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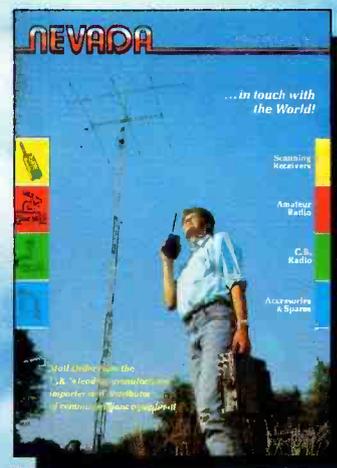
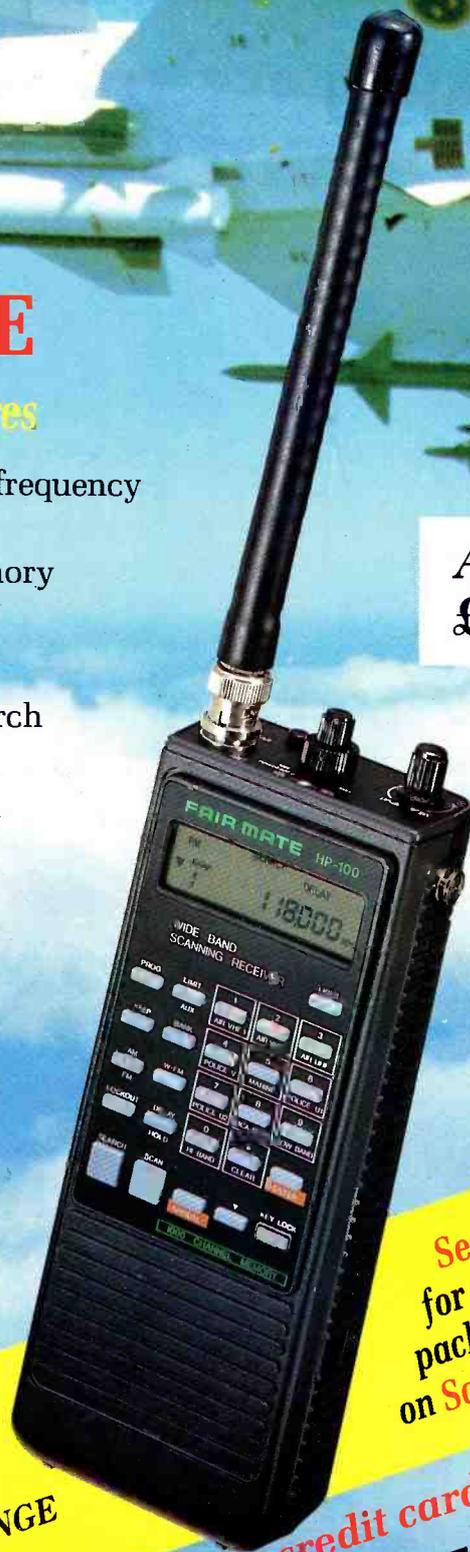
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**NEVADA
COMMUNICATIONS**

ON SALE MAY 24th

JULY ISSUE ON SALE
JUNE 24th

[30] Capco Set-Top Magnetic Loop Antennas.



Cover The Capco Magnetic Loop Antennas have been arousing interest among the amateur fraternity for some time now. Mike Richards has been trying out their latest versions designed specifically for the listener.

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A WORD IN EDGEWAYS

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.

Dear Sir

I have been interested in radio, mostly short wave and amateur bands, since 1983. It was only during the summer of 1989 that I purchased a Realistic PRO-2004, which has given me new insight into v.h.f./u.h.f. listening.

This month I sold my PRO-2004 and bought the 2005 model after reading about it in SWM. I have discovered that most of the frequencies in the Complete VHF/UHF Guide change from county to county. I would like to hear or see printed possibly a county by county list of frequencies in your magazine sent in by readers. This I think would be of help to new and old hands alike on the scanning bands u.h.f./v.h.f. My radio equipment consists of a Yaesu FR50B, PRO-2005 and Selena 215. I am most interested to see what other readers think of this and I would be more than happy to swap frequency lists for Northumberland with anyone also in this country.

Keep up the good work SWM.

**JOHN HEPBURN
ASHINGTON
NORTHUMBERLAND**

Dear Sir

I read with interest, Peter Robinson's letter in April 1990.

If he is a coward, then I also was a coward, and gave up over fifty years ago. The Morse code was devised, in America, in the early-middle nineteenth century, by Samuel Finley Breese Morse (1791-1872), as a means of sending messages over long distances by wire (Electric Telegraph).

This method of communication became less popular after 1876, by the introduction of the telephone, invented by Alexander Graham Bell (1847-1922).

The code was probably introduced into radio, in the early days, when spark transmitters were the order of the day, and was still widely used by many services, and some radio 'hams' up to the outbreak of WW2.

During the last fifty years radio technology has progressed considerably. Today we have hi-tec equipment, with radio telephones, scramblers, descramblers, etc. In fact, you name it, and we have it, and after around 150 years, WE STILL HAVE THE MORSE CODE.

If one scans the frequencies between 150kHz and 30MHz, very few, if any, Morse transmissions will be heard.

The questions are, do we still need it? And how many people still use it? If the Morse code is no longer in general use, why do the powers that be, still insist on a proficiency test for this complicated and antiquated form of communication?

Surely, for the would-be radio 'ham', with average education, today's RAE minus the Morse code, is enough to cope with.

**GEORGE MILLMORE
WOOTTON
ISLE OF WIGHT**

Dear Sir

In the 2nd edition, vol. 2, pages 3 & 4 of Tucker and Wilkinson's, Radio, (reprinted 1969), they remark, "When an alternating current flows in an inductor an alternating magnetic field is set up. This field is appreciable, except in the case of toroids, within a distance equal to about one diameter of the coil, and any conductors in this space will have e.m.f.s induced in them.

These e.m.f.s cause currents to flow in the conductors, representing a power loss which has to be supplied from the circuit of which the inductor is part. Due to this effect the losses within the coil increase, and so its "Q" value decreases".

To me, this quotation seems to imply that the tapped coil of an a.t.u. must be positioned within a metal case accordingly and, metal or plastic case, the wiring-up and controls too, must be suitably positioned.

Any comments from anyone else?

**PHIL TOWNSEND
LONDON**

WHAT'S NEW

Presentation

At the recent Annual General Meeting of the Highfields Amateur Radio Club in Cardiff, Alan Pickard GW4OES was presented with a framed collection of his Amateur Radio Awards.

Alan is the principal daytime operator for the Club, which is based in the Highfields Centre for the Physically Handicapped, using the the Club's callsign GW4LFO.

Confined to a wheel chair for many years he has amassed thousands of contacts, evidence of which is to be seen in the QSL cards which festoon every available space on the shack walls.



WHAT'S NEW

Catalogues

Barenco launched their new Amateur Catalogue at the recent RSGB Convention at the NEC. There is no charge for the catalogue, just send an s.a.e. no smaller than 160 x 210mm.



They also have a Commercial Distribution Service backed up with a 50 page, 800 stock item, catalogue for the trade. Both catalogues contain a large range of cables, connectors, communications hardware, etc., and they still offer a Free Design Service to amateurs in the mast support field.

Barenco, 27 Park Road, Barnstone, Nottingham NG13 9JF. Tel: (0949) 60607.

The UNIFAX Electronic Equipment & Audio Accessories 1990 Catalogue is available from **Potters Bar Radio, 124b Darkes Lane, Potters Bar, Herts EN6 1AE. Tel: (0707) 49456.** It is in four-colour with good pictures and descriptions of products. All kinds of radio and electronic products are covered including power supplies, tool and computer accessories and disco equipment.

Telethon 1990

The Itchen Valley Radio Club will be running a Special Event Station with the callsign GB0IVT (Itchen Valley Telethon) from 1900BST on 27/5/90 to approximately 1900BST on May 28.



They will be operating on all h.f. bands, 144 and 50MHz and are hoping to make in excess of 1000 contacts during this 24-hour period. The club members are looking for a large number of sponsors and are suggesting that they contribute, say, 1p per radio contact: **M Cheeseman G1IPQ, 63 Ringwood Drive, North, Baddesley, Southampton SO52 9GR. Tel: (0703) 732997.**

World DX Club

To further promote the hobby of short wave listening, World DX Club has introduced a new subscription structure whereby a 15 month membership is being offered for the enrollment fee. This novel promotional idea is designed to allow new members to get the feel of the listening side of the hobby over an extended period.

The club publishes a full 38-page bulletin within days of the monthly deadline, which carries 15 regular columns plus many one-off articles and features.

World DX Club is also seeking short wave listeners who might be willing to sponsor radio listeners in Eastern Europe now that they are able to enjoy more freedom of choice. The club is compiling a panel of names that might be considered for a twelve month membership. They reside in East Germany, USSR and Romania at the present. World DX Club is a non-profit making organisation which puts the emphasis on the 'world' of short wave radio listeners.

Further information is available for an s.a.e. or IRC from: **Arthur Ward, 17 Motspur Drive, Northampton NN2 6LY.**

Waterproof Tape

Rubbaweld is a self-amalgamating tape that welds to itself on contact. Applied by stretching and wrapping the tape around the object to be sealed, Rubbaweld forms a solid rubber coating which provides excellent electrical insulation properties and protection against water penetration.

It protects electrical fittings from water and chaffing, making it ideal for outside antennas and other external electricals. Other applications include general electrical work and hose and pipe connections and repairs.

Rubbaweld is supplied in a 3m x 25mm roll, complete with instructions - available by mail for £2.65 including VAT and P&P.

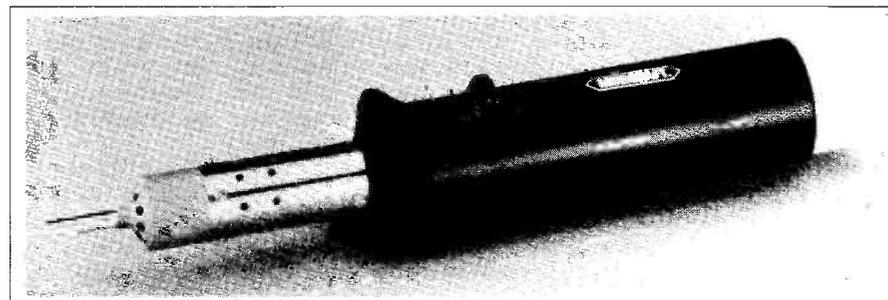
**Geedon Performance Coatings Ltd
Commerce Park
Whitehall Road
Colchester
CO2 8HX
Tel: (0206) 42234**



Cordless Soldering

Black and Decker are adding a new Cordless Soldering Iron to their Minicraft range. The new Cordless Soldering Iron (MB650) is lightweight and has a built-in stand for ease of handling and extra convenience. Powered by a screw-in butane cartridge with simple ignition, the Cordless Soldering Iron enables the user to solder anywhere. The cartridges give a minimum of three hours continuous use.

The Cordless Soldering Iron, which comes complete with a ready-to-use butane cartridge and two soldering bits, is priced at £24.99 including VAT. It is available from most hobby and craft shops.



GRASSROOTS

Farnborough & District RS meet 2nd & 4th Wednesdays, 7.30p at the Railway Enthusiasts Club, off Hawley Lane, (by M3 bridge). June 13 is Silver Jubilee construction contest, hosted by G8ATK and the 27th is HF Field Day summary/VHF Field Day preview and planning. Tim FitzGerald G4UQE on Camberley 29231 or Adrian Hammon G0HNA on Farnborough 519773.

Loughton & District ARS have Aylmers Farm Field weekend on May 25-27, Map Reading on June 1 and Top Band DF Hunt on the 15th. Room 14 of Loughton Hall, Rectory Lane. John Ray G8DZH on 081-508 3434 (after 7pm).

Thornbury & District ARC have their 6th Foxhunt G4ZOG on June 6 and HF activity/natter night on the 20th. United Reform Church, Chapel Street, 7.30pm. Tom Cromack G0FGI on Thornbury 411096.

South East Kent (YMCA) ARC meet Wednesdays, 7.30pm in the YMCA, Leyburne Rd, Dover. May 30/June 6 are natter nights, June 13 is Dicks Choice by G0BPS, the 20th is GB2WVW Final Arrangements, the 23-24 is Waldershare Vintage Weekend GB2WVW and the 27th is The Special Olympics '89 - a video presentation G4GAN. G8ZY on Dover 852533.

Wimbledon & District ARS have Wireless Before Radio by G8CYE on May 25 and Joint

Mid-Warwickshire ARS meet 2nd & 4th Tuesdays, 8pm at 61 Emscote Rd, Warwick. June 12 is a 2m DF Foxhunt and the 26th is The Cairo Unification Scheme demo by G8CQH. Mike Newell G1HGD on Kenilworth 513073.

Felixstowe & District ARS have East Suffolk Wireless Revival on May 27, Visit to the Suffolk Ambulance Centre on June 11, DF Hunt/Barbecue on the 17th and Crime Prevention on the 25th. Back Room of the Ferry Boat Inn, Felixstowe Ferry, 8pm. Paul Whiting G4YQC on Ipswich 642595 (daytime).

Cheshunt & District ARC have NFD Briefing on May 30, natter nights on the 6/20th and Portable evening - Baas Hill Common, Broxbourne on the 27th. Wednesdays, 8pm in the Church Room, Church Lane, Wormley. Roger Frisby G4OAA on Hoddesdon 464795.

Norfolk ARC meet Wednesdays, 7.30pm at The Norfolk Dumpling, The Livestock Market, Harford, Norwich. May 30 is Final HF NFD briefing, the 6th is a Real Radio evening, the 13th is Slow Scan TV by G4TUK, the 20th is an informal and the 27th is Backyard moonbounce by G3HUL. Steve Sewell G4VCE on Mulbarton 78258.

Hornsea ARC meet Wednesdays, 8pm at The Mill, Atwick Rd. June 6/27th are natter nights, the 13th is Survey of old East Yorkshire Contest Sites by Ted and the 20th is SWR by Geof. Jeff G4IGY on 0964 533331.

Rugby ATS have an Aerial Rigging demo on June 5 and 144MHz direction finding competition round two. Cricket Pavilion, outside Rugby Radio Station, 7.30pm. Kevin Marriott G8TWH on Coventry 441590.

Wirral & District ARC have a Practice DF Hunt on May 30, D&W on June 6/20th, Elvaston Castle Rally on the 10th, Surface Mount Devices talk by G3VZU on the 13th and The Eileen Medley DF Hunt on the 27th. Meetings on the 2nd & 4th Wednesdays at Irby Cricket Club, Mill Hill Rd. Vic Alien G8UDR on 051-648 3859.

Dunstable Downs RC now have a new secretary, so all future correspondence should be addressed to Mr M. Spacey, 54

Dovehouse Hill, Luton, Beds LU2 9ES. Tel: 0582 30664.

Sutton & Cheam RS meet 3rd Fridays, 7.30pm at Downs Lawn Tennis Club, Holland Avenue, Cheam with Natter Nights on 1st Mondays in the Downs Bar. June 4 is a natter night and the 17th is PW 144MHz QRP Contest. John Puttock G0BWW at 53 Alexandra Avenue, Sutton.

Trowbridge & District ARC have a 144MHz DF Foxhunt on June 6. 1st & 3rd Wednesdays at the TA Club. Ian G0GRI on Bratton 830383.

Coventry ARS meet Fridays, 8pm at Baden Powell House, 121 St. Nicholas Street, Radford. May 25/June 15 are both nights on the air with Morse tuition, June 1 is an Outdoor Operation evening - Buron Dasset, the 8th is a Trip to Coventry Police Black Museum and the 22nd is a Canal Trip. Neil Blair G7ASZ on Coventry 523629 (Home) or 523523 Ext. 2541 (Work).

Horndean & District ARC have Roll Your Own G4BEQ on June 7. 1st Thursdays, 7.30pm at Horndean Community School, Barton Cross, off Catherington Lane, Horndean, Hants. Stuart Swain at 35 Mavis Cres, Havant, Hants PO9 2AE.

Yeovil ARC meet Thursdays, 7.30pm at The Recreation Centre, Chilton Grove. May 31/June 28 are natter nights, June 7 is Product Detectors G3MYM, the 14th is Antenna Fundamentals G3MYM and the 21st is Propagation at night over sea G3MYM. David Bailey G1MNM at 7 Thatchem Close, Yeovil BA21 3BS.

South Bristol ARC have a Video activity evening/SBARC committee meeting on May 30, a Film & Slide Bring & Show evening on June 6, Bullseye contest with NBARC on the 13th, Briefing for Longleat Rally/committee meeting on the 20th and Briefing for VHF-NFD on the 27th. Wednesdays at the Whitchurch Folkhouse, Bridge Farm House, East Dundry Rd, Whitchurch. Len Baker G4RZY on Whitchurch 832222.

Delyn RC meet every other Tuesday, 8pm in the Daniel Owen Centre, Mold, Clwyd. June 5 is a talk about the work of the animal rescue service and the 19th is the Chairman's Night -

what has he got up his sleeve? S. Studdart, PO Box 150, Mold, Clwyd, North Wales CH7 1YL. Tel: Deeside 819618.

Salop ARS have a talk by the Senior Engineer Shropshire Radio on June 21. Thursdays, 8pm at 'Ye Olde Bucks Head', Frankwell, Shrewsbury. Fred Hall G3NSY on Shrewsbury 790457.

North Bristol ARC have a talk by a representative from Jandek Kits on June 15. Meetings at S.H.E., 7 Braemar Crescent, Northville, Bristol. Details from Chris Budd G0LOT at 7 Stanley Mead, Bradley Stoke, Bristol, Avon BS12 OEG. Tel: Almondsbury 616267.

North Ferriby United ARS meet Fridays, 8pm at the Football Club Social Room, Church Rd, North Ferriby. Frank Lee G3YCC on Hull 650410.

Dragon ARC meet 1st & 3rd Mondays, 7.30pm at Fourcrosses Hotel, Menai Bridge. June 4 is Mr Eric Lynn GW3REY a talk from his store of information. Tony Rees GW0FMQ on Bethesda 600963.

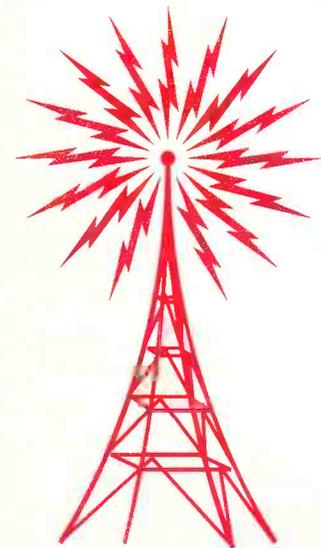
York ARS meet Fridays at York City Social Club, Bootham Crescent. Keith Cass G3WVO at 4 Heworth Village, York.

Chelmsford ARS have East Suffolk Wireless Revival on May 27 and Constructors' competition on June 5. The Marconi College, Arbour Lane, 7.30pm. Roy Martyr G3PMX on Chelmsford 353221 Ext. 3815 (Office).

Keighley ARS have Air Traffic Comms & Navig Aids on May 29, natter nights on June 5/12/19 and The Ambulance Service G0LLL on the 26th. Clubroom, rear of Victoria Hall, 8pm. Kathy on Bradford 496222.

Derby & District ARS meet Wednesdays, 7.30pm at 119 Green Lane. May 30 is night on the air, June 6 is a Junk Sale, the 13th is a Barbecue at Drum Hill, Little Eaton and the 20th is Simple HF Aerials. Kevin Jones G4FPY on Derby 669157.

Lothians RS have their AGM on June 13 and a Social on the 27th. 2nd & 4th Wednesdays, 8pm at the Orwell Lodge Hotel, Polwarth Terrace, Edinburgh. Peter Dick GM4DTH, 21 West Maitland Street, Edinburgh EH12 5EA.



meeting at home with Sutton Library Computer Club on June 8. 2nd & last Fridays, 7.30pm in St. Andrews Church Hall, Herbert Rd. Nick Lawlor G6AJY on 081-330 2703.

TRADING POST

FOR SALE Icom R71E brand new, mint, unbelievable performance, pacific DX, etc + Dressler ARA30 instructions, full guarantee, maps, £695. Rod Ellis. Tel: Reading 811168.

FOR SALE Sony PRO-80, boxed as new, £175 o.n.o. N. Smith. Tel: Basingstoke 477002.

FOR SALE Panosonic communications receiver, model RF-B600 LBS/LBE full band coverage f.m./l.w./m.w. memory bank, etc + Datong indoor active antenna, £250. Free Securicor if required. F. Ivison, 20 Blunt Street, Carlisle CA2 5LT. Tel: Carlisle 36958.

FOR SALE Realistic PRO-34, 200 channel hand-held scanner, 66-88, 108-174, 380-512, 806-960MHz, manual, £150. M.W. Gosling. Tel: Plymouth 766946.

FOR SALE Icom IC-735 transceiver, never been used in transmit. Microphone manual, boxed, mint condition, £730. Or **exchange** NRD-525/IC-7000. Also Belcom 2m scanner, 10 crystals fitted, £35. Mike G6MNX QTHR. Tel: York 422773.

FOR SALE HRO & MX with PS & 18GC coils, 50kHz to 30MHz, £150 each. Drake 2B/2Q c.w. spkr Q multiplier, spare xtals, £135. Marconi B28, £25. Lot £420, carriage extra. A. Roth. Tel: Langport, Somerset 251930.

FOR SALE Tandy Realistic PRO-34 u.h.f./v.h.f./airband hand-held 200 channel scanner, plus NiCads, mains charger and two antennas, short rubber and telescopic, owners manual supplied, boxed, £150. D. Wallace, 3 Rowan Avenue, Egham, Surrey TW20 8AN. Tel: Staines 430027 after 6pm.

WANTED Sony PRO-80 hand-held, must be mint condition with instruction manual. N. Johnson. Tel: Bradford 566712.

FOR SALE R AR-900, UK excellent condition, five months old, £150. Trio R1000 comms receiver with manual as new, £200. Realistic PRO-2003 base scanner v.h.f./u.h.f. with manual, £125. F. Leek. Tel: Warwick 497380.

FOR SALE Yaesu FRG-7700 receiver, 150kHz to 30MHz all mode, plus FRT-7700 antenna tuner, plus FRV-7700 v.h.f. converter, 118 to 150MHz. Plus manuals, £300 o.n.o. John Shepherd. Tel: Bristol 649257.

FOR SALE Black Jaguar MkIII scanner, boxed as new, complete with v.h.f. & u.h.f. aerials, mains and mobile charger, £145 o.n.o. Enquiries to Mr Jim Anderson, Stable Cottage, Dunachton, Kincaig, Inverness-Shire PH21 1LY. Tel: Kincaig 4234.

FOR SALE Wavecom 4010 all-mode decoder, £650. Pocom FTU-2100 RTTY filter terminal unit, £300. JRC ST3 headphones, £45. Hantarex 12" monitor, all metal frame, £80. All items mint. George Boyd. Tel: Preston 704009 after 6pm.

FOR SALE Sony ICF-2001D portable receiver, immaculate condition, 15 months old, rarely used,

£170 for quick sale. P. Arkless. Tel: Bathgate 630548 any evening.

SWAP Commodore 128-64 personal computer with datassette leads, joy stick, books with trilogic expert cartridge, for a m.o.d. 19 set with control box variometer and other accessories. Clive, 28 Kington Gardens, Chelmsley Wood, Birmingham B37 5HS. Tel: 021-788 8447.

FOR SALE Icom IC R7000 mint condition, £550. Mr Emmott. Tel: Maidenhead 893406 (day) or Maidstone 36283 evening.

FOR SALE AOR AR-900 hand-held scanner, superb performance, excellent condition, under guarantee, boxed with instructions, case, v.h.f./u.h.f. antennas, mains charger all included, £150 for quick sale. P. Bailey. Tel: Derby 32670.

FOR SALE Icom R71-E rare opportunity to acquire this outstanding communication receiver at a bargain price. Excellent condition with band-pass tuning in original box. £855, will accept first offer of £550. J. Plant. Tel: 081-644 2508.

WANTED Communications decoder, comax telereader model CD660. F. Upstone. Tel: Tewkesbury 73366.

FOR SALE Yaesu FRG-8800 communications receiver plus FRT-7700 a.t.u., £450. P. Crook. Tel: Nailsea, Bristol 852216 anytime.

FOR SALE Fairmate v.h.f. u.h.f. mobile base scanner, £125. Bearcat 50XL hand-held scanner & charger, £75. Realistic DX440 all-band short wave a.m./f.m./l.w. digital display scanner, £75. Mr M. File, Melrose, Easole Street, Nonington, Nr Dover. Tel: Nonington 840550.

FOR SALE Sony B/W TV, 8 inch tube, v.h.f./u.h.f. (405/625). Suitable TV/DXer or 405 line enthusiast, was working, needs attention, open to offers. Mike Evans. Tel: 081-505 6303.

FOR SALE Panasonic communications receiver, l.w./m.w./v.h.f. seven s.w. bands with digital readout, mint condition, bargain at only £150. David Head. Tel: Malvern, Worcs 572686.

FOR SALE Uniden Bearcat 55XL scanner, as new, boxed, 66-88MHz, 136-174MHz, 406-512MHz, £70. Also Realistic "Jetstream" airband pocket radio, 108-136MHz, as new, £10. D. Burrows. Tel: Bristol 518529 after 6pm.

FOR SALE Kenwood R2000 with VC10 v.h.f. converter, £480. AOR-2002, hardly used, £350. AOR-900, as new, £160. Realistic DX-400 synthesised communications receiver, £70. Peter Gillman. Tel: 081-643 5063.

FOR SALE Uniden Bearcat 200XLT with spare battery pack, in excellent condition and boxed, £170 o.v.n.o. R. Pratt. Tel: Cosham, Hants 382821 only after 6.30pm.

FOR SALE Matsui-4099 world band receiver, as new, boxed with handbook, £70. C. Bartlett, 41 Wycombe Road, Prestwood, Great Missenden, Bucks HP16 0PF. Tel: Great Missenden 64178.

FOR SALE Icom IC-R7000 scanner as new, six months old, still under warranty (Sept 1990), £750. **Wanted** FRG-8800. B. Timlett. Tel: Dunstable 668648.

WANTED MFJ-901 or similar entry level a.t.u. suitable for Matsui MR-4099. Home-build not objected to in principle. Can collect north of Watford. T. James. Tel: York 704595.

FOR SALE or **SWAP** Trio R1000 receiver as new, offers around £200. Or **SWAP** for AR1000 scanner or similar. Buyer to collect. Mr P. Clay. Tel: Bradford 617209.

FOR SALE Fairmate HP-100E scanner 25MHz-1300MHz, 1000 memories, four months old, as new, boxed with manual, £200, carriage extra. Keith Ferry. Tel: 081-570 5603.

FOR SALE AOR-2002, 25-1300MHz scanner, £320. ARO-2001, 25-550MHz scanner, £120. Bearcat 10kHz-30MHz all-mode s.w. receiver, £170. 40-channel, hand-held 4W-CB transceiver (Realistic), £60. C. Wood. Tel: 0889 563445 (Staffs).

FOR SALE YAESU FT-290R multimode 2m transceiver with carry case, antenna, mobile gutter mount and 7/8ths whip., £235 no offers. Licenced amateurs only please. Mr A. Fryzicki. Tel: 081-648 1978 Mitcham, Surrey.

FOR SALE NRD-525 receiver, excellent condition, original packing, manual, complete, £725. Filter 1.kHz for NRD-525, £70. Datong FL3, £70. KX3 a.t.u., £35. DM091G screened 9" green monitor, £40. Heil SS2, £35. Ralph Moxon, 28 Litchard Cross, Bridgend, South Wales CF31 1NY. Tel: Bridgend 659544.

FOR SALE Saisho SW-5000 world-band portable receiver, 150kHz-30MHz a.m., s.s.b. and 87.5MHz-108MHz w.b.f.m., digital frequency readout, switchable filter, scanning, nine memories, clock, etc, as new, £60. R. Taylor. Tel: Haverhill 708409.

FOR SALE Working KD wireless 1932, three bands, original condition, varnish worn, £20. Available Blandford. Mr Telfer. Tel: Charmouth 60806.

EXCHANGE 62 set MkII with mick and headphones and Yashica Mat-124G twin lens reflex camera as new with carrying case. **Swap** for 19 set MkII with accessories. Clive Powis, 28 Kington Gardens, Chelmsley Wood, Birmingham B7 5HS. Tel: 021-788 8447.

SWM JUNE 90 TP

Write out your advertisement in BLOCK CAPITALS - up to a maximum of 30 words plus 12 words for your address - and send it together with your payment of £2.30, to Trading Post, Short Wave magazine, Enefco House, The Quay, Poole, Dorset BH15 1PP. You must send the flash from this page, or your subscription number as proof of purchase of the magazine. Advertisements from traders, apparent traders or for equipment which it is illegal to possess, use or which cannot be licensed in the UK will not be accepted.

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Calls charged at 38p per minute peak period and 25p per minute off peak.

RALLIES

May 27: The 14th annual East Suffolk Wireless Revival will be held at the Civil Service Sportsground, Straight Road, Bucklesham, Ipswich. There will be a Bring & Buy, Car Boot Sale, a transceiver clinic, 50MHz demonstration, all the usual traders and lots more including a children's play area. **Paul Whiting G4YQC. Tel: (0473) 642595.**

May 27: The Plymouth Radio Club are holding their annual Radio & Electronics Fair in Plymstock School, Church Street, Plymstock, Plymouth. The doors open at 10am with all the usual attractions - traders, Bring & Buy, raffle and a licenced bar and refreshments. There will also be an RSGB Zonal meeting and lecture along with Morse tests. **Jan Fisher. Tel: (0752) 340946.**

May 28: The 1990 Bircotes Radio Rally will be held near Bawtry, Doncaster. Doors open at 11am (10.30am for the disabled). Talk-in on S22. Details and or booking forms from: **Pat Smith, 23 Florence Avenue, Balby, Doncaster. Tel: (0302) 857526.**

June 2: The first Belfast Amateur Radio Convention, organised by the RAIBC (Northern Ireland Area), is being held in the Ormeau Park Recreation Centre, Ormeau Embankment, Belfast. All the usual convention attractions will be there plus demonstrations and talks on the hobby by local well-known amateurs. They are also trying to cater for the XYLs by having demonstrations on microwave cookery, crafts and first aid. The special event station operating on the day will be GB2BRC **David Caldwell G10HOW. Tel: (0232) 471370.**

June 3: The Southend & District Radio Rally and Boot Sale will be held at the Rocheway Centre, Rocheway, Rochford, Essex. There will be the usual trade stands plus a Bring & Buy, licenced bar and coffee bar. Doors open 10am with talk-in on S22. **John Stone G0OFFE. Tel: (0702) 202216.**

June 10: The Mid Lanark ARS Annual Open Day will be held at Newarthill CE Centre, High Street, Newarthill. Doors open 11am. There will be the usual traders, a Bring & Buy, demonstrations of packet radio, a talk by John Branegan GM4IHJ on his experiences with satellites, demonstrations of equipment and the annual award of their EHI Trophy. **David Williams. Tel: (0698) 732403.**

***June 10:** The Royal Naval Amateur Radio Society Annual Mobile Rally will be held in the Sports Field, HMS Mercury, near Petersfield, Hants from 1000-1700.

***June 10:** The 21st Elvaston Castle mobile radio rally will be held in the grounds of the castle. Car parking is £1 per vehicle, coaches £5. There's plenty for all the family to do at Elvaston Castle which is 8km SE of Derby on the B5010. There will be a Grand Bring & Buy and a flea market as well as all the usual traders. **John Robson. Tel: (0332) 767994.**

June 17: The Newbury Radio Boot Sale is being organised by the Newbury & District ARS at Ackland Hall & Recreation Ground, Cold Ash, Newbury between 10am and 3pm. There will be refreshments available, with free entry and parking for visitors. Talk-in will

be provided by GB4NBS. **Mike G3VOW. Tel: (0635) 43048.**

***June 24:** The Annual Longleat Mobile Rally will be, as usual, held at Longleat near Warminster, Wilts. **Shaun O'Sullivan G8VPG. Tel: (0225) 873098.**

July 1: The Worcester & District Droitwich Strawberry Rally will be held at the High School, Droitwich. There will be the usual trade stands, Bring & Buy, family entertainment and strawberry fields (weather permitting). Gates open at 11am with free car parking and entrance. **Tony G4OPD. Tel Worcester 620507 or Derek G4RBD. Tel: Worcester 641733.**

July 1: The York Radio Rally will be in the Tattersall Building, York Race Course, The Knavesmire, York. Doors open at 11am with an entrance fee of 50p (children admitted free). There is ample free parking. On show will be amateur radio, electronics and computing, arts and crafts, there's a grand Bring & Buy, Morse tests, lectures on various aspects of amateur radio, a raffle and talk-in on S22. A licenced bar and cafe will be available for refreshments. The Knavesmire is well signposted and there will additional RAC signs round the main approaches to York. **Frank Webb G3ZKS. Tel: (0904) 625798.**

July 1: Newport ARS are holding their 3rd Grand Surplus Equipment and Junk Sale at the Brynglas Community Education Centre, Brynglas Road, Newport. The Sale is open from 10.30am to 4pm (10am for the disabled). **Kevin GW7BSC. Tel: (0633) 262488.**

July 6, 7 & 8: The Popular Flying Association Rally is again being held at Cranfield Aerodrome, Beds. All activities related to flying, including airband radio will have a place there.

