evening several more may be heard, including Radio DW via Wertachtal, W. Germany 13.790 (Eng, Port to E. Africa 1800-2050) SIO 454 at 1935 by Kenneth Buck; Voice of Israel, Jerusalem 13.625 (Eng, Fr, Russ to Europe 1900-2155) SIO 222 at 2130 by Philip Rambaut; WYFR via Okeechobee, Florida 13.695 (Fr, Eng to E. USA 1200-2245) 34333 at 2223 by Graham Johnson; WRNO New Orleans, USA 13.760 (Eng to E. USA 2100-0000) 44444 at 2315 by David Wratten.

The conditions prevailing in the 11MHz (25m) band have not favoured long distance reception in the early hours of the morning, but a general improvement has been noted later. George Hewlett noted Radio Australia's broadcast to S. Asia via Shepparton 11.910 (Eng 0400-0630) as very disappointing. Due to a jammer it may not be heard until 0600. Kenneth Reece also monitored their transmission during several mornings and noted it as 24433 at 0539 and 43433 at 0622.

The broadcasts from several DX spots were noted. Listening at 0830, John Nash heard FEBC Manila, Philippines 11.850 (Eng to SE. Asia 0830-0930) 33222. At 1100, Jim Willett logged KYOI Saipan, N. Mariana Islands 11.900 (Eng to E. Asia 0800-1600) SIO 222. Later, John Evans picked up FEBA Radio Mahe, Seychelles 11.865 (Eng to S. Asia 1515-1610) 333 at 1545. The BBC World Service via Kranji, Singapore 11.750 (Eng to S. Asia 1030-1615) attracted the attention of Philip Rambaut at 1615 noted as 322. At 2116 he heard their broadcast to S. Asia on 11.955 (Eng 2100-2245) noted as 312. Later he picked up weak signals from VOA via Tinang, Philippines 11.925 (Chin to C. Asia 2100-0100) rated as 111 at 2218.

A relatively new station to this band was mentioned in the reports; The Voice of the Mediterranean, Malta 11.925 (Eng, Ar 1400-1600). Using a Hammarlund HQ180XE receiver, Robert Cowell rated their broadcast as 44444 at 1400.

The 9MHz (31m) band was selected by Radio Australia as being the most suitable for early morning direct transmissions to Europe and for many months their broadcasts via Shepparton 9.655 (Eng 0700-1000)

have been well received here. Recently however, their signal has been marred by the co-channel interference from Radio HCJB in Quito, Ecuador. Instead of closing down at 0700 as hitherto, HCJB have continued their transmissions to Europe until 0830. George Hewlett has noted that the intensity of the interference varies, but on average the signal from Australia is SIO 322 at 0700. When HCJB closes it is 433. Their programmes are also beamed via Shepparton to SE. Asia on 9.770 (Eng 1000-1100) and to the C. Pacific and USA on 9.580 (Eng 0800-2130). David Wratten logged 9.770 as 34333 at 1000 and Philip Rambaut noted 9.580 as 111 at 0821.

Many broadcasts to Europe were noted. They included the Voice of the Mediterranean, Malta 9.765 (Eng, Ar 0600-0800) SIO 333 at 0630 by Vernon Day using a Pye TR 2252 portable plus 15m wire antenna in Bristol; Vatican Radio, Rome 9.645 (It, Sp, Pol, Fr, Eng, Ger, Port 1230-1600) heard at 1430 by Richard Bealey in Exeter; Radio Afghanistan via USSR 9.665 (Pa, Ger, Eng 1730-1930) heard at 1909 by Colin Diffell; Radio Baghdad, Iraq 9.770 (Fr, Ger, Eng 1800-2155) 54555 at 2000 by Bill Griffith; VOIRI Tehran, Iran 9.020 (Fr, Eng, Sp, Far 1845-2230) 44444 at 2115 by Ian Bond; Radio Yugoslavia, Belgrade 9.620 (Gr, Sp, Eng, Fr 2030-2145) 33323 at 2130 by Colin Godwin (Malvern) while using a Sangean ATS-801 portable on holiday in N. Devon.

The early morning broadcasts in the 7MHz (41m) band include the BBC via Ascension Island 7.105 (Fr, Eng, Ha to Africa 0430-0700) 533 at 0610 by Alan Smith; RTV Sfax, Tunisia 7.475 (Ar to Europe 0430-0600) 444 by John Evans; WYFR via Okeechobee, Florida 7.355 (Russ, Ger, Eng to Europe 0400-0745) heard by Richard Bealey; Voz del Cid, Costa Rica 7.380 (Sp to C. America 2300-1050) 322 at 0752 by Philip Rambaut; WHRI South Bend, USA 7.355 (Eng, Sp to Europe 0800-1100) 35443 at 0815 by John Nash.

Later, Dick Moon heard Voice of Asia, Taiwan 7.445 (Th, Ind, Chin, Eng to SE. Asia 1500-1630) at 1530. Kenneth Reece received Radio Australia via Carnarvon 7.205 (Eng to S. Asia, Europe 1430-2030) 44333 at 1642. Julian Wood listened to Radio Kiev Ukraine, USSR 7.240 (Eng to Europe) at 1900. Ian Curry heard AIR via New Delhi, N. India 7.410 (Eng to Europe 1845-2230) 43233 at 1945. Peter Hall and Sheila Hughes listened to IBRA Radio via Cyclops, Malta 7.110 (Pol, Ger, Eng to Europe 2000-2115) 44433 at 2045. Philip Rambaut logged the BBC via Hong Kong 7.180 (Chin to C. Asia 2215-2245) as 322 at 2220.

Although many of the broadcasts in the 6MHz (49m) band stem from Europe, some long distance signals may also be heard, including Burma BS, Rangoon 5.985 (Bur, Eng to Burma 0930-1600) logged at 1500 by Dick Moon; BBC via Kranji, Singapore 5.975 (Eng to SE. Asia 1615-1830) SIO 333 at 1623 by Philip Rambaut; Radio Australia via Carnarvon 6.035 (Eng to S. Asia, Europe 1530-2030) 22222 at 1800 by Alan Curry; ABC in Perth, W. Australia 6.140 (Eng to W. Australia 0950-0100) logged by Simon Hamer in New Radnor at 1815; Radio Pyongyang, N. Korea 6.576 (Russ, Fr, Ger, Sp, Eng to Europe 1500-2150) 44554 at 1920 by John Parry in Northwich. □

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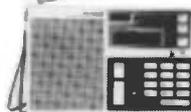
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