Short Wave Magazine

£1.60

FEBRUARY 1990

SWM SWM SWM SWM SWM

REVIEWED THIS MONTH

FAIR MATE HP-100 HAND-HELD SCANNING RECEIVER

PLUS

I BECAME A SHOPKEEPER

Recollections of a Pioneer Wireless Dealer

AND

Regular Features For Airband, Scanning and Broadcast Enthusiasts

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For The Radio Listener

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VOL 48 ISSUE 2 FEBRUARY 1990

ON SALE JANUARY 25th

MARCH ISSUE ON SALE
FEBRUARY 22nd

|28| **Fair Mate HP-100E Scanner**

Cover The Fair Mate HP-100E is as hand-held scanner with a difference. It boasts one thousand memories! Jack Aldridge has put this latest creation through its paces for you.

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SEEN & HEARD

GOOD LISTENING

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

With reference to the letters from Mr E. S. Walden-Vincent, although the gentleman in question may have been a little blunt the fact remains that radio amateurs do NOT use Grundig receivers.

If our friend reads SWM *and/or* PW *he will see the type of equipment used by radio hams.*

I have two Philips portables for listening to s.w. broadcast stations where good audio is required, but I also have a Trio R1000 for DXing for amateurs where the audio quality is not as important as being able to hear the chap, weak as he might be.

Trio (Kenwood) receivers are excellent performers on s.s.b. with a length of wire slung anywhere. I hope to be able to purchase a R2000 in the near future.

Grundig are good quality domestic portables, and although now with s.s.b.(?) and digital readout of frequency they do not compare with communications receivers such as ICOM, Kenwood, Yaesu, etc., for pulling in weak amateurs and DX generally.

CLIFF STAPLETON
TORQUAY
DEVON

Dear Sir

It is unfortunate that Mr Palmer's letter in the December 89 SWM *criticises what I did not say and ignores what I did.*

Nowhere in my original letter is there any implication that the BBC is the 'best computer for the job'. What I did say is that, with its excellent facilities for interfacing directly with the outside world, it is more suitable for this purpose than a PC, which requires additional hardware. There is, surely, nothing too controversial about this.

The prices he quotes for a BBC are over the top and noise is less of a problem than with several other makes. Indeed, this very morning a delighted user of one of our BBC systems telephoned us to say that he was getting excellent FAX printouts from an S0 (yes, zero) signal.

Yes, any computer can be interfaced to a radio for any purpose but someone has to design and build the hardware and write the software. Most people do not have the ability and time to do this themselves and want an off-the-shelf product. Whereas simple software can be produced quite easily, a high quality product takes a lot of time and effort.

The main point of my original letter was to say that, because of the limited market, we can only afford to write really good software for the most popular computers. This is not a technological decision but an economic one. The Atari ST may well be the most amazing machine imaginable but it is still several weeks since we last had an enquiry about it. In contrast, the BBC remains very popular among radio-minded people (even the author of the SWM *'Decode' column uses one), which is why we support it and why the second-hand price is higher than many other, less popular computers.*

I, too, would encourage prospective computer purchasers to have a good look round to see what's available. However, I would also advise them to make sure that the software which they require, at the standard they require, really is available BEFORE they part with their cash.

RICHARD WILMOT
TECHNICAL SOFTWARE
CAERNARFON
GWYNEDD

Dear Sir

I am writing to you in reference to a review I recently read in Short Wave Magazine. *The review, by Alan Gardener in his October 89 'Scanning' column, stated that the Jupiter (Yupiter) II pocket scanner has a first i.f. frequency of 705MHz. This is not correct. The first i.f. is 45MHz and second i.f. is 455kHz.*

I now note that in their advertisement in Short Wave Magazine *November 89, Waters & Stanton have quoted from this review - 'good circuit design and 705MHz i.f. helps to ensure freedom from unwanted image signals'.*

There is nothing one can do about companies who deliberately use quotes from magazine reviews for their own commercial advertising, but it would be appreciated that, if they do so, they print the correct information. One could say that they are misleading the general public into believing that one particular product is better, etc, than some other.

You might be curious to know what I have to do with scanners. I was the first person in the world to have a pocket scanner outside of the USA. At that time I was living in Sweden working with the USA company that manufactured the first pocket scanner. I have been manufacturing scanner, etc, accessories since 1974 and still do so. I also arrange scanner products from Japan for Nevada, and I have just received the world's first 1000 - channel pocket scanner, the Fairmate HP-100E, from Japan.

JAMES FINCH, SOLID STATE ELECTRONICS
SOUTHAMPTON

Dear Sir

I'm writing to say thank you to all the readers who replied to my plea for information concerning frequency to wavelength conversion. I was amazed by the response I got from all over the country.

KEVIN LANGTHORPE
WASHINGTON
TYNE & WEAR

Dear Sir

It's revealing to compare the cost of electronic equipment aimed at different sections of the market. When one does it becomes clear that many short wave RXs are considerably overpriced.

The Philips D2935 for instance costs £170 and offers continuous coverage with digital tuning from 146kHz to 30MHz plus f.m. For £10 less the same company will sell you their F1385 music centre with f.m. digital tuner (24 memories), turntable and pick-up, twin cassette deck, 20 watt stereo amplifier, five-band equaliser, and two speaker enclosures!

When a Grundig spokesman was asked on the BBC World Service Waveguide *programme how the industry could justify the price of small short wave receivers, he said that it was due to high frequency oscillators needing careful screening. When asked to justify the cost of large receivers costing in the region of £1000, he replied these employed motorised tuning which was expensive. I cannot help wondering how he would justify the low cost of motorised turntables and motorised cassette decks.*

It would appear that most synthesised receivers in the £150 price bracket offer marginally poorer performance than their analogue counterparts costing around £50. Thus one can easily pay £100 just for the digital facility which isn't much use unless you happen to know the exact frequency of the station you are looking for.

All is not lost though with the Sangean ATS830A synthesised model offering excellent performance at around £90 (see letter from R. Q. Marris SWM *August 1989 where it appears as the Matsui MR4099) while the Toshiba RP-FIIL as a small analogue receiver is, dare I say, well received by the reviewers at around £70.*

H. HUMPHRIES
NEWMARKET
SUFFOLK

WHAT'S NEW

New from Grundig

The new Cosmopolit from Grundig is a compact combination of a clock, world radio receiver and cassette recorder.

One of the features of the Cosmopolit is the clock facility which includes a multi-function display and a speech synthesiser which announces the time of day, or an alarm time setting at the touch of a button.

The alarm may be programmed to switch on the radio or cassette player, or to sound an alarm buzzer which builds up in volume. An internal sleep-timer turns the radio or cassette on up to an hour after it has been set. The alarm can also be used for timed recordings from the radio section, so for example, news broadcasts can be recorded automatically.

The analogue-tuned radio is capable of receiving f.m., stereo f.m., m.w. and seven short wave bands between 16 and 49 metres. Additionally, there is a built-in telescopic antenna for improved reception.

The cassette recorder/player has an automatic recording level control and allows the recording of live speech through a built-in microphone as well as recording from the radio. Simple controls make for easy play-back of pre-recorded cassettes and a tone switch ensures good sound reproduction. A three-digit tape counter helps the user locate any point on the tape and when the end of the cassette is reached, the tape drive automatically switches off, during both recording and play-back.

The amplifier supplies 400mW maximum power to the loudspeakers and 2 x 80mW though Cosmopolit's super-light earphones. Power is supplied by 3 x HP7 batteries and the clock is powered separately by a lithium battery. The Cosmopolit weighs only 520g (excluding batteries), measures a compact 200 x 85 x 40mm and comes complete with a carrying strap and case to make it a good travellers companion.