July 14: The Cornish Radio Amateur Club Rally will be held in the Richard Lander Scholl, Truro. There will be the usual trade stands, Bring & Buy, a computer display/demo and a weather satellite demo. There will be refreshments, good free parking and the doors open at 10am (9.30am for the disabled). **Rolf Little G7FKR. Tel: (0872) 72554.**

***July 15:** The Sussex Amateur Radio and Computer Fair will be held at Brighton Racecourse. All the usual traders and other attractions will be there. Doors open from 10.30am to 4.30pm, with entrance at £1. **Ron Bray G8VEH (QTHR). Tel: (0273) 415654 office hours or (0903) 763978 other times.**

July 22: The Burnham Beeches and the Maidenhead & District Amateur Radio Clubs are staging the 7th McMichael Rally at the Haymill Centre, Burnham, near Slough. Doors open to the public at 10.30am (10.15am for the disabled). Admission is £1, the car boot sale pitches cost £5. There will be the usual trade stands, packet radio demo, refreshments, (tea and coffee on the RAIBC stand this year - honestly!), bar as well as the GB4MR special event station.

***July 29:** The Scarborough ARS Rally will be held at the Spa, Scarborough. Doors open at 11am. Many trade stands, large Bring & Buy, Morse exam and demonstration for the Morse examiners, refreshments and bar. Details from **Ian G4UQP (QTHR). Tel: (0723) 376847.**

July 29: The Rugby ATS will be holding their Car Boot Sale at Lodge Farm, Walcote, near Lutterworth, Leicestershire. Talk-in will be provided by GB8CBS on S22. Pitches are £5 for the whole day, entrance for visitors is 50p per cae. Gates open at 10am. **David G4DDW. Tel: (0455) 552599.**

***August 12:** Hamfest '90 will be held at the Flight Refuelling Sports Grounds, Wimborne, Dorset. The event will feature Radio and Electronics Trade Stands, Craft and Gift Fair, Bring & Buy, a vintage wireless exhibition and full family entertainment. Talk-in will be on S22. The event opens at 10am. There is free parking and overnight camping on the Saturday night by prior arrangement. **John G0API. Tel: (0202) 691649 or Rob G6DUN. Tel: (0202) 479038.**

August 12: The 1990 Derby Mobile Rally will take place once again at Lower Bemrose School, St Albans Road, Derby, just off the A511 Derby Ring Road. Gates open at 10.30am with all the usual attractions including the Giant Junk Sale. **Kevin Jones G4FPY, 20 Pinecroft Court, Oakwood, Derby DE2 2LL. Tel: (0332) 669157..**

August 19: The West Manchester Radio Clubs Red Rose Summer Rally will be held at the Bolton Sports and Exhibition Centre, Silverwell Street, Bolton.

August 26: The Three C's Rally will be held at the Tiddenfoot Leisure Centre, Linslade, Leighton Buzzard, Beds. Entrance fee is £1, children free. **A Perkins. Tel: (0582) 33885.**

August 27: The Huntingdon Junk Sale & Auction will be held at the Medway Centre, Coneygear Road, Huntingdon, Cambs. The doors open from 10am to 6pm, food and drink will be available all day. **G1YVS. Tel: (0836) 611025 or (0487) 830212 (eves).**

September 9: The Vange ARS will be moving the rally this year to The Laindon Community Centre, Aston Road, Laindon, Basildon, Essex. Doors open from 10am to 4.30pm with admission at 50p. The rally will include many traders, a Bring & Buy, refreshments and free raffle. Talk-in on S22. **Doris Thompson. Tel: (0268) 552606.**

***September 9:** The Lincoln Hamfest will be held in the Exhibition Centre, Lincolnshire Showground. Gates open at 10.30am (10am for the disabled) and the rally closes at 5pm. All the usual trade stands will be there, along with the real ale bar. There will be lots of attractions for the whole family too. Caravans welcome by prior arrangement. Talk-in on S22 by the West Lincs RAYNET Group. **Sue Middleton. Tel: (0522) 531788.**

***September 16:** The British Amateur Radio Teledata Group annual rally will be held at Sandown Park Exhibition Centre, this time in the larger Surrey Hall. **Peter Nicol G8VXY. Tel: 021-453 2676.**

Dial RADIOLINE on 0898 654676 for up-to-date rally news

LISTEN OUT FOR

GB2RBC: A return visit to Balmoral Castle, by Royal permission will mean this station on the air over the weekend of June 9/10. **Paddy GM3MTH. PO Box 59, Hamilton, Lanarkshire**

GB2STB: This station will be on the air on the final day of Beith Civic Week, Ayrshire, that's June 16. **Paddy GM3MTH. PO Box 59, Hamilton, Lanarkshire ML3 6QB.**

GB2NTS: This station will be on the air over the week July 15-22 for the Castle Country Four Castles Event. The castles will be Grampian Region Drum Castle, Castle Fraser, Craigievar Castle and Leith Hall. A certificate is available for overseas stations if they work any two of the stations or for the UK if they work any three. Annotation is available for working all four stations (the cost for the certificate is 50p, 1 dollar or equivalent). **Robbie**

GM4UQG, PO Box 59, Hamilton, Lanarkshire ML3 6QB.

GB70SIG: To celebrate the 70th Anniversary of the formation of the Royal Corps of Signals, the Scarborough Special Events Group, with members from RSARS, RNARS and RAFARS propose to run a special event station from the Royal Signals Training Centre, Burniston Barracks, Scarborough during the period June 10 to July 7.

Operation will be around 3.725 and 7.055MHz on the h.f. bands, plus 144MHz s.s.b. operation and f.m., in addition to activity on the RSARS nets. Special QSL cards will be available and further details can be obtained from: **Roy Clayton G4SSH, QTHR.**

GB5SN: This station will be operating from the summit of Snowdon on either June 1 or 2, weather conditions permitting. The operators, G3XWH,

G3YHC and G4KCR will be using a hand-held Mizuho 7MHz 2W hand-held transceiver into an end-fed Zepp antenna, all supplied by Waters and Stanton.

This group of Harrogate Radio Amateurs operated GB5BN from the summit of Ben Nevis on June 1 last year in arctic conditions!

GB2RAF: The station will be operating from RAF Henlow on June 2.

GB8FC: Now it's the turn of the Science Museum, Wroughton on June 3.

GB4RAF: This station will be operating on June 10 from RAF Cosford.

GB0RAF: From June 16 to 21 this station will be on the air from RAF Coningsby.

GB4RAF: On June 16 this station will be active from RAF Halton.

GB2RAF: RAF Locking is the venue for this station on June 22/23.

GB50BOB: The Science Museum at Wroughton will be using this callsign on July 8.

GB2CPC: In conjunction with the Administrator of Penrhyn Castle, owned by the National Trust, the Dragon ARC will be running this station on three separate occasions. The first is June 15/17 for the Flower Festival at Castell Penrhyn Castle. The second is June 23 which is the 25th Anniversary of the castle's Railway Museum. The third is July 27/29 which is for a weeked display of rare domestic breeds (including radio amateurs!!), local crafts and other activities. **Tony Rees GW0FMQ. Tel: (0248) 600963.**

GB50BOB: This time, this station will be on the air from RAF Swinderby over the four days August 3/6.

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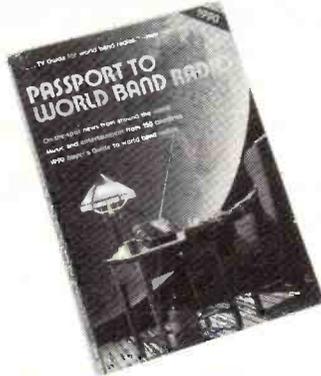
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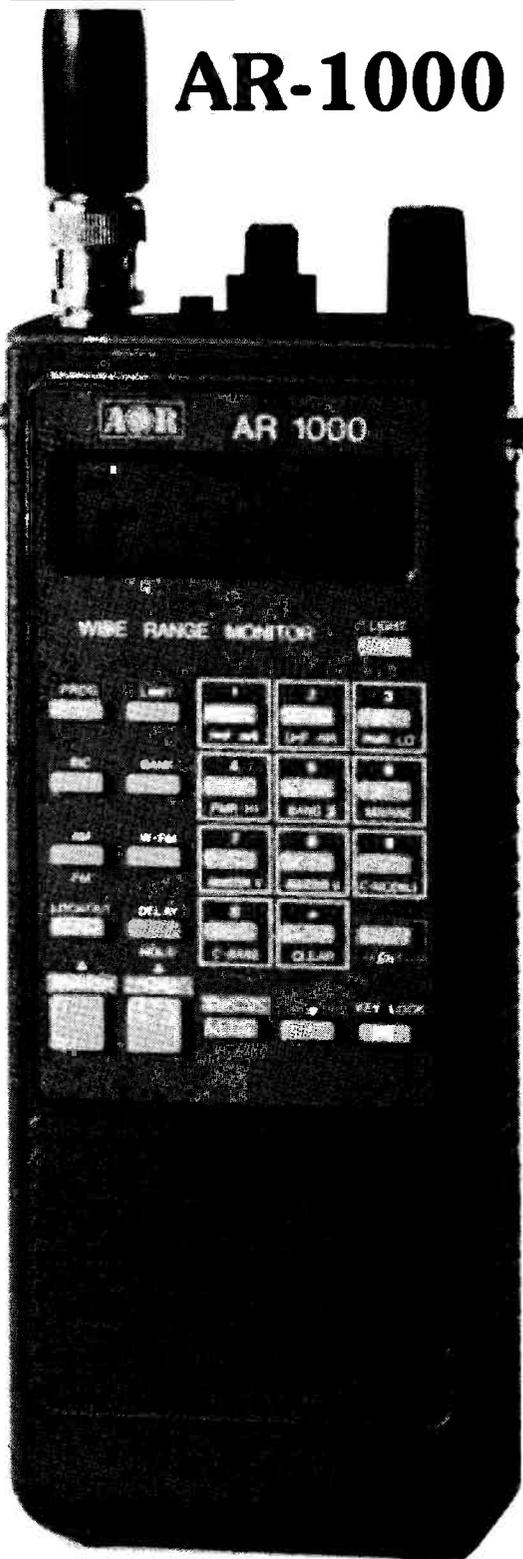
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7. VHF amateur	144-146MHz	8. UHF amateur	433-435MHz
9. Cell mobile	890-905MHz	10. Cell base	935-950MHz

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USING A SOLAR RADIO TELESCOPE

Ron Ham
Part 2

Work Began In May 1968

The first small burst and a single day noise storm that I recorded in 1968 were on May 7 and 22 respectively and the first long burst, of 9 minutes duration, came on August 13. This was followed by a minor noise storm which started on the 18th and lasted 3 more days. However, the sort of event that I was really looking for began on October 26, with a slightly noisy trace, and ended on November 3 with individual bursts. Many such bursts were recorded each day but on the 29th and 30th and November 1, the sun was very noisy. Around 1930 on the 1st an aurora manifested and by 2000, auroral reflected signals from amateur stations in Ireland and Yorkshire on the 70MHz band and Wales on the 144MHz band were heard in southern England. This was my first experience of a direct connection between the "active" sun and an atmospheric disturbance and I knew then that all the work put into this telescope was well worthwhile. Towards the end of 1969, solar activity was rising and I recorded noise on 16 days in October and 27 days in November.

'Listening' To The Sun

During the first year of recording solar noise I realised just how important it was to monitor the receiver background noise and actually "hear" the sun in action as well as seeing the shapes of a solar event being drawn on the paper chart. Do keep in mind that any input of r.f. to the antenna from man-made or natural sources will cause the pen to deflect and draw a spike or a pattern on the chart. Although a clear part of the spectrum is selected before using a radio telescope, unwanted signals do sometimes appear and these can be identified and ruled out of the records by listening to the sound. When the system is running normally the only output from the loudspeaker should be the steady 'twittering' of receiver noise and the "whoOOoshing" of solar activity.

Ron continues his account of his fascination with listening to the sun with his home built solar radio telescope.

The 1970s

Although I was delighted with the instrument's work in 1968/9, I had little idea then just what the sun had in store for the next decade and how well this simple radio telescope would process the data.

A major solar storm began on March 1st 1970 with high-amplitude individual bursts inside a slight noise storm and ended on the 8th with a period of gigantic bursts. Meanwhile, the storm was slight on days 2 and 5 and intense on the 4th, with various sized bursts being recorded on the other days. With all this activity on the sun it was no surprise when an aurora manifested on the 8th. This was a big one, because, during its lifetime (1600-2200) auroral reflected signals were received in Sussex from the Polish broadcast transmitter at Gdansk on 70.31MHz, amateur transmissions from Denmark, northern- England, Holland, Ireland, Scotland and Wales on the 144MHz band and IBA (then ITA) television pictures from their Band III stations in London and the Isle of Wight.

In each case the solar storm had warned me that the sun was ejecting particles and that an aurora could appear at any time. Auroral displays (northern-lights) are rarely visible from southern-England, but the strange effect that it has on v.h.f. radio signals, described as tone-A, is enough to confirm its presence especially when it cannot be seen because the skies are overcast or during the daylight hours.

From the start I kept a daily log of the solar events that occurred and from these archives I prepared a graph, Fig. 2.1, showing the total number of days each year and the low indicated by the "star"

when some form of solar noise was recorded. The sun was active every day from October 9 to November 5 and then went quiet until the 11th, when a few tiny isolated bursts appeared on the chart. Next day the receiver noise line increased and decreased as the sun passed through the antenna beamwidth and by starting-time on the 13th a noise storm was in progress and the amplitude of noise-line was half way up the chart. This line was higher and the noise more intense on the 14th and 15th and peaked on the 16th and 17th when the pen spent most of the observation against the upper stops, Fig. 2.2 and only declined a little on the 18th. Although still strong the noise-line was about midway on the 19th and 20th and then gradually returned to normal, with slight noise and a few small bursts, on the 21st and 22nd.

This solar activity was responsible for many fade-outs on the h.f. bands and after sunset on the 16th, the background noise on these bands was exceptionally high. It sounded as though the whole atmosphere was "alive" after its excessive bombardment from the sun. I thought that perhaps the ionosphere, or even the earth's surface was re-radiating the solar noise and a fellow radio-astronomer suggested that it could be the moon deflecting the solar noise towards earth after sunset. Another good possibility because the sun was still pumping the stuff out and I don't think the earth's ionosphere was in any state to stop it getting through to my receiver. Whatever the cause it was a fantastic natural event from which I learnt a lot more and realised that this must of happened millions of times before in the earth's history, but without radio, there was no means of knowing about it.

During this storm, the media was carrying the story of the East Pakistan flood disaster and on the 17th I noted a piece in the Daily Telegraph newspaper which began, "Pakistan's tidal wave disaster was caused by the influence of sunspots, Prof. Raffaele Benandi, director of the Faenza Geophysical Observatory

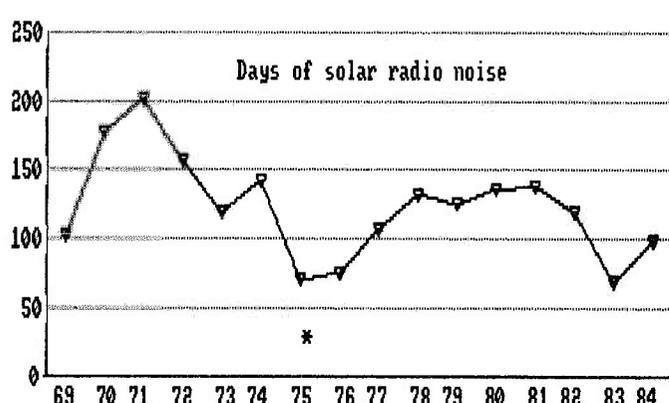


Fig. 2.1

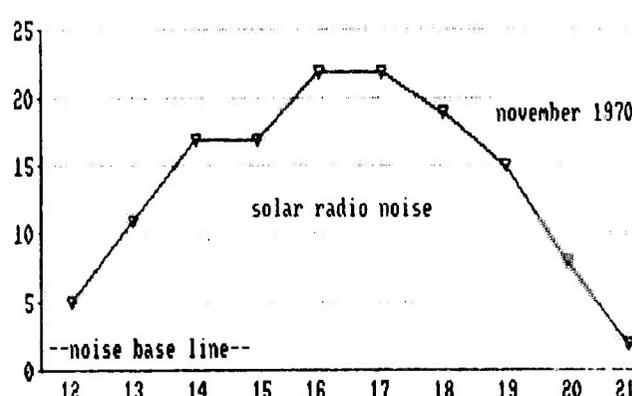


Fig. 2.2

USING A SOLAR RADIO TELESCOPE

in Italy, suggested yesterday." "Why not," thought I, there may still be unknown particles coming from the sun, which, as yet, man has not found an instrument to detect. After all the sun has been transmitting radio waves for millions of years, but science knew nothing of it until the invention and development of the short-wave radio receiver earlier in this century. The Telegraph's report continued, "Prof. Benandi said that four separate groups of sunspots were moving across the Sun's face, the largest of them containing about 20 spots. The biggest group passed through the central meridian yesterday. [remember that peak of noise on the 16th]. It will disappear over the Sun's western horizon on Nov. 22."

Over the years I found that noise storms always produced something of great interest for instance; my home is situated on the northern slope of the south-downs which rise sharply by approximately 120m, about 90km to the south of my garden. This has some advantages but during the mid-winter months the sun, being low in the sky, sets quite sharply behind the hill. On 9 January 1971, the sun was radiating a high level of radio-noise and as it set behind the downs and the source of the noise was gradually cut off from the telescope's antenna, a rough profile of the hill was drawn on my recording chart.

According to my readings about solar radio astronomy in the late 1960s, the active sun's output at meter-wavelengths varied with frequency so, with this in mind, I added a second receiver to my system which was electrically similar to the first, observed the sun on a clear spot around 95MHz [you could then] and its

antenna, next to the 136MHz array in Fig. 2.3, was a 6-element Band II Yagi mounted on a 2m square wooden frame. The frame's wire mesh covering replaced the Yagi's own reflector and a metal pipe, slightly longer and secured to the rear of the framework, enabled the antenna to be centre slung between two uprights. These uprights were lengths of 50mm mast standing on foot plates buried in the ground. The horizontal pipe was attached to them at each end with strong universal clamps, thus allowing for vertical adjustment.

By mid-1970, the second instrument was running concurrently with the first and the output of both receivers was fed to an Evershed and Vignoles twin-track chart recorder, Fig. 2.4, so that direct comparison between the solar activity on each frequency, 95-left/136-right, was easy to see. The telescope and its work received a lot of publicity and on November 5, 1971, it was featured in the BBC television programmes, 'TOMORROWS WORLD', presented by James Burke and SOUTH TODAY, with Andrew Harvey, Fig. 2.5 and later in a science film ALL FOR LOVE presented by Paul Dunstan for Yorkshire Television. A close study of the 136MHz antenna between Andrew and myself will show some of the woodwork, the tight wire-mesh reflector and the fixing of the booms to the frame.

1972, was unforgettable for me with several major solar storms occurring through the year plus the aurora which manifested from 1300 to 1700 on June 18 and the h.f. blackout on November 1 were both associated with noise storms. However, the real "winner" for me was the massive solar storm during the first



Fig. 2.4: Twin chart recorder.

week of August which began at 1146 on the 1st with a hefty burst of noise which lasted for 8 minutes on both 95 and 136MHz, Fig. 2.6 and was strong enough to blot out the static spikes from a local thunder storm that was in progress at the time. Thunder storms are a pest during any solar observation because every crash of static draws an unwanted spike on the recording chart, however, on this occasion, it was scientifically valuable and became an excellent demonstration as to the power of a solar burst. The static was being generated only a few kilometres from my solar antennas but the radio waves that "crushed" them originated 150 million kilometres away on the sun and had taken just over eight minutes to reach my telescope's antennas. This said it all, something big had started on the sun's surface and very soon I was told about the appearance of a very large sunspot group which remained visible until the 9th. The daily increase in radio noise reached its peak on the 4th and then declined as the group crossed the centre of the sun's disc. From sunrise on the 4th, the solar radio noise was so strong that other equipment, working with a horizontal antenna on 70.31MHz, could not be used for several hours until the sun was much higher in the sky. When the telescope switched on at midday, both recording pens were banging the upper stops. Like any other day the instrument switched off automatically at 1430 and I closed my mind to radio astronomy and by 1500, I was helping fellow members of Storrington's Horticultural Society to prepare for their annual flower show next day. Our venue

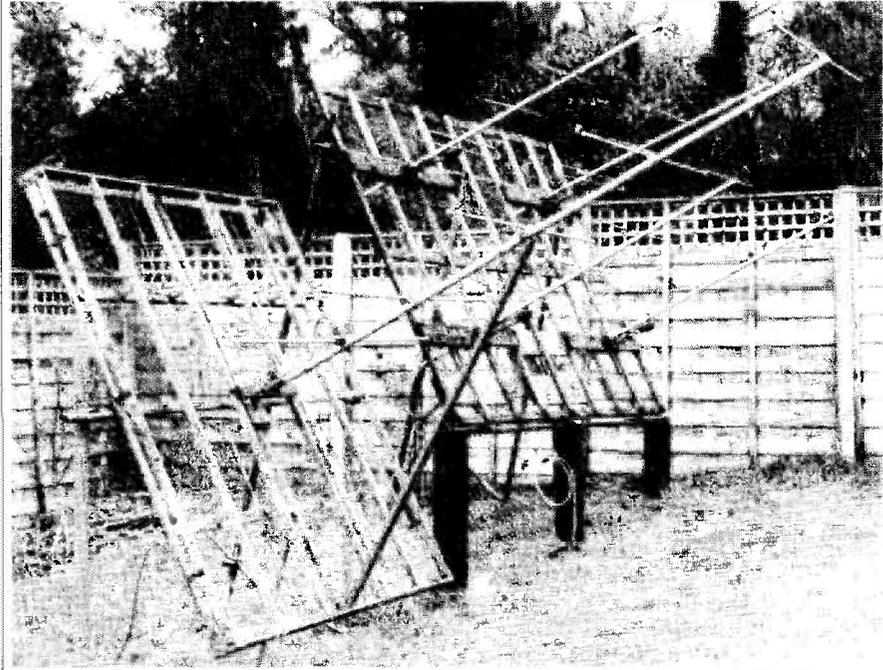


Fig. 2.3: The 136MHz array with a 95MHz antenna

USING A SOLAR RADIO TELESCOPE

was a large marquee on the recreation ground and moving and installing tables and exhibits in the pouring rain was no joke. However, around 2200 the rain stopped leaving the sky so clear that the stars in the milky way appeared like diamonds. The seeing was extra good because there were no street lamps near the ground to hinder our view of the night sky. About 2330, my attention was drawn to an arc of white light on the northern horizon about 20 degrees wide and 5 degrees high in the centre. From this arc came several searchlight type beams, a few degrees apart and reaching over my zenith. As these giant beams moved across the sky from west to east, their delicate shading changed from red to green to light blue. It is very rare for an aurora to be seen in Sussex and I lapped up every second of it because it was my first ever sight of the northern lights. This particular display lasted almost 3 hours and its climax came about 0200 when the bright stars of Ursa Major (The Plough) were shining through a pink auroral glow which, by that time, had become the backdrop behind the beams and the periodic patches of bright light. I heard later that this aurora had an umbrella effect on v.h.f. radio signals, but nothing could have dragged me home to find out. Had the sky remained overcast no one, apart from v.h.f. enthusiasts, would have known about this event. The sun was still active on the 5th and another aurora manifested at 1500 hours, but this time it was in broad daylight and its existence was only known by a small number of v.h.f. enthusiasts. Before the advent of radio, untold numbers of aurorae must

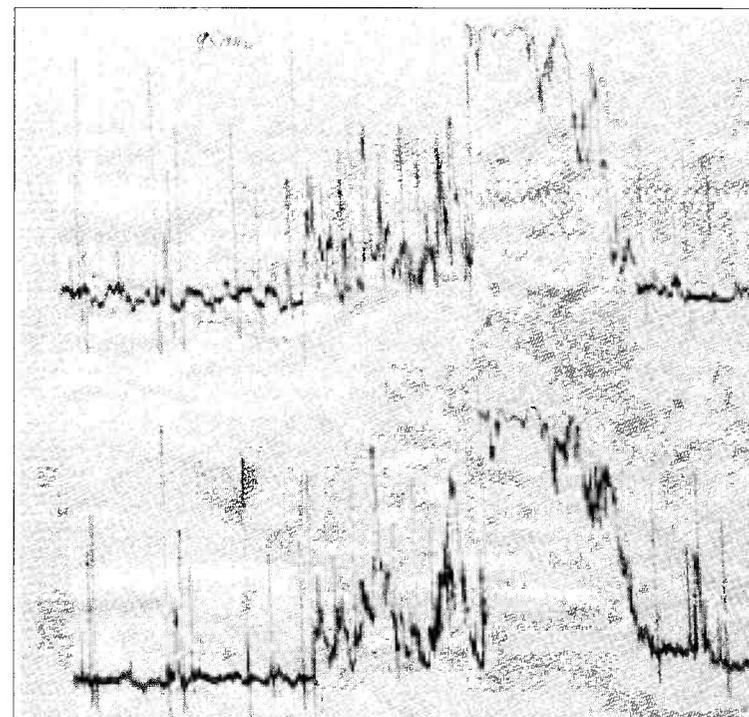


Fig. 2.6: A solar burst overpowering local thunder spikes.

have gone by unrecorded because their light was hidden by overcast skies or because they manifested during the hours of daylight.

At midday on April 1, 1973, a colleague reported hearing solar noise from 14-20MHz and my telescope recorded a couple of individual bursts at 136MHz. Something had begun, because a two-phase aurora manifested between 1600 and 1800 and 2000 to past midnight. Throughout the initial phase, amateur stations, peaking north-east, exchanged tone-A QSOs on 144MHz while, lower

down, at least 15, mainly East-European, broadcast stations were heard "burbling" between 49 and 71MHz. Later, between 2015 and 2056, I heard "burbling" on 3 such stations in the 70MHz band and strong auroral signals from the broadcast station at Gdansk on 70.31MHz. Before the main solar storm began on the 5th, noise was recorded at 95MHz during the midday observations on days 2 and 4 and individual bursts appeared at 136MHz on days 2, 3 and 4.

The BBC's World Service warned their listeners about poor reception, "due to ionospheric disturbances", on October 30, 1973, when a noise storm was in progress and I noted similar warnings on September 14, 15 and 16, 1974, during a period of intense sunspot activity. The solar noise on July 2, 1974, was severe and still very strong at sunrise on the 3rd. However, while monitoring this with other equipment in my observatory, a massive burst took place, lasted for 8 minutes and covered the spectrum from 8 to 136MHz. The entry in my log explains, "0832, Burst of radio noise 136MHz, gradually getting stronger and it spread down past 70, 50 and 30MHz to 8MHz. It remained strong on all these frequencies until 0836 when it slowly worked its way back up and died out at 136MHz at 0839. Whilst this burst was in progress, the solar noise drowned out all signals between 8 and 20MHz." □

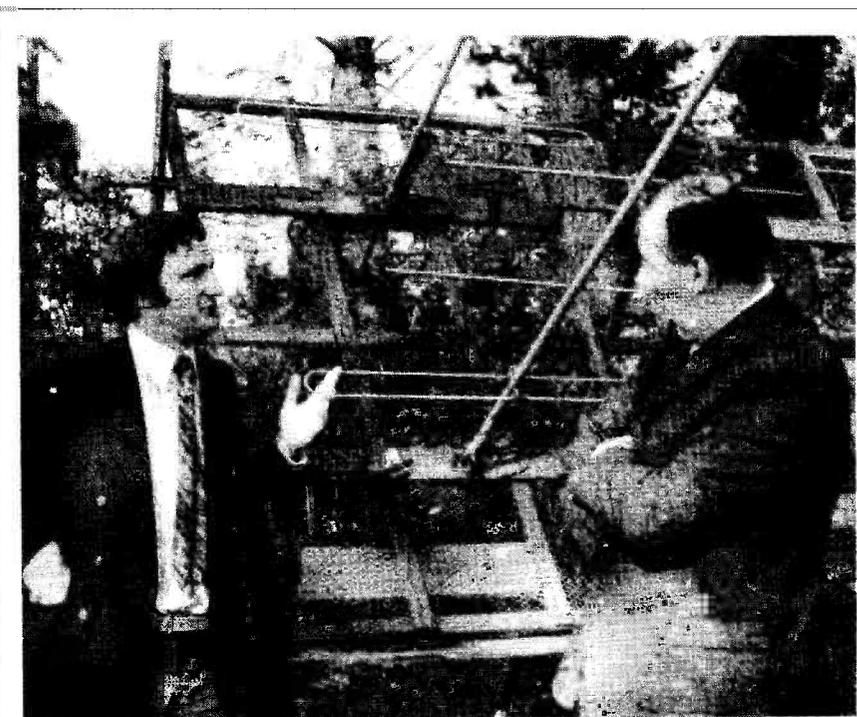


Fig. 2.5: Ron appears on BBC South Today.

Ron continues the fascinating story of how he made his own solar telescope and listened to the sun's radio noise in next month's issue of *Short Wave Magazine*.

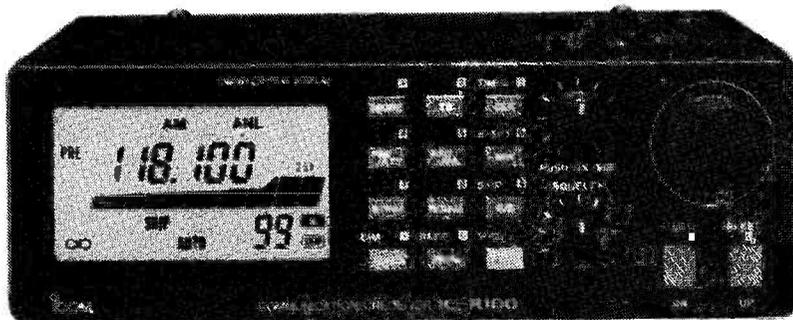
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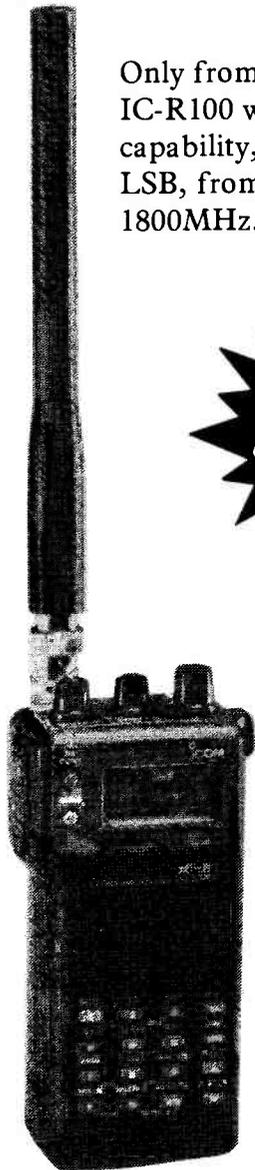
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ENTER MR MURPHY

Clifford Stephenson

I had been in the radio business for seven years and was just beginning to sell a few commercially-built receivers in addition to my major trade in components and loudspeakers. Loudspeakers were big business and I was already selling large quantities - especially the Celestions mentioned previously. We had a special showroom where the speakers were demonstrated, and on Saturdays all my time was spent in it, helping customers to choose. On a good day I sold as much as £100 worth and occasionally a commercial set as well.

At this time, some very original advertisements began to appear for a new make of 'portable' radio receiver, under the 'Murphy' name. The advertisements were distinctive in style and original in message - quite different from the usual exaggerated claims. I was intrigued by the unusual approach and the feeling of honesty they conveyed, and the agency conditions (only one dealer in each town) they offered. Unfortunately, I had little or no sale for portables, and in any case another dealer had the agency.

But circumstances changed unexpectedly. The other dealer, despite his sole Murphy agency, went bankrupt and I was offered the sole Murphy dealership for Huddersfield. With only luke-warm enthusiasm - as I had little demand for portables - but persuaded because the erstwhile dealer had sold quite a number, I took the agency and delivery of one Murphy B4 portable. I still had that set in stock when I went to the annual Radio Exhibition in London later that year!

The year, 1931, was when most manufacturers offered, as their new and

Sometime early in 1931 there occurred one of those happenings, unplanned, unsought and unappreciated at the time, which was destined to play a major part in my business and Clifford Stephenson's life.

principal model, a 3-valve (plus rectifier), all-electric set with a moving-coil speaker in the same cabinet. Amongst them was the recent entry into the industry Murphy Radio Ltd. Their new Model A3, in a striking and attractive cabinet, was sold under the slogan 'making wireless simple'.

Wireless World, the leading periodical of the day in the field, ran a competition to decide which set in the Exhibition was best. It was won by the A3, made by the virtually unknown Murphy Radio Ltd - for whom we were the sole Huddersfield agent. From then onwards we couldn't go wrong.

News of the winning set spread quickly. Quite soon we had a waiting list for them, and we basked in the reflected glory of this runaway success. However, several months later that wretched B4 portable was still in stock, though I did eventually sell it. Several years later, in honour of its crucial role in causing me to become a Murphy dealer, I bought it back from the customer and it is now in the Ravensknowle Museum!

My association with Murphy Radio began in 1931 and continued until I retired

from the radio trade in 1957 - 26 happy and profitable years later. Frank Murphy, founder of the firm and the inspirer of its unique and sometimes revolutionary business philosophy, was one of my greatest influences, though my contact with him only lasted a few years as he resigned in 1937 from the company bearing his name to start a new career as a manufacturer of furniture.

Murphy - Pioneer and Trend Setter

Indicative of his interest in furniture was Frank Murphy's approach to the design of the cabinet for his famous A3 model. There were already in existence several large-scale manufacturers of cabinets, good but unimaginative in design. Murphy wanted something different and better, so he approached Gordon Russell, a manufacturer of cabinet work of national repute and an acknowledged pioneer in design - beginning an association that was to last the life of the firm.

This association was not without its problems for Murphy dealers. It is in the nature of a leading designer - as Gordon Russell was - that at times he moves too far ahead of public taste, and so we were faced with the difficulty of selling advanced cabinet designs to a public not yet ready for them. It was a common experience for competitors to adopt, in the following season, the styling previously pioneered by Murphy the year before.

R&D

The technical research and design, fostered by Murphy, paid a steady dividend in technical leadership. Murphy Radio was one of the first manufacturers to incorporate many of the improvements in receiver performance. Their A88-valve superhet, introduced in 1932, was a leader in the field, and the A4 of 1933 was one of the first superhets available at a popular price - £14.50.

Always there was emphasis on the quality of the product, both in performance and reliability, and to achieve the latter the proportion of inspectors to operators in the factory was twice the usual. Most of the assemblers on the production line were men instead of, as usual, women. This was deliberate policy, Murphy believing that to employ men, though more costly, served a social end.

Innovations

In 1934 a new type of receiver, the floor standing 'Console', was introduced, the first of a long line of this style for which Murphy was rightly famous. Others had installed an ordinary receiver and



ENTER MR MURPHY

loudspeaker in a large floor-standing cabinet, more impressive in appearance, but otherwise little different from a table model set.

The Murphy Console aimed not only to look better but to sound better - and it did. A vastly improved loudspeaker, to take advantage of the Console's larger baffle area was fitted. It weighed a massive 18lb - compared with the usual 3 or 4lb - hence its undeniably superior performance. Exploiting the baffle principle with its better sound reproduction led to numerous models, some of them table sets, which being unconventional in appearance were famous, though not very popular sellers.

Remote Control

Among innovations and improvements in receiver design pioneered by Murphy were features now commonplace, such as automatic volume control, automatic tuning correction, alphabetical station dials, extended scale short wave tuning, and push-button tuning - the first mechanical method, using an electric motor to 'search' for the required station, was not a great success, but later designs using electronic tuners were quite satisfactory. Even remote control was developed, using a cable-connected push-button armchair control unit as early as 1939.

The Murphy Model A78C, introduced just before the outbreak of war, but never in full production, probably represented the ultimate in state-of-the-art. Superb quality, a handsome and impressive console model with remote control, its price was £40. We will not see its like again.

A Remarkable Man

In my opinion Frank Murphy was one of the three or four people who most influenced the early development of domestic radio in England. In his case the influence was in the production and distribution of radio receivers. He did more than anyone to stabilise prices and bring order and standards into an industry without recognised principles, standards or traditions.

As a new manufacturer in 1930 he adopted the common practice of a price to dealers based on a generous discount similar to that of other manufacturers, who gave 33 per cent discount, plus 3 per cent more for seven days settlement or 2 per cent on monthly account - which most dealers used. The maximum total discount available was therefore almost 36 per cent. Murphy was smarter however, he gave 30 per cent and 10 per cent for cash in seven days, a total of 37 per cent. The 10 per cent was too good to miss so virtually every Murphy dealer

paid within seven days, thus ensuring for himself a rather better profit margin than other manufacturers gave, and at the same time providing the struggling young manufacturer, Murphy, with a most useful cash flow - the envy of other makers.

Notorious

But this situation was not long to last. It was notorious that the national -price-lists of other manufacturers were commonly not observed although, strictly speaking, they were subject to retail price maintenance.

Wide-awake buyers could easily 'get something off'. This operated to the disadvantage of Murphy sales, because Murphy dealers were rigidly required to sell at full Murphy prices or otherwise lose the valuable agency.

Frank Murphy pondered on this problem and concluded - quite logically - that if dealers gave discount away it could only mean that they had more discount than was needed to cover costs and make a profit.

Survival

The result of this pondering was that, in order to ensure the survival of both Murphy Radio and its dealers, factory prices, the workforce's wages (including Frank's) and dealers' margins would have to be cut. This decision, taken with the agreement of dealers and Murphy's employees, drastically changed trading conditions and, more importantly, brought down prices of all radio sets by about 25 per cent.

Sales of radio sets were very seasonal in those days. Fueled by the publicity of

the Radio Exhibition at Olympia in September, the next four months accounted for as many sales as did the remaining eight months of the year. This gave rise to several problems: shortage of deliveries of the new models, hurried production leading to unreliable products and socially important, shortage of work and consequent unemployment in the factories during the summer.

Frank Murphy was very concerned about these problems, but unlike other manufacturers did something about them, in three ways.

Advertising

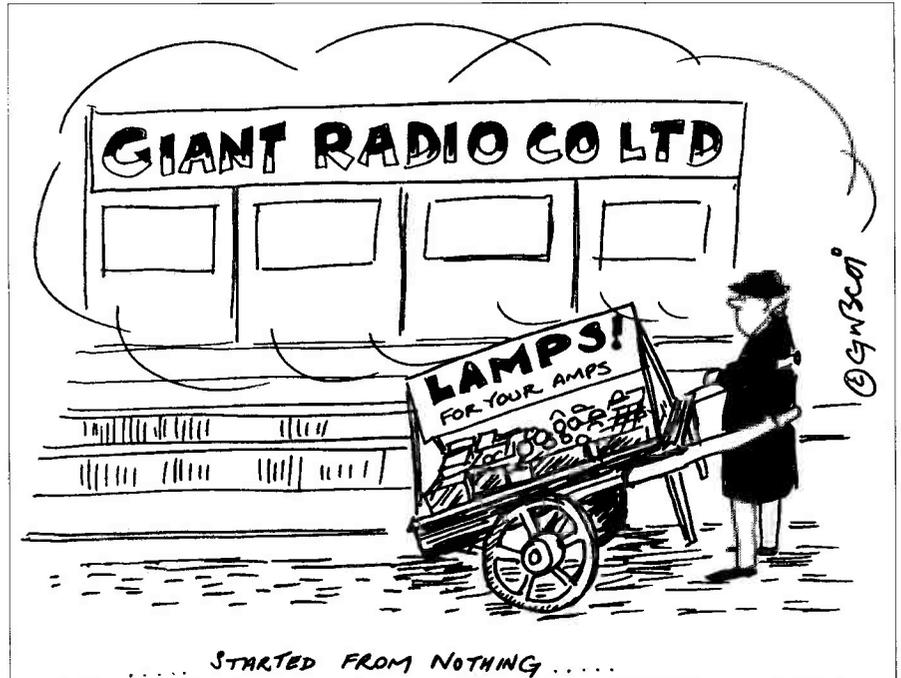
He introduced the new Murphy models in the spring, so attracting some sales when the season was quiet, and allowing production to build up gradually; he spent a lot of money on advertising, and finally he instituted a 'stocking plan' under which the production during the quiet summer months was delivered into dealers' stocks as produced, without the dealer having to pay for it until the selling season arrived.

The advantages of a steady production flow with resulting better workmanship, regular employment of staff, the reduction in high season overtime and the fact that dealers were not waiting for deliveries when the winter rush started, were considerable benefits.

Avant-garde

Of course in an imperfect world, neither was Murphy the man nor the Company perfect. His schemes and ideas were not always good or workable and some models were less than excellent.

In particular, somewhat *avant-garde*



ENTER MR MURPHY

cabinet design made some models, particularly radiograms, difficult to sell, though reluctant buyers usually became enthusiastic owners.

Loyalty towards Murphy was strong amongst set owners and even more so amongst Murphy dealers, who undoubtedly carried the Company through occasional difficult times. A biography of Frank Murphy, A First Class Job, has recently been written by his daughter, Joan Long.

Murphy Radio Ltd represented as much a philosophy for living as a business. All who were associated with the firm learnt from it, with the interchange and interplay of ideas and yes, idealism. How much I owe to it would be impossible to measure, but I know that it has been one of the great influences and pleasures in my life.

WYMDA

Among all the associations and organisations of which I have been a member, the West Yorkshire Murphy Dealers' Association stands high in the pleasure and benefit I derived from it.

A number of similar associations were formed in various parts of the country, where Murphy dealers met together, exchanged ideas, discussed problems and generally helped each other.

The key to their success was the frank interchange of information between dealers with common problems, not constrained as competitors; the Murphy principle of having only one dealer per shopping-centre ensured this.

Such intimate information as balance sheets were exchanged between some

dealers - a degree of trust almost unknown in normal commerce. For nearly 30 years the monthly WYMDA meeting in Leeds was the highspot of my business calendar. Friendships made there are amongst my closest and most valued - several having lasted over 50 years.

We Move to New Street

When, in 1924, we opened the first specialist 'wireless' shop in our end of Yorkshire, there were so many who thought that we were taking a big risk in having all our eggs in this new-fangled-craze basket that we weren't too sure ourselves. But such was the appeal of broadcasting that, despite the fact that the country was in a recession and that unemployment was rife and wages poor, the wireless trade prospered and our business with it. Twice in ten years we extended this first shop.

At the end of ten years our lease was due to expire. Should we renew or remove?

Take the Plunge

We decided to take the plunge and move to a high-street location, 32 New Street. After extensive internal shop-fitting and a new shop front we opened for business on 1 August 1934, our tenth birthday. We were not to regret our move.

By now the radio business was almost exclusively in complete mains sets and radiograms. Component parts, originally the mainstay of the business, were consigned to the service department we had fitted out in two rooms behind the sales shop. The large upstairs room

became the showroom.

For a while we stocked replacement valves and dry batteries in the shop but the valves were soon relegated to the back rooms of the service department.

Catalogue

A catalogue we published at the time of our move says that we were 'The Sole Murphy Dealers for Huddersfield', but we also sold sets made by Marconiphone, Pye, Philips, Ekco, McMichael, Ferranti, Ultra, Aerodyne and RGD.

Of these once-famous radio manufacturers only Philips survives as a brand name, the rest, including Bush and HMV (for which we were not agents in Huddersfield) have disappeared, amalgamated, been absorbed or taken over, gone bankrupt or sunk without trace. Business is tough!

The list above was itself a list of survivors. In the first 12 years of broadcasting, dozens of firms had tried and failed to achieve permanent success as radio manufacturers.

Race

Strikingly, the really big names in the electrical world such as GEC, Metro Vick, BTH, Ediswan, all entered the race but failed to stay the course despite their huge resources and research facilities; why was always a mystery to me.

Only Philips of all the big names, and they are a Dutch-based company, succeeded and have survived from the earliest days.

The early successful firms almost all started from nothing. E. K. Cole (Ekco) began by making battery eliminators in his father's back bedroom, Murphy started in a small shed in Welwyn Garden City - most firms had a comparable beginning.

Could it be that, like 'hungry fighters', they had the need to succeed which the big companies lacked?

The story of Thorne, today's giant electrical firm which became big enough to absorb the mighty EMI - itself the absorber of HMV and Marconiphone - is a case in point. Julius Thorne, a mid-European, hawked cheap electric lamps from a barrow in London. His hard work brought enough prosperity to enable him to import Ferguson radio sets from America. The next year he imported the sets in kit form and assembled them here. In year three he began making his own English Ferguson radio set. The rest is a history of success succeeding success.

This brief summary of the commercial situation in 1934 when we moved to New Street is, perhaps, an appropriate place to end the story of my first ten years as a shopkeeper. □



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DECODING THE DATA

Mike Richards G4WNC

Part 3

In the first two parts of this series I covered, in very basic terms, the transmission and display of a single key press over a radio link.

The next step is to understand some problems associated with this basic RTTY system so we can move on to more complicated systems. Still, before we can move on, we need a fuller understanding of the ITA No2, as many problems start here.

International Telegraph Alphabet No2

I ought to point out at this stage that the ITA No2 is often incorrectly called the Baudot code after Jean Baudot, a pioneer of telegraphy. This is where the unit of measurement for the speed of RTTY signals, the Baud, gets its name.

I first mentioned this code in part 1 where it formed a simple look-up table enabling the computer to allocate a number to a particular key press. Now we need to look in a little more detail at how the code operates.

Five Bits

A most important point about this code is that it uses just five bits, hence the name - the five bit or five unit code. Referring to my binary weightings listed in Part 1 of this series, you can see the highest five bit code number is thirty-one. If we call zero a valid number that gives us a total of 32 combinations that can be made from a five bit code. This creates a problem. To use this code for the transmission of normal text, we clearly need 26 combinations for the alphabet, plus another 10 for the digits 0 through to 9. If we add that lot up, we have an absolute minimum requirement of thirty-six and that doesn't include any spaces or punctuation!

Simple

So, how is this seemingly impossible requirement handled? Fortunately the answer is really very simple, each available combination has two meanings or character sets. These two sets are called Letters and Figures simply because they contain mainly letters or figures.

The next question I can hear you asking is - how does the receiving equipment know which set is which? The answer again is very simple and involves the use of two shift characters - one called figure shift and the other letter shift. The system starts by assuming everything is in letter shift. If a character from the figure shift set needs to be sent the transmitting station first sends a figure shift followed by the character. If only one character from the

We move on through the world of radio teletype communications by looking at the actual code used in RTTY transmissions.

figure shift set is sent, the transmitting station then sends a letter shift to return to the normal condition

One limitation of this system, which is really only cosmetic, is that only uppercase letters can be sent.

From this description I hope you can see that the figure and letter shifts simply switch the character set between the two options.

Table 1 shows the two character sets complete with their binary and decimal equivalents. You will no doubt notice that some common characters are the same in both figures and letters.

Table 1

Binary	Decimal	Letters	Figs
00011	3	A	-
11001	25	B	?
01110	14	C	:
01001	9	D	\$
00001	1	E	3
01101	13	F	!
11010	26	G	&
10100	20	H	
00110	6	I	8
01011	11	J	Bell
01111	15	K	(
10010	18	L)
11100	28	M	.
01100	12	N	,
11000	24	O	9
10110	22	P	0
10111	23	Q	1
01010	10	R	4
00101	5	S	'
10000	16	T	5
00111	7	U	7
11110	30	V	=
10011	19	W	2
11101	29	X	/
10101	21	Y	6
10001	17	Z	+
01000	8	Carriage Return	
00010	2	Line Feed	
11111	31	Letter Shift	
11011	27	Figure Shift	
00100	4	Space	
00000	0	Blank	

This system, although an ingenious way of increasing the number of characters that can be sent with a five digit code, has a serious problem. If anything happens during the transmission that causes a letter or figure shift to be

corrupted, then a large amount of the received text also may be corrupted. This happens because the receive station becomes out of synchronisation with the transmitter and so ends using the wrong character set. This is probably best illustrated with a simple example:

Transmitted text: PLEASE SEND 25 EXTRA LIFEBELTS.

Received text: PLEASE SEND 25 3/54-)8!3?3)5'.

You will note that the message was fine until the end of the number 25, so what happened? Well, a lost single letter shift after the 25 resulted in the loss of synchronisation I mentioned earlier.

To prove the point, if you refer to Table 1 you will find that you can translate the apparent garbage after the 25 back into the original text. Select the corresponding characters from the letters shift set to read the correct message.

Another common manifestation of this loss of synchronisation occurs when receiving RYs, used by so many stations as an idle signal. The loss of synchronisation results in this idle arriving as 46.

RY Tuning Signal

Having mentioned RYs, this is probably a good point to explain why RYs are used as an idle or tuning signal. For a proper explanation we need to return to the earlier days of telegraphy and its use over land lines rather than radio.

In these systems, a type of electromechanical typewriter known as a teleprinter generated the signal.

In a typical system the teleprinter would output a signal that switched between -80 volts and +80 volts for the mark and space conditions. At the receiving end a special type of relay known as a polarised relay would be connected to the land line.

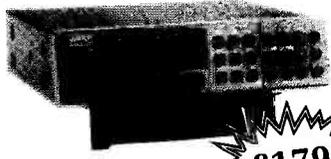
This converted the signal back to its original ± 80 volts after the inevitable losses of the line. The polarised relays had a pair of adjustment screws that could be set to vary the ratio between the mark and space signals. The adjustment of this relay was critical and the technique used was to send a signal with a precise 1:1 mark to space ratio. The adjusting screws were then set to achieve the same 1:1 ratio.

Analogy

An analogy can be made with the tuning of a receiver when receiving a RTTY signal. The problem being that we don't have an accurate 1:1. Or do we? This is where the RY signal comes in as it combines two letters made up of

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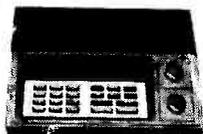
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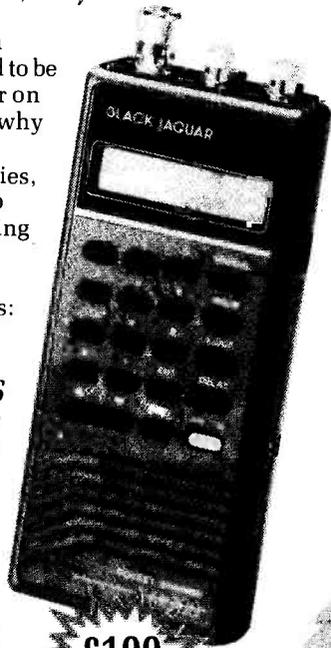
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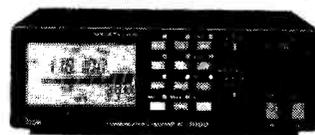
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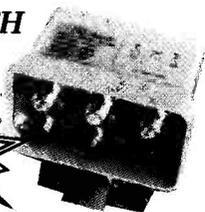
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DECODING THE DATA

alternate marks and spaces. This can be checked by reference to the binary values for the letters R and Y in Table 1, which are 01010 and 10101 respectively.

I'm sure you can now see that if we keep repeating these letters we have a signal that alternates between mark and space. That is ideal for our tuning signal.

So there we are, the story behind the use of RYs as a tuning signal. Now let's get back to some solutions to the weakness of the basic RTTY system.

Solutions

One solution still in use, particularly for telegrams and press reports, is to ignore the figure shift character set and send only from the letters' set. One disadvantage of this system is that numbers and punctuation have to be spelled out, i.e. STOP for a full stop.

You may have seen these types of reports whilst listening around the utility bands,

particularly from press stations. Of course for full benefit to be made of this system, the receiving station must be fixed to receive letters only.

Variant

Another variant is to use fixed message formats that can be recognised by the receiving station. For example, the many weather stations that send coded reports.

Although the main reason for the coding is to abbreviate the information, it has the added advantage of a fixed format that, with some intelligent software, can minimise errors.

With weather reports it's easy to identify them, they are five digit groups of numbers.

One system that is very common amongst short wave listeners' stations is 'Unshift on Space'. This is a simple receive-only facility that automatically forces a return to letter shift mode after

a space.

The theory behind this is very basic in that a space follows most punctuation and groups of numbers. So it is not unreasonable, during normal communications, to force a return to letters after a space.

Of course if you were receiving some numerical data separated by spaces, such as the coded weather reports I mentioned earlier, you would find the information corrupted. So, where this option is available, it is normally user selectable so that it can easily be disabled.

That just about sums-up a selection of the basic problems associated with a simple RTTY system.

Next Month

Next month I will continue with details of some more sophisticated techniques used to provide more reliable communications systems. □

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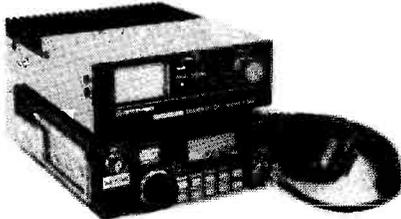
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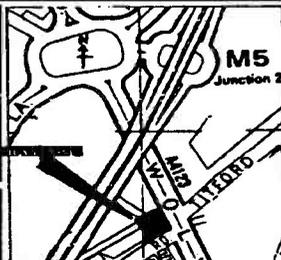
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North American Cuts Reversed

Director Richard Carlson has announced that the money to keep the languages running will have to come from other funds within the US Information Agency. And Radio Canada International has also withdrawn its plans to cut a morning news broadcast in English and French beamed to Europe and Africa.

Vilnius - A Defiant Voice

With Lithuania in the news you may like to check the English broadcasts of Radio Vilnius which are an hour earlier during the summer time. At 2130UTC there's a broadcast to Europe, during which 6100 and 1557kHz give the best reception in the UK. Half an hour later at 2200hrs there's a repeat, during which 6100kHz and 1557kHz are audible in Europe albeit with some rather annoying interference.

In fact many of the external service programmes from the many Soviet republics don't necessarily originate from transmitters in that republic. The Soviet Union has a giant network of transmitters and programmes are slotted in depending on where they are beamed to and what frequencies are likely to propagate. Only three of Radio Vilnius's frequencies originate in Lithuania, the rest come from Bulgaria, the Moscow area and the Soviet Far East. So when Lithuania declared its independence it wasn't a surprise when a few days later the Soviet relays of Radio Vilnius were interrupted. Contrary to some press reports, the programmes were not jammed, they were simply replaced with other material.

If active, the Soviet relays of Radio Vilnius on 12060 & 11770kHz are audible in the UK at 2200UTC, although the audio quality seems to vary from night to night. The programmes continue their strong anti-Soviet content. It seems strange that whilst the Soviets have taken control of some leading buildings in Vilnius as of press time, they haven't so far attempted to take control of the radio station. If you want to try and phone Radio Vilnius, the number is 010 7 0122 660526. Some readers of this column report success in getting through.

Television Marti

TV Marti, the Voice of America's new TV service to Cuba, has begun test transmissions this past Tuesday morning. However, soon after it started the Cuban authorities started jamming the signal being beamed into Havana from Florida. Now the Cuban government has threatened to not only jam TV Marti but also to interfere with a.m. radio stations in a large part of the US. Since the programmes are actually originating from

It seems that in spite of an announcement in February, VOA in Washington will not drop six of its foreign language services after all.

a studio complex in Washington DC and are being sent by satellite to the transmitter site in the Florida Keys, people with home satellite receiving dishes can pick up the signal.

On Tuesday 17 April, Cuba stepped up its interference of Radio Marti. Deliberate interference was noted between 0645-1145UTC on 1180kHz. There has always been a transmitter in Cuba on 1180kHz with an open carrier slightly off tune. This resulted in a slight whistle on the Radio Marti signal in downtown Havana. But now the Cuban 'Radio Taino' service is being used to effectively block 1180kHz, rendering it useless for that time period. US monitoring sources say the transmissions are believed to come from a place called La Julia just south of Havana where two transmitters with a combined output of some 600kW are being used. Actually, Radio Marti broadcasts round the clock on 1180kHz, so it can't be a coincidence that the jamming only happens when the time the new Television Marti is testing. This confirms fears expressed by the US National Association of Broadcasters who pointed out that Cuban m.w. stations are already widely heard across the US because they tend to use non-directional antennas.

FCC Cashes In

The Federal Communications Commission has decided to charge private short wave broadcasters in the US a fee for the use of the airwaves. Last year the US Congress came up with a federal budget which contained a clause allowing the FCC to charge for their services, at a fee set by Congress. Engineer George Jacobs, who heads a private consulting firm in Silver Spring Maryland and is a founding member of the newly formed US National Association of SW Broadcasters, says there's growing opposition to the move. They want short wave broadcasters to be exempt from the fee, along with non-commercial TV stations. Jacobs argues that the FCC rules are very restrictive when it comes to private short wave broadcasting stations, similar to non-commercial f.m. and TV stations. The broadcaster is allowed to seek programme sponsorship and mention that a programme has been brought to you by a certain company, but in theory,

no more than that. But with some stations like religious station WYFR using anything up to 300 frequency hours a day, that means the bill will be in the region of £30000 a year. The fees took effect on May 21. This might force some broadcasters to reduce their airtime.

France Overseas Development

The French radio and television station that broadcasts to France's overseas departments and territories, RFO, has just announced a series of major changes in its policy and programming. The most interesting of these is that, for the first time, RFO is planning to broadcast to countries neighbouring France's overseas territories in the Pacific, the Caribbean and the Indian Ocean. Jean-Paul Siré, RFO's news and programming director, told me that the main change at RFO is that they've radically modified the television news programmes. Up until now, they made a 20-minute news programme in Paris about events in Europe and the rest of the world. This was followed every day by news produced locally about events in and around the overseas territories. They've now introduced a new formula: our news is now half-an-hour long and they report on events in the different French territories but also in the rest of the world.

RFO currently produces eight hours of television programmes a day. But, the most important change at RFO are its plans to broadcast to foreign countries. Countries near France's overseas departments can already pick up the TV signals. For example, the island of Mauritius can easily receive the TV programmes broadcast on the island of Reunion in the Indian Ocean. So, they plan to formalise this and expand the coverage. They have already begun negotiating with several TV stations in the Indian Ocean - in the Seychelles, Rodriguez, Comoros and Madagascar. And they have a similar sort of project in the Pacific where they want to broadcast the TV programmes of French Polynesia in Fiji. And, in the Caribbean, they are negotiating to have the programmes of Guadeloupe and Martinique broadcast in Trinidad and Jamaica.

Well, despite the enthusiasm, all these different projects do lead to the impression that France's audiovisual policy is one big muddle, severely lacking co-ordination. RFO's Jean-Paul Siré says he thinks the more outlets they have, the better, because if you count up all the American or Anglophone TV stations, you'll realise that they are far more numerous and powerful than the French ones. Secondly, the French projects are largely complementary. They're trying to



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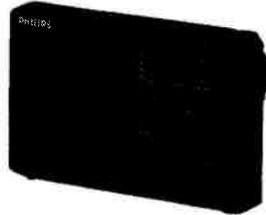
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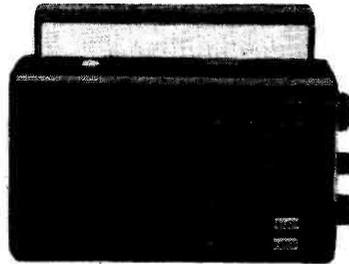
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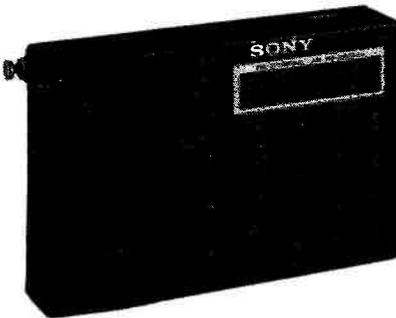
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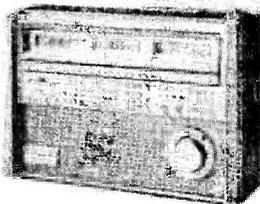
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P.O.A.

reach different audiences around the world. Nevertheless, one French organisation has tabled plans to create some order out of this mess. Sofirad, the group which represents the interests of the French government in private radio and TV stations, has now proposed that two new organisations be established within Sofirad. The first, "Radio France for the World", would coordinate all of France's activities in the field of radio. Sofirad wants to negotiate a distribution of these activities with Radio France International. The second is "TV France for the World". Sofirad wants to expand the operations in Africa of Canal France International, start negotiations with RFO, examine the viability of TV5, become a member of Canal + Afrique (a private French network for Africa) and start up a company called 'North-South Images' to sell African TV programmes in developed countries. A tall order, but Sofirad says it will unveil a plan by June 15 to coordinate all these activities.

Radio RSA Cuts Back

Surprising news reached us in April that Radio RSA has dropped all its broadcasts beamed outside the African continent. Twenty one of the 105 jobs at the station have been axed. Fanus Venter is the director of Radio RSA and he explained to *SWM* that these cuts were partly because of financial problems, and partly because the South African government, which funds RSA, believes that short wave is no longer viable to developed parts of the world. They want to invest in TV projects instead, like specially made TV reports which are done for the CNN 'World Report' Programme.

RSA has always reflected the South African government's view on the political situation in the country. Yet they did an excellent job in covering the release of Nelson Mandela earlier this year, broadcasting it live with a much better commentary than was available on BBC Television. If South Africa is going through change, then surely now would be a time to strengthen RSA, not cut it back. The European services in Dutch and German have already been cut back. English programmes are still on the air, but no longer as easy to find on the dial as in the past.

Those Strange Masts Of Radio Freedom

The changes in South Africa have also affected Radio Freedom, the Voice of the African National Congress. Their media headquarters may move back to South Africa from Lusaka. But it seems their plans for a 250kW short wave transmitter on Madagascar still seem to be going ahead. Piet van den Broek in

Amsterdam sent me a brochure being distributed to raise money for the project. I must confess the 'artists impression' of the new transmitter site looks rather fanciful. Those antennas remind me of high tension power lines - I'm now sure there would be much use for short wave broadcasting.

Radio Prague Cut Backs

On April 1, Radio Prague suddenly went off the air. It should have returned on May 7, but in a very different form. We reached Vladmir Veldman, senior editor in the English section of Radio Prague. He's a regular voice on the air and explained that Radio Prague now consists of 150 people, that's around 45% of the previous size. It seems though that the board of directors wants to make a completely fresh start, Radio Prague has returned with just 14.5 hours of broadcasts a day. Some of the rest of the available airtime may be given over to other broadcasters. Reports in the Czech capital suggest that US financed Radio Free Europe might be interested. Radio Free Europe in Munich told me that they are in the process of opening a bureau in Prague to feed material to their studios in Southern Germany. They are in close touch with the Czech government on other matters but are not at liberty to disclose details at this stage. Meanwhile, because the existence of a short wave external service is not well known inside the country itself, Radio Prague is worried about its long term existence - its regarded by some politicians as an expensive luxury.

Africa Number One

Has anyone noted those strange promos on Radio Luxembourg's English service. They claim the ASTRA satellite is beaming programmes from 75000 miles out in space. Really? That's well beyond any geostationary orbit. They also claim to be planet earth's largest commercial radio station. In fact that status now belongs to Gabon based Africa Number One. It's the most popular radio station in francophone Africa, and it is expanding. In the middle of February, the station officially inaugurated a new 500kW transmitter. This is in fact the fifth, because four 500kW transmitters at Moyabi in Gabon are already on the air. But this new transmitter is located at another site, known as Moyabi II. Africa Number One also has plans to build a second 500kW transmitter at the new site some time in the future.

Africa Number One is owned by three groups: the Sofirad, the French state-run media organisation, the government of Gabon and Nkussou Productions, a private Gabonese organisation. *SWM*

called up the director of the Sofirad, Hervé Caukrel and asked him, whether Africa Number One is now breaking even. He claims they are, they made a profit of about four million French francs last year. Africa Number One's main source of income comes from relaying the programmes of other international short wave radio stations, like Swiss Radio International, Radio France International and NHK Japan. Only 20% of the station's income comes from commercials and this figure is dropping because of the economic crisis in Africa.

Even though Africa Number One boasts that it's the most popular station in French-speaking Africa, with a daily audience of 16 million listeners, it is examining ways to improve its coverage of the continent, and at the same time making more money. The latest plan is to create a network of f.m. stations. The working title for the network is Africa Number Two and we asked Mr Caukrel to tell us something about it.

Chinese Puzzle

A couple of months back, the general news media picked up on a story about the 'Goddess of Democracy', a radio ship which left a French port bound for waters off the coast of the Chinese mainland. The £900000 broadcast ship is supposed to use a high power m.w. transmitter to beam towards the Peoples Republic. It seems the rather vocal leader of the prodemocracy students group in the United States, a man by the name of Wu'er Kaixi, is heavily involved in the scheme. However, he seems to have left the United States without the support of the Chinese student community. The 27m long vessel left La Rochelle in France in a blaze of publicity, but judging from video footage, without a proper mast to support a proper m.w. broadcast antenna. One wonders just how much technical advice this group has taken.

The station and the ship is named after the statue erected by the prodemocracy students in Tiananmen Sq. It is currently broadcasting in Mandarin, since most of the broadcasts are aimed at a broad range of people. There are also specialist programmes for the Chinese Moslem minority and for Tibetans. Mind you, given the size of the Peoples Republic of China, how will they solve the problem of the limited reach of mediumwave. The French office told us that clandestine f.m. relays are being set up around the country. If we assume the secret radio transmitters are f.m. to serve large cities, they'll have to receive the radio signal from the ship somehow. If the Chinese authorities jam the main m.w. frequency, in the same manner as they currently jam programmes from the Voice of Free China Taiwan, the VOA and

SCANNING

Alan Gardener

Scanning & Crime

Concern has been growing for some time now over the number of scanners sold in this country and the slowly increasing number of crimes associated with their illegal use. This has resulted in many Police Forces and associated organisations reviewing their communication procedures. It has always been possible to listen to police communications. Until recently these used frequencies in the middle of the v.h.f. f.m. broadcast band and nothing more sophisticated than a domestic transistor radio was required to monitor the transmissions. However most Police Forces recognised the lack of privacy that this allocation provided and took steps to prevent sensitive information from being disclosed over the air. The u.h.f. personal radio band which was used for more localised communications was considered to be more secure, although care still had to be taken. Recent changes to the f.m. broadcast band resulted in both the Police and Fire Brigades having to move to new frequencies. It was also hoped that this would reduce the incidence of casual listening to transmissions. What has happened in the meantime of course is the rapid growth in sales of scanning receivers and their increasing level of sophistication.