The price for the Cosmopolit is: £129.95.

Engineering Information

On Sunday 3 Decembr 1989, BBC Radio Derby began a stereo service from its f.m. transmitting sites at Derby, Sutton Coldfield and Stanton Moor. This follows the completion of extensive re-engineering work, not only at the transmitters but also at the main studio centre in Derby.

Radio Derby's f.m. frequencies are:
Sutton Coldfield - 104.5MHz
Derby - 94.2MHz
Stanton Moor - 95.3MHz

Note that the antenna rods should be horizontal in the case of Sutton Coldfield and Stanton Moor, but vertical in the case of the local Derby transmitter.

Snippets from Sweden

Turkey: The Voice of Turkey can now be heard in English to Europe 2100-2150 and 2300-2350 on 9.795MHz. The latter transmission can also be heard in North America on the additional frequency of 9.445MHz.

The Turkish Police Radio has apparently left the long used outlet on 6.340MHz and was recently noted at 0610 on the new frequency of 7.380MHz.

Sri Lanka: The Deutsche Welle relay station at Trincomalee is fully operational right now. English programmes to South Asia can now be heard 0200-0250 on 1.548, 9.615 and 11.835MHz. Other frequencies used by Deutsche Welle from Trincomalee include 6.17 and 7.225MHz. There has been some misunderstanding concerning Trans World Radio operations from Sri Lanka. These transmissions used transmitters rented from and operated by the SLBC, not the other way round.

Malta: IBRA Radio can now be heard in Englsih 2045-2115 on the new frequency of 7.110MHz

Lebanon: A radio station broadcasting material in support of General Michel Aoun was observed in the middle of November at 1520 on 5.978MHz. The station identified itself as Lebanese Radio (al-Idha'ah al-Lubnaniyah) and announced that it broadcast on a number of f.m. frequencies as well, and indicated it would continue broadcasting until 2200.

Gibraltar: The British Forces Broadcasting Service, BFBS, is now on the air 24 hours with two channels in Gibraltar. BFBS-1 operates on f.m. 89.45, 93.5 and 97.8MHz and BFBS-2 is on 99.5MHz.

Glasgow 1990

Glasgow 1990 - Cultural Capital of Europe. A prize draw will decide the winner of a seven day trip to Glasgow Scotland. This will include return air fares for two people from the winners country of origin to Glasgow, hotel accommodation for the winner and a guest in Glasgow and complimentary tickets to events taking place in Glasgow during the winners stay. A secondary prize of two 7-day Freedom of Scotland Rover Tickets will be offered.

Amateur Radio Clubs in the Greater Glasgow Area have joined forces in celebrating from club premises and cultural events during the year. The main callsign for Glasgow 1990 is **GM90CC**. The participating club callsigns are: GB0CCE, GB2CCE, GB4CCE, GB5CC and GB6CC.

Callsigns at other special events include: GB8CA - GB8CZ, GB1CCE, GB6CCE and GB8CCE.

To enter the draw you need one contact with GM9OCC on any band and any mode plus any four of the other stations. Send your QSL for GM9OCC only, via the GM Bureau or direct to PO Box 599, Glasgow G1 1EW. Quote the other four stations you have contacted on that QSL card. Please do not QSL individual GB callsigns involved in this event unless requested to do so by the station.

The draw will take place on 1 May 1990.

If you wish your card to be entered for the secondary prize draw, please mark 'Flying Scotsman' on your QSL card. This draw will take place on 1 June 1990.

Radio Stand

In the *SWM* offices, we get to see (and try) many of the radios that are sent in for review. One of the biggest problems we have is reading the display when the radio is sat on the desk, the solution usually is a years supply of *SWM* with the radio propped against them!

Well if you use a Sony 2001D, Matsui MR4009, Sangean ATS803A or one of the receivers modelled on these there is help at hand. Radio Aid have a kit available that you can build into a stand for your radio. Because there are external connections to the back of the radio, holes have been carefully made to accomodate the various leads. This way, the radio sits at a 37° angle to make it easy to see the display. The kit costs £11.00 plus £2 post and packing.

M.S. Rooke,
5 River Close,
Formby L37 6DJ

GRASSROOTS

Norfolk ARC have an Informal/ Committee meeting on January 31, Real Radio - Club Project discussion on February 7, Science For All G3PTB on the 14th and an Informal and Project Year Planning on the 21st. Wednesdays, 7.30pm in The Norfolk Dumpling, The Livestock Market, Harford, Norwich. Steve Sewell G4VCE on Mulbarton 78258.

Southdown ARS have ICS Electronics on February 5. 1st Mondays, 7.30pm in the Chaseley Home for Disabled Ex-Serviceman, Southcliff, Bolsover Rd. Wednesdays & Fridays in the Clubroom, Hailsham Leisure Centre, Vicarage Rd. C. R. Evans G4VOS on Heathfield 3168.

Todmorden & District ARS meet 1st & 3rd Mondays, 8pm in the Queen Hotel. February 6 is their AGM. Mrs E. Tyler G0AEC on Halifax 882038.

Stourbridge & District ARS have On Air/Natter night on February 5 and a Constructors Competition on the 19th. 1st & 3rd Mondays, 7.45pm at the Robin Woods Centre, Scotts Rd. Clive Williamson G4IEB on Stourbridge 392006.

Midland ARS have a Project Night G6DRN on February 20. 1st Tuesdays are Committee and 4th Tuesdays are RAYNET. Wednesdays is Morse G0FOC and Thursdays is Night on the Air/Natter night. Paul O'Connor G1ZCY on 021-443 5157.

Sutton & Cheam RS meet 3rd Fridays, 7.30pm in Downs Lawn Tennis Club, Holland Ave. Natter nights are 1st Mondays in Downs Bar. January 31 is a Committee Meeting at 35 Great Ellshams, Banstead and Februay 5 is a Natter Night. John Puttock G0BWV at 53 Alexandra Ave, Sutton, Cheam, Surrey SM1 2PA.

Coventry ARS have their Annual Dinner on January 26, Night on the Air and Morse Tuition on February 2/16 and a Quiz Night G7ASZ on the 9th. Fridays, 8pm at Baden Powell House, 121 St. Nicholas St., Radford. Neil Blair G7ASZ on Coventry 523629.

Torbay ARS have Club Nights on January 26/February 2/9th and their monthly meeting followed by Filters and Cavities on the 16th. Fridays, 7.30pm at the ECC Social Club, Highweek, Newton Abbot. Walt G3HTX on Paighton 526762.

South Bristol ARC have Planning evening - Lundy Expedition G0LHD on January 31. Wednesdays at the Whitchurch Folkhouse Association, Bridge Farm House, East Dundry Rd. Len Baker G4RZY on Whitchurch 832222.

Aylesbury Vale RS have a Surplus Equipment Sale on February 7. Hardwick Village Hall, 8pm. Geoff Groom on Buckingham 817496.

Yeovil ARC have a Discussion Night on February 1, Safety In Amateur Radio G3GC on the 8th, Preston School Videos on the 15th and a Natter Night on the 22nd. Thursdays, 7.30pm at The Recreation Centre, Chilton Grove. David Bailey G1MNM at 7 Thatchem Close, Yeovil BA21 3BS.

Hornsea ARC have Natter Nights on January 31/February 21, Plaisance to Mount Pleasent by Land, Sea and Air G7DNN on February 7 and QRP Setting and Operating G0DEB on the 14th. Wednesdays, 8pm at The Mill, Atwick Rd. Jeff G4IGY on (0964) 533331.