In the UK it is illegal to listen to any transmissions other than those from Broadcast stations, Radio Amateurs or CBers. Permits are available for the reception of Aircraft and Maritime communications but are not normally granted to individuals for hobby purposes. The often quoted phrase 'It is not illegal

This month Alan takes a look at some new developments in police communications and tries to provide a few answers to readers' questions.

to listen but it is illegal to act upon or pass on anything heard' is not true - it is illegal to listen. One of the reasons this statement has passed into scanning folk law may be because people only tend to be prosecuted in connection with other offences. It is usually only in these instances when any illegal listening is discovered that it is worthwhile going to the expense of a court case. I believe that it is very unlikely that any law would prevent people from listening, particularly when it is difficult to detect such an occurrence. It would be much more effective to prevent casual eavesdropping by electronic means rather than by the threat of legal action. I cannot imagine many professional criminals being discouraged from listening by the thought of breaking one further law.

In the past the major factors preventing the introduction of electronic encryption or scrambling techniques have been the relative complexity and size of the equipment and the cost of installation. These aspects had to be considered against any reduction in the crime rate that the introduction of such equipment was likely to produce. In recent years the balance has changed in favour of encryption. In part this is due to developments in v.l.s.i. and surface mount technology making both the cost

and reliability of such circuits more acceptable. But the other factor which has to be considered is the increasing sophistication with which criminals are operating, particularly in the fields of drug smuggling and fraud where very large sums of money are involved.

The encryption is achieved by use of a digital time domain techniques making de-encryption without an identically configured decoder very difficult. An additional 'masking' tone is also transmitted in order to further improve security of the system. Judging by the comments relating to the illegal use of scanners that I have seen in several Police Force annual reports it must only be a matter of time before other forces follow Fife constabularies lead.

My thanks to the readers who sent information on this subject - keep your eyes peeled for further developments.

PRO-32 Modifications

Two readers who have been busy during the past month are **Adrian Lygo** of Oxford and **Paul Hayden** of Essex. They have been experimenting with the Tandy PRO-32 hand-held scanner. This follows the information I included in the April column relating to manual a.m. selection on the PRO-34 scanner.

Adrian was the first to write describing how he had found the r.f. board connector to be slightly different to that in the PRO-34, the PRO-32 having 17 pins. Following the method I outlined Adrian checked each pin with a test meter until he found the one which changed in voltage level when the a.m. aircraft band was selected. This turned out to be pin 12 which he connected via a switch and diodes to pins 11 (v.h.f. low) and 13 (v.h.f. high) - as in the original modification.

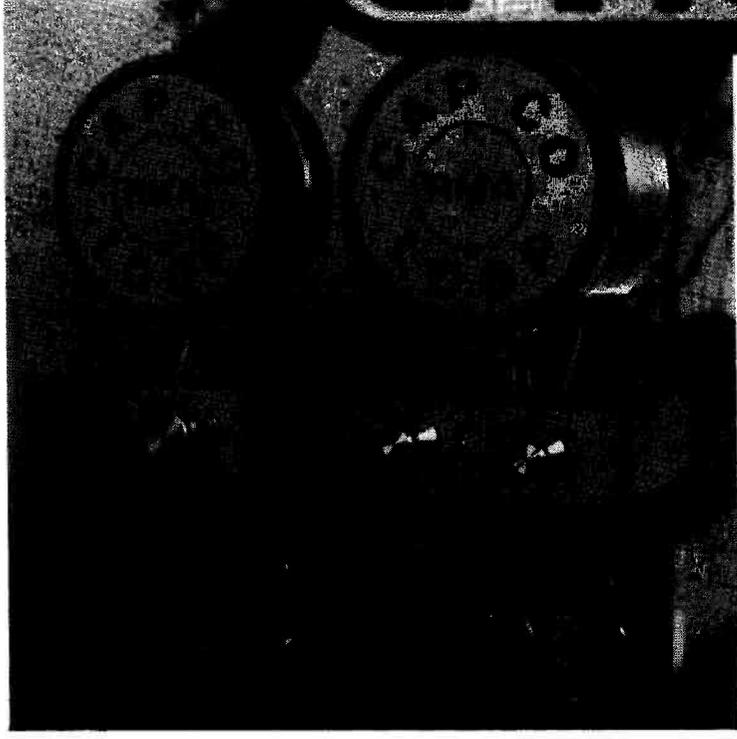
Paul came to the same conclusions but performed the modification in a slightly different way. He drew up voltage charts showing the levels for all the r.f. board connector pins at different frequencies. By doing this he not only discovered the correct pin for the selection of a.m. but he also found that pin 4 had a permanent 5 volt supply on it. So in Paul's version of the modification he connected the anode of a 1N4148 diode to pin 4 and the cathode (the end with the band) via a switch to pin 12. By doing this a.m. is available on all of the ranges covered by the scanner.

I have not had an opportunity to try these modifications for myself but both of the modified scanners have been working for several weeks without any apparent problems. My thanks to both Adrian and Paul for this information.

From this it would seem that the method could work with other models - I wonder if anyone has tried it with models from the Uniden/Bearcat range yet?



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73 from Dave G4KQH, Technical Manager.

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BC200 Mod Update

Another reader who has been experimenting is **F.G. Pennington** of Southport. He has noticed a couple of small errors in the BC200 modification details printed in the Feb 1990 column. The text should read 'With a very fine soldering iron connect a small silicon switching diode - such as a 1N4148 in the position shown, with the cathode (band on diode) facing IC3. Connect a fine insulated wire to the cathode of the diode and the other end of the wire to one of the switch contacts'. It should be noted that the drawing is correct. Thanks for bringing this to my attention. Just as a matter of interest I wonder how many readers have actually attempted this modification? I would think that quite a few have been discouraged by the very fine soldering required - just one of the problems associated with the miniature components found in modern receivers.

PRO-2005

Two people looking for help with the PRO-2005 are **Leslie Sargent** and **A.R. McNee** of Yorkshire. Dealing with Leslie first - he has noticed an apparently unused 13-way connector inside the top left hand corner of the receiver and wonders what it's use is. Unfortunately I don't own a PRO-2005 but I am sure that someone out there can tell me what it is used for. Leslie suggests that it could be some sort of test point used during the manufacture and alignment of the scanner but I am not quite so sure. Judging by his description of the connector I would say that it sounds rather too substantial to be used just as a test point. It would be interesting to know if it connects directly to the microprocessor control board as this may be a way of providing remote computer control of the receiver. Has anyone got a copy of the circuit diagram showing what this connector does?

A.R. McNee owns a PRO-2005 which he bought whilst working in the US - the only problem is that it has the American cellular telephone bands missing and he would like to restore them. I would think that this is only a case of adding or removing a diode on the microprocessor control board as in the PRO-2004 modification which I featured in the May 1988 column. I would guess that you would have to remove one diode in order to restore the missing range and add

another diode in order to give the correct tuning step sizes for Europe as opposed to the 30kHz steps used in the US. Once again can anyone help?

PRO2004/5 Auto Search & Store

One further item of interest to PRO-2004/5 owners is an internally mounted p.c.b. which adds an automatic search and store facility to the scanner. Although the unit is so far only available in the US I shouldn't think that it will be too long before an enterprising company will make it available in the UK. In operation the circuit automatically loads any active frequencies found during a search into a bank of 10 temporary memory channels. This means that you can leave the scanner running whilst you are out and check for any activity that has occurred when you return. Installation is easy with just seven wires to be connected. Operation of the unit is by means of existing controls so no extra holes have to be drilled in the case and all the existing facilities are retained. The unit is available in a couple of options. The one I just described offering up to 10 memory channels is priced at \$25 and the other, which is slightly more expensive at \$45 offering storage in a preset number of memories up to a maximum of 255. If you can't wait for a UK dealer to offer the unit you can contact the manufacturer at the following address - Key Research Company, PO Box 5054, Cary, NC 27511, USA.

AR800 WBFM

A couple of readers owning AOR AR800 hand-held scanners have written asking if there is a modification that will permit the reception of w.b.f.m. in addition to the standard n.b.f.m. and a.m. modes. This would be particularly useful as the low frequency range extends from 75-105MHz which includes the East European broadcast band as well as the more common West European Band II allocation.

I would think that such a modification is possible however it may involve rather a lot of surgery to the receiver. The most likely method would involve switching the 455kHz ceramic filter out of circuit in some way - possibly using the keyboard 'lock' push button. By doing this the receiver i.f. bandwidth would be determined just by the filter in the first i.f. stage. This would also have to be switched out of circuit or substituted for

a wider bandwidth version in order to give a suitable bandwidth for w.b.f.m. transmissions. This would also provide a wideband a.m. function if a.m. was selected. I must admit that I can't think of an immediate use for such a feature - but it would be there if you needed it! One slight drawback of this method could be that the squelch circuit will not operate correctly in the w.b.f.m. position. However without actually trying out the modification it is difficult to predict how well it would perform. One tip if you do try this method - be careful with the length and routing of any new leads connected to the i.f. filters as this is likely to effect the matching, insertion loss and selectivity of the filters in the narrow-band modes. Has anyone out there already tried something like this I wonder? Why not drop me a line if you have. One further thought - with the new price of an AR800 at around £150 it may be worthwhile looking out for second hand bargains in the small ads or at Amateur Radio Rallies this summer - you never know!

Exotic!

One final thought. If you want to hear something a little more exotic than usual the Summer weather may bring us enhanced propagation conditions - so why not try listening between 30-40MHz for American Utility stations. Use 5kHz tuning steps in order to pick out the channels from each other. Just take a listen for a few minutes - you will soon know if conditions are good, making a longer monitoring session worthwhile.

Ok, that's all this time around. As usual all letters to PO Box 1000, Eastleigh, Hants SO55HB. Until next month - Good Listening.

Abbreviations	
a.m.	amplitude modulation
f.m.	frequency modulation
i.f.	intermediate frequency
kHz	kilohertz
MHz	megahertz
n.b.f.m.	narrow band frequency modulation
p.c.b.	printed circuit board
r.f.	radio frequency
u.h.f.	ultra high frequency
v.h.f.	very high frequency
v.l.s.i.	very large scale integration
w.b.f.m.	wide band frequency modulation

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CAPCO MAGNETIC LOOP

Mike Richards G4WNC

Cap.Co Electronics have become famous for their range of very compact magnetic loop transmitting antennas. These have obvious appeal to the amateur with limited antenna space and have proved to be a popular solution for a number of operators. The release of the RMA 1 and 2 antennas brings magnetic loop technology to the domestic environment of the shortwave listener.

The antennas are very distinctive in appearance, a feature common to other products from this company. The RMA-1 is the basic unit which houses the electronics and provides coverage from 1.5MHz to 8.0MHz. The RMA-2 on the other hand is an add-on unit which extends the frequency coverage of the RMA-1 up to 30MHz.

Both units were very simple to set-up, with very few external connections.

The RMA-1, being the master unit, was fitted with two SO-239 coaxial connectors on the rear panel. One of these was used for the connection to the receiver, whilst the other was for the connection to either an external antenna or the RMA-2 antenna.

As the RMA-1 contained the electronics, a power source was required. This was provided by two AA size cells which fitted into a neat tubular battery compartment on the side panel.

Because the RMA-2 was a purely passive device, the only connection necessary was that to the RMA-1, which again used an SO-239 coaxial socket.

The instructions for both antennas were contained in a two-page A5 leaflet. From the size of the leaflet you can see that the instructions were brief but, nevertheless adequate. This says something about the ease of operating the RMA-1. The only area that appeared to be missing was details of the function of the HI/LO switch on the front panel. However its function was obvious once the antenna was in use.

Operation

With the instructions read and digested, it was time to focus on the operation of the system.

At this point it would be pertinent to point out some of the differences between the RMA-1 and other active antennas on the market. The majority of active antenna on the market have a very small, in proportion to the wavelength that is, whip or dipole antenna. This small antenna being interfaced to the receiver via a pre-amplifier. The main purpose of the pre-amp is to provide an important impedance transformation, whilst boosting the level of the received signal. In the case of the RMA series of antennas, a rather different principle is used. The antenna actually uses a resonant loop with a low impedance coupling which feeds a pre-amplifier. Because the loop is resonant, there is a need to provide tuning controls so that the antenna can be operated over a wide frequency range.

One of the most common problems facing the shortwave listener is what type of antenna to use and where to put it! This latest release of the RMA-1 and RMA-2 active antennas from Cap.Co could go a long way to solving some of those problems.

The result being that this type of antenna requires more effort on the part of the operator. However, this is offset by the extremely compact nature of the antenna.

Getting back to the matter in hand, I intended to use my existing installation as the reference, so connected the RMA-1 and 2 to my Icom IC-720A transceiver. This was chosen as it features an excellent general coverage receiver. I ought to add a warning at this point - the RMA-1 and 2 are strictly receive only devices and the application of any r.f. power from a transmitter will almost certainly cause damage.

Moving on to the operation, there are very few controls so familiarity is reached very quickly. The front panel of the RMA-1 comprised two rotary controls and a toggle switch. The first of these controls functioned as the on/off switch and antenna selector. The two antenna options being the RMA-1 itself or an external antenna, i.e. the RMA-2. An alternate external antenna would be a simple length of wire. This would provide broad band coverage from 1kHz through to 30MHz using just the internal r.f. amplifier.

The second rotary control was used for the main tuning and was fitted with a slow motion drive to assist tuning. The

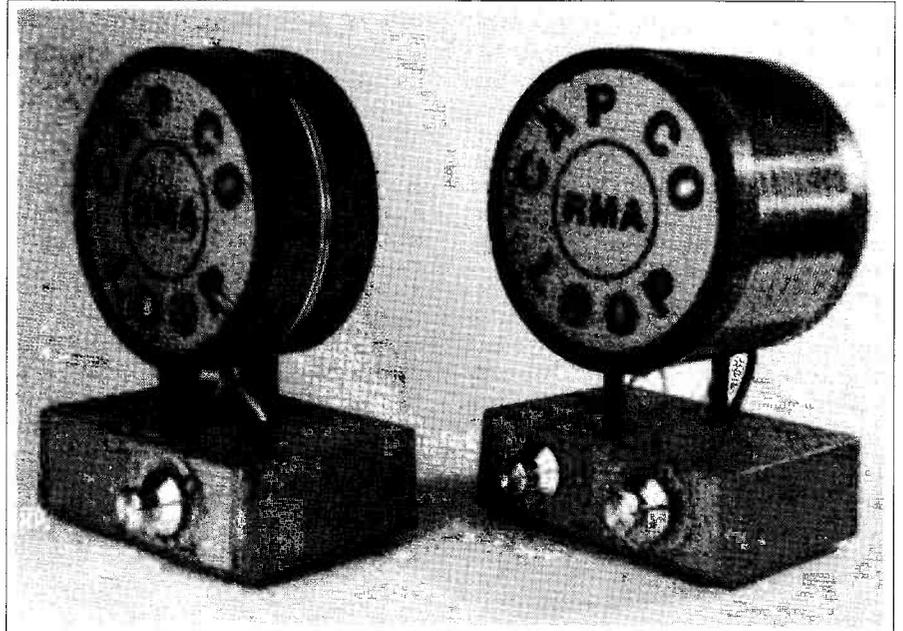
centre toggle switch, as I mentioned earlier, was not covered in the instructions but served to switch between the high and low frequency ranges. Incidentally the frequency range of the review model was 1.5MHz to 5.3MHz and 2.3MHz to 8.5MHz.

The RMA-2 was even simpler to operate as it featured on one control - the main tuning. As with the RMA-1, this control was fitted with a slow motion drive to ease the operation.

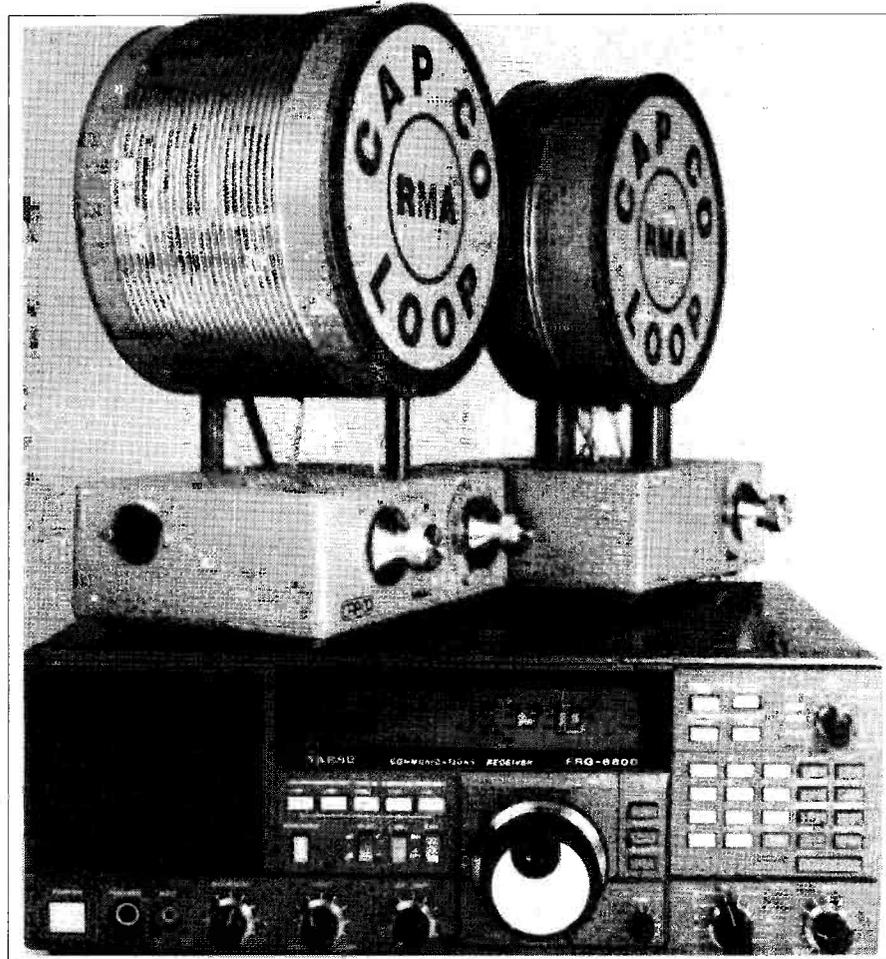
Air Tests

This is the acid test of any system and where all those carefully constructed specifications can fall flat! Fortunately this was not the case with the RMA-1 and 2. My first task was to select the best site for the antennas. Despite their compact nature they were a little cumbersome around my rather cramped shack. The important point about the location is that it should be as far away as possible from any sources of interference, whilst still being within easy reach of the operator for adjustment of the tuning.

I started the air tests by tuning to the 3.5MHz amateur band as I am familiar with the conditions and there always seems to be plenty of activity. The first point I noticed was how very sharp the tuning was. In fact if the control was moved quickly you could easily miss the point of resonance. When detuned there was very little of the wanted signal audible resulting in a very rapid increase of the signal level at resonance. I was very impressed with the received signal level, which generally matched that from my nest of dipoles. I ought to qualify this because despite the fact that the RMA gave a high signal level the signal quality was not as good as the conventional antenna. The main degradation was in the form of increased background noise,



CAPCO MAGNETIC LOOP



so the overall signal to noise performance was worse than the dipoles. Nevertheless this is still a very creditable performance when you consider the size and inconvenience of a full size dipole against the modest dimensions of the RMA-1.

The scale on the tuning control of the RMA-1 and 2 was linear and marked 0 to 10 so there was no direct correlation between the scale and the operating frequency. The simple solution to this problem was to make up a small chart which showed the frequency against dial indication. Another point about the operation of the dial was that it was not actually linear with a general compression at the high frequency end of the scale. However this compression was not a problem in practice. The review model also featured a very wide overlap between the coverage of the high and low ranges which had the effect of minimising the number of band changes required.

Although some versions of this type of antenna have significant directional properties, I found that this effect was not significant in the RMA-1. In fact during the air tests it was only possible to obtain about 12dB of null whilst rotating the antenna. Although the directional properties of this type of antenna may be useful in some applications, this is not the case here. This is because of the need for access to the controls on the front panel.

Moving on to the RMA-2 this, as expected, turned in a performance very similar to the RMA-1. Its frequency range extended from 6.5MHz through to 30MHz and exhibited the same non-linear scale characteristics. The directional properties were also similar, with a maximum null of about 10dB. The only problem I encountered was simply one of finding a suitable location. Although both antennas were very compact it was not that easy to find a layout where the receiver and both antennas were easily available for adjustment.

Non-speech Modes

I have always been keen on the non-speech communication modes such as c.w., RTTY, AMTOR, etc. so these were the next stage in the air tests. It was while investigating these modes that I discovered a not unexpected problem - computer interference.

Because the antennas have to be

Specifications

Freq. Range:	
RMA-1	1.5 to 8.0MHz
RMA-2	7.0 to 30MHz
Weight:	2kg
Height:	260mm
Width:	170mm
Depth:	160mm

located adjacent to the receiver, they are inevitably close to the computer and its peripherals. In my own installation this meant a significant degradation in the signal to noise ratio, with the noise floor raised to S-9. Although the set-up was still just about usable, the performance was degraded to an unacceptable level. It is important to remember that the level of computer interference experienced will vary enormously from one system to the next, so my experiences may not be typical.

Proving A Point

Just to prove the point, I tried using the RMA-1 with a Wavecom 4010 data decoder in place of my IBM computer based system and the results were much improved, with the only interference coming from the monochrome monitor.

I mentioned earlier that the RMA-1 could be used with a simple trailing wire antenna for coverage down to 1kHz. This is likely to be of great interest to the FAX enthusiast, as there are several interesting transmission at around the 100kHz range. The only snag may be of course the interference problem.

The final stage of the air tests was to check out the performance on the shortwave broadcast bands. Here the performance was very good indeed throughout the frequency range. The received signals levels were extremely high, to the point where I felt that the gain of the internal pre-amplifier needed to be reduced. These high signal levels could possibly cause an overload problem with some receivers, a point that needs to be watched.

Summary

The RMA-1 and 2 series of magnetic loop antenna proved themselves to be very effective during the review period. I can see that they would be of great benefit to amateur and broadcast band DXers with limited space for antennas. The value of these antennas to the data enthusiast is dependant on the type of decoding system in used. Users of devices such as the Microreader, Wavecom and other decoding systems that do not require the use of a computer should be ok. Having said that, it would obviously be a good idea to try the system out before committing yourself.

So to conclude, the performance of the RMA-1 and 2 was good enough to make them a viable alternative for those operators who are frustrated by external antenna restrictions.

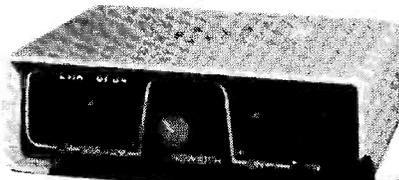
The antennas are available from **Cap.Co Electronics Ltd., Unit 6, Peel Road Industrial Estate, Peel Road, West Pimbo, Skelmersdale, Lancashire WN89PT.** The RMA-1 costs £79.50 while extending the frequency range with the RMA-2 costs £44.50. My thanks to Cap.Co for the loan of the review models.

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Bob Locher W9KNI

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Margaret Mills G3ACC

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19 pages. £2.88

THE SECRET OF LEARNING MORSE CODE

Mark Francis

Designed to make you proficient in Morse code in the shortest possible time, this book points out many of the pitfalls that beset the student.
87 pages. £4.95

AIRBAND

Godfrey Manning G4GLM

Look out over London and neighbouring counties for more than 160 aircraft in the Battle of Britain 50th anniversary flypast on September 15! Thanks to **Graham Tanner G6SUQ** (Harlington, near runway 27R at Heathrow) for the advance warning.

Hardware

Graham Tanner wonders what improvement an a.t.u. would make on h.f. I strongly suggest trying one - the result could be improved sensitivity and possibly selectivity. However, the interference on the Sony ICF-2001 could also be due to strong signal problems. Here, paradoxically, an attenuator will improve performance. All a question of experiment but I'm sure the results would be worth it.

By putting it in an ex-Army shoulder bag, **D. Todd** (Pencader, Dyfed) has made the Signal R535 into a 'neat portable unit.' A sealed 2.6Ah lead-acid accumulator provides power for 20 hours but a 500mA fuse is essential as the short-circuit fault current could be high enough to start a fire; a switch also helps. These are mounted in a small Verobox strapped to the battery with rubber bands.

Good performance is obtained from the Maplin BNC telescopic antenna, but do mind people's eyes. Maplin's largest multimeter carrying case is an alternative for housing this set-up.

Navigation

Knowing your navigation procedures is the key to understanding i.f.r. traffic. **Philip C. Mitchell** (Newbury, Berkshire) would like information on north Atlantic tracks. Twice a day, a series of tracks are chosen depending on weather conditions. They are defined by latitude/longitude points along them.

At the American ends of the tracks, aircraft leave north Atlantic airspace and enter that of Canada at one of various reporting points. Examples of these are LOACH, SCROD, OYSTR and PRAWN. Airfields in the area include Goose Bay and Gander.

While on the tracks, flights are assigned Mach numbers to adhere to so as not to run into the next aircraft ahead and to prevent the aircraft behind from catching up. The Mach number is airspeed relative to local speed of sound; at high speeds the indicated airspeed would be subject to certain inaccuracies and Mach number becomes more convenient.

What's On HF?

So many of you have written in about h.f. allocations this month that I only have

By popular demand
Godfrey presents a special
h.f. edition of 'Airband.'

room to summarise. The result reads like a mini version of an *En Route Supplement*.

2872kHz Secondary for 5649kHz.
2899kHz Secondary for 5616kHz
3016kHz Santa Maria/New York.
Atlantic flights south of 45°N.
3470kHz Asia ASI-2 & ASI-5.
4675kHz Secondary for 8891kHz.
5598kHz Santa Maria/New York.
Atlantic flights south of 45°N.

5616kHz Gander/Shanwick. North Atlantic tracks. Aircraft registered west of 30°W (USA & Canadian).

5649kHz Gander/Shanwick. North Atlantic tracks. Aircraft registered east of 30°W (European & Middle East).

5658kHz Asia ASI-1 & ASI-4 (Near & Far East, evening).

6556kHz Same as 3470kHz but better propagation.

6669kHz VOLMET: Auckland, Hong Kong, Tokyo.

8825kHz Santa Maria/New York. Atlantic flights south of 45°N.

8828kHz Honolulu/Tokyo VOLMETs, early morning.

8861kHz Irkutsk meteorological, SAT-1 (South Atlantic).

8879kHz Gander/Shanwick, Dar-es-Salaam (East coast of Africa), Mauritius, Nairobi, Seychelles.

8891kHz Gander/Iceland. Polar and random northerly tracks.

8903kHz West coast of Africa/Western Sahara, East Indies, South China Sea.

10066kHz Calcutta/Rangoon. Far East traffic en route to Europe. Late afternoon-early evening. See also 6556kHz.

10090kHz Meteorological: Novosibirsk, Tashkent.

11300kHz See 5658kHz.

13279kHz Same as 10090kHz.

13282kHz Honolulu/Tokyo VOLMETs, early morning; see also 6669kHz.

13318kHz See 6556kHz.

17907kHz See 6556kHz.

23142kHz Portishead/Stockholm radios.

23210kHz Portishead/Stockholm radios.

Although re-use of frequencies is subject to wide geographical separation, stations in opposite hemispheres can sometimes interfere with each other under certain propagation conditions. At the present peak of the sunspot cycle the higher reaches of the h.f. bands are tending to propagate over surprising distances.

Contributions to the above were from **Anthony Barrett** (Newton Abbot), **Tim Christian** (North Walsham, Norfolk), **Roy F. Merrall** (Dunstable, Bedfordshire), **Graham Tanner** and **Dave Wright** (Sheffield).

Can someone answer a question for **John Garnett** (Truro, Cornwall)? Which h.f. channels are used by RAF Nimrods from St. Mawgan and Kinloss on search and rescue operations?

When supplying an answer, please quote your source so as to confirm that the information is in the public domain. Thanks.

Frequency & Operational News

Plenty of frequency changes in the 3/90 issue of the Civil Aviation Authority *General Aviation Safety Information Leaflet (GASIL)*. In MHz: Bournemouth Approach 119.625 (was 119.750); Bristol Tower 133.850 (was 120.550); Dunsfold Radar 119.825 (was 118.825); East Midlands Radar 120.125 (was 120.150); London Gatwick Approach/Radar/Tower when instructed by ATC 134.225 (was 129.275); Luton a.t.i.s. 120.575 (was 133.975); Luton v.h.f. direction finder 119.975 (was 120.200); Oxford Tower 118.875 (was 119.8); Southampton Radar 120.225 (was 121.300); Southend Tower 127.725 (was 119.700); West Malling Tower 128.675. Hawarden v.h.f. direction finder (123.35 and 129.85) has been withdrawn.

Now the n.d.b.s: Blackpool (BPL) changes from 278.5 to 276.5; Chiltern (CHT) from 279 to 277, all kHz. On this subject, I can't explain to **Alan Jarvis** (Cardiff) why some n.d.b.s occasionally precede their Morse identification with a single dot. Anything other than the standard ident. is regarded as meaning "This beacon is unreliable!" and nav aids identifying as TST should definitely not be used.

NOTAM A98 announces the closure of Bridlington aerodrome. NOTAM A119 defines the uses of 127.275 and 131.300MHz (Flight Information Service); and 135.675MHz (control of parts of airways B2 and B3) - all at the Scottish Air Traffic Control Centre.

A small triangle of the London Terminal Manoeuvring Area west of the Detling v.o.r. has had its base raised back to 3500ft altitude; the adjoining area still has the lower base of 2500ft imposed last year.

Whereas pilots and aeroclubs receive the *GASIL* free, other people such as myself and Alan Jarvis can subscribe at the current rate of £12 per year to Civil Aviation Authority, Printing and Publication Services, Greville House, 37 Gratton Road, Cheltenham, Gloucestershire, GL50 2BN (telephone:

AIRBAND

0242 235151). *Safety Sense* pamphlets and regular *General Aviation Airmisses* are included in the subscription.

Follow-Ups

LATCC air traffic controller **Keith Green** (Rickmansworth, Hertfordshire) at last pinpoints the source of the north Atlantic track broadcast on 133.8MHz: Dundonald Hill, Prestwick; and Winstone, Cheltenham. The LATCC North Sea sector on 134.25MHz transmits from Trimmingham, Norfolk; and Rothwell, Lincolnshire. Eastern Radar uses Trimmingham; Chedburgh, Suffolk; and Grantham, Lincolnshire. Thanks Keith for correcting the information I gave in the April issue.

Also in April was the suggestion that

a data link is being used on north Atlantic communications. **Anne Reed RS87871/G-20126** (Cheltenham) read the same in *Aeroplane Monthly*; can anyone verify the details? The Shanwick frequency given as 2873 should read 2872kHz.

Information Sources

Anne Reed likes expensive books, especially when bought for her as a present by her husband! Wonder what you'll get when visiting the RSGB Convention on your birthday? Anne has found a UK source of the *Aeronautical Communications Handbook* by **Robert E. Evans** (Ontario DX Association). Reviewed in September '89 'Airband', this is now available from Interbooks of Perth and Flightdeck - The Airband Shop;

both of these companies advertise regularly in *SWM*.

Want cheap, recently out-of-date RAF *En Route Supplements*? Graham Tanner often finds these sold by 6FTS. Look out for their red/white Jetstream in the static park at airshows. Likewise, the *US Dept. of Defense Flight Information Handbook* is useful if you can get it.

Javiation (another *SWM* advertiser) produce a v.h.f. frequency list with an alphabetical callsign decode, so **Jeremy Cottingham** (Gainsborough, Lincolnshire) tells me.

Now it's back down to earth until next month. Thanks for all your letters.

The next three deadlines (for topical information) are June 8, June 29 and August 3. All correspondence to *SWM* office please. □

Abbreviations

Ah	Amp-hours	ident	identification	n.d.b.	non-directional beacon
a.t.s.	automatic terminal information service	i.f.r.	instrument flight rules	NOTAM	Notice to Airmen
a.t.u.	antenna tuning unit	kHz	kiloherz	v.h.f.	very high frequency
ft	feet	LATCC	London Air Traffic Control Centre	VOLMET	VOLUME METeoroological report
GASIL	General Aviation Safety Information Leaflet	mA	milliamps	v.o.f.	v. h. f. omni-directional radio range
h.f.	high frequency	MHz	megahertz		
		navaid	navigational aid		

BANDSCAN

25

the BBC, then how will the secret transmitters get their signal? So instead of this James Bond style operation, wouldn't it be more logical to hire airtime on the several Taiwanese radio networks especially set up to broadcast on medium and short wave to the Chinese mainland. These run round the clock.

The radio ship says it is a free radio station operating from international waters. ITU regulations forbid broadcasts from floating vessels, although that doesn't mean that all countries issuing flags of convenience are too worried about the exact letter of the law. The reaction from the Chinese authorities has been swift. Back on March 3 the Chinese foreign ministry summoned the French ambassador in Beijing. The government officials told him in no uncertain terms that the project constitutes what they term an unacceptable interference in Chinese domestic affairs. But then deliberate Chinese interference of short wave broadcasts is also a rather unacceptable state of affairs too.

Abbreviations

f.m.	frequency modulation
hrs	hours
kHz	kiloherz
kw	kilowatt
m	metre
MHz	megahertz
m.w.	medium wave
UTC	Co-ordinated Universal Time (GMT)

Raiders In The Dark

In late February HCJB reported that raiders had forced their way into the transmitter site of this long established religious broadcaster who's studios are based in Quito Ecuador. They stole some vital printing circuit boards disabling many of the transmitters. A few hours later a random call was made. The fact that the raid took place so quickly seems to suggest that the robbers had inside information. HCJB management reacted quickly and had new control boards sent

down from the United States. However the 500kW transmitter for use in the European service is still not on the air, and probably won't return until mid summer.

Venezuela

Even though Venezuelan National Radio announces several frequencies, it only appears to broadcast on one frequency in the 31m band: 9540kHz. The station only broadcasts in Spanish at the moment, but it plans to start transmissions in other languages soon.

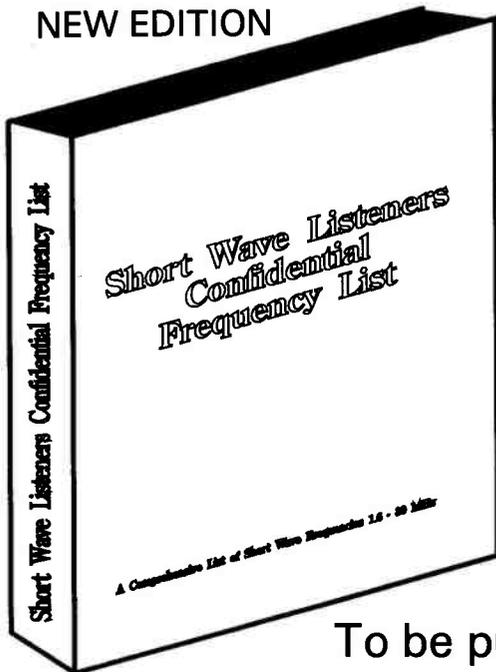
Another short wave station is going to be going on the air from Caracas in the near future: The Voice of Venezuela, which belongs to the Venezuelan state-run broadcasting system. The Voice of Venezuela will broadcast on m.w., on the frequency of 1240kHz. In other words, it will reach neighbouring countries like Colombia, Brazil and the Netherlands Antilles. It will use a medium wave transmitter, with an output of 500kW. □

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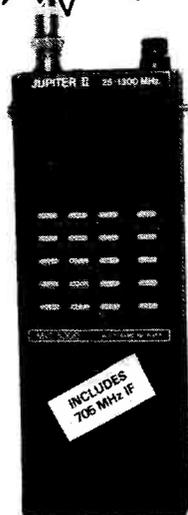
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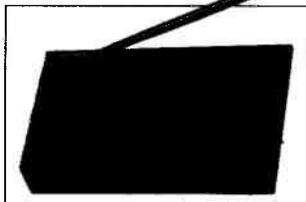
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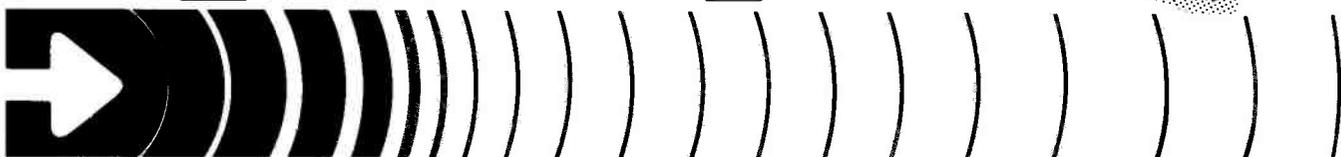
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RIGHT THE FIRST TIME

Rev George Dobbs G3RJV Part 9

The layout of the two chip radio is shown in Fig. 9.1. This is more complex than former layout drawings. A comparison with the drawings in Part 7 shows that the One Chip radio remains almost the same with the LM386 circuitry added to the board. Notice that the LM386 straddles the two portions of the board to allow a break in connections between the pins on the opposite sides of the package. The leads to the volume control, R4, can be tightly wrapped around the tags on that control or soldered into place, if you have that skill and facility.

Several components in the layout

In Part 8 George explained the circuit diagram of the simple two-i.c. radio. Now he tells you how to build it.

have to be inserted the correct way around. This applies to the LM386 and to the electrolytic capacitors C6, C7, C9 and C10. Usually the correct polarity of electrolytic capacitors (+ or -) is clearly marked on the barrel on the component. Very often it is the negative lead (-) that

is marked. These capacitors are polarised during manufacture and must be connected the correct way around to avoid damage. One of these capacitors, C7, actually straddles the LM386 and this capacitor must be mounted with care. The layout drawing shows the correct + & - markings for correct placement of the electrolytic capacitors.

Note that the electrolytic capacitors have a working voltage marked on the barrel. Whenever possible this should be at least one and half times higher than the supply voltage and must always be over that voltage. The working voltages used in the prototype are quoted in the parts list but not all manufactures use the same working voltages for particular physical sizes of electrolytic capacitors. Electrolytics of a working voltage much above those quoted will probably be too large to fit the board layout.

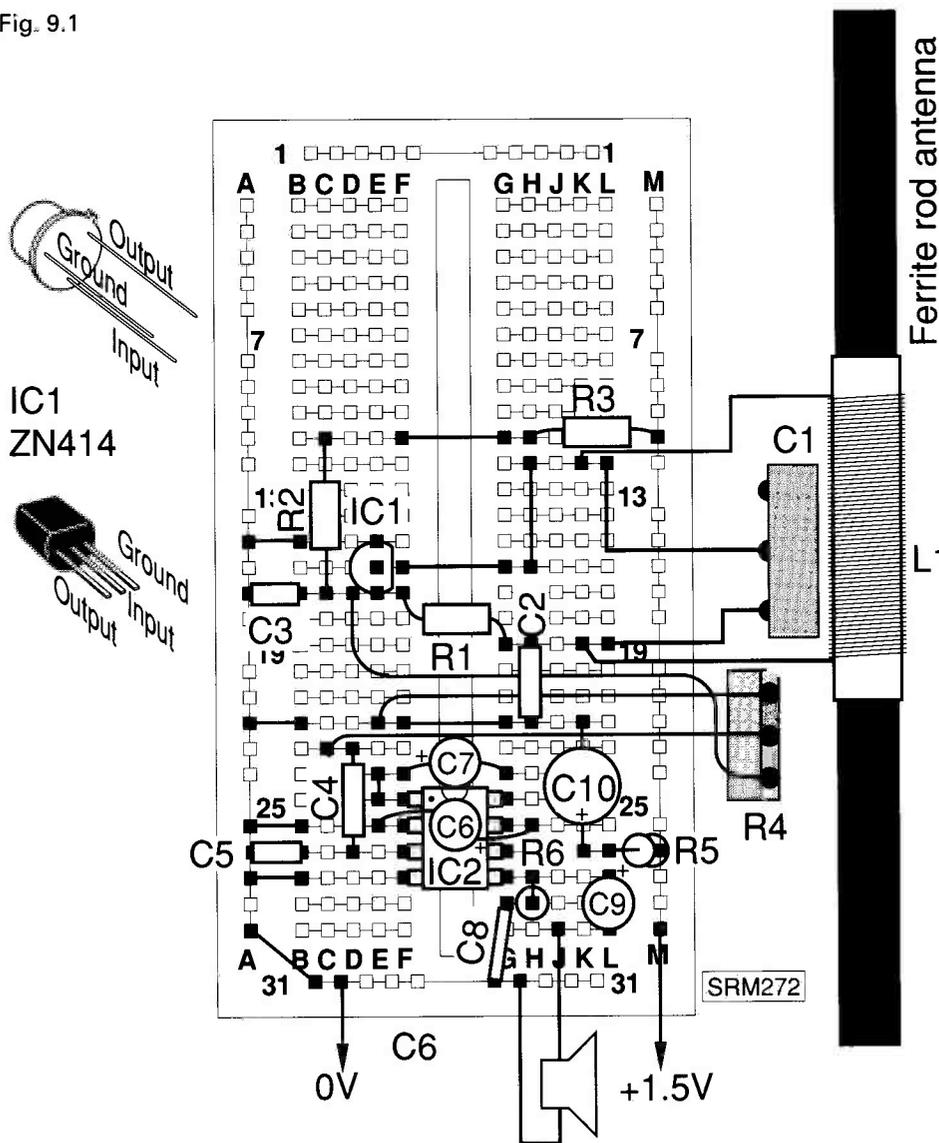
The battery supply should be 9 volts. I used the compact PP3 battery and this gives quite a long playing life for the radio. A larger capacity (if it is 9 volts) battery could be used. The easiest way to connect the supply is to buy a PP3 snap-on connector lead, the free ends of which plug into the circuit board. An on/off switch could be added in the positive (+) line of the battery but it is easy to un-snap the battery to switch off the radio. The choice of loudspeaker depends upon what is available. A small 75mm, 8Ω speaker will work quite well. I got very good results from an old car radio loudspeaker in a plastics housing.

Before switching on the radio for the first time, check all the connections very carefully. A special check must be made to ensure that the LM386 is plugged in the right way round and the electrolytic capacitors are the correct polarity and the battery leads are the right way round.

This radio should tune in to quite a few stations on the medium wave band. The amount of sound output will be enough for a small room, ideal for a bedside radio. It may even be worth making a simple case for the radio if it is to be used as a regular item.

This is a real radio!

Fig. 9.1



Parts for the Two-IC Radio

- R2 820Ω, R3 15kΩ, R5 27Ω, R6 10Ω. (all 0.25W)
- R4 10kΩ log potentiometer
- C4 & C8 0.1μF ceramic
- C5 10nF ceramic
- C6 1μF, C7 10μF, C9 & C10 100μF (all 15V electrolytic)
- IC2 LM386
- LS1 8Ω loudspeaker
- Other parts as for One Chip Radio in Part 7 of this series.

STARTING OUT

Brian Oddy G3FEX

Two simple methods of applying negative feedback (n.f.b.) to a single stage *npn* transistor audio amplifier were described last month. It was shown that omitting the by-pass capacitor across the emitter resistor results in current derived, series applied negative feedback. Also that the signal voltage at the collector can be fed back to the base via a resistor, so that it is applied in parallel with the incoming signal.

In some designs only a fraction of the signal voltage (V_{out}) at the collector is applied to the feedback resistor - see **Fig. 1a**. In this circuit the signal voltage developed across the collector load resistor (R_3) is coupled to the next stage via a d.c. blocking capacitor (C_1). A potential divider formed by two resistors (R_1 , R_2) enables a fraction of the signal output (V_{out}) to be applied to the base of the transistor via the feedback resistor (R_4). The voltage fed back (V_{fb}) = $V_{out} R_2 / R_1 + R_2$. The feedback factor (β) is defined as V_{fb} / V_{out} , so in this case $\beta = R_2 / R_1 + R_2$. Note that the biasing arrangements have been omitted in this simplified circuit.

A similar arrangement is often employed in a valve amplifier - see **Fig. 1b**. A transformer (T_1) has been used in this design to couple the signal from the previous stage (V_{in}) into the control grid of the triode valve (V_1). A fraction of the amplified signal voltage is obtained from the potential divider (R_1 , R_2) and applied in series with the induced secondary voltage from T_1 . The feedback is therefore voltage derived and series applied. Auto bias is provided by a resistor in the cathode circuit (R_4), which is by-passed by a large value electrolytic capacitor (C_2) to prevent additional feedback.

In many amplifiers an output transformer is employed to isolate the

The concept of using negative feedback to minimise the distortion introduced by the audio stages of a receiver was detailed last month in this series. The operation of some of the feedback circuits in common use is now outlined.

load from the d.c. conditions within the amplifier and provide a balanced output - see **Fig. 2a**. The ratio of the primary turns (N_1) to the secondary turns (N_2) is chosen so that an optimum load is presented to the collector of the transistor. The feedback voltage could be obtained from a voltage divider connected across the secondary winding (N_2), but this would necessitate earthing one side of the secondary, thereby unbalancing the output. If the balanced output across N_2 must be maintained, the feedback voltage can be derived from an additional winding (N_3). In these circumstances the feedback factor (β) will be equal to N_3 / N_1 . The voltage derived from N_3 can be fed back to the emitter of the same transistor as shown in **Fig. 2b**. Note that emitter resistor R_3 has been by-passed by a capacitor (C_2).

Overall Feedback

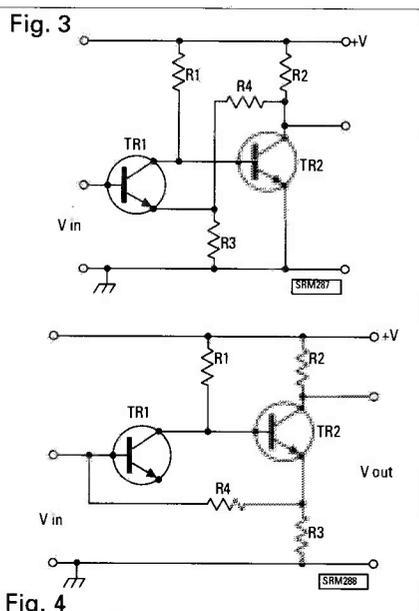
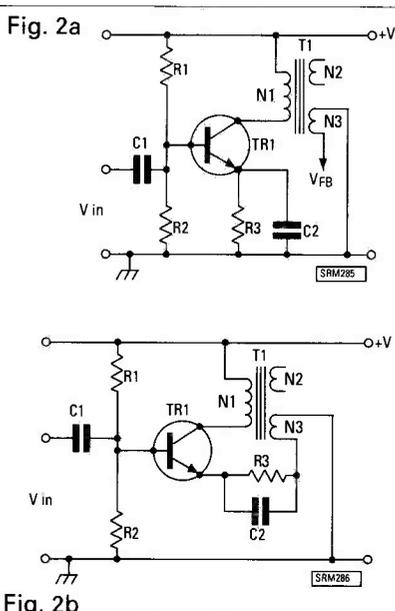
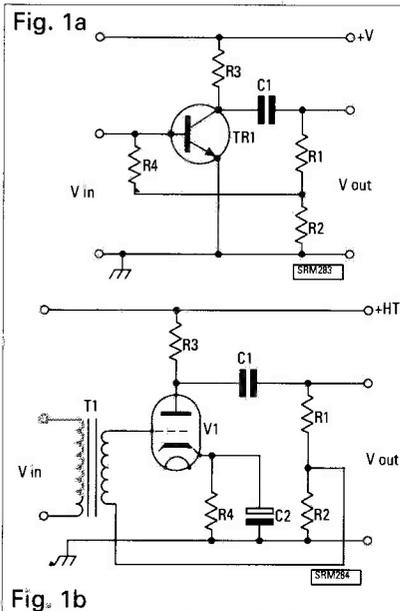
To minimise distortion it is desirable to apply the feedback over more than one stage in an amplifier. In principle any number of stages can be included within a feedback loop, but in practice it may be difficult to obtain proper operation of a feedback amplifier when more than two

or three stages are involved.

One method of applying overall feedback to a two stage audio amplifier is to return part of the signal output at the second collector to the emitter of the first stage. The simplified circuit of two directly coupled *npn* common emitter amplifier stages is shown in **Fig. 3**. When the signal applied to the base of the first transistor (TR_1) is positive going, the signal voltage developed across the collector load (R_1) will be negative going i.e. there is a 180 degree phase change - see page 33, *SW/M* March '90. A similar phase reversal will occur in the second stage, consequently the signal voltage developed across the collector load (R_2) of TR_2 will be positive going. Current derived feedback is series applied to the first stage because the by-pass capacitor across the emitter resistor (R_3) of TR_1 has been omitted. Since the collector of TR_2 is connected to the emitter of TR_1 via the feedback resistor (R_4) an additional signal current will flow through R_3 - this will be in phase with the signal emitter current of TR_1 , so additional overall negative feedback will be applied.

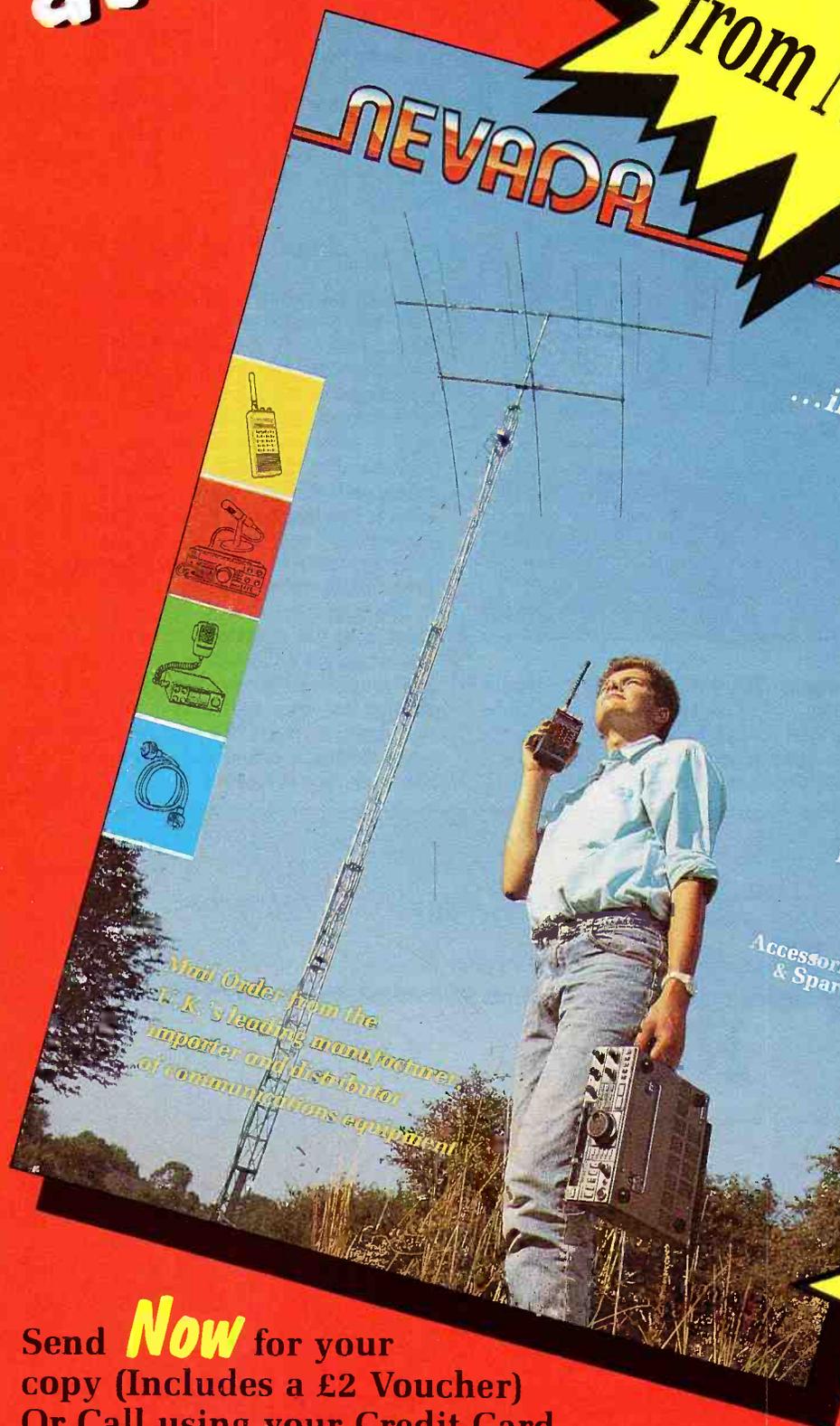
An alternative approach, which is used extensively in low cost equipment, many car radios and in some communications receivers, is to provide a feedback path between the emitter of the second stage and the base of the first stage - see **Fig. 4**. In this arrangement two *npn* common emitter stages (TR_1 , TR_2) are directly coupled. A signal voltage will be developed across the emitter resistor (R_3) of TR_2 because the by-pass capacitor has been omitted - it will be in-phase with the signal on the base of TR_2 , but out-of-phase with the input signal applied to TR_1 ; consequently it can be applied as negative feedback to the base of TR_1 via the resistor R_4 .

Overall feedback can also be readily



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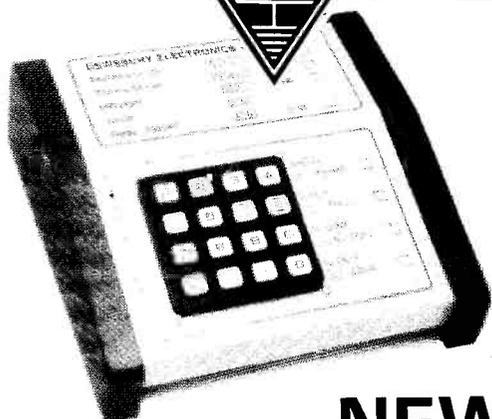
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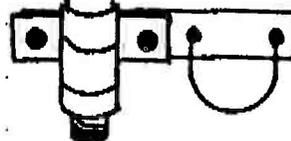
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SEEN & HEARD

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Quite a pile this month, with the Set Listening Period to be mentioned, and some questions to answer. Let's get straight into the answers.

A J Bartram of Bedford, Middlesex has a simple question...who is Slim! I think the name Slim originally applied to a pirate station on our bands by Hugh Cassidy years ago in West Coast DX Bulletin of hallowed memory. Slim, because there was a slim chance of him being any good!

Thus, anything allegedly from Albania is dubbed Tirana Slims simply because there have only been a couple of operations from Albania accepted for DXCC credit in the past 25 years, and there is widespread doubt about those. The transmitting amateur, hearing a ZA, works him anyway and hopes they have tripped over a genuine one...but the optimist who speculates a QSL card and an IRC for a direct reply always finds they had a pirate!

As for 5U7NU, I don't really think this one is necessarily a pirate. Although like most rare spots, he does on occasion suffer from the attentions of a Slim borrowing his call. The only tests that one can apply are first the direction the signal is coming from, and secondly whether a report nets a QSL!

Why is the scale on an S-meter non-linear? Thus **Phil Townsend** (London E.17), who has two receivers and notes each has a scale cramped at one end - but at opposite ends! This is a good one. To obtain a linear scale extending over many decibels is a special and expensive trick that turns a receiver into an accurate Field Strength Meter. Back in the 1950s I recall such an instrument costing over £400 then.

One of two methods are used for out S-meter indications. The first one involves looking at the a.v.c. line of the receiver in some way. This variety of circuit does funny things when you wind the r.f. gain control back from maximum gain. The meter winds over as you retard the r.f. gain until you have full scale deflection on the meter but no input signal.

Another circuit used is one that measures the current at the collector or anode of some specified stage - say an i.f. stage - as the incoming signal strength changes. Often this is a Wheatstone Bridge network with a couple of resistors as fixed arms, the device collector load fixed and the device itself as the variable, so the change of collector current unbalances the bridge. About all the normal S-meter circuit can say is that the chap is either getting stronger or not, but it is a gimmick that has lasted since the thirties! Perhaps the transceiver S-meter has a little more point if only because it uses the meter needed for transmitting, when receiving!

Antenna Theory

Phil drops in a second query at the end, which I almost missed. He has been reading G6XN - with some mental indigestion! - on HF Antennas

for All Locations but didn't find any reference to what one can expect from the s.w.l.s few metres of wire in the receive mode.

The principle of Reciprocity covers this - 'it works the same on transmit and receive'! However, antenna theory bases itself upon 'free space' conditions, where the presence of ground or nearby objects don't affect the antenna; theory translates into practice when the design hangs in the normal site and is found to give differing results from the prediction.

Consider a wire fed against ground. In theory a straight vertical wire up to 5/8λ long fed against a good earth will radiate (and receive) equally well all round with a low angle of radiation. Practically, we probably have the wire running in a mainly horizontal direction at a low height. We feed it against anything but a good earth and in the presence of surrounding buildings, with wiring which may or may not show resonant lengths to act as parasites. On top of that, on h.f. most of our signals have come via the ionosphere, which is changing its characteristics from moment to moment. About all our theoretical investigation can do is enable us to predict very roughly which direction it will respond best from, tell us to spend much more time on improving the earth system and give a clue how we might extract the most from it by matching.

If, after a reasonable trial, our wire seems to respond well in our location, theory can tell us how we can improve it by working with improved earthing and rematching. We only approach the theoretical case when we have our v.h.f. antenna up 20m or so and our horizontal h.f. antenna up 200m and more.

I recall working on an antenna range where we had an antenna at 15m for test purposes, and a frequency around Band III TV, say 200MHz. The receiving site was a couple of hundred metres away. An apple tree some 200m off to one side produced notable skewing of polar diagrams in spring, and a train passing half a kilometre or more behind the receiving site would produce measured gain changes of several dB; the effect repeats when the TV suffers from 'aircraft flutter' at even greater distances. This whole problem bedevils antenna work, and even professionals can believe phoney theories. For example, G6CJ thirty years or more ago showed that the end-fed Zepp cannot work in the way the books said. Thirty years on the books still offer the untenable theory of operation! Either way lots of amateurs can tell you that the end-fed Zepp works at their location!

Clatter of Hooves!

Heard on 3.5MHz, around 3.647-3.653MHz at S7 on March 30, at night, and sounding like canter of horses going slow - what was it? **Lee Greaves** (Dallington, Northampton) asking the question. Answer - Heaven only knows! Seriously, since 3.5MHz is a shared band anyway, we don't

even know whether it was an amateur signal. If it was an amateur, the description doesn't give enough clarity to be sure, but one would hazard a guess at either RTTY or AMTOR. Most likely though, I favour a non-amateur signal, especially as it spread over such a wide spectrum space, implying a d.s.b. signal.

SWL Reports

Over Easter weekend, my local club had GB4SMC operating for 24 hours as part of a fund-raising and publicity thing for Montgomery Canal Restoration, and Powys REMAP (disabled) group. I was on site for some thirty hours, and Phil Townsend (London E17) seems to have caught me operating at a 'down' moment.

However, that is only part of a typed report covering a full page of A4 paper. The report covered several QSOs and a period of one full hour, using first the old Codar CR70A receiver bought new in 1974, and then the more modern Lowe SRX 30 receiver. He added some comments upon each receiver, notes on the way the received signal strength of GB4SMC varied and so on. A valuable report and one that will get a QSL card when we have them printed. Notice, this was not a report on a standard form, or a shiny pasteboard, but a one-off report covering several QSOs and a period of time. The criterion of ANY s.w.l. report to an amateur station must be its use to the recipient, unlike the BC report, where the verification aims to add to the BC station's regular audience.

The SLP

This time it was **Andy Brown** in Barnet at the top. His JR500SE is still silent, alas, so he stuck with the Realistic DX400, followed by a graphic equaliser to clean up the audio. A change on the antenna side saw a half-size G5RV put up for the weekend, with the 28MHz half-wave vertical and the random wire in the loft. The G5RV performed best in terms of signal strength on 3.5, 7 and 14, but above this frequency, the other wires mostly outperformed it, despite being noisier. Conditions, Andy thinks, were better this time, with 28MHz open till late in the evening. All continents were noted, with **John Thomas VK2AU** doing the honours for Oceania; the SLP was doubly worth while for producing two new ones in 4K2BCA in Franz Josef Land, and PY0FF on Fernando do Noronha.

Runner-up was **Philip Davies** (Market Drayton) who again used his 1958-vintage Eddystone 840A plus loft antenna of ribbon feeder to run

up a total of 6336 points. Philip also managed all six continents, with four VKs logged, a VK8 who was too quick on the draw and a ZL. KC7BL in Nevada gave a State that has eluded the log for some years now, while on 3.5MHz, GW40XB of the ILA was active.

Two worthy contestants again; congratulations to both.

Letters

First **Mr H Wood** of Gorton, Manchester who has a Philips D2935 and telescopic antenna. On 14MHz this netted KP4DAL, HS1BV, D44BC; while on 28MHz he noted A47RS from Oman, 6W1AAD, CN2AQ, JH0BBE, and J28TY (Djibouti). On a different tack his s.w.l. report to CN2AQ yielded a QSL back in just 13 days, which is pretty quick - and reflects great credit on CN2AQs QSLing arrangements.

Eric Carey hails from Preston, and runs the Yaesu FRG-7 plus a wire running N-S, fed through an a.t.u. against earth. Radio Budapest takes up most time, but on the amateur bands the activity is mainly c.w., and includes such loggings as 9H1LR, 9H4C, PS7KM, ZS2LR, PY7SA, IS0NNO for Sardinia, SV5TS on Rhodes, PP2FN, 3C1EA for a Philippine Special, ZS6BI, PY2TN, VK6ZBS, ZS3PH, PY6AM, PY2LVI, PP2CE and K8MP. A consistent signal to Eric was YC1YMN, heard on several occasions.

Down in St Austell where the clay comes from, is **Robert Watters**. He notes ZD8HH (QSL via W4FRU), 9L1EY (QSL via F6GZA), the V51NAM station, C56/G4LJA (QSL via G4LJA), S0IEA (QSL via EA2JG) in the Western Sahara Republic, 4K1J (QSL via UA1JJ) for Antarctica, ED4WPX (QSL via EA4KK), ZF2PB on Little Cayman (QSL to N7ARO), A41JR, ZD8HH, JR1CUY, 9K2KD, JA5RH, JA2PJC, 9J2LG, 5N9BHA, JA9BOH, S0YC7JK, AP2JZB, AP2DM, HS1BV, VK6AI, 9M8FH, V85NR, ZL2AWG, 4S7SW, 4S7SV, VK2APT, VK4DH, ZL2ANB, EP2FMM, 9K2GM, TR8AHO, VU2AU, TU2QQ, VY2YN, CF3CPA, CP4MPO, ZW5B, KL7XV, A45GY and many smaller fry.

Events

This section has become somewhat redundant since the arrival of PWs WirelessLine, which will give you all the latest details week by week. Much that is in the future when my copy is sent to Poole has become history when the issue can reach you.

However, let's see what I can predict for you. KS9F/HS should be there for a couple of years; no other details now.

There is a small problem at the

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SEEN & HEARD

PY Bureau, which is holding up cards outgoing from that country's amateurs, although the incoming side is functioning. It seems a bit pointless to shove cards out to PYs through the Bureau if they can't be actioned by the recipient.

In the first two weeks of July, a large team of US and USSR amateurs will activate UF7V in Oblast 013; c.w. and s.s.b., 28-3.5MHz.

XU1SS and his YL are in a refugee

camp in the Philippines and hope to be in USA this summer.

More Letters

D. Robertson (Wick) comments on the way 28MHz has been dead for long periods of time. When he wrote the Ws had been missing from this band since February. So far up there, the rapid change in the number of daylight hours over the seasons can

present a problem in knowing which band to tackle.

The days are shorter in midwinter than we have down here in the south, and in high summer there is no real night - one can normally read a newspaper at midnight BST!

Don notes 3W3RR on 28MHz. This is the chap who has been giving various dates for a trip to Spratly Is, 1S, but I have my doubts if this one will come off.

Finale

That's it for another time; deadlines are June 11, July 9, and August 13, for your letters, reports, queries or whatever to arrive here.

Don't forget that I welcome your reports covering anything to do with the available amateur bands or modes. So a report on SSTV, or RTTY, or the 10GHz band or whatever would be great!

DECODE

Mike Richards G4WNC

200 Christchurch Road, Ringwood, Hants BH24 3AS

FAX List Price Error

In the April issue I featured a new FAX book from **Jan Nieuwenhuis** who is a regular contributor to this column. Unfortunately the gremlins were at work and most of the prices I quoted were wrong. So, my apologies to Jan and here are the correct prices: For addresses within Europe, 9 Dutch Guilders, outside Europe is 10 Guilders. However, if you live in Holland the price drops to 8 Guilders.

Jan has also asked me to point out that he is away for the whole of June and part of July and August so as the book is very much a one man band expect some significant delays if you order near to those periods.

Readers Letters

Alan Afford of Sandiway, Cheshire uses the sophisticated RX-8 decoding system from Technical Software for his utility monitoring. As the name implies this combined hardware and software package for the BBC range of computers can decode eight different modes. These are: RTTY, ASCII, AMTOR or ARQ, CW, SSTV, FAX, Packet and UoSAT. Alan is no newcomer to utility monitoring and has built his station up over a period of many years.

He did, in fact, start with second-hand equipment, as many of us did and advises newcomers to start with what ever gear they have available - the most important point being to build up their listening experience. This is sound advice, as some listening experience is a great help when it comes to choosing a more sophisticated and inevitably more expensive set-up.

Alan's complete station line-up is: Kenwood R-5000 receiver, BBC Master 128 computer, Datong v.l.f. convertor, Panasonic 9-pin printer and the RX-8 system. Alan is particularly impressed with the performance of the RX-8 system and has sent me a few examples of FAX charts.

If I must agree with him, as the results really are very good indeed. If you are interested and would like further details of the RX-8, please see the Technical Software adverts elsewhere in the magazine.

Another point raised by Alan, which is backed-up from my old friend **Doug Middleton**, is that wonderful

piece of equipment from Datong in the form of their v.l.f. convertor. As I'm sure many of you will have realised, there are many interesting utility stations down on the v.l.f. bands. To be able to monitor this section of the spectrum you really need a receiver which is capable of operating from about 70kHz through to 150kHz.