Halifax & District ARS have Junk Sale/Surplus Sale on February 20. 1st & 3rd Tuesdays, 7.30pm at the Running Man Public House, Pellon Lane. 1st Tuesdays are Noggin and Natter nights. David L. Moss G0DLM on Halifax 202306.

Mansfield ARS meet 1st & 3rd Thursdays, 7.30pm in The Polish Catholic Club, Windmill Lane, off Woodhouse Rd. February 1 is Home Brew Evening, bring you winter project, finished or not and the 15th is Fire Prevention Officer. Keith Lawson G4AAH on Mansfield 642719.

Wimbledon & District ARS meet 2nd & last Fridays, 7.30pm in St. Andrews Church Hall, Herbert Rd. January 26 is Night on the Air and February 9 is Test Your Own Equipment G6AJY. Nick Lawlor G6AJY on 01-330 2703.

Southgate ARC meet 2nd & 4th Thursdays, 7.45pm at Holy Trinity Church Hall (Upper), Winchmore Hill. February 8 is Sporadic E Propagation G3YLA and the 22nd is normal club meeting night. Brian Shelton on 01-360 2453.

Farnborough & District RS have the First Silver Jubilee Special Evening on February 28. 2nd & 4th Wednesdays, 7.30pm at the Railway Enthusiast Club Premises, off Hawley Lane (by M3 bridge). Tim FitzGerald G4UQE on Camberley 29231 or Adrian Hammon G0HNA on Farnborough 519773.

Loughton & District ARS have a Night on the Air on January 26 and a Homebrew VHF-HF Converter G0LWF on February 9. Room 14 of Loughton Hall, Rectory Lane, 7.45pm. John Ray G8DZH on 01-508 3434 after 7pm.

Stevenage & District ARS have PSST Wanna Buy a Rig G1ZZH on February 6 and Band Plans and Square Bashing G3HEA on the 20th. Ground Floor Lecture Room, 'D' Block, Ridgemond Training Enterprise, Ridgemond Park. Pete G0GTE on Stevenage 724991.

Derby & District ARS have a Return Visit to Derby High Power Signal Box on January 31 and a Junk Sale on February 7. Wednesdays, 7.30pm at 119 Green Lane. Kevin Jones G4FPY on Derby 669157.

Horndean & District ARC have Brains Trust on February 1. 1st Thursdays, 7.30pm at Merchistoun Hall, London Rd. Stuart Swain G0FYX on Havant 472846.

Bromsgrove & District ARC have Badger Boards G4YZO on February 9. 2nd Fridays at Avoncroft Art Centre. Trevor Harper G0KIN on Bromsgrove 33173.

Lothians RS meet 2nd & 4th Wednesdays, 7.30pm at the Orwell Lodge Hotel, Polwarth Terrace, Edinburgh. Peter GM4DTH at 21 West Maitland St., Edinburgh EH12 5EA.

Rugby ATS meet Tuesdays, 7.30pm at the Cricket Pavilion, outside Rugby Radio Station. February 13 is the QSL Bureau by G0BDF. Kevin Marriott G8TWH on Coventry 441590.

South East Kent (YMCA) ARC have Natter Nights on January 31/ February 7/21 and Chairmans Choice G0BPS on February 14. Wednesdays at the YMCA, Leyburne Rd. G8ZYZ on Dover 852533.

Cheshunt & District ARC have Natter Nights on January 31/ February 14, Computers, Databases & Examples G4IUZ on February 7 and Modifying PMR Equipment For Amateur Bands G3WFM on the 21st. Wednesdays, 8pm in the Church Room, Church Lane, Wormley. Roger Frisby G4OAA on Hoddesdon 464795.

Hasting Electronics & RC meet 3rd Wednesdays, 7.45pm at West Hill Community Centre, Croft Rd and Fridays, 7.30pm in the Clubroom, Ashdown Farm Community Centre, Downey Close. In February they have Wire Antennas For The Beginner by G3BDQ. Reg Kemp G3YYF at 7 Forewood Rise, Crowhurst, Battle, E. Sussex TN33 9AH.

Wirral ARS have Presidents Night with Guest Speaker on February 7. 1st & 3rd Wednesdays, 7.45pm at Ivy Farm, Arrowe Park Rd, Birkenhead (opposite Landican Cemetry Gates). Alec Seed G3FOO on 051-644 6094.

Acton, Brentford & Chiswick ARC have a discussion on Further Club Policy on February 20. Chiswick Town Hall, High Rd, Chiswick, 7.30pm. W. G. Dyer G3GEH at 188 Gunnersbury Ave, Acton, London W3 8LB.

The Radio Society of Harrow meet Fridays, 8pm at The Harrow Arts Centre, Uxbridge Rd, Hatch End. January 26 is G2UV Talk Challenge, February 2 is an Activity Evening and the 9th is a Bring & Buy Sale. Chris Friel G4AUF on Ruislip 621310.

Verulam ARC meet 2nd & 4th Tuesdays, 7.30pm at the RAF Association HQ, New Kent Rd. February 13 is an Activity evening and the 27th is Clandestine Radio G3VA. Andy Ince G0BZS at Cottage No. 1, Rounton, 28 Nascot Wood Rd, Watford, Herts WD1 3SD..

Biggin Hill ARC have VSWR G4VTD on February 20. 3rd Tuesdays, 7.30pm at the Victory Social Club, Kechill Gdns, Hayes. Geoff Milne G3UMI on 01-462 2689.

TRADING POST

FOR SALE Trio R2000 pristine condition plus Trio headphones, antenna and various publications for listening, boxed, can deliver to 50 miles, £340. B. Tennyson. Tel: Largs 675656.

FOR SALE Eddystone receiver 940, 480kHz to 30MHz in five ranges. Boxed/leaflets, stored for years. Excellent condition and checked over professionally, £120. Buyer collects. A. Robinson, Lindfield, Nr Haywards Heath, West Sussex. Tel: Lindfield 72625.

FOR SALE Sommerkamp FR-1008 h.f. receiver, bands 80-40-20-15-10, v.g.c., £130. Fairmate AS32320 mobile or base scanning receiver, 110MHz to 367.9875MHz, v.g.c., £100 **or exchange** for AR-900 hand-held. Mr A. Amphlett. Tel: Tewkesbury 295707 evenings.

FOR SALE Sony ICF-2001 synthesised receiver, 150 to 29.999kHz, f.m., a.m., s.s.b., digital readout with memory, complete with power supply and instructions, £100. Michael Deackes, 25 Read Way, Bishops Cleeve, Cheltenham, Glos. Tel: Bishops Cleeve 674702.

FOR SALE Realistic PRO-32 hand-held scanner, 200 channel, C/W home and telescopic antenna, p.s.u./charger, batteries, manual and frequency lists, £185 o.n.o. M. Hyde. Tel: Romford 755781 evenings please.

FOR SALE Racal RA17L, £150 o.n.o. Eddystone 730/4, £100. Trio 9R-59, £50. All good condition. Mr A. Hackman. Tel: Camberley 79683 evenings.

FOR SALE Icom R70 receiver s.s.b., c.w., f.m., a.m., 250Hz c.w. filter. Homebrew 144MHz converter, 5-way coax antenna switch. Global AT-1000 antenna tuner. Datong active antenna AD370. Yaesu headphones YH55 manuals, £390. Dick Stanbridge G8NT. Tel: Leiston 830791 Suffolk.