Unfortunately many receivers don't get any where near these frequencies, whilst some only go down to about 100kHz. The solution is to use a v.l.f. convertor. The convertor takes the incoming low frequency signal and changes the frequency up to a range which is well within the capabilities of virtually all communications receivers. In the case of the Datong unit this frequency is 28MHz. I have heard many excellent reports of the Datong unit, so if you're interested in v.l.f. reception I can thoroughly recommend it.

The recent *Short Wave Magazine* feature detailing modifications to the ex-MoDR-210 receiver seems to have roused quite a lot of interest. **Adrian Jones** of Congleton has recently acquired one of these sets and has now completed the modifications for mains operation. He is very pleased with the results and is now setting himself up with some RTTY software to use with his Spectrum computer. His initial problem is one of curing the interference from his computer. However if he follows the basic rules, i.e. keep the antenna as long as possible and away from interference and ensure that you have one good earth, he should be OK. I will of course be interested to hear of anyone who is using the R-210 for utility monitoring.

Norman Hartford of Telford has been a regular contributor and this month he writes with details of some

interesting press stations.

The station is Reuters, London and the mode used is standard RTTY, but with an unusual speed of 66 baud combined with a shift of 425Hz. The frequencies and operating times are shown here:

6.854MHz, 0100UTC
10.959MHz, 0030UTC, 0130UTC, 0200UTC
10.961MHz, 0230UTC, 0400UTC
13.626MHz, 0400UTC
14.514MHz, 0230UTC
14.516MHz, 0130UTC, 0200UTC, 0300UTC

I have not had time to try any of these myself mainly because they occur when I am safely tucked up in bed! I'm sure some of you insomniacs will be able to check these out!

Peter Thompson of Crewe has been using a Universal M-7000 for the past six months and reports very good results. Peter has managed to achieve a fair degree of success in most of the exotic modes, including some v.f.t. although this requires a lot of patience. Better results are obtained with the simpler t.d.m. modes such as ARQ-M, ARQ-E and ARQ-E3. The problem with these signals tends to be that they send idles for long periods of time, so it takes some dedicated monitoring before any actual messages can be received.

Station Logs

As you can imagine I regularly receive quite a number of logs and it is interesting to note the number of different techniques used by readers. As a result I thought it would be interesting and perhaps informative to review some of the systems used by readers.

By far the most common system is to use a simple paper log. Some of

these comprise just a notebook with ruled lines whilst other readers use proprietary listeners logs. For those of you who are perhaps new to monitoring I have shown a typical utility receive log in Fig. 1. You will note that it includes room for the speed and shift of the data signal, a feature which is not usually available in pre-printed logs.

If you have a computer available you can of course use that for your log keeping. One of the problems here is that you may well want to use the computer to decode the utility signals, so there is a conflict of requirements. The simple solution is to use a rough paper log for each operating session and then to transfer the information to the computer at the end of each session. Although there are some programs on the market specifically for log keeping all that is really required is a simple database. The database can be set up to include all the information of the paper log, but has the great advantage that you can usually perform quite powerful searches and sorts. This can for example allow you to sort your log in frequency order thus creating your own frequency list. This is in fact how my own frequency list operates.

I have an Amstrad PC-2086 IBM compatible computer and currently use the Buttonware Shareware PC-FILE dB package, which is excellent. With this package not only can I perform simple sorts to produce a frequency list I can also specify the date of the oldest logging to be included. It is this simple feature that allows me to produce a frequency list that only contains recently received logs, without having to physically remove the old loggings. The computer database has many other useful applications as you could for example set it to list only one

Group	Country	Station					General Info.																							
Baud	Shift	Mode	Drum	IOC																										
Call					Time UTC																									
Sign	Freq	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24				
		:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:			

Fig. 1

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- 2-position AM selectivity
- SSB and narrow FM reception*
- Squelch controller (auto & manual)

ICF 2001D

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Super-wide coverage (150-29999.9kHz, 76-108MHz, 116-136MHz) with the versatility of both digital and "precise-feel" analog tuning. There's also two types of scan modes, either auto-stop or 1.5-second hold. 2-position AM selectivity, AM RF-gain control, AM attenuator, 3-position tone control, direct meter band access, 4-event programmable timer and SSB* reception. Plus an external antenna for AM, FM and AIR Band. In short, everything an enthusiast could ever want in a high-performance receiver - and can only get from Sony!

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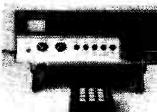
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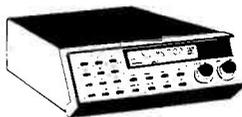
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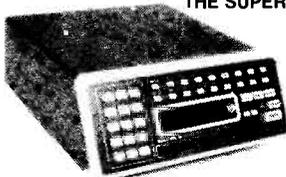
- Covers: 75-106MHz, 118-175MHz, 406-496MHz, 830-950MHz
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SEEN & HEARD

particular type of station i.e. RTTY stations. If you have an IBM compatible computer and would like to try out the Buttonware database, the best source is the Public Domain Software Library (1).

So far I have only covered straightforward log keeping, but there are other ways to skin a cat!

One very interesting idea comes from **Day Watson** of Cleavdon. He uses a system called a work sheet, which is a way of collating some of the information from a logging system to give much wider information.

A typical worksheet is illustrated in Fig. 2 and as you can see concentrates on a particular station or agency. The object of the worksheet is to gradually build up a clear visual picture of the operating times, modes and frequencies. The vertical and horizontal axis are used for station frequency and time of day respectively. The procedure for building up the worksheet is to first select the station, a good example here would be to build a sheet for TASS transmissions.

Now every time a TASS station is logged, you enter the frequency and call sign with a bar indicating the length of time the station was active. By doing this you will gradually build up a picture of all the frequencies used by the station or agency and the operating times. You can of course expand the information to include many other useful items. An example of this would be to add the transmitted language when recording press stations such as TASS. You can make life a little easier if you have a guide such as the *Klingenfuss Guide to Utility Stations* as this contains the schedules and frequencies of a number of press agencies. Your loggings then serve to confirm that the station is still operating to that schedule.

So there you are a couple of examples of logging techniques used by readers. However if you have a system you think offers some additional advantages why not drop me a line with the details. If we can come up with a suitable and popular format for the receive log I might even be able to persuade someone to produce a specialist utility log.

Date	Time	Frequency	Mode	Speed	Shift	Call	SINPO	Comments

Fig. 2

Signal Reporting

The observant among you will have noticed the use of the term SINPO in my example receive log shown in Fig. 1.

It seems appropriate to include this item here while we have log keeping in mind.

First of all SINPO actually stands for Signal, Interference, Noise, Propagation and Overall. So what is the purpose of this reporting system? Quite simply it is a formalised way of categorising and abbreviating the quality of the received signal.

Each of the components are rated on a scale of 1 to 5 according to the following scale.

Signal strength and Overall:

- 1 - Unreadable
- 2 - Poor
- 3 - Fair
- 4 - Good
- 5 - Excellent

Interference, Noise and Propagation disturbance:

- 1 - Extreme
- 2 - Severe
- 3 - Moderate
- 4 - Slight
- 5 - Nil

I think it would be useful to expand on the interpretation of the interference, noise and propagation disturbance items.

Starting with interference, this is really interference from another signal or group of signals. An example

of this would be a station which is operating on virtually the same frequency as the one you are trying to receive. It could also be due to a poor quality transmission from another station causing splatter across the band.

Noise on the other hand applies more to background hisses and crackles. The source of this type of degradation is extremely variable and ranges from atmospheric noise through to noise from fluorescent lights!

The final area of propagation disturbance refers to problems such as fading or the scourge of FAX reception - multipath propagation.

From this you can see that the SINPO signal reporting code covers all the areas relating to the reception of utility signals quite effectively. Because the SINPO system was developed for commercial use it is ideal for use when sending QSLs to commercial stations.

Frequency List

For those of you would like a copy of my frequency list, just send three first or second class stamps to the address at the head of the column and I will do my best to send you the latest list as soon as I can.

For those of you who may be new to the magazine, my frequency list is compiled from utility loggings sent in by readers of this column.

These loggings are entered into a computer database where they are

sorted into frequency order.

I then produce a list of the latest 400 or so stations logged and it is this that I send to you. The reason for sending just the latest 400 loggings is to keep the log as up-to-date and therefore as accurate as possible.

Although there are loggings of the more complicated types of signal the main emphasis is on simple RTTY and c.w. signals so the list is of particular use to the newcomer to utility stations.

Here is a small flavour of some of the latest loggings for you to try out. The format used is the usual: frequency, mode, speed, shift, call sign, time and notes.

- 4.48MHz, RTTY, 75, 850, GYA, 1812UTC, Navy
- 5.2522MHz, ARQ-E, 72, 398, ?, 2057UTC, Strasbourg
- 6.4067MHz, RTTY, 100, 850, 98DDX, 2057UTC, Spanish
- 10.143MHz, FAX, 120, 576, ?, 1323UTC, RAFC Frankfurt
- 10.610MHz, RTTY, 50, ?, SUA251, 2053UTC, MENA Cairo
- 10.68MHz, FAX, 60, 576, ?, 2100UTC, AP Buenos Aries, Press photos
- 13.504MHz, RTTY, 50, 850, ?, 2134UTC,
- 13.736MHz, RTTY, 50, 425, 5YD, 2008UTC, Nairobi, Kenya
- 14.730MHz, RTTY, 50, 425, HZJ, 2149UTC, Jeddah, Saudi Arabia
- 17.674MHz, FAX, 60, 576, ?, 2100UTC, AP Buenos Aries, Press photos.

INFO IN ORBIT

Lawrence Harris

5 Burnham Park Road, Peverell, Plymouth, Devon PL3 5QB

One of the most interesting periods in satellite activity is here. The Russian satellite scene has changed completely; there is much activity with the geostationary satellites, and, together with some interesting letters from readers, I have also received some helpful responses from abroad.

Letters

Edward Laverty writes from Wishaw to ask about software for decoding satellite pictures with his Atari 130XE which has 128Kb RAM. I do know of software for the Atari - see later - but unfortunately I know of no software for this particular machine. Edward

is keen to work within a small budget and mentions that he has a Kenwood receiver. Perhaps a better solution would be to try receiving the FAX weather pictures from the utility stations instead of direct from the satellites. Software for this purpose may well be obtainable at moderate prices.

Another reader keen to use his computer for decoding weather pictures is **David Bolton** of Enniskillen. He has an Amstrad CPC464 and was planning to build a system around it. It is certainly possible to write software for the 464 which uses the Z80 chip, but I don't know of anyone who has written such

software. Programmers will usually write for the machines such as the official schools' machines (BBC and Research Machines computers) which are well supported by such software.

More recently, satellite software has been written for many other machines and you can now see companies advertising weather satellite picture decoding programs for the following:

- Acorn Archimedes and BBC
- Apple 2 GS
- Atari ST 1040
- Commodore Amiga A500
- IBM PC and its various clones
- Research Machines PC186 & PC286

The above is not a comprehensive list and I will add to it if anyone writes with details.

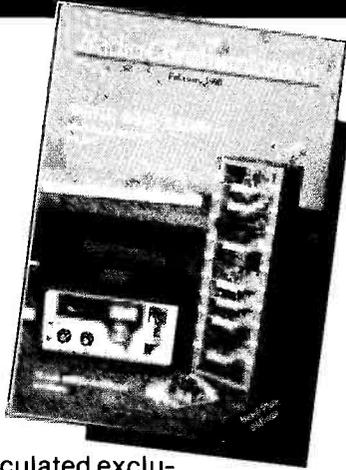
For the best system you will need to check out the specifications of the computer, and try to have a demonstration under real domestic conditions.

You might well spend your hard-earned cash on a spectacular system only to find that it generates so much hash that you can't use it properly! And don't forget the trusty framerstore!

I have been promised a visit from one of the manufacturers of a weather satellite computer system and so may provide a report at a later date.

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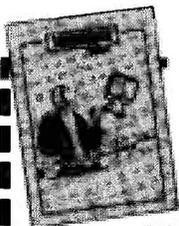
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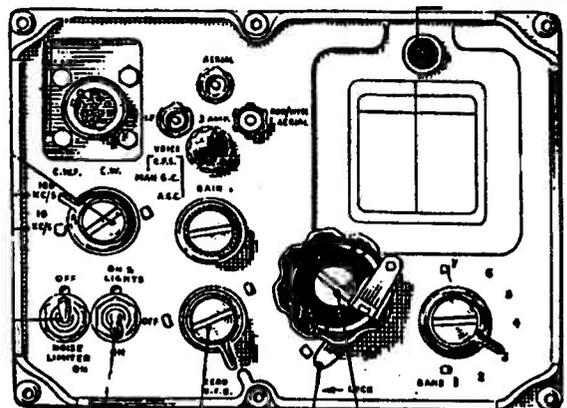


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SEEN & HEARD

METEOSAT

The geostationary European weather satellite METEOSAT-3 continues to provide us with good quality images despite its antenna problems. During the spring and autumn equinoxes certain transmissions are not included. This is because all the geostationary satellites are positioned close to the celestial equator and at some 37800km distant from earth in order to establish their orbital periods at about 24 hours. So twice a year the sun passes directly behind the satellite about midday and this event happens for several days around each equinox. So remember that if you have a pre-amplifier fitted in your dish you may need to protect it from reflected heat.

Similarly the ground controllers are pointing their antennas at the sun for several minutes each day to receive data and some 12 hours later the earth's shadow will cross the satellite for several minutes forcing it to rely on on-board power. This period is referred to as the eclipse season and causes a reduction in transmissions for a few days.

James Northam GW1XBF of Malvern had asked me about the eclipse season so I hope that that clarifies it. This information is always carried on the satellite's bulletin board which is transmitted on alternate channels at 0238UTC, 0538UTC, 0838UTC, etc.

Those watching the A2 channel on METEOSAT, which provides the whole disc formats will know that these transmissions ceased during early April while tests were continued.

METEOSAT-4 was switched off for tests in February while the controllers examine the problem with its systems.

GOES

Sadly we may not see many more GOES pictures for some time because its station-keeping fuel has run out. I had a call from **Mr O Jackson GM4VYU** who lives in the Borders Region in Scotland. He has a home-made 2 metre dish which he uses for METEOSAT and has been trying to find the signal from GOES.

The latest news is that GOES-5 which has been relaying pictures to us (it is called the eastern relay) that we can see here in Britain, ran out of fuel and has entered a cycle which will cause it to drift between 145 and 65 degrees west. By late May it will be near longitude 78 west. It has seen over eight years service but was designed for seven so deserves retirement!

GOES-7 is the only satellite in that series actually producing images for the USA and is currently positioned at about 108° west, which is called the winter storm position. It will be moved to about 98° west for the summer Atlantic hurricane watch.

I received a welcome list of expected future satellite launches from Geoffrey Falworth of Penwortham who reminds me that GOES-8 was scheduled for launch at the end of March.

More Letters

My query about Yagis for the 1690MHz weather satellite band was responded to by **James Northam** who referred me to two companies who list these in their catalogues. James has Jaybeam and Spacetech antennas feeding his MSR20 receiver and a YU3UMV framestore fitted with the Dartcom A/D conversion unit. For those not familiar with this device it is used to expand the dynamic range of the satellite signal so that a full grey scale can be achieved. It's big advantage is seen when you use it for NOAA infra-red pictures when by correctly adjusting the black and white controls you can get a full 64 levels.

James is particularly lucky because he works near one of the sophisticated Dartcom systems running on an Apple computer producing stunning pictures from either NOAA or METEOSAT. James has been able to see it provide 256 grey levels on NOAA infra-red pictures to reveal land detail and ocean currents.

Graham Smith G1JVZ of Mansfield sent me some information about modifications that can be done to the Tandy PRO-2004 scanning receiver. He points out that this unit can have its memory channels increased from 300 to 400. I counted up the number of channels in which I have actually stored frequencies and it comes to about 30! Graham has plans to purchase the new AR-100 from Lowe Electronics. Although a hand held receiver it should be quite capable of receiving satellite transmissions judging from its specifications.

Mr Philips contacted me from Glamorgan where he teaches at the St Richard Gwryn High School. They use a Century 21 receiver and as part of the national curriculum they are decoding various types of data. Mr Philips was wondering how the law was in relation to their reception of information. Perhaps Mike Richards who writes the 'Decode' column in *SWM* can answer that poser?

Kepler Elements

Following recent antenna problems my Kepler elements, usually collected from the amateur radio satellite UoSAT-2, became rather old so I gave the Remote Imaging Group's (RIG) membership secretary Des Watson G3YXO a call and within a day or so he very kindly sent me a complete set.

I joined RIG some years ago and quickly realised what a wealth of experience there is amongst its membership. Although it is an organisation for amateurs its committee is composed of experts in the field who will provide help to those needing it. From my postbag I know that many readers of this column are also RIG members.

RIG can be joined by writing to Des at Norton, Gote Lane, Ringmer, Near Lewes, E Sussex BN8 5HX.

For those of you who need a set of Keplers I will be happy to provide a print out if you let me have an s.a.e.

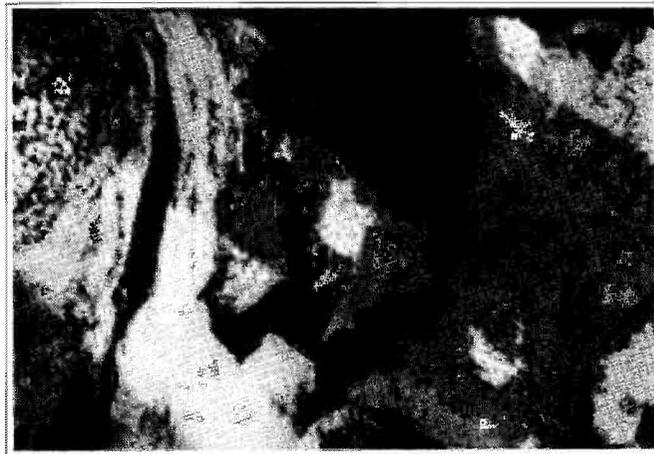


Fig. 1: A sunny day for Britain last May. This is a morning transmission from NOAA 10 photographed from my monitor using my framestore.

China WX?

Back in September 1988 while listening to the scanner one morning I heard a weather satellite transmitting APT on 137.06MHz. I was completely taken by surprise because I did not know of any such satellite using that frequency. I put the signal through the framestore and it was of the NOAA type, that is, two frames side by side with land detail clearly visible, compared to the METEOR type in which land is difficult to identify unless that of desert.

The satellite turned out to be a new Chinese weather satellite called FEN YUNG 1. Sadly this satellite started to tumble and it was switched off after a few weeks. The Chinese did, however, announce that they would be launching a second one within about 2 years or so. On that basis I am taking an interest in monitoring the bottom end of the 137MHz band in case it is launched this spring.

Satellite Predictions

No doubt many readers have suitable equipment to receive satellite signals but have no predictions program to know when to listen. As an experiment I am including a selection here of satellite pass times for Sunday May 27. If you tune to the expected frequencies, or scan the band 137 to 138MHz you may well hear these APT transmissions. I will be glad to hear whether this is of help to beginners using hand-held receivers outdoors. This table will identify the satellite concerned but only a selection of my printouts is included because of space.

Satellite identification is followed by the predicted acquisition time AOS (Universal Time should be within a couple of minutes), LOS, the maximum elevation reached by the satellite (about half-way through the pass), and whether the direction is over to the east or west and travelling either north or southbound.

Sunday May 27					
Satellite	AOS	LOS	Maxel	Dir	
Met 2/17	0917	0933	62W	NB	
NOAA10	1011	1024	15W	SB	
Met2/18	1033	1049	36E	SB	

Met2/18	1218	1234	45W	SB
Met3/2	1304	1322	28E	SB
NOAA11	1312	1326	68E	NB
Met3/2	1455	1514	74W	SB

NOAA Satellites

During early April the NOAA-9 pass times coincided with NOAA-11 and so the former was switched off for a few weeks. During the summer months NOAA-9 is passing over Britain during the early hours of the day at approximately 2am. Due to the long hours of sunlight the spacecraft is actually in part sunlight and so if you record the overnight passes you can see Britain and eastern Europe in very early sunshine.

The pictures from NOAA-10 in the morning are quite spectacular. The sun always catches the sea and causes a strong reflection, usually near the Mediterranean but sometimes across the North Sea.

NOAA-9 and NOAA-11 transmit APT on 137.62MHz

NOAA-10 transmits on 137.50MHz.

METEORS

It was all change during March and April! Not one of the Russian satellites was transmitting on the same frequency as during February. I mentioned last month that 2/16 and 2/17 had ceased transmissions for several weeks.

On the morning of April 7 I was monitoring 3/2, which had itself changed frequency to 137.30MHz, and as it disappeared over the north pole the scanner immediately picked up another METEOR on 137.85MHz at 1122UTC. When it was all over I ran predictions for the various satellites and could see what was going on.

The transmission on 137.85MHz was 2/16 and the transmission on 137.30MHz was 3/2. 2/17 has not yet returned. 2/18 was previously using 137.30MHz but was switched off.

Summary
Met 2/16 now on 137.85MHz
Met 3/2 now on 137.30MHz
Met 3/3 suddenly back on 137.30MHz.
Okean 2 transmissions occasionally on 137.40MHz.

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SEEN & HEARD

BAND II DX

Ron Ham

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Weather

"We have had the most unpredictable weather this winter. It rained on 21 and 22 December (89) followed by heavy fog till 5 January (90), something which was unheard of on the Indian Plains. There was no sun for these 15 days. We were not used to such weather conditions and although temperatures were between 7°C at night and 15°C in the day everyone felt very cold as our houses are not centrally heated and we usually bank upon the sun to heat us during the day.

"This was followed by warm weather and we thought the winters had finished. But by February 9 we again started having rains and heavy snow in Kashmir, Himachal Pradesh and the hills of Uttar Pradesh. The temperatures went down to what we should have had in January. The result is that it is cold now when it should be warm and we are still using warm clothing," wrote Lt. Col. Rana Roy from Meerut, India on March 7. He concluded, "The sky is clear since March 1 and I think by the time this letter reaches you we should be off with our winter clothing."

Let's hope so Rana, our weather during the six weeks prior to April 18 could not be classed as normal. The only rain that I recorded was 0.19in for the whole of March plus 0.35in on the 3rd and 0.76 on April 13. Apart from March 1, the atmospheric pressure was high, up to 30.9in (1046mb) on the 3rd and 4th, and fluctuated above 30.2in until the 31st.

Deceiving sunny days, bitter cold winds and a few overnight temperatures down to 26°F has been the April pattern so far.

Tropo Openings

Although the prolonged high pressure should have produced a few good tropo-openings Band II and above has been relatively quiet. However, on March 17, **George Garden** (Edinburgh) noted a high of 1042mb (30.75in) on the weather map with a good bit of the associated ridge over much of Scotland and the UK, so, around 1500 he drove to his favourite DXing location, high on Cairn O' Mounth and heard a fluctuating *North Yorkshire Sport* from BBC Radio York.

"It was very strong while it lasted," said George, adding, "The radio band is more congested now, with IRN Borders just above Radio Tay's frequency of 102.8MHz, but the car radio is selective enough to receive others".

At 1845 on the 30th, BBC Radio WM from Birmingham was pounding in at my home in Sussex. On the 31st, George noted that the very high pressure was declining and was soon off to Cairn O' Mounth for a spot more DXing. Around 1340 he received BBC Radios Cumbria and York and ILR T-FM (Radio Tees) which are not often heard at that site. Before climbing the hill, he checked Band II from his home in Laurencekirk with a Sony hi-fi, single transistor booster and horizontal dipole and received



Fig. 1

strong signals from the Blackhill transmitter of Clyde 1 FM, and the Dundee transmitter of Radio Tay, plus IRN Radio Borders "at phenomenal strength." At Laurencekirk George has a big hill in front of him and can only hear DX signals when a good lift is in progress.

Simon Hamer (New Radnor) heard AFN (102.3MHz), BFBS (96.5MHz), Deutschlandfunk (100.3MHz), Radio Hamburg (103.6MHz), NDR2 (87.6MHz) and WDR2 (99.2MHz), from West Germany on March 16, Radios Borders, Clyde (1), Forth (RFM), plus CN-FM (Cambridge), Denmark (P3 99.6MHz), Norway (NRK1 99.7MHz) and Sweden (P3 99.4MHz) on the 26th and BBC Radio Suffolk (air-tests on 103.9 and 104.6MHz), ILR Radio Broadland, Buzz FM (Incremental station in Birmingham), Downton Radio, Jazz FM, Key 103 (Manchester), Marcher FM, Ocean Sound/Power FM, Radio Orwell, Saxon Radio, South West (East Devon), Two Counties Radio (2CR) and the Irish Independent KFM on the 28th.

Late on the 7th, Simon went to a nearby hilltop and logged BBC Radios 1 (Belfast), Cornwall, Devon, Guernsey, Jersey, Lincolnshire and York, Ireland's RTE FM1, 2 and 3, Manx Radio and the Irish Commercials, Century Radio, Classics 98 (Dublin), Horizon Radio (Bray), Capital Radio (Dublin), Clare FM, County Sound (Cork) and Radio South East (Wexford) and the Manchester Incremental station, Sunset Radio, early on the 8th.

One of my favourite hilltops for 'coffee or tea stop' DXing is in

Ashdown Forest near Hartfield, Fig. 1 and another, for a 'pre and post-walk' tune through Band II, is a car-park near Rackham Clump on the South Downs seen on the centre horizon in Fig. 2. Both sites are around 200m a.s.l. and the latter was photographed some 16km to the south, on the river bank at Arundel, with a 70-210mm zoom lens.

Info

My thanks to Simon Hamer and his sources of information for the gen that a new private station is broadcasting from Bratislava, 24 hours daily, on 101.8MHz. Programmes from Radio CD are in German, aimed at an audience in Austria. A station in Prague, Europe Plus, broadcasts in French on 88.2MHz and in Budapest a local commercial station, Radio Bridge, uses English, on 102.1MHz. We must look out for these during Sporadic-E disturbances.

Before concluding this column on April 18, I checked the engineering information on teletext and learnt from the BBC's CEEFAX, page 698, that Radio 1 FM should be heard, in late May, from new transmitters at Rowridge on 98.2MHz and Londonderry on 98.3MHz and that a new f.m. service from Walsden South, West Yorkshire, will carry Radios 2, 3 and 4 on 88.4, 90.6 and 92.8MHz respectively. ITV's ORACLE, page 297, said that Melody Radio from Croydon is scheduled to be in service in June, on 104.9MHz. More stations to listen out for and include in future reports folks.

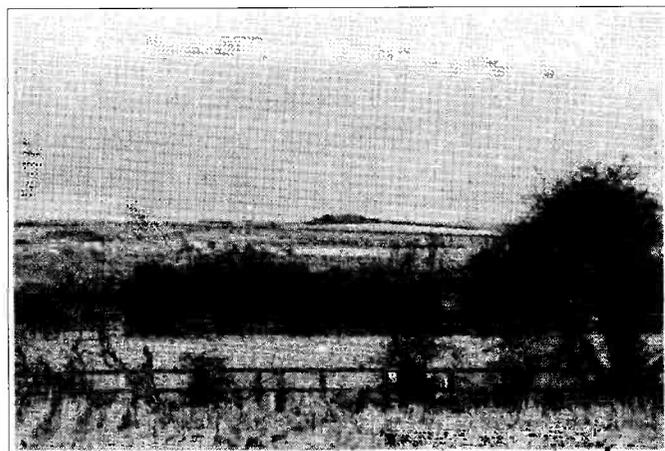


Fig. 2

TELEVISION

Ron Ham

Faraday, Greyfriars, Storrington, West Sussex RH20 4HE

The TV Bands

While TV DXing over the past 3 years, **Russ Burke** (Northampton) has received pictures from almost the whole of Europe and has photographs of test-cards and/or captions from Czechoslovakia, Finland (YLE TV1), Italy (RAI) Fig. 1, Monte Carlo, the

Norwegian regionals (Bagn, Gamlem and Melhus), Poland (TVP), Saudi Arabia, Spain (TVE), Switzerland and the USSR. His equipment for this work includes an up-converter, JVC Colour 7 and Yoko TV8M receivers and various v.h.f. beam antennas with which he enjoys experimenting.

Readers who look for United

Kingdom DX on the u.h.f. band should find it worthwhile checking the engineering information on teletext provided by the BBC's CEEFAX on page 698 and the IBA's ORACLE on pages 297 (ITV) and 697 CH.4). From this source I learnt that new TV services are scheduled for Kinross (Tayside), Lydden (Kent), Millthorp

(Cumbria) and Redbrook (Glos.) in June and Great Torrington (Devon) in July.

Band I Auroral and 'F2'

Simon Hamer (New Radnor) received "distorted images", possibly

SEEN & HEARD



Fig. 1: Italy



Fig. 2: Italy

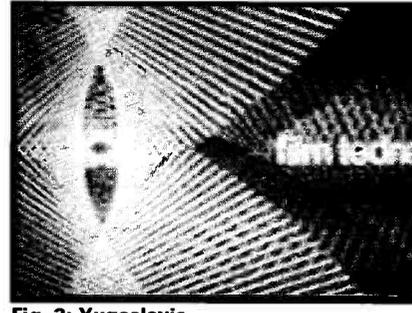


Fig. 3: Yugoslavia



Fig. 4: Morocco



Fig. 5: Malaysia



Fig. 6: USSR

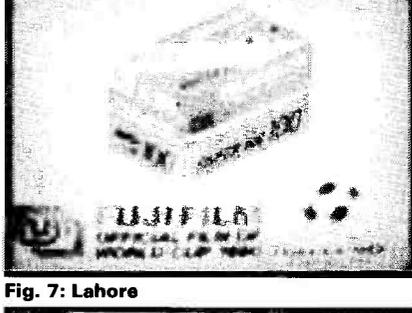


Fig. 7: Lahore

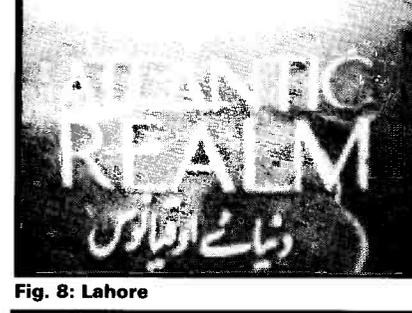


Fig. 8: Lahore



Fig. 9: Ulster

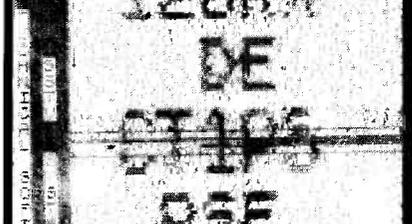


Fig. 10: Portugal



Fig. 11: Czechoslovakia



Fig. 12: Sweden

auroral, in Band I on Chs. E2 (48.25MHz) and R1 (49.75MHz) and from Ireland's RTE1 on their Ch. B (53.75MHz) on March 13 and found unidentifiable signals on Ch. E2, via the 'F2' region of the ionosphere, at 1230 on the 14th. He also logged pictures from RTE on Ch. B in Band I again and Chs. D, F, G, H, I and J in Band III, while an aurora was in progress on April 10.

"Band I seems to be full of r.f. at times, I think there is some 'F2' mixed up with Sporadic-E," wrote **John Woodcock** (Basingstoke) on April 8 and reports that on the 5th he heard Arabic music in the band during the early evening but could not lock any pictures. Next day, at 1215, Simon tuned his receiver between 30 and 50MHz and found it "choco bloc" and in particular he noted television synchronising-pulses on Chs. A0 (46.25MHz), E2 and R1. At this point he switched on the vision gear and

found, typical 'F2' type propagation, a smeary fading picture on the Australian channel (A0), unidentifiable signals on Ch. E2 and Chinese and Russian characters on Ch. R1.

"We have had some very good tropo and some 'F2' also," wrote **Lt. Col. Rana Roy** (Meerut, India) for the period December 11, 1989 to January 26, 1990 and continued, "If there were any ES they were mixed up with 'F2' receptions and hence, I was not able to distinguish between them." He logged typical 'F2' signals, smeary and usually unlockable, on December 15, 17, 21 and 24 to 28 and January 11 and 13. During the period 24 to 28, Rana identified pictures from Malaysia (TV3) regularly on Ch. E2 between 0730 and 0915. The following is a typical entry from his log; "17 Dec A2 0800 F2 rolling pictures which were adjusted by vertical hold. It was 525 line station. The script appeared

to be SE Asian. Probably Vietnam. On E2 Malaysian TV3 came in at 0810. Picture were fairly clear considering that this was an 'F2' reception, pictures faded away at 0850. TEP from Malaysia came up again at 1400 to 2230."