FOR SALE Yaesu transceiver FT101Z with fan, £400. Icom IC240 f.m. 2 metre mobile, £100. ERA Microreader, £100. Phillips world receiver l.s.b., u.s.b., b.f.o. memories, model D2935, £100. Realistic scanner PRO-2005, £300. Mr F. Steele. Tel: Little Cherington 75202 after 8pm.

WANTED Military R-216 v.h.f receiver, together with operating details etc., RX to be in g.w.o., unable to collect, spares welcomed. Delivery details to Mr M. Evans, 120 Loughton Way, Buckhurst Hill, Essex IG9 6AR. Tel: 01-505 6303.

FOR SALE YC10 converter 118-174MHz for Trio R2000 radio, discone antenna + 48ft low-loss coax. R. Norman. Tel: Gourock 34475.

WANTED Top prices paid for your german gear of WWII vintage. Looking for receivers, transmitters, accessories. Will collect. Lissok, Rue M. Poedts 9, B-1160 Brussels, Belgium. Tel: 010-322-6737115.

FOR SALE RealisticPRO32 hand-held scanner with NiCads and charger, as new, £130. Revcone discone antenna with low-loss cable, used inside only, two months old, £25. P. Thompson. Tel: 091-567 4048.

WANTED Communications receiver 150kHz-30MHz digital preferably Kenwood R-2000 or Yaesu FRG-7700 or FRG-8800. Under guarantee or mint condition. Contact R. Ahmad, 32 Sinclair Drive, Liverpool L18 0HW. Tel: 051-722 5799 after 6pm.

FOR SALE Yaesu FRG-7 general coverage receiver, boxed with manuals, mint, £125. Also **exchange** AOR-2002 scanner for 144MHz multimode base station Tx. Must be excellent condition. B. West. Tel: Pontypool 557221.

FOR SALE Lowe HF-225 receiver, 30kHz/30MHz, four filters, 30 memories, twin v.f.o.s with optional keypad, unmarked with manual and original packing. An impressive performer, cost £435 June 1989 will accept £350. Wilkinson, 11 Hildyard Close, Hedon, N. Humberside HU12 8PE. Tel: Hull 898322.

FOR SALE Sony AN1 active ant, boxed, unused, £30. Revcone discone ant with extra whips, £30. **Exchange** AR900 scanner complete and boxed for Sony Air 7 in similar condition. Tel: Cheltenham 228782. I. H. Plumb, 38 Glencairn Court, Lansdown Road, Cheltenham, Glos GL50 2NB.

FOR SALE Sony PRO-80 portable receiver/scanner, 150kHz to 223MHz, boxed, as new, £150. R. Sharp, 100 West Way, Broadstone, Dorset BH18 9LN. Tel: Broadstone 696127.

FOR SALE Kenwood R2000, six months old, mint condition, six months guarantee left. ERA Microreader, latest version, mint, nine months guarantee left. External speaker, all boxed, £500. Write enclosing your telephone number to J. Havard, 5 Broughton Street, Preston, Lancashire PR1 7US.

EXCHANGE EL/M 500 hasselblad valve, £1000, perfect + extra view finder with optic adjuitment. **For** Icom R71E or Icom R7000 with 500kHz to 30MHz or Kenwood R5000. Will do straight swap, no rubbish. Ted. Tel: Barnsley 203128.

WANTED v.h.f./u.h.f. scanner or h.f. receiver. **For Sale** 1930 Mullard Master Three, Amplion speaker in wooden cabinets, £85. Icom IC24G 2m f.m. Trx, £110. Tandberg series 14, 4 track reel-to-reel, £60. D. Garner, 26 Wordsworth Ave, Warrington, Cheshire. Tel: Warrington 55924.

FOR SALE Kenwood R2000 good condition, little used, £400. Almost new, bargain. M. Allen. Tel: Sheffield 464186.

FOR SALE Matsui MR-4099, 0.150MHz-29.999MHz, £60. Signal R5375 airband, £40. Or **Swap** both for hand-held scanner. Bill. Tel: Coatbridge 53366 after 6pm.

FOR SALE PRO-2005, £260. CTE1600 with speakermike charger + BP4, £150 o.n.o. Also Pye PF70 xtalled S21, S22 R3 with two batteries + charger, £50. Greg. Tel: 01-253 5764 after 5pm.

FOR SALE Yaesu FRG-8800 communications receiver. FRV-8800 v.h.f. converter fitted, 150kHz-30MHz, 118-174MHz, £430. Nigel G4PJJ. Tel: Minsterworth 75542.

FOR SALE R5000 communications receiver, fitted with s.s.b. filter, in as new condition, £650. Also Comax CD 670 decoder, good condition, £150. Prefer buyer sees and collects. B. Caine, 8 Franklin Street, Barrow-in-Furness, Cumbria. Tel: Barrow-in-Furness 25836.

SWAP Meteor 600 frequency counter, service manual, probe, new Oct 1989, value new £160, will swap for base scanner like Cobra SR925 etc. **For Sale** Lowe HF125 Service Manual, £5. S. Harmer, 9 Park Square East, Clacton, Jaywick, Essex CO15 2NL.

FOR SALE Eddystone 680X 15-valve communication receiver, 500kHz to 30MHz, unmoded and in excellent working order, £160. Arthur. Tel: Wickenby 5725.

FOR SALE Datong indoor antenna AD270, fitted with 12 metres extra cable, bought 10-7-89 (receipt supplied), £25 plus postage. B. Blanchard. Tel: 091-526 7902.

FOR SALE AOR-2002 communications receiver, including Dixon discone 25-1300MHz antenna and AR2002/1 interface software for BBC-B. All in perfect condition. H. E. Thomas, 425 Hurst Rd, West Molesey, Surrey KT8 9QT. Tel: 01-979 6290.

SWAP/EXCHANGE F1300 Laptop MOD200 maxram, 3.5in drive, programs and disks, full DTI freqs DMP105 printer + 6 ribbons, 8 manuals, Bar-code wand. Total working system, 6 months new. **Swap** for v.h.f./u.h.f. h/port or 70cm h/port + cash ajust or 70cm mobile + power/s no cash. P. J. Turner G8TSY. Tel: Witnesham 85203.

WANTED Drake R4245 MR3 RR3 DSR2 or R7A receiver, any condition, also service manuals. Pat McAlister G3YFK. Tel: Shrewsbury 884858.

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SWM FEB 90 TP

DX LETTER FROM AMERICA

Gerry L. Dexter

KYOI's original owners used the station to provide a commercial American pop/rock format to Japan. The station now serves to extend the reach of Herald Broadcasting into Asia and the new transmitter is enabling the establishment of a service to Australia as well. Herald Broadcasting also operates WCSN in Scott's Corners, Main and WSHB in Cypress Creek, South Carolina, both with a pair of 500 kilowatt transmitters on the air. Unfortunately, reception reports on these stations are only answered with a 'no data' acknowledgement card, a la the BBC.

High Adventure Ministries, which operates KVOH in California and the Voice of Hope in southern Lebanon, says it is close to putting its third short wave station on the air. The new station will broadcast from the island of Guam and will probably use the call KHBN. The station's main target will be China. As this is written there is still no indication of when broadcasts may begin or on what frequencies.

The Association of Short Wave Broadcasters

Short wave broadcasters in the United States have formed their own group - the Association of Short Wave Broadcasters. Membership is open to all FCC-licensed short wave broadcasters (and thus not to the official Voice of America which needs no license from the FCC). Initial members are WCSN, WSHB, WWCR, WRNO, WMLK, WHRI, KUSW, KGEI, KNLS, KSDA, KFBS, KHBI and KNLS. The group's main purpose is to make the Federal Communications Commission more aware of the specialised needs of American short wave broadcasters.

Budget Cuts For RCI

Radio Canada International, faced with budget cuts - perhaps of a severe nature - has discontinued its programming in German.

Radio Clarin in the Dominican Republic is reported to be planning a frequency change from the long-used 11.700 to 9.950MHz. The Cuban American National Foundation, the most centrist of the anti-Castro organisations active in the United States, wants to buy programme time on Clarin and broadcast to Cuba. According to our source, CANF will not sign an agreement as long as Clarin remains on 11.700MHz since that frequency suffers so much interference from other broadcasters.

Herald Broadcasting, the short wave service of the Christian Science Monitor, was scheduled to return KYOI in Saipan to the air this past fall. The resumption of service will bring with it a new set of call letters - KHBI (Herald Broadcasting International) and a second 100 kilowatt transmitter.

Radio Antilles

Radio Antilles, on the Caribbean island of Montserrat may be purchased by the Organisation of Eastern Caribbean States. Until last summer the station had been financially supported by the Voice of Germany and the short wave part of the facility used as a DW relay. DW withdrew its support from the station after it decided to spend those funds on other improvements.

The Adventist World Radio Station

The Adventist World Radio station, Radio Lira International in Costa Rica, has added a 40kW transmitter and is now broadcasting on 5.970, 9.725, 11.870 and 15.460MHz, all of which are being quite well heard at various times. The 11.870 frequency, however, tends to vary by several kilohertz. Also from Costa Rica, Radio For Peace International is now using up to three frequencies simultaneously: 7.375 (sometimes on upper sideband on a test basis), 13.660 and 21.566MHz. All of these are being heard at fairly good levels.

Falkland Islands Broadcasting Service

It appears that the Falkland Islands Broadcasting Service may be off short wave permanently. The British Forces Broadcasting Service, which was providing much of the programming on FIBS, says the short wave transmitter has been destroyed by a hurricane and a replacement is not planned.

Broadcasts by the government of Surinam over the Radiobras transmitter in Brazil are to be somewhat expanded. Programme segments in English and Dutch will be lengthened and a Spanish segment will be added. Radio Surinam International is on the air daily on 17.840 at 1700 with English at 1725.

SODRE Active Once Again

SODRE in Uruguay is active once again. SODRE (which stands for Servicio Oficial de Difusion Electrica) is one of the oldest broadcasters in Latin America. Over the last ten or twenty years its commitment to short wave has seemed rather half hearted as it has had a long series of active and inactive periods. North American listeners are currently hearing it on 9.620MHz at around 0130. The channel is often dominated by strong signals from Radio Yugoslavia, however. SODRE's programmes are in Spanish only.

Brent Allred, the popular host of HCJB's *DX Party Line* programme has been promoted to the position of Director of the English Language Service. As a consequence to that, *DX Party Line* had been cut back to just the Monday edition. HCJB is interested in having listener reaction to this change.

Radio Centro

A new Ecuadorian short wave station is Radio Centro, broadcasting from Ambato. It is being heard occasionally, usually with poor signals on variable 3.2897MHz around 1000 and 2000. The Peruvian station, Radio Tayabamba, is active in this area, too (3.290MHz) so caution is advised.

The Mexican cultural/educational station Radio Educacion in Mexico City is being heard with better signals on its usual 6.185 frequency of late. This may be due to the station's announced plans to boost power to 5kW.

Radio Las Palmas

Radio Las Palmas, in Nuevo Bambamarca, Peru is active on 4.510MHz, slightly variable. It signs off at widly varying times after 0200. Another new Peruvian station is Radio Juanjui, Juanjui. It is apparently using very low power and no schedule has been determined yet.

That covers our news and notes for this time. Your comments are always welcomed. We'll have another 'Letter From America' in three months time. Until then - good listening! □

AIRBAND

Godfrey Manning G4GLM

Your questions answered; frequency changes; it's all here! Read on...

Along with **Alan Jarvis** (Cardiff) I have had the experience of hard-to-read a.t.i.s. transmissions. Coming back from holiday, I had to explain to our French crew some of what was being said; it was just too fast. One doesn't like to criticise a good service, but I don't suppose the controllers who record the a.t.i.s. get much feedback as to how it sounds "up there." Stand by for a postbag full of letters from irate controllers...

Alan further asks about arrival procedures at Filton. Is it necessary for aircraft to be handed off to London Airways until final approach? It depends on altitude. If the traffic is under the airways which, across the English Channel, start at typically FL85, then there would be no problem in giving (say) a radar advisory service to aircraft in the open flight information region.

Question Time

For his first question, **Tim Binder** (East Grinstead, W. Sussex) wants to know why many airports relay some of their v.h.f. channels on u.h.f. allocations. This is for the benefit of military aircraft, some of which have only u.h.f. (not v.h.f.) transceivers. They are still entitled to use civil airfields and air traffic control facilities when the need arises, though. Let me add an idea from Alan Jarvis: it might be necessary for aircraft transmitting on v.h.f. to be relayed on u.h.f. so that u.h.f.-only traffic will know when the controller is already occupied.

Secondly, "Where's Koksy?" asks Tim. It's at N51°05.7' E002°39.2' half-way between Calais and Ostend on the Belgian coast. It's a v.o.r. (KOK: dah-di-dah, dah-dah-dah, dah-di-dah, 114.5MHz) and d.m.e. (Channel 92). Also, it's the next beacon on airway G1 after leaving Dover; if traffic is light, aircraft on a Dover departure might be cleared "Direct to Koksy" without actually going over the Dover v.o.r. itself, thus taking a short-cut. Hope all this helps.

Frequency News

The General Aviation Safety Information Leaflet 11/89 (Civil Aviation Authority) introduces new n.d.b.s at Cumbernauld (CBN: dah-di-dah-dit, dah-di-di-dit, dah-dit, 374kHz) and Walney Island, Cumbria (WL: di-dah-dah, di-dah-di-dit, 385kHz, 15nm range). At Henton, Buckinghamshire, the n.d.b. (HEN: di-di-di-dit, dit, dah-dit) has moved frequency to 221kHz. Lastly, those using 123.45MHz for unofficial air-to-air "chat" risk interfering with North Sea traffic working North Denes on this frequency.

Alan Jarvis reports a new helipad at Cowbridge (18km west of Cardiff) with frequency 123.17MHz. Cardiff Tower now has a u.h.f. frequency of 341.8MHz, which I confirm in the latest *Aerad Supplement* dated 10/89. I can't confirm why Filton might be allocated 134.5MHz; is it perhaps an operations frequency? And to clear up your point about Brookmans Park, the n.d.b. on 328kHz is past history; it's been a v.o.r./d.m.e. for quite some time!

Airways Clearance

Recent issues have described engine starting and take-off procedures for a typical medium-sized airliner. At some point prior to take-off the airways clearance will be given. Here's an example of a clearance being issued as the aircraft taxis to the runway:

Manchester Ground: "Short wave One Zero Eight Niner, I have your airways clearance."

First Officer: "One Zero Eight Niner, ready to copy."

Manchester Ground: "Short wave One Zero Eight Niner is cleared for a Lichfield Two Romeo standard instrument departure. Squawk Four Seven Two Three. Contact London One Two Four Decimal Two when instructed."

It is essential that the clearance is read back for confirmation. Although a flight plan has been filed (perhaps on a repetitive basis if this is a regular flight) further en route clearances will not be issued until airborne. Often, these will be more direct than planned, which results in a saving on the journey time - see my answer to Tim Binder about the Koksy beacon (above).