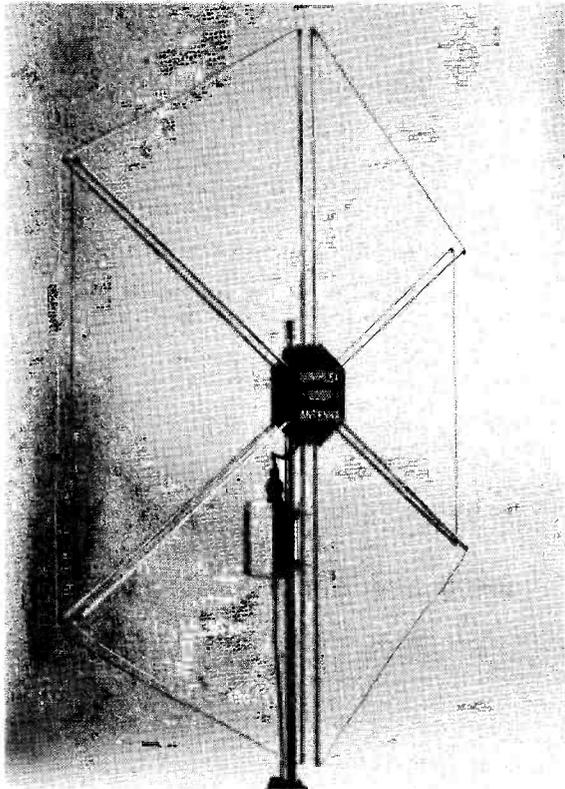
Band I Sporadic-E

During a Sporadic-E disturbance early on March 20, Simon Hamer logged Arabic script from an unidentified source on Ch. E2 and test-cards from Denmark (DR) on Ch. E3 (55.25MHz), Iceland (RUV) on Ch. E4 (62.25MHz), Norway (Televerket) and Sweden (SVT-1) on Ch. E2 and the USSR (TSS) on Ch. R1.

Next day he saw the news (Taggesschau) from West Germany's ARD (Grunten) on Ch. E2 and, at 0730 on the 27th, he logged a test pattern from Czechoslovakia (CST) on Ch. R1.

Picture Archives

At 0010 on June 11, 1989, **David Glenday** (Arbroath) saw a programme from Raiuno on Ch. Ib, Fig. 2 and the caption *Film Tedna*, Fig. 3, from Yugoslavia on Ch. E3 at 1907 last August 9. Another prize catch from the 1989 Sporadic-E season came from Morocco (RTM), Fig. 4, received by fellow journalist, **Garry Smith** (Derby) on Ch. E4 and between January 14 and 26, Rana Roy received multiple-images, via 'F2' or 'ES', or a bit of both, from Malaysia (TV3), Fig. 5, on Ch. E2 and the USSR, Fig. 6, on Ch. R1 and an advert and a caption from Lahore TV, Figs. 7 and 8, while a tropospheric opening was in progress. The Ulster TV caption, Fig. 9 was received on the south-coast of England, in Brighton, under good tropospheric conditions by **David Hunt**.



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SEEN & HEARD

Tropospheric

Rana Roy logged test-cards and saw Breakfast TV via tropospheric openings in Band III from Amritsar, Bhatinda, Kanpur, Kasauli and Jalandhar on December 11, 17 and 19 and January 4, 5, 11, 20 and 26. He logged these stations again between 1700 and 2230 on January 3, 4, 12, 17 and 18 and watched such items as regional and national news, plays and songs. At 2130 on January 3 signals from Bahawalpur (Pakistan TV) were very strong and interfered with pictures on Ch. E10 from Musoorie.

"Lahore also came up again on E5 but there were two other Indian stations also on E5 with each fighting for predominance on the screen," said Rana. Band III proved rewarding for Simon Hamer during the short lived tropospheric openings on March 12, 16, 18, 26, 28 and April 4 when he logged pictures and test-cards from Austria (ORF1) on Ch. E5, Belgium (RTBF1 and BRT1) on Chs. E8 and 10 respectively, Denmark (DR) on Chs. E5, 6, 7, 8 and 10, East Germany, (DFF1) on Chs. E11 and 12, West-

Germany (RTL Plus, SWF, ARD/WDR1 and NDR1) on Chs. E7, 8, 9 and 10 respectively, Holland (NED1) on Chs. 5, 6 and 7, Ireland (RTE1) on Chs. D, E, F, H and I (175 to 215MHz), Norway (NRK) on Chs. E10 and 11, Sweden (SVT1) on Chs. E6 and 9 and Switzerland (+PTT/SR6-1) on Chs. E6 and 7.

During the same events he checked the UHF band and identified pictures from Austria (ORF2), Belgium (BRT1&2 and RTBF 'TELE21'), Denmark (TV2/Danmark and Hedensted), all French channels, East Germany (DFF2), West Germany (ARD/WEST3, NDR1&3, R-Bremen 1, ZDF), Holland (NED1,2&3), Ireland (RTE2), Sweden (SVT1&2) and Switzerland (+PTT/BS1 and TS1 and SSR1). Among the new UHF catches for Simon this time were Denmark's TV2 on Ch. E28 and Switzerland's French service (+PTT/SSR1) on Ch. E31.

While the very high pressure was falling on March 30, I received a weak picture from France (Canal+) on Ch. L5 on my Yoko TV8M with its own rod antenna, while parked in East Sussex

at 1600 and at 1845, from home I saw a programme from Belgium on Ch. E8. It's a treat to see positive pictures from France on the YOKO after years of negative ones on earlier sets.

John Woodcock received negative pictures from Canal+ around noon on March 12, 26 and 27 and at times on April 2, 3 and 4. In Scotland, **David Glenday** (Arbroath) had a thin time for DX in March, however, during the late afternoon and early evening of April 1 he received test-cards and programmes from Holland (NED2&3) in the UHF band on Chs. E44 and 47 and some co-channel interference, which he thinks was coming from Ostfriesland, Germany (NDR3) on Ch. E43.

SSTV

First, congratulations to **Ian Armstrong** (Millom) on passing the RAE and obtaining the call-sign, G7GUN. Ian, one of our slow scan television enthusiasts has now included the J & P TX/RX program to his software collection for future SSTV work. He also uses a Panasonic DR49

receiver fed by a long-wire antenna, a Sinclair Spectrum 48K computer with Technical Software's RX4 program and an Alphacom 32 printer to produce the hard-copy of received pictures.

Among the stations he copied, around 14.235MHz, between 1100 and 1219 on April 7 were CT1PS (Portugal), Fig. 10, HA1ZH (Hungary), OK3CKW (Czechoslovakia), Fig. 11, SM5EEP (Sweden), Fig. 12 and YU1NR (Yugoslavia). The line through the call-sign on Fig. 11 was caused by the signal fading.

During the morning of the 8th, around 14.3MHz, he logged EA3FHC (Spain), HA1ZH in contact with G4EI and in the afternoon added OK3CKW exchanging pictures with W2UOX (USA), SP4KM (Poland) working RB5HD in the USSR and UA3ZU (USSR). At 1500, Ian decided to check 21.340MHz and received his first pictures on the band from another Russian station sending the caption 'CQ CQ CQ DE UZ3DWH OP.VLAE MOSCOW'. All good stuff Ian and well done on the 11 countries from 20 stations in your slow scan log.

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Long Wave DX

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

Whilst making a comparison between reception during the day and at night in London, **Phil Townsend** was surprised to find that the broadcasts from DLF via Donebach, W. Germany on 153 are inaudible after dark, as they reach him at SIO 333 during daylight. Other changes were noted after dark, including an increase in the signal strength from Saarlouis 183 from S3 to S4 and reductions in the signal ratings of Roumoules 216 (SIO 444/422); Junglinster 234 (444/322); Burg 261 (422/322); also Topolina 270 (444/433).

Considerable variations in the reception of the broadcasts from Atlantic 252 in Clarkestown, S. Ireland has been reported from different areas of the UK. In Folkestone, **Andy Cadier** has noted poor reception and a rhythmic swing in signal strength due to co-channel interference, but he has found that reception is improved by moving inland by 30km or more. Their signal in London was rated as SIO 322 by Phil Townsend and reception along the south coast is far from good. Down in Plymouth,

Robin Clark quoted 33343. In contrast, particularly good reception was noted in Milton Keynes by Peter Walduck, he rated their transmission as a perfect 55555. Reception is also good further north, in Northumberland, **John Hepburn** (Ashington) quoted 44444 and a rating of SIO 444 was noted by Ike Odooom in Glasgow.

The problem of splatter from Atlantic 252 was again mentioned in the reports. Writing from Largs, **John Stevens** says, "On both of my receivers (Hammarlund HQ-180 and Icom R-70) Atlantic 252 spills over to adjacent stations on either side of its frequency, but then so does Radio 4 on 198kHz. Is it that my receivers are at fault, or is 9kHz separation not enough to avoid interference in close proximity to powerful l.w. transmitters?" Phil Townsend also noted that the upper sideband of Atlantic 252 causes interference to Radio Volga via Burg on 261kHz, so perhaps a few words on this topic will clarify the situation.

The bandwidth required by an a.m. transmission equates to twice the highest frequency of modulation. With 9kHz channel spacing this implies that the modulating frequency must not exceed 4.5kHz. However, by adopting a band plan, the channels can be allocated in terms of the geographical location of the stations, so that somewhat higher modulating frequencies may be used without causing interference to the distant stations on adjacent channels in their respective service areas. It follows that DXers who listen to signals outside the official service areas may well experience adjacent channel interference. In the service area the signal to noise ratio usually exceeds 40dB.

MW Transatlantic DX

Having restored an old (1936) McMichael all-wave domestic receiver, **Ron Pearce** (Bungay) decided to put it to the ultimate test - m.w. transatlantic DXing! Listening at 0230 he was delighted to hear Radio Globo in Rio, Brazil on 1220 at SIO Glasgow.

The broadcasts from Radio Globo on 1220 were also received by **Jim Willett** in Grimsby, he rated them as SIO 222 at 0200. The earliest signal to reach him stemmed from CJYQ in St. John's, Newfoundland on 930, which he noted as SIO 223 at 2350. It was not long before another broadcast from the St. John's area became audible, namely VOXM on 590, it rated SIO 222 at 0012. Encouraged by these results, Jim searched the band until 0305 and logged three more signals from Canada and four from the USA, see chart. The only other signal to reach him, originated from the Caribbean Beacon, Anguilla on 1610, which rated as SIO 222 at 0100.

A copy of the log compiled by **Mark Hattam** (Hereford) during a two week DX-pedition to N.W. Scotland in March has just reached me. The reception conditions proved to be not too good for transatlantic DXing, but nevertheless the broadcasts from some 56 stations in Canada, 25 in the USA, 15 in S. America and 5 in the Caribbean area were positively identified. During the first two nights good signals were noted from the Great Lakes area and Ontario. The next two nights favoured Manitoba, but the best night proved to be the 17-18 March, when the 250 watt transmission from CHFC in Churchill, MB on 1230 was heard clearly at 2245. Other highlights were

the reception of CFCN in Calgary, AB on 1060 at 0258; CJRW in Summerside, PEI on 1240 at 0359; also KRWB in Roseau, MN on 1410 at 0543. To achieve these results Mark used three 400m long terminated Beverage antennas in conjunction with his Drake R7A receiver plus RV-75 v.f.o., Sherwood SE3 sync a.m. detector and a Datong FL3 filter.

Other MW DX

The sky wave signals from some of the stations in North Africa have been reaching the UK after dark. Whilst monitoring the band in Lytham St. Annes, **Neil Wheatley** picked-up a broadcast from Algiers, Algeria on 891 (600/300kW). In Derby, **Roy Patrick** listened to a programme in English at 1900, broadcast via Alger, Algeria on 981 (600/300kW). Three stations in Morocco were noted in the extensive log compiled by **George Millmore** in Wootton, IOW, namely Sidi Bennour 540 (600kW), Oujda 594 (100kW) and Sebba-Aioum 1044 (300kW). Also noted were broadcasts from Algeria and Tunisia, they stemmed from Les Trembles 549 (600kW) and Alger 981; also Tunis-Djedeida 630 (600kW).

Whilst monitoring the band at night in Thumrait, Oman **Rhoderick Illman** was delighted to hear Radio DW Cologne via Trincomalee, Sri Lanka on 1548 (600kW). His entries in the chart however, were logged in Oxted during a spot of leave in the UK.

MW Local Radio DX

Some long hauls were noted in the reports this time! The extensive list which **David Wratten** compiled in Cambridge between 0650 and 1030

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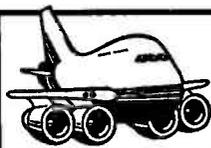
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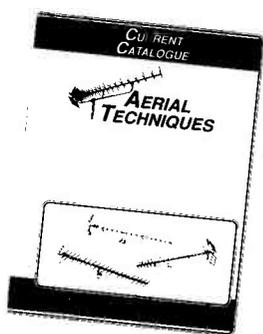
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SEEN & HEARD

Local Radio DX Chart

Freq kHz	Station	ILR BBC	Power (kW)	DXer	Freq kHz	Station	ILR BBC	Power (kW)	DXer
585	R.Solway	B	2.00	D,J,O*	1161	R.Tay	I	1.40	D*
603	Invicta Snd(Coast)	I	0.10	N,P	1161	Viking R.(Gold)	I	0.35	P
603	R.Gloucester	B	0.10	I,P	1170	R.Orwell	I	0.28	P
630	R.Bedfordshire	B	0.20	G,I,N,P	1170	Signal R	I	0.20	L*
630	R.Cornwall	B	2.00	I,L	1170	TFM Radio (GNR)	I	0.32	C,J
657	R.Clywd	B	2.00	G,I,O*,P	1170	Ocean Sound	I	0.12	G,I
666	DevonAir R	I	0.34	I,P	1242	Invicta Snd(Coast)	I	0.32	I,N,P
666	R.York	B	0.80	C,O*,P	1251	Saxon R	I	0.76	G,I,N,P
729	BBC Essex	B	0.20	I,N,P	1260	GWR (Brunel R.)	I	1.60	I,P
738	Hereford/Worcester	B	0.037	I,P	1260	Marcher Sound	I	0.84	O*
756	R.Cumbria	B	1.00	C,J,O*	1260	Leicester (GEM-AM)	I	0.29	G,N,P
756	R.Shropshire	B	0.63	I,O*,P	1260	R.York	B	0.50	C
765	BBC Essex	B	0.50	I,N,P	1278	Pennine R.(C.Gold)	I	0.43	C
774	R.Kent	B	0.70	G,I,J*,N,P	1305	R.Hallam (C.Gold)	I	0.15	K*,P
774	R.Leeds	B	0.50	C,O*	1305	Red Dragon R	I	0.20	I,P
774	Severn Sound	I	0.14	I,P	1323	R.Bristol	B	0.63	A*
792	Chiltern R	I	0.27	B,G,N,P	1323	Southern Sound	I	0.50	G,I,P
792	R.Foyle	B	1.00	E,J	1332	Hereward R	I	0.60	G,P
801	R.Devon	B	2.00	I,P	1332	Wiltshire Sound	B	0.30	G,I
819	Hereford/Worcester	B	0.037	J,P	1359	Essex R.(Breeze)	I	0.28	G,N,P
828	2CR	I	0.27	I	1359	Mercia Snd(Xtra-AM)	I	0.27	P
828	R.WM	B	0.20	L,P	1359	Red Dragon R	I	0.20	A*
828	R.Aire	I	0.12	C	1359	R.Solent	B	0.85	I
828	Chiltern R	I	0.20	G,N,P	1368	R.Lincolnshire	B	2.00	P
837	R.Cumbria	B	1.50	C,J,O*	1368	R.Sussex	B	0.50	G,I,N
837	R.Leicester	B	0.45	G,N,P	1368	Wiltshire Sound	B	0.10	P
855	R.Devon	B	1.00	I	1413	Sunrise RI	I	?	G,N
855	R.Lancashire	B	1.50	J,K,O*,P	1431	Essex R.(Breeze)	I	0.35	G,N,P
855	R.Norfolk	B	1.50	C,G,N,P	1431	Radio 210	I	0.14	I,P
873	R.Norfolk	B	0.30	C,G,I,L,N,P	1449	R.Cambridgeshire	B	0.15	P
936	GWR (Brunel R.)	I	0.18	G,I,P	1458	R.Devon	B	2.00	I
945	R.Trent (GEM-AM)	I	0.20	P	1458	GLR	B	50.00	I,P
954	DevonAir R	I	0.32	I	1458	GMR	B	5.00	O*
954	R.Wyvern	I	0.16	K*,P	1458	Radio WM	B	5.00	P
990	Beacon R. (WABC)	I	0.09	P	1476	County Sound(Gold)	I	0.50	G,I,P
990	R.Devon	B	1.00	G,I	1485	R.Humberside	B	1.00	C,P
990	Hallam R.(C.Gold)	I	0.25	P	1485	R.Merseyside	B	1.20	O*
999	Red Rose R	I	0.80	C,J,O*	1485	R.Oxford	B	0.50	I,P
999	R.Solent	B	1.00	G,H,I,P	1485	R.Sussex	B	1.00	G,I
999	R.Trent (GEM-AM)	I	0.25	P	1503	R.Stoke-on-Trent	B	1.00	A*,I,P
1026	R.Cambridgeshire	B	0.50	G,N,P	1521	R.Mercury	I	0.64	I,N,P
1026	Downtown R	I	1.70	O*,J,O*	1521	R.Nottingham	B	0.50	P
1026	R.Jersey	B	1.00	G,I	1530	R.Sussex	B	0.15	N,P
1035	R.Kent	B	0.50	G,N,P	1530	Pennine R.(C.Gold)	I	0.74	O*
1035	NorthSound R	I	0.78	C,D*,F	1530	R.Wyvern	I	0.52	J,P
1035	West Sound	I	0.32	J,M	1548	R.Bristol	B	5.00	I
1107	R.Northampton	B	0.50	G,I,P	1548	Capital R. (Gold)	I	97.50	I,P
1116	R.Derby	B	1.20	J,P	1548	R.City	I	4.40	O*
1116	R.Guernsey	B	0.50	I	1548	R.Cleveland	B	1.00	C
1152	R.Broadland	I	0.83	P	1548	R.Forth (Max AM)	I	2.20	D*,J
1152	R.Clyde (Clyde 2)	I	3.60	D*,J	1548	R.Hallam	I	0.74	P
1152	LBC (L.Talkback R)	I	23.50	I,P	1557	R.Lancashire	B	0.25	O*
1152	Piccadilly R	I	1.50	O*	1557	Chiltern R	I	0.76	J,P
1161	R.Bedfordshire	B	0.10	P	1557	Ocean Sound	I	0.50	G,I
1161	GWR (Brunel R.)	I	0.16	I	1584	R.Nottingham	B	1.00	G,P
1161	R.Sussex	B	1.00	I,L	1602	R.Kent	B	0.25	G,I,J*,N,P

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

included two stations in Devon: ILR DevonAire Radio via Exeter 666 (0.34kW) and BBC Radio Devon via Barnstaple 801 (2kW). John Hepburn logged North Sound Radio, Aberdeen 1035 as 44354 at 1200. Listening around 1900, Ike Odoom picked up the sky wave signals from BBC Radio Kent via Littlebourne 774 (0.7kW) and via Rusthall 1602 (0.5kW). Later, **Leo Barr** (Sunderland) logged BBC Radio Bristol via Taunton 1323 (0.63kW) as 33323 at 2318 and ILR Red Dragon Radio via Cardiff 1359 (0.2kW) as 22222 at 2320.

Whilst checking the band with his car radio at a location close to the BBC Pontop Pike TV transmitter at 1500, **Adrian Don** heard several stations which are inaudible at his home in Whitley Bay: BBC Radio Lancashire via Preston 855 (1.5kW); ILR Radio Trent (GEM-AM) via Quarndon 945 (0.2kW); Downtown Radio via Knockbreckan 1026 (1.7kW); Radio Hallam via Ardsley 1305 (0.15kW); also Pennine Radio via Vicars Lot 1530 (0.74kW).

Following a number of test transmissions during early April, Isle of Wight Radio have commenced their broadcasts to the local community from their studios in Newport. Their transmitter is located in Wootton, quite close to George Millmore, so he has been been taking a keen interest in their activities. They have informed him that reception reports on their 0.5kW transmissions would be very

welcome from listeners both near and far. They are 'on the air' 24 hours a day, so before preparing a report it would be advisable to monitor their frequency during daylight and again after dark to ascertain the level of adjacent and co-channel interference. If you require confirmation of your reception, be sure to enclose an SAE with your report, which should be sent to IOW Radio, Dodner Park, Newport, IOW PO30 5XE.

Short Wave DX

The reception conditions prevailing in the h.f. bands have in general been excellent, but during some days the effects of solar flares disturbed the ionosphere and reception deteriorated. From time to time reception was disrupted by Dellinger fade-outs. Despite these problems, potent signals from places near and far have reached our shores.

Excellent propagation conditions prevail in the **25MHz (11m)** band, so it is rather surprising that more broadcasters are not taking advantage of them. One broadcaster to do so recently is SRI in Berne, Switzerland, who now broadcast daily to listeners in S.E.Asia on 25.680 between 1315 and 1500.

In contrast, the BBC seem to have given up their daily broadcasts to Africa via Daventry on 25.750 (Eng 1100-1615), although their transmissions often reached their

target at SINPO 44444, as noted by **Dick Moon** in George, S.Africa. However they are now broadcasting in French to Africa on 25.870 (1200-1245). Perhaps these changes are due to a transmitter shortage, as their Skelton 'B' station is now off the air and being refurbished.

In the reverse direction, the broadcasts from Radio RSA Johannesburg, S.Africa 25.790 (Eng 1400-1556) have been reaching the UK very well, the SINPO 44544 rating by John Hepburn at 1400 being typical during most days.

Radio Moscow's World Service broadcasts on 25.780 (Eng to E.Africa, Middle East 0400-1400) have also been reaching the UK well. Whilst checking the band in London, **Bill Griffith** rated their transmission as 55555 at 1000. They have also been reaching Quebec, Canada where **Alan Roberts** rated them as 25333 at 1200. During one Sunday morning Alan picked up Radio Nederland's broadcast to Africa via Flevo 25.970 (Du 1030-1125 Sun only) for the first time since last November, it rated as 25222 at 1045. Also noted in his report were broadcasts from Radio Yugoslavia, Belgrade 25.795 (Eng to ? 1200-1230), rated as 25222 at 1200; SRI Berne, Switzerland 25.680 (Esp, Eng, Fr, Ger to S.E.Asia 1315-1500), 35444; BBC via ? UK 25.870 (Fr to Africa 1200-1245), 35444.

Good reception over long distances has also been noted in the

DXers:

A: Leo Barr, Sunderland.
B: Darren Beasley, Bridgwater.
C: Adrian Don, Whitley Bay.
D: Peter Easton, Edinburgh.
E: Mark Hattam, while in N.W.Scotland.
F: John Hepburn, Ashington.
G: Sheila Hughes, Morden.
H: Rhoderick Illman, while in Oxted.
I: George Millmore, Wootton, I.O.W.
J: Ike Odoom, Glasgow.
K: Roy Patrick, Derby.
L: Tim Shirley, Bristol.
M: John Stevens, Largs.
N: Phil Townsend, London.
O: Neil Wheatley, while in Lytham St Annes.
P: David Wratten, Cambridge.

21MHz (13m) band. Some of Radio Australia's broadcasts have been reaching the UK, although they are intended for other areas. In Eyemouth, **David Middlemiss** rated their transmission to SE Asia via Carnarvon 21.525 (Eng 0100-0900) as SIO 333 at 0650. Particularly good reception of their transmissions to S.Asia on 21.775 (Eng 0630-1400) has been noted here. Listening at 1230, **Simon Hamer** (New Radnor) rated them as SIO 455. Ron Pearce also obtained good reception of their broadcast while using his restored 1936 McMichael all-wave radio!

Some of the many other broadcasts to target areas outside Europe have also been logged in the UK. They stemmed from the BBC via Limassol, Cyprus 21.470 (Eng to E.Africa 0430-0730), rated as 33433 at 0557 by **Kenneth Reece** in Prenton; Radio Finland via Pori 21.555 (Fin, Sw, Eng to S.E.Asia, Australia 0800-0925, 34444 at 0901 by David Wratten; Radio DW via Julich, W.Germany 21.560 (Ger to S.Asia 0600-1600), 45544 at 1240 by **David Edwardson** in Wallsend; Radio RSA Johannesburg, S.Africa 21.535 (Eng to USA, Canada 1400-1556), 54333 at 1400 by **Chris Shorten** in Norwich; Radio Pakistan, Islamabad 21.470 (Ur to Middle East 1315-1545), SIO 333 at 1420 by **Alan Smith** in Northampton; RFI Paris, France 21.770 (Eng, Fr to SE.Asia 1400-1600), SIO 322 at 1555 by **Philip Rambaut** in Macclesfield; WCSN Scotts Corner, Maine 21.640 (Eng to E.Africa 1600-1755), 43434 at 1650 by **Cliff Stapleton** in Torquay; BBC via Ascension Island 21.660 (Eng to S.Africa 0700-1745), 34322 at 1705 by Rhoderick Illman (in Oxted); Radio RSA Johannesburg, S.Africa 21.535 (Eng to Africa 1800-1856), 44444 at 1845 by **Darren Beasley** in Bridgwater.

Also noted in the reports were some of the many broadcasts to Europe during the day: Radio Pakistan, Islamabad 21.575 (Eng 1100-1120), rated as 44444 at 1100 by **Sheila Hughes** in Morden; Radio RSA Johannesburg, S.Africa 21.590 (Eng 1400-1555), 54333 at 1430 by **John Sadler** in Bishops Cleeve; WCSN Scotts Corner, Maine 21.780 (Eng 1400-1555), 55555 at 1500 by **Ken Whayman** in Bexleyheath; Voice of the UAE in Abu Dhabi 21.515 (Ar 7-1556), SIO 555 at 1556 by **Kenneth Buck** in Edinburgh; Radio Japan via Moyabi, Gabon 21.700 (Eng, Jap 1500-1700), SIO 233 at 1557 by **Ted Walden-Vincent** in Gt.Yarmouth; Radio Kuwait, Sulaiyah 21.675 (Ar 1600-?), SIO 455 at 1605 by Neil Wheatley; UAE Radio Dubai 21.605 (Ar, Eng 0615-1730), 55544 at 1642 by Andy Cadier; Radio HCJB Quito, Ecuador 21.470 (Cz, Ger, Sw, Eng,

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LongWave DX Chart

Freq kHz	Station	Location	Power (W)	DXer
153	DLF Donebach	Germany (W)	500	A,C*,G,H,I,J,M*,N,P*
153	Brasov	Romania	1200	A,J
162	Allouis	France	2000	A,C,G,H*,I,J,M*,N,P*
162	Agri	Turkey	1000	K
171	Medi 1-Nador	Morocco	2000	I*,J*
171	Kaliningrad	USSR	1000	A,H,J*,J,K*,P*
171	Moscow	USSR	500	M*
177	Oranienburg	Germany (E)	750	A,G*,H*,I,J,M*,P*
183	Saarlouis	Germany (W)	2000	A,G,H,I,J,M*,N,P*
189	Motala	Sweden	300	A,J
198	BBC Droitwich	UK	500	I,J,M*,N,P*
198	BBC Westerglen	UK	50	A,H
207	DLF Munich	Germany (W)	500	A,G*,I,J,M*,N*,P*
207	Azilal	Morocco	800	I*
207	Kiev	Ukraine	500	K*
216	Roumoules	Monaco	1400	A,D*,I,J,M*,N
216	Oslo	Norway	200	A,H,K*
225	Konstantinow	Poland	2000	A,D*,G,H,I,J,M*,N,P*
234	Junglinster	Luxembourg	2000	A,G,I,J,M*,N
234	Kishinev	USSR	1000	H
234	Kuybyshev	USSR	1200	J
243	Kalundborg	Denmark	300	A,G,H,I,J,M*,N
252	Tipaza	Algeria	1500	A*,G*,H*,J*,P*
252	Lahti	Finland	200	A*,J*
252	Atlantic 252	S.Ireland	500	A,B,C,E,F,G,H,I,J,L,M,N,D
261	Burg (R.Volga)Germany	(E)	200	G,H,I*,J,M*,N
261	Moscow	USSR	2000	A,I,J*
270	Topolna	Czechoslovakia	1500	A,G*,H,I,J,M*,N
279	Minsk	USSR	500	A,J,K*,M*

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

DXers:

A: Kenneth Buck, Edinburgh.
 B: Andy Cadier, Folkestone.
 C: Scott Caldwell, Warrington.
 D: Jim Cash, Derby.
 E: Robin Clark, Plymouth.
 F: John Hepburn, Ashington.
 G: Sheila Hughes, Morden.
 H: Ike Odoom, Glasgow.
 I: Fred Pallant, Storrington.
 J: Philip Rambaut, Macclesfield.
 K: Tim Shirley, Bristol.
 L: John Stevens, Largs.
 M: Darran Taplin, Brenchley.
 N: Phil Townsend, London.
 O: Peter Walduck, Milton Keynes.
 P: Neil Wheatley, while in Lytham St.Annes.

Norw, Da, Fr 1800-2130), 44444 at 2140 by Darren Beasley; WYFR via Okeechobee, Florida 21.615 (Eng 2000-2245), 33333 at 2045 by **Robin Harvey** in Bourne.

The conditions prevailing in the **17MHz (16m)** band have enabled the 100KW transmissions from Radio New Zealand International (Eng to E.Asia 1800-2110) to be received quite often in the UK. Reception is usually at its best during the first hour. At 1800 **Darran Taplin** (Brenchley) rated their signal as 44444, whereas **John Parry** (Northwich) quoted 34453 at 1948. In S.Africa, Dick Moon has been

listening to their broadcast to Pacific areas on 17.680 (Eng 0330-0610; Sat until 1000). He noted their signal as "strong" at 0512. This transmission was also monitored daily by Kenneth Reece, who noted variations in reception ranging from inaudible to 44444. Radio Australia's broadcast to E.Asia via Darwin 17.750 (Eng 0800-0900) was heard at 0800 by **Scott Caldwell** in Warrington.

Among the many other 16m broadcasts noted in the logs were Radio Romania Int. 17.720 (Eng to Australia, Pacific 0645-0715), rated as 44444 at 0655 by **Ted Agombar** in Norwich; AIR via Delhi 17.387 (Eng to Australia 1000-1100), 34333 at 1000 by David Wratten; Radio Moscow, USSR 17.565 (Eng to N.Africa 1000-1300), 55544 at 1040 by Ken Whayman; UAE Radio Dubai 17.865 (Ar, Eng to Europe 0615-1400), SIO 444 at 1330 by Kenneth Buck; Radio Romania Int. 17.745 (Eng to Middle East, S.Asia 1500-1526), 53223 at 1520 by John Sadler; Radio Sweden, Stockholm 17.880 (Sw, Fr, Eng to USA 1430-1600), 55555 at 1535 by David Edwardson; Vatican Radio, Rome

Equipment Used

Ted Agombar: Grundig Yacht Boy 700 + 20m random wire.
 Thomas Barnett: Kenwood R2000 + random wire.
 Leo Barr: Matsui MR4099 + internal antenna.
 Darren Beasley: Philips D2935 + Hexagon loop or a.t.u. + 10m random wire.
 Kenneth Buck: Lowe HF225 + random wire or home-built t.r.f. set + loop.
 Andy Cadier: Saisho SW500 + 40m random wire or Datong active antenna.
 Scott Caldwell: Saisho 2000 + random wire.
 Derek Carter: Matsui MR4099 + 30m end fed Zepp.
 Jim Cash: Sony ICF 2001D + AN-1 active antenna.
 Robin Clark: Saisho SW5000.
 Phil Cooper, Guernsey: Sony ICF 7600DS portable.
 John Coulter: Yaesu FRG-7 + random wire.
 Adrian Don: Philips 752 digital car radio + whip antenna on car.
 Peter Easton: Kenwood R5000 + ERA BP34 audio filter + trap dipole.
 David Edwardson: Trio R600 + trap dipole 22m long.
 Alf Gray: Codar CR70 + PR30 + Codar a.t.u. + Ex-Army rod antenna.
 Bill Griffiths: Matsui MR4099 + Sony AN-1 active antenna or Sony ICF 2002.
 Simon Hamer: Lafayette HE30 + "Soooper Loop" or Grundig S1400 + 19m wire.
 Robin Harvey: Matsui MR 4099 + s.w. loop.
 Mark Hattam: Drake R7A + RV-75+ Sherwood SE3 + Datong FL3.
 Francis Hearne: Sharp GFA3 cassette radio + random wire or Yoko portable.
 John Hepburn, Ashington: Yaesu FR-50B + random wire or Vega Selena 215.
 Simon Holland: Sangean ATS-803A portable + built-in whip.
 Sheila Hughes: Panasonic DR48 + 15m inverted L or Vega 206 portable.
 Rhoderick Illman: Sony ICF-7600DS + 23m random wire.
 David Middlemiss: Yaesu FRG-7 + random wire.
 George Millmore: Tatung TMR-7602 portable or Raçal RA17L + loop.
 Dick Moon: Icom R-70
 John Nash: Kenwood R5000 + random wire.
 Ike Odoom: Philips D2935 portable.
 Fred Pallant: Trio R2000 + random wire in loft.
 John Parry: Realistic DX-400 + 33m random wire.
 Roy Patrick: Lowe HF-125 + 20m wire.
 Ron Pearce: Domestic McMichael all-wave mains radio, circa 1936.
 Philip Rambaut: Int. Marine Radio R.700M + random wire.
 Kenneth Reece: Icom R9000 or Kenwood R5000 or R2000 + delta loop.
 Alan Roberts: Panasonic RF-B40 + whip.
 John Sadler: Realistic DX-400 or DX100L + a.t.u. + folded dipole.
 Tim Shirley: Trio R600 + loop.
 Chris Shorten: Matsui MR 4099 portable + 10m wire.
 Alan Smith: Matsui MR4099 + Mizuho KX-3 a.t.u. + dipole.
 Cliff Stapleton: Trio R1000 + dipole for 19m.
 John Stevens: Hammarlund HQ 180 or Icom R70 + random wire.
 Darran Taplin: Lowe HF225 or Eddystone 680X + Global a.t.u. + 30m random wire.
 Phil Townsend: Lowe SRX-30 + a.t.u. + random wire + SEM i.w. convertor.
 Ted Walden-Vincent: Grundig Satellit 1400 + random wire.
 Peter Walduck: Saisho SW5000 + built-in whip.
 Ken Whayman: Realistic DX-440 + 15m inverted L or Saisho SW2000 + whip.
 Neil Wheatley: Sangean ATS-803 or Clarion car radio + 1m wire.
 Jim Willett: RCA AR77 or Trio 9R-59DS + Diawa CL-22 a.t.u. + X dipole in loft.
 Julian Wood: Trio R2000 + random wire.
 David Wratten: Philips D2999 + loop or Trio R2000 + a.t.u. + 30m random wire.