Three separate items of information were given in the clearance. In reverse order, once the flight leaves the Manchester zone and joins the airway system it will be handed off to the Daventry sector controller at the London Air Traffic Control Centre (LATCC) on 124.2MHz. The pilot has advance warning to set up this frequency on whichever of his radios is free. Next, the squawk code is set on the secondary surveillance radar (s.s.r.) transponder. The controller sees the aircraft identified on radar by flight number and destination code - because the squawk number is decoded by the LATCC computer to give this information. The computer is previously loaded with a list of squawks against flight numbers. The flight level is also displayed when the transponder is set to mode C.

Finally, the standard instrument departure (s.i.d.). There will be about four or half-a-dozen different departure routes at a major airport. The routes terminate at a fixed point after which the en route part of the journey continues. The departure point is chosen according to the general direction in which the flight will proceed. In our case, the flight will head towards the London area having overflown the Lichfield beacon, so this is a Lichfield departure. Because of the runway in use, Lichfield 2R will be the operative route; a reversal of runway direction would result in Lichfield 2S becoming applicable. The details of the departure are stipulated in the let-down plates - a set of navigational maps for the particular airport. The routes also avoid creating noise over towns when still at low level, and altitudes along the s.i.d.s are chosen so as not to conflict with other traffic (including that which is inbound to the same airport).

Follow-Ups & Foul-Ups

Sorry! On the other hand, bet you didn't notice the photo caption in the November 1989 issue "Descending through 60ft..." Well, look at the altimeter: it's 500ft of course. You don't descend through 60ft, you flare at it!

Staying with November, welcome to new reader **Jim Brennan** (Camberley, Surrey) who has been a radio technician with a large airline for nearly 20 years. He recognises my Cossor s.s.r. transponder controller; it's used with the SSR 1600/1 equipment (e.g. on the VC-10). The most likely explanation as to why the squawk code selector switches run from 0 through to 8 is that they were are all that were easily available at the time (unless any other reader knows better!). Digit 8 is actually treated the same as digit 0, so all is well. As a matter of interest, British Airways 747s use Kirrg or Cossor transponders with controllers by Gables.

Moving on to the list of callsigns in the December 1989 "Airband" it may not be completely clear that TEA is the callsign for TEA Belgium. **Rick Matthew VE7BFB** (Vancouver, Canada) gives EASTEX's base as Upton, Gainsborough; JETSET is at Crawley, West Sussex; and NEATAX at Wilmslow, Cheshire.

To Alan Jarvis: sorry, no further information on why some local airfield frequencies seem to appear in the listings for LATCC relays.

More on the Trimmingham radar (December) from **Paul Johnson G4RMT** (Lowestoft, Suffolk). Paul noticed a mobile RAF type which is part of a chain connected to RAF Neatishead (near RAF Coltishall). Another unit is at Weybourne, near Sherringham (north of the A149 road). Now removed, a further unit was between Lowestoft and Great Yarmouth at Hopton (the site of an original Chain

When you are ready to graduate to real listening Look to Lowe

The New HF-225 Receiver

I am delighted that the HF-225 has been a raging success world wide, and I will just quote a letter received from one of our American customers:—

"I received my Lowe HF-225 about a week ago. Since then I have enjoyed many pleasant hours listening to it. As a past owner of receivers such as the Sony ICF2010 and Grundig Satellit 650 and 500, I must say that none compare to your Lowe HF-225. Without question, for hour after hour listening, nothing compares. I especially like the Genie key pad. Why more receivers do not incorporate such intelligent rergonomics is beyond me. I also thought both the instruction manual and the short wave book were well written, with the shortwave guide particularly enjoyable."

The letter comes from Chris Williams in Massachusets, but is typical of many letters we are receiving from all over the world about the HF-225.

Technically, the HF-225 distinguishes itself by having a low phase noise synthesiser, which gives a reciprocal mixing performance not far off that of "professional" receivers costing up to ten times the price, and that's not just advertising talk, it is really true. The synthesiser actually tunes in steps of 8Hz, which betters most other receivers and gives a smooth "VFO" feel when tuning. As one user has already commented "If you tuned the HF-225 with your eyes closed, you would believe you had a £5,000 receiver on the table".

The HF-225 has a range of low cost options which extend its appeal; such as a keypad for direct frequency entry, which simply plugs into a rear panel jack; an active whip aerial; a rechargeable battery pack for portable use; and an attractive carrying case which protects the receiver whilst allowing full operational use. The new D-225 detector option is really something special, because it gives true synchronous AM detection for dragging sensible programme quality out of a signal being affected by selective fading distortion. The same option also gives narrow band (communications) FM demodulation.

Every listener these days appreciates a receiver which offers facilities for memorising favourite or regularly used frequencies, and the HF-225 offers 30 memory channels for this purpose. Using the memories has been made particularly versatile, because the operator can review the contents of the memories whilst still listening to the frequency he is using, or alternatively in the "Channel" mode, can tune through the memory channels using the main tuning knob, listening to each frequency as it appears on the display. Just like having a bank of single channel receivers under your control. Terrific for checking HF airband channels for activity.

Unlike most HF receivers on the market, the HF-225 comes complete with all filters fitted for every mode:— 2.2kHz, 4kHz, 7kHz, and 10kHz. There is also a 200Hz audio filter for CW, and if the D-225 detector is fitted, a 12kHz filter for FM. The correct filter for each mode is automatically selected by the receiver mode switch, but further selection can be made by the user from the front panel and the receiver remembers which filter was last used. True versatility and all built in at no extra cost. When selecting filters in use, the filter bandwidth is shown on the main display.

The display itself is a high contrast liquid crystal type, and shows frequency, filter bandwidth, detector lock (when D-225 is fitted), and whether the receiver is in memory mode. Automatic placing of the decimal point takes place as the receiver is tuned, so there can be no ambiguity in reading.

At the end of the day, what does the HF-225 offer you as a user? I can do no better than quote what was said by Rainer Lichte about the earlier HF-125:—"The HF-125 is a serious piece of equipment; don't be deceived by the unassuming front panel and the lack of spectacular features. The HF-125 will outperform most competitors. If you like an honest approach to receiver design, this is it. British understatement at its best".

The HF-225 is even better.

HF-225 £395 John Wilson

FREE

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

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26 YEARS IN SHORTWAVE

NEW YEAR – NEW PRODUCTS

We are constantly on the lookout for worthwhile products which we think will enhance the listener's enjoyment of the hobby, and are pleased to give brief details here of three such items — widely different in application, but all new and exciting.

The first new goodie is the latest handheld scanning receiver from AOR; the AR-1000. The specification was drawn up as a handheld version of the well loved and much respected AR-2002, and there is no doubt that AOR have succeeded in their plan. The AR-1000 fits in your hand, covers the frequency ranges of 15 (fifteen) to 600MHz, and 805 to 1300MHz. It has no less than 1000 memory channels organised in ten banks of 100, and the scanning speed is approximately forty channels a second, so even scanning large banks of memory takes but a few seconds. What else? well it also has ten pre set search frequency bands, which in the UK version come ready loaded with the important band parameters such as VHF air, UHF air, Marine, Cellular base, Cellular mobile, Land mobile, amateur and so on. To search any band you simply press "Search" "Band" "1" (or whatever band number you want), and the AR-1000 does the rest. In fact the whole receiver is designed to be incredibly easy to use.

Modes of reception include not only the essential AM and narrow (communications) FM, but also wide FM for listening to broadcast stations and TV sound. So, when you want some light relief you can pop on to Radio Two and relax with the latest book (more of this later).

The price? expected to be about £250 which includes the radio, aerial, rechargeable batteries, and the all important mains charger. Quite acceptable when compared with other handheld scanners offering much less for much more money. AR-1000 from AOR. The best radio from the best supplier.

AR-1000 wide range handheld receiver. . . . About £250

I did mention settling down with the latest book, and my advice would be to grab a copy of the 1990 Passport to World Band Radio. We here at Matlock have been most impressed with this publication because it gives a complete listing of all short wave broadcasters not only in order of frequency but also listed by language and country of origin AND also the times of broadcasts. Almost two hundred pages of such detail makes the book worthwhile, BUT you also get detailed reviews and comment from an acknowledged and respected authority on such matters on no less than forty radio receivers ranging from the sublime to the gor-blimey. AND over a hundred pages of general news, views, and information. This book is an indispensible companion for any listener and the price is exceedingly reasonable at £12.95. It is available at all our branches, or by post for an additional £1.50 to cover postage and packing.

Passport to World Band Radio. . . . . £12.95 (£1.50 p&p)

For many people the thought of having a really good aerial system to enhance their listening is foiled by the lack of space outside the house. One answer is to use an "active" aerial, which consists of a short whip or wire, with a preamplifier at the bottom to match the impedance of the whip to coaxial cable and to give some gain to overcome the consequent small signals from a small aerial. However, the performance of some so-called active aerials is worse than diabolical, because they generate intermodulation products within themselves, which defeats the whole purpose of the device. Put simply, such aerials take 100 signals in and generate 1000 spurious products which are then fed to your long suffering receiver. However, the military use active receiving aerials to good effect, so it must be possible to achieve high performance in limited space.

We have now located just such an active aerial, known simply as the DX-One. Originally designed to meet a military specification by the specialist company of RF Systems, they found that by removing the need for making the aerial collapsible and battlefield proof, it was possible to produce an active aerial for the semi-professional and hobby user. The frequency coverage of the DX-One is an amazing 50kHz to 50MHz at full specification, and from 10kHz to 110MHz at slightly reduced performance. The gain of the system is up to 6dB compared to a full sized dipole (that is to say you will get twice the signal voltage from the DX-One), and there are independent outputs for feeding two receivers. The aerial itself is a four element cage about 1.2 metres high and 1 metre in diameter which can be simply mounted on a pole. The control unit which contains the switched attenuator, switchable medium wave filter, aerial switch, aerial feed splitter and mains power supply, can be conveniently situated close to the receiver. The only connection needed between the controller and the aerial is normal coaxial cable, so no special cables are needed. As you may imagine, the DX-One cannot be a cheap device, and in fact costs £249, but for the convenience and sheer performance, it's unbeatable.

DX-One. 10kHz to 110MHz active aerial system. . £249

My colleague has just reminded me that we have also received from the same source as the DX-One a superb masthead preamplifier which is designed for the really serious VHF/UHF listener. As the name implies, a masthead preamplifier is designed to be mounted at or near to the aerial, and provide extra gain either for DX listening or to overcome losses in a long coaxial cable run — or a combination of both. Problems come with cheap amplifiers when they have too much gain, or they are simply badly designed, at which point they behave as mixers, generating large numbers of unwanted signals in themselves, and feeding these nasties down to your poor unsuspecting receiver. The LNA-3000 from RF Systems, has a bomb proof performance, first class weatherproofing, and a price tag of £112.70. Once again, not cheap, but then quality never is. The LNA-3000 covers the frequency range from 50 to 3000MHz and gives a gain of 13dB, enough to give you a worthwhile improvement in your receiver overall performance, and plenty to drive a longish length of coax cable. For those more technically inclined, the 3rd order intercept point is + 22dBm and the maximum output is 2.5V into 50 ohms.

LNA-3000 50 – 3000MHz masthead amplifier. £112.70

Now, because this page of text has no photographs, I thought I would include just one of me which clearly shows what a heavy load I am under in searching out new and better products for you all. Happy New Year.

Shops in **GLASGOW** Telephone 041-945 2626, **DARLINGTON** Telephone 0325 486121, **CAMBRIDGE** Telephone 0223 311230, **BARRY** Telephone 0446 721304, **LONDON** Telephone 01-429 3256, **BOURNEMOUTH** Telephone 0202 577760
All branches are closed all day Monday.

I BECAME A SHOPKEEPER

Clifford Stephenson

Disillusioned by the lack of prospects in engineering in the slump of the twenties, Cliff Stephenson accepted the offer of a job as manager of a new radio shop in Huddersfield and the radical changes in his life. Here he brings to life something of those far-off days.

Having been appointed as manager, it was time to set up the business. It was decided that the four directors of Benjamin Shaw & Sons - Frank, Sidney and Ben Shaw and my father, Beaumont Stephenson - would each contribute £250 to the capital of £1000 required to fund the enterprise, which was to be called the Radio Equipment Company.

It was obvious that a shop in the centre of town would be an advantage and fortunately we found one we could afford, in Greenwoods Yard off New Street. The position was good and the rent reasonable, and it served us well for 10 years. When opened in 1924, it was the first solely 'wireless' shop in our end of Yorkshire.

When, like every boy, I had dreamed about the career I would like, that of shopkeeper had no place in my dreams. Work behind a counter, work all day Saturday? Never! Yet here I was, a volunteer, not a conscript, to that life.

By both inclination and training I was a 'maker' (I still am). My tools had been a two-foot rule rather than a yard stick, drawing paper not wrapping paper, a lathe to stand at rather than a counter to stand behind. But I was soon to find that there was interest, skill and challenge in selling, which I enjoyed and for which I had an unexpected talent. There was the added attraction that I was selling a fascinating product, and the excitement of being involved in a new and constantly improving science and service - it was thrilling.

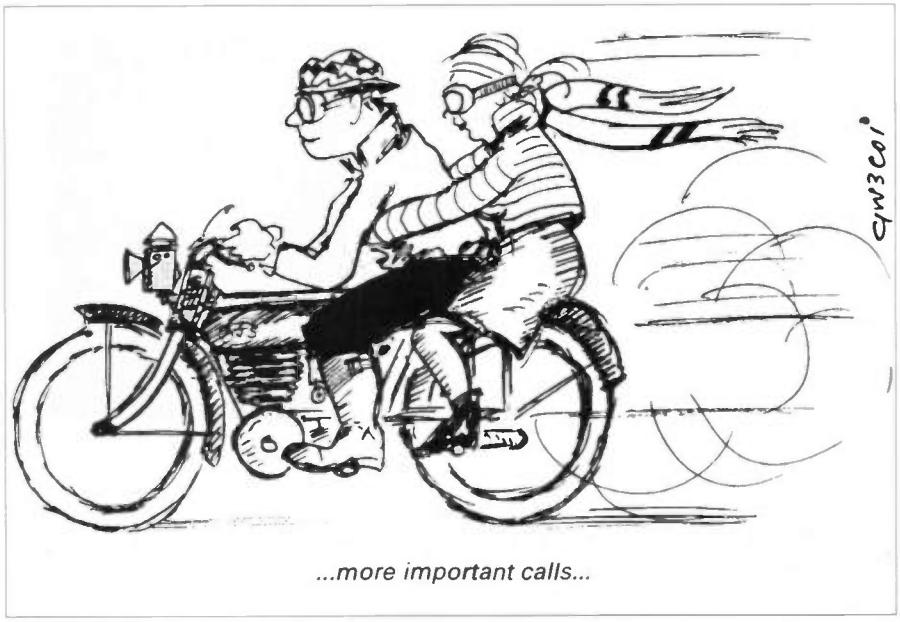
I was, of course, as green-as-grass in both the fields of commerce and 'wireless'. When in 1922 father brought home the components to make our first wireless set, using the 'ST100' circuit, I applied my engineering skills to drill holes in the panel on which the components were fixed. That was about the extent of my interest and involvement. I had other more important calls on my leisure, playing football and tennis, riding my motor-bike and above all, courting!