17.710 (Eng to Africa 1730-?), SIO 444 at 1758 by Philip Rambaut; BBC via Ascension Island 17.880 (Eng to S.Africa 1745-1845), SIO 344 at 1800 by **Thomas Barnett** in Slough; Radio Netherlands via Bonaire, Ned. Antilles 17.605 (Eng to Africa 1830-1925), 45334 at 1900 by Darren Beasley; Radio RSA Johannesburg, S.Africa 17.765 (Eng to Europe, W.Africa 1900-1956), 34343 at 1900 by Cliff Stapleton; VOA via Bethany, USA 17.800 (Eng to W.Africa 1600-2200), 54433 at 1919 by Andy Cadier; RCI via Sackville, E.Canada 17.820 (Eng, Fr to Africa 1800-2200), SIO 444 at 2125 by David Middlemiss.

Quite a number of the **15MHz (19m)** broadcasts to areas outside Europe were mentioned in the reports: RFO Papeete, Tahiti 15.170 (Fr, Tah to Oceania 1600-0930), noted as 23332 at 0452 by Kenneth Reece; Radio Moscow via Alma Ata, USSR 15.280 (Chin, Can to C.Asia 0900-1500), SIO 455 at 1015 by Neil Wheatley; SRI via Schwarzenburg, Switzerland 15.570 (Eng to S.E.Asia 1100-1130), 54434 at 1100 by Ted Agombar; AIR via Aligarh, India 15.020 (Sin to Asia 1300-1500), SIO 322 at 1415 by Alan Smith; Radio

Prague, Czechoslovakia 15.155 (Eng to E.Africa, Middle East 1430-1457)-13232 at 1449 by Andy Cadier; Radio DW Cologne 15.595 (Eng to S.Asia 1600-1650), 54444 at 1602 by David Wratten; BBC via Kranji, Singapore 15.310 (Eng to S.Asia 1615-1830), SIO 322 at 1720 by Philip Rambaut; VOA via Tanger, Morocco 15.205 (Eng to N.Africa 1700-2200), SIO 444 at 1825 by Thomas Barnett; Radio Netherlands via Talata Volon, Madagascar 15.560 (Eng to Africa 1830-1925), 33233 at 1849 by Leo Barr; Radio Portugal, Lisbon 15.250 (Eng to ? 2000-2030), 32222 at 2003 by Robin Harvey; Radio Australia 15.465 (Eng to ?, 2100-?), 43434 at 2100 by Cliff Stapleton; also on 15.130, rated as 12221 at 2107 by **Jim Cash** in Swanwick. Their broadcast in Chinese to C.Asia via Darwin 15.170 (2200-0000) was logged as 24533 at 2215 by David Wratten.

Relatively few of the broadcasts to Europe were noted: VOIRI Tehran, Iran 15.084 (Sp, Ar, Fa, Tur, Fr to Europe, USA - 24Hrs), rated as SIO 444 at 1155 by **John Coulter** in Winchester; WWCR Nashville, USA 15.690 (Eng 1300-1800), 43433 at 1527 by Darran Taplin; UAE Radio Dubai

Freq kHz	Station	Location	Time (UTC)	DXer
USA				
770	WABC	New York, NY	0214	C
1010	WINS	New York, NY	0150	B,C
1020	KDKA	Pittsburg, PA	0500	B
1120	KMOX	St.Louis, MD	0115	B
1210	WCAU	Philadelphia, PA	0130	B,C
1510	WKUU	Boston, MA	0305	C
Canada				
590	VOCM	St.John's, NF	0012	C
680	CIYQ	Grandfalls, NF	0030	C
820	CHAM	Hamilton, ON	0330	B
930	CJYQ	St.John's, NF	2350	C
960	CFFX	Kingston, ON	(?)	B
1070	CHOK	Sarnia, ON	2330	B
1220	CKCW	Moncton, NB	0142	C
1570	CKLM	Lavel, PQ	0130	C
C.America & Caribbean				
1610	Caribbean Beacon	The Valley, Anguilla	0100	C
South America				
1220	R.Globo	Rio, Brazil	0200	A,C

DXers:

A: Ron Pearce, Bungay.
 B: Tim Shirley, Bristol.
 C: Jim Willett, Grimsby.

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Medium Wave DX Chart

Freq kHz	Station	Country	Power (kW)	DXer	Freq kHz	Station	Country	Power (kW)	DXer
531	Leipzig	Germany (E)	100	L,S	936	Radio Bremen	Germany (W)	100	C*,L,T
531	Beromunster	Switzerland	500	M	936	Lvov	USSR	500	L*,O*
540	BRT-2 Wavre	Belgium	150/50	L,T	945	Toulouse	France	300	C*,L*,M
540	Conamara	Ireland (S)	2	H	954	RCE Madrid	Spain	20	L*
540	Sidi Bannour	Morocco	600	L*	963	Pori	Finland	600	G*,K*,L,T*
549	Les Trembles	Algeria	600	L*	963	RRE Seixal	Portugal	10	N*
549	DLF Bayreuth	Germany (W)	200	G,L,O*,T	972	NDR/WDR Hamburg	Germany (W)	300	A*,L,T*
558	Espoo	Finland	100	L*	981	Alger	Algeria	600/300	L*,N*,U*
558	DDR/F Rostock	Germany (E)	20	A*	990	RIAS Berlin	Germany (W)	300	C*,L*
567	West Berlin	Germany (W)	100	A*,L*	990	SER R.Bilbao	Spain	10	M,T*
567	RTE-1 Tullamore	S.Ireland	500	G,L,T	990	BBC-Redmoss	UK	1	F,G*
576	Stuttgart	Germany (W)	300	G,L,T	999	Hoyerswerda	Germany (E)	20	C*,M
585	FIP Paris	France	8	C*,L,T	1008	Hilversum-5 Flevo	Holland	400	L,M*,T
585	RNE-1 Madrid	Spain	200	A*,L*,T*	1017	SWF Wolfsheim	Germany (W)	600	A*,C*,L*,T*
585	BBC-R Scot Dumfries	UK	2	F	1035	Prog.3 Lisbon	Portugal	120	L*,R*
594	Pleven	Bulgaria	250	L*	1044	DDR-1 Burg	Germany (E)	250	L*,T*
594	HRF Frankfurt	Germany (W)	400	G,L*,T	1044	Sebaa-Aioum	Morocco	300	L*
594	Oujda-1	Morocco	100	L*	1062	Kalundborg	Denmark	250	G*,J*,L
594	Muge	Portugal	100	M	1071	Brest	France	20	L
603	Lyon	France	300	M	1080	Katowice	Poland	1500	L*
603	Sevilla	Spain	20	L*	1080	La Coruna	Spain	3	H
603	BBC-R4 Newcastle	UK	2	G,L	1089	BBC-R1 Moorside EdgeUK	UK	150	F,L
612	RTE-2 Athlone	S.Ireland	100	A*,G,L,M,O,T	1089	BBC-R1 Westerglen	UK	50	G*
612	Lerida	Spain	10	L*	1098	Bratislava	Czechoslovakia	750	L*
621	RTBF-1 Wavre	Belgium	300	G,L,T	1125	La Louviere	Belgium	20	L
630	Vigra	Norway	100	L*,U*	1134	Valencia	Spain	10	L*
630	Tunis-Djedeida	Tunisia	600	L*	1143	Century R. Dublin	Ireland (S)	?	L*,N,U
639	Liblice	Czechoslovakia	1500	B,G*,J*,L*	1143	Kaliningrad	USSR	150	G*,L,T*
639	La Coruna	Spain	100	B,J*,L*,M	1161	Strasbourg (F.Int)	France	200	C*,L*
648	BBC Orfordness	UK	500	B,G*,L,L,M	1179	Solvesborg	Sweden	600	G*,J*,L*
657	Burg	Germany (E)	250	L,O*	1188	Kuurne	Belgium	5	T
657	RCE-2 Madrid	Spain	20	L*	1197	VQA via Munich	Germany (W)	300	M
657	BBC-R Wales Wrexham	UK	2	F,L	1197	BBC-R3 Bournemouth	UK	0.5	L
666	Bodenseesender	Germany (W)	300/180	G*,L*	1197	BBC-R3 Enniskillen	N.Ireland	1.0	M
666	ISBS Hofn	Iceland	4	H	1197	Minsk	USSR	50	O*
666	Lisboa	Portugal	135	M	1206	Bordeaux	France	100	L*
666	Barcelona	Spain	20	L*	1215	Lushnje	Albania	500	U*
675	Marseille	France	600	M	1215	BBC-R3 Moorside EdgeUK	UK	100	L
675	Hilversum-3 Lopic	Holland	120	B,J,L,T	1224	Vidin	Bulgaria	500	L*,S*
684	RNE-1 Sevilla	Spain	250	L*,M	1233	Prague	Czechoslovakia	400	L*
702	Monte Carlo	Monaco	300	L*	1251	Huisberg	Netherlands	10	L
711	Rennes 1	France	300	B,L,M	1260	SER San Sebastian	Spain	10	L*
711	Heidelberg	Germany (W)	5	C*	1269	Neumunster	Germany (W)	600	A*,C*,L,M
720	BBC-R4 Lisnagarvey	N.Ireland	10	A*,I	1278	Strasbourg	France	300	L*
720	BBC-R4 Londonderry	N.Ireland	0.25	B	1278	RTE-2 Dublin/Cork	Ireland (S)	10	M
720	BBC-R4 Lots Rd London	UK	0.5	F,L	1287	Litomysl/Liblice	Czechoslovakia	300/200	J*,L*,M
729	RTE-1 Cork	S.Ireland	10	A*,B	1296	BBC Orfordness	UK	500	L,M
729	Oviedo	Spain	50	D*,L*,M	1305	Marche	Belgium	10/5	M
738	Paris	France	4	L	1314	Kvitsoy	Norway	1200	K*,L
738	Poznan	Poland	300	H*,L*	1323	R.Moscow v. Leipzig E.Germ.	Italy	150	T*
738	RNE-1 Barcelona	Spain	250	L*,M	1322	Rome	Italy	300	J*,T*
747	Hilversum-2 Flevo	Holland	400	B,J*,L,M,T	1341	BBC Ulster LisnagarveyNI	France	F,L,T	100
756	Brunswick	Germany (W)	800/200	B,C*,L*,M,T*	1350	Nancy/Nice	France	100	L*,T*
765	Sottens	Switzerland	500	B,L*,M	1359	RBI Berlin	Germany (E)	250/100	J*,K*
774	RNE-1 San Sebastian	Spain	60	L*	1368	Manx Radio, Foxdale	I.O.M.	20	C*,L*,O*
783	Burg	Germany (E)	1000	B,C*,G*,L,T	1377	Lille	France	300	M,T
783	Kiev	USSR	100	O*	1386	Kaunas	USSR	1000	L*,T*
792	Prague	Czechoslovakia	60	L*	1386	R.Tirana via LushnjeAlbania	USSR	1000	L*,T*
792	Limoges	France	300	M	1404	Brest	France	20	L*,T*
792	Sevilla	Spain	20	L*	1413	RCE Zaragoza	Spain	20	L*
801	BRF via Munich	Germany (W)	420	L*,M	1422	Heusweiler	Germany (W)	600	U*
810	SER Madrid	Spain	20	L*	1422	Saarbrücken	Germany (W)	1200/600	J*,T*
810	BBC Scot Westerglen	UK	100	E*,F,G*,L*,M	1440	Marbach	Luxembourg	1200	E*,H*,L,M
819	Batra	Egypt	450	L*	1449	BBC-R4 Redmoss	UK	?	F
828	Corca Dhuibhne	Ireland(S)	1	I	1458	R.Tirana, Lushnje	Albania	500	J*,L*
837	Nancy	France	200	L	1467	TWR Monte Carlo	Monaco	1000/400	J*,J*,L*
846	Rome	Italy	540	L*,T*	1476	Wien-Bisamberg	Austria	600	J*,L*
855	Murcia	Spain	125	B,G*,L*	1485	Kelavik	Iceland	0.25	H
864	Paris	France	300	L,M,T	1485	BBC-R4 Carlisle	UK	1	F
873	AFN Frankfurt	Germany (W)	150	G*,M*	1494	Leningrad	USSR	1000	J*,L*,O*
873	R Ulster, EnniskillenUK	UK	150	G*,M*	1512	BRT Wolvenstem	Belgium	600	J*,L*,M,P*,T*
882	BBC-Wales Washford	UK	70	F,G*,I,L,T	1521	Oviedo	Spain	5	M*
891	Algiers	Algeria	600/300	H	1530	Vatican Radio, Rome	Italy	150/450	L*,M*,T*
891	Hulberg	Holland	20	L*	1539	DLF Mainflingen	Germany (W)	700	L*,M
908	BBC-R2 Moorside EdgeUK	UK	20	F,I,L	1557	R.Vilnius, Kaunas	USSR	75	H
908	BBC-R2 Westerglen	UK	50	G*	1566	Sarnen	Switzerland	300	L*,M
918	R.Intercont. Madrid	Spain	20	L*	1584	Pamplona	Spain	2	M
927	BRT-1 Wolvenstem	Belgium	300	B,L,T	1593	Langenberg	Germany (W)	400/800	L*,T*

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

15.435 (Eng 1600-1645), SIO 333 at 1640 by Ted Walden-Vincent; Radio Sophia, Bulgaria 15.330 (It, Fr, Eng, Ger 1700-1930), 54555 at 1840 by John Sadler; Voice of Israel, Jerusalem 15.640 (Russ?) 2000-2030, SIO 333 at 2015 by Alf Gray in Birmingham; Voice of Vietnam, Hanoi 15.010 (Eng, Fr 2030-2130), 33443 at 2100 by Robin Clark.

Radio Australia is now taking advantage of the generally good propagation conditions prevailing in the 13MHz (22m) band. During the early morning they occupy 13.700 (Eng to ? 0600-0800). At best, Kenneth Reece rated their transmission as 43433 at 0729. Later, they use 13.740 (Eng to Pacific area 1600-1755), rated as 43333 at 1600 by Derek Carter in Cambridge. Other broadcasters using the band include Radio Moscow, USSR 13.665 (Eng to W.USA 0500-

0800), noted as "noisy" at 0750 by John Nash in Brighton; BRT Brussels 13.675 (Eng, Du to ? 7-1130), 34323 at 0900 by Sheila Hughes; SRI via Sottens, Switzerland 13.635 (Eng to E.Asia 1100-1130), 54555 at 1110 by Chris Shorten; Radio Austria Int. Vienna 13.730 (Ger, Fr, Eng, Sp to Europe 0400-1700), 55555 at 1155 by Andy Cadier; Radio Nederlands via Flevo 13.770 (Eng to Europe, S.W Asia 1430-1525), 45554 at 1521 by David Edwardson; Voice of the UAE in Abu Dhabi 13.605 (Ar to ?), SIO 555 at 1930 by Kenneth Buck; Radio Kuwait, Sulaibiyah 13.610 (Eng to Europe, USA 1800-2100), 55355 at 2012 by Darren Beasley; Radio Nederlands via Flevo 13.700 (Eng to W.Africa 2030-2125), 44333 at 2035 by Jim Cash; WHRI Noblesville, USA 13.760 (Eng to Europe 1700-0000), SIO 222 at 2143 by Julian Wood in

Elgin; WCSN Scotts Corner, USA 13.770 (Eng to Europe 2000-2155), 55555 at 2100 by Ken Whayman.

Some of the 11MHz (25m) broadcasts to Europe stem from Vatican Radio, Rome 11.740 (It, Sp, Port, Fr, Eng, Ger, Pol 1330-1600) rated as 44444 at 1345 by Sheila Hughes; Voice of the Mediterranean, Malta 11.925 (Eng 1400-1500), 44433 at 1400 by Darran Taplin; Radio Beijing, China 11.575 (Eng 1700-1755), SIO 333 at 1708 by Alan Smith; Radio Pakistan, Islamabad 11.570 (Eng 1720-1800), SIO 555 at 1749 by Philip Rambaut; Radio Bangladesh, Dacca 11.862 (Eng 1815-1900), 35333 at 1815 by Roy Patrick; Radio Finland via Pori 11.755 (Eng 1830-1930), SIO 333 at 1830 by David Middlemiss; Radio Budapest, Hungary 11.910 (Eng 1830-?), SIO 444 at 1835 by Thomas Barnett; Radio Afghanistan, Kabul 11.830 (Eng 1830-

DXers:

- A: Leo Barr, Sunderland.
- B: Darren Beasley, Bridgwater.
- C: Scott Caldwell, Warrington.
- D: Jim Cash, Swanwick.
- E: Robin Clark, Plymouth.
- F: Adrian Don, Whitley Bay.
- G: Peter Easton, Edinburgh.
- H: Mark Hattam, while in N.W. Sotland.
- I: Simon Holland, Douglas, I.O.M.
- J: Sheila Hughes, Morden.
- K: Rhoderick Illman, while in Oxted.
- L: George Millmore, Wootton I.O.W.
- M: Ike Odoom, Glasgow.
- N: Roy Patrick, Derby.
- O: Tim Shirley, Bristol.
- P: Chris Shorten, Norwich.
- Q: Alan Smith, Northampton.
- R: John Stevens, Largs.
- S: Darran Taplin, Tonbridge.
- T: Phil Townsend, London.
- U: Neil Wheatley, while in Lytham St. Annes.

1930), 44444 at 1910 by Darren Beasley; Voice of the UAE in Abu Dhabi 11.965 (Ar 1600-2130), SIO 555 at 1930 by Kenneth Buck; Radio Damascus, Syria 12.085 (Eng 2005-2105), SIO 444 at 2015 by Alf Gray;

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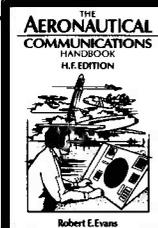
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SEEN & HEARD

Tropical Band Chart

Freq kHz	Station	Country	Time (UTC)	DXer					
2.420	R.Sao Carlos	Brazil	0158	O	4.845	R.Nacional Manus	Brazil	0206	I
2.475	PBS Zhejiang	China	2200	X	4.845	ORTM Nouakchott	Mauritania	2225	E.Q
2.560	Xinjiang	China	2215	H.X	4.850	R.Yaounde	Cameroon	2110	E.K.L.Q.V.X
3.215	R.Orange	S.Africa	1900	E.J.X	4.850	Taiwan 2, Beijing	China	1723	U
3.220	CPBS 1, Beijing	China	1900	L.Q	4.850	R.Tashkent 2	USSR	1930	C.L.Q
3.220	R.Togo, Lome	Togo	2120	L.Q	4.865	PBS Lanzhou	China	2257	E.H.I
3.230	R.Nepal	Kathmandu	0020	X	4.865	Caracol	Colombia	0703	E
3.230	ELWA Monrovia	Liberia	2120	E.Q	4.865	Y of Cinaruco	Colombia	0214	E.H.I
3.240	TWR	Swaziland	1845	J.X	4.870	R.Cotonou	Benin	2115	C.E.I.L.Q.V
3.255	BBC via Maseru	Lesotho	1800	X	4.880	SABC Radio 5	S.Africa	1840	E.H.Q.V.X
3.270	SWABC 1, Namibia	S.W.Africa	1900	J	4.885	R.Clube do Para	Brazil	0030	E.H
3.295	AIR New Delhi	India	1721	L	4.885	Ondas del Meta	Colombia	0623	L
3.300	R.Cultural	Guatemala	0549	E	4.885	Voice of Kenya	Kenya	1900	Q
3.315	AIR Bhopal	India	1729	L	4.890	RFI Paris	via Gabon	0505	E
3.320	R.Suid Afrika	S.Africa	1845	J	4.895	Voz del Rio Arauca	Colombia	0447	E
3.335	R.Alvorada	Brazil	0212	O	4.895	R.Moscow (Kafinin)	USSR	2305	E.V
3.365	GBC Radio 2	Ghana	1855	Q.X	4.900	Y de la Rev.Conakry	Guinea	2140	I.Q
3.905	AIR Delhi	India	1841	E.J	4.905	R.Nat.N'djamena	Chad	2120	C.E.J
3.915	BBC Kranji	Singapore	2000	E.J.L.R.V.X	4.905	R.Beijing	China	2231	H
3.925	AIR Delhi	India	1648	L	4.910	R.Zambia, Lusaka	Zambia	1955	Q
3.945	R.Vanuatu, Port Vila	?	0402	L	4.915	R.Anhanguera	Brazil	0618	E.I
3.950	PBS Qinghai Xining	China	2320	L	4.915	R.Ghana, Accra	Ghana	2115	A.C.E.P.Q
3.955	BBC Daventry	England	2036	C.E.F.N.V	4.920	Voice of Kenya	Kenya	1755	I.Q
3.960	RFE/RI Munich	W.Germany	2031	E	4.925	ABC Brisbane	Australia	1940	L.O
3.965	RFI Paris	France	1859	A.B.E.V	4.925	R.Nacional, Beta	Eq.Guinea	1755	E.Q
3.970	RFE Munich	W.Germany	2100	C.E	4.930	R.Moskva 2(Ashkhabad)	USSR	2125	C.E.V
3.975	BBC Skelton	England	1923	E	4.935	Voice of Kenya	Kenya	1755	E.O.Q.V
3.980	VOA Munich	W.Germany	2000	C.E.V.W	4.940	R.Kiev 2	USSR	1940	C.E.G.Q
3.985	R.Beijing, China	via SRI Berne	2105	C.D.E.F.N	4.940	R.Continental,Barinas	Venezuela	0221	L
3.985	SRI Berne	Switzerland	1835	C.E.T.V	4.945	Caracol, Neiva	Colombia	0629	E
3.990	VOA Monrovia	Liberia	0611	E	4.958	R.Baku	USSR	2128	C.E.L
3.990	RFE Munich	W.Germany	2035	E	4.970	PBS Xinjiang	China	1628	L
3.995	RAI Rome	Italy	1540	M	4.970	R.Rumbos, Caracas	Venezuela	0457	E
3.995	DW Cologne (Julich)	W.Germany	2008	E.K.V.W	4.975	R.Ilganda, Kampala	Ilganda	1940	E.Q
4.055	R.Moskva 1 (Kafinin)	USSR	1830	E	4.980	PBS Xinjiang	China	2300	V
4.220	PBS Xinjiang	China	2323	H.L	4.980	Ecos del Torbes	Venezuela	2245	E.I.J.L.M.S.V
4.330	PBS Xinjiang	China	0040	H	4.985	R.Brazil Central	Brazil	0600	E.H
4.500	Xinjiang	China	2309	E.H.I	4.990	AIR via Madras	India	0030	S.X
4.735	Xinjiang	China	2326	E.H.L.S	4.990	FRCN Lagos	Nigeria	2050	B.E.H.I.J.Q.V
4.740	R.Afghanistan	via USSR	1840	E.J.L.Q.X	4.990	R.Moscow (Yerevan)	USSR	2213	C.E.L.V
4.755	Sani Radio	Honduras	0220	X	5.005	R.Nacional, Beta	Eq.Guinea	1940	C.E.Q.S
4.760	Yunnan Kuming	China	2327	L	5.005	R.Nepal, Kathmandu	Nepal	0012	L
4.760	ELWA Monrovia	Liberia	2220	E.L.Q.V.X	5.010	R.Malagasy	Madagascar	0247	L
4.765	R.Moscow	via Cuba	0600	E.L	5.010	SBC Singapore	Singapore	1430	J.L
4.770	FRCN Kaduna	Nigeria	1955	H.L.Q.X	5.020	La Voix du Sahel	Niger	2050	E.Q
4.775	R.Gabon, Libreville	Gabon	1935	E	5.025	R.Rebelde, Habana	Cuba	0500	E
4.775	RRI Jakarta	Indonesia	1849	L	5.030	R.Catolica, Quito	Ecuador	0039	L
4.795	R.Moscow (Kharkov)	USSR	2012	C.E.I.V	5.035	R.Bangui	C.Africa	2213	E.Q
4.795	R.Peace & Progress	USSR	2100	E.I.M	5.035	R.Alma Ata	USSR	2057	E
4.800	LNBS Lesotho	Maseru	1821	E	5.040	PBS Fujian, Fuzhou	China	2300	J
4.805	R.Nac.Amazonas	Brazil	2330	E.O.X	5.040	R.Tbilisi 1	USSR	1636	E.I
4.815	R.diff TY Burkina	Ouagadougou	0340	E.H.L.X	5.044	R.Impacto	Costa Rica	0038	E.I.L.M.X
4.820	La Voz Evangelica	Honduras	0327	L	5.045	R.Cultura do Para	Brazil	0551	A
4.822	R.Atahualpa	Peru	0533	L	5.047	R.Togo, Lome	Togo	2013	E.J.Q
4.825	Y of Selva	Peru	0135	L	5.050	SBC Singapore	Singapore	1430	J
4.830	Gaborone	Botswana	1840	L	5.050	R.Mundial, Caracas	Venezuela	0300	X
4.830	R.Tachira	Venezuela	0100	E.J.Q.V.X	5.055	Faro del Caribe	Costa Rica	0555	E
4.832	R.Reloj	Costa Rica	0520	E.H.I.L.M.X	5.055	RFO Cayenne(Matoury)	French Guiana	0600	E.X
4.835	R.Tozulutan, Coban	Guatemala	0143	E.L.U.V	5.055	TWR Manzini	Swaziland	0357	E
4.835	RTM Bamako	Mali	2220	J.L	5.060	PBS Xinjiang	China	2335	H.L
4.840	PBS Harbin	China	2135	A.C.E.H.I.K.L.Q	5.075	Caracol Bogota	Colombia	0015	E.H.I.S.I.U.X
4.840	R.Valera, Trujillo	Venezuela	0145	Q	5.260	R.Alma Ata 2	USSR	2055	E.L
				E.M	5.290	R.Moundou	Chad	0530	X
					5.290	R.Moskva 1(Krasnoyarsk)	USSR	1643	L
					5.440	PBS Xinjiang	China	0040	H.L

DXers:

- A: Leo Barr, Sunderland.
- B: Darren Beasley, Bridgwater.
- C: Andy Cadier, Folkestone.
- D: Derek Carter, Cambridge.
- E: Jim Cash, Swanwick.
- F: Robin Clark, Plymouth.
- G: John Coulter, Winchester.
- H: David Edwardson, Wallsend.
- I: Bill Griffith, London.
- J: Simon Hamer, New Radnor.
- K: Robin Harvey, Bourne.
- L: Mark Hattam, while in N.W.Scotland.
- M: Sheila Hughes, Morden.
- N: Rhoderick Illman, Thumrait, Oman.
- O: Dick Moon, George, Rep. S. Africa.
- P: Ike Odoom, Glasgow.
- Q: Fred Pallant, Storrington.
- R: John Parry, Northwich.
- S: Roy Patrick, Derby.
- T: Chris Shorten, Norwich.
- U: Alan Smith, Northampton.
- V: Darran Vincent, Brechley.
- W: Ted Walden-Fincent, Great Yarmouth.
- X: Jim Willett, Grimsby.

AIR via Aligarh, India 11,620 (Eng, Hi 1845-2230), SIO 222 at 2129 by Julian Wood. Also noted were RBI Berlin, GDR 11.790 (Hi to Asia 1315-1345), rated as 54344 at 1315 by Chris Shorten; Radio Romania Int, Bucharest 11.940 (Eng to S.Asia, Middle East 1500-1530), 13232 at 1500 by Andy Cadier; Radio Australia via ? 11.800 (Eng to ?-?), 32222 at 2050 by Jim Cash; Voice of Israel, Jerusalem 11.605, SIO 333 at 2245 by Francis Hearne in Bristol; Radio Japan via Moyabi, Gabon 11.835 (Jap, Eng 2200-0000), 34444 at 2343 by Leo Barr.

Many broadcasters use the **9MHz (31m)** band to reach listeners in Europe. They include the BBC via Rampisham, UK 9.410 (Eng 0300-0915), noted as 54444 at 0530 by Ted Agombar; AVR Sines, Portugal 9.670 (Eng 0900-1000 Sun only), heard at 0915 by Scott Caldwell; IRRS Milan, Italy 9.860 (Eng 0800-1130 Sun Only), 55555 at 1030 by Bill Griffith; Radio Netherlands via Flevo 9.715 (Eng 1130-1225), SIO 555 at 1130 by Neil Wheatley; BRT Brussels 9.925 (Fr ?-?), SIO 333 at 1210 by Ted Walden-Vincent; Voice of Vietnam, Hanoi 9.840 (Eng to Europe, N.Africa 1600-1630), 33343 at 1612 by Andy Cadier; Radio Jordan, Amman 9.560 (Eng 1420-2200), SIO 444 at 1700 by

Kenneth Buck; Radio Kiev, USSR 9.600 (Eng 1800-?), 44444 at 1800 by Sheila Hughes; Radio Romania Int. 9.835 (Eng 1830?-?), 54444 at 1830 by David Wratten; Radio Yugoslavia, Belgrade 9.660 (Eng 1830-?), 53233 at 1840 by John Sadler; Radio Pyongyang, N.Korea 9.345 (Eng to Europe 2000-2050), 43343 at 2030 by Chris Shorten; Radio Tirana, Albania 9.480 (Eng 2130-2156), 55555 at 2145 by **Phil Cooper** in Guernsey.

Some of the 31m broadcasts to other areas also reach the UK. Those noted were Radio Netherlands via Bonaire, Ned.Antilles 9.630 (Eng to New Zealand 0730-0825), logged as SIO 333 at 0815 by Francis Hearne; AIR via Aligarh 9.565 (Eng to Asia 1330-1500), logged as SIO 333 at 1350 by Alan Smith; Radio Australia via ? 9.710 (Eng to ? 1730?-?), 22222 at 1822 by Rhoderick Illman (in Oxted); Radio Budapest, Hungary 9.585 (Eng to USA? 2000-2025), 32322 at 2015 by Robin Harvey; Voice of Turkey, Ankara 9.445 (Eng 2200-?), 45444 at 2300 by Roy Patrick; also Voice of Greece, Athens 9.395 (Eng to USA 2335-2345), 44444 at 2339 by Leo Barr.

In the **7MHz (41m)** band John Coulter logged Radio Free Europe via Biblis, W.Germany 7.115 (Hung to E.Europe 0700-1800) as SIO 444 at 1108; David Wratten listened to Radio

Polonia, Warsaw 7.285 (Eng to Europe 1830-1855) at 1830 (SINPO 45444); John Parry noted the Voice of Greece, Athens 7.430 (Gr to Europe 2000-2050) as 44554 at 2020; Darren Beasley heard Radio Korea, Seoul 7.550 (Eng to E.Africa, Middle East 2030-2130) at 2045 (43333); Phil Cooper heard AIR via Delhi 7.412 (Hi, Eng to Europe 1845-2230) at 2138 (44445); Alan Smith noted Radio Beijing, China 7.935 (Chin to N.W.China 2000-0100) as SIO 333 at 2150.

Some of the **6MHz (49m)**

broadcasts to Europe originate from BRT Brussels 6.035 (Du, Ger 0810-1130), noted as 54555 at 0810 by Chris Shorten; Radio Austria Int, Vienna 6.155 (Eng 0830-0855), SIO 333 at 0830 by Francis Hearne; BBC via Daventry, UK 5.975 (Eng 0900-1515); Radio Netherlands via Flevo 5.955 (Eng 1130-1225), 55555 at 1145 by Robin Clark; RFI Paris 6.175 (Eng 1600-1700), 54544 at 1600 by Ken Whayman; Radio Polonia, Warsaw 6.135 (Eng 1600-1630), 44444 at 1605 by David Wratten; Radio Vilnius, Lithuania 6.100 (Eng ?-2155), 22222 at 2000 by Rhoderick Illman (in Oxted).

Station Addresses

BBC Radio Sussex, Marlborough Place, Brighton, East Sussex BN1 1TU.

ILR Radio Tees, 74 Dovecot Street, Stockton-on-Tees, Cleveland, TS18 1HB.

RNB Radiobras, Caixa Postal 04-0340, 70323 Brasilia, Brazil.

Radio RSA, P.O.Box 4559, Johannesburg 2000, S.Africa.

Radio Tirana, External Service, Rrugasmail Qemali, Tirana, People's Republic of Albania.

WYFR, Family Radio, 290 Heegenberger Road, Oakland, California 94621, USA.



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