But the challenge of the new job inspired me to equip myself for it. As a first step I had to learn something about wireless sets: how they were made and how they worked.

Fortunately there was a course on wireless running at the local tech; this, Sidney Shaw and I joined. Six months later we were 'experts' (in very large inverted commas), but at least we were one step ahead of the majority of our potential customers.

As far as my commercial inexperience was concerned, fortunately that was only a temporary handicap. I had first class help, advice and instruction from my father - he was a tower of strength.

The question of supplies was another and more serious matter. We had only a rudimentary knowledge of the items we would have to stock and no knowledge at all of where to obtain them. Somehow, we found the names of a few wholesale suppliers and acquired their catalogues.



...more important calls...

Over these we poured for countless hours, deciding what and how many items to buy.

Inevitably we bought some of the wrong ones, which stayed on the shelves for years in mute rebuke of our ignorance, until eventually they were thrown into the bin - their loss charged to experience!

First Sale

The shop door opened for business on 29 July 1924, and my first customer bought 12 yards of maroon twin-twisted flex for three shillings (15p); my second a 'Sterling Dinky' loudspeaker for two pounds ten shillings (£2.50). We were in business, and I was a shopkeeper with a 33-year career ahead of me.

The travellers selling wireless goods soon found us and used their wiles to persuade this young greenhorn - me - to buy. I was only 21 and young-looking for my age, so they thought they had an easy mark. In self-defence I was driven to develop an unnatural hard-bitten toughness, but it worked. In time, so I was told later, a traveller's statement to another dealer 'I've sold it to Radio Equipment' was taken to mean that his price and goods must be right if I had bought them. I was a convinced subscriber to the retailer's motto 'well bought if half sold'.

It was quickly evident that I couldn't run the shop alone at busy times - Fridays and Saturdays. We stayed open until 8 o'clock Fridays and 9 o'clock Saturdays, with 'early' closing at 7 o'clock on other days. Sidney and Ben Shaw came in to help, but there was still the problem of meal times needing relief. An advertisement for a young lady assistant resulted in the appointment of Miss Bruce. Aged about 23, she had lovely golden hair - remembered and mentioned by old customers 30 years later.

Though she remained with us for 15 years, giving devoted service, I don't think she ever got to know anything about wireless, but she knew the names of components, where they were kept and the price. She had little conversation and no advice to offer, so she never wrongly advised or antagonised customers. She was, however, a constant source of expense through no fault of her own: an important service we offered was the re-charging of acid filled accumulators and it was an ever-present hazard when handling accumulators to be splashed with acid from them. These splashes ruined many pairs of stockings worn by Miss Bruce, which of course the firm had to pay for!

Being conveniently situated, the shop soon became an attraction to wireless enthusiasts. At times, the window gazers were three deep and the shop inside packed with customers. Before

I BECAME A SHOPKEEPER

Christmas, only five months after opening, there was one Saturday when our sales reached the magic figure of £100. To appreciate how remarkable was this achievement, and how powerful was the attraction of the wireless craze, it should be remembered that it took place when local industry was in severe depression and unemployment rife.

A hundred pounds seems a small sum today, but in 1924 when a working wage seldom exceeded £3 a week - engineering which I had left paid £2.14 shillings (£2.70) - it was big money, equivalent to £4000 today. It cost between £10 and £20 to buy the components, batteries and accessories to build a set - money taking one to two months to earn. Now the cost of a much better set can be earned in one day.

It is interesting to note that in the first 12 months of trading we sold only four factory-built receivers valued in total at about £200, out of a year's turnover of £900 - but this was soon to change.

Service, Antennas and Headphones

From the outset I believed that it was both a responsibility and good business to provide technical help and advice, usually called 'good service'. We really tried to live up to the phrase, if for no other reason than that it paid off by generating customer goodwill. To give service in the homes of customers and to deliver the goods we sold required transport, and as early as 1925 a purpose-built van was acquired and put into use - the first of its kind in the West Riding.

Early sets were insensitive and BBC transmissions low powered, so an efficient antenna was very desirable. The optimum specification for an antenna was 30 metres of copper wire with an open span as high as possible above the ground. This was achieved by having a tall pole at the bottom of the garden to the top of which one end of the wire was attached, the other end being fastened to the chimney of the house.

Amongst other jobs I became the firm's antenna erector, which meant I was the one who sunk the 12m pole and scrambled on the roof to fix the wire to the chimney from which came a down-lead passing through the window frame. I became quite adept at climbing ladders and clambering on roofs. The need for outside antennas - often there was one at nearly every house in a street - resulted in a forest of antenna poles defacing the landscape!

Sets in the 1920s had little power, often only enough to work headphones. A family with each member 'tethered' to the set by headphone cords was a common sight, but the thrill of listening more than made up for the inconvenience.

Crystal Sets

The crystal set popularly associated with the early days of broadcasting, was uncommon in Huddersfield. The signal from the nearest BBC transmitter in Manchester (call sign 2ZY) was too weak for crystal set reception. Two or three-valve sets were the norm.

A crystal is, to me, the most remarkable phenomenon in the amazing magic of radio - indeed I fear that radio itself is now so commonplace that its magic is forgotten. The crystal set performs the miracle of taking from the air an unseen, intangible wireless wave, transforming it into electric power which in turn produces sound waves generated in, and sent out, by headphones. Yet it is of the utmost simplicity, consisting of only five inexpensive parts: a small piece of cheap natural crystal - galena - a springy length of fine wire, a coil of wire of 50-100 turns and about 750mm in diameter, a variable condenser (capacitor) to tune it to the required station, and a small fixed condenser costing coppers. Connect them together through a pair of headphones and, hey presto, music and speech from miles away: no batteries, no valves, no transistors. This is supreme magic, and we used to sell a complete crystal set for five shillings (25p). It was even possible to use a small piece of coal or coke as the crystal - or so it was claimed!

Like all new ventures and developments - aeronautics, motor cars, package tours - the emerging wireless industry attracted the adventurous try-anything-once people who saw in this industry without roots, tradition or organisation, a route to quick profits. They were not necessarily dishonest, but their trading methods and products were of the 'here today gone tomorrow' kind. To avoid them was something learnt by experience, sometimes costly. But there were others who were full of faith in the great future of the industry and the products they offered. With them I made long lasting and happy relationships and, not uncommonly, friendships still enjoyed.

RPM and RRP

Products of the well-known firms were only available to us for sale under a system known as 'limited licence', the condition which stated that we undertook to sell products at the price fixed by the manufacturer. Known as Retail Price Maintenance (RPM), this has since been made an illegal condition of sale.

Valves, the heart of a wireless set, were strictly subject to the maintained price condition. The English Valve Manufacturers' Association agreed selling prices between its members - in other words operated a 'ring' - and rigidly enforced the prices at which dealers sold, as well as the 25per cent discount at which we were able to buy valves. This was not entirely to the disadvantage of the customer who at least knew what the price should be, in contrast with today and recommended retail price (r.r.p.) when no one knows what the 'proper' price should be.

The Development of Radio

Looking back over the 33 years (1924-1957) I spent as a radio retailer, I realise how fortunate for me were the circumstances which gave rise to my change of direction when, aged 21, I abandoned my planned career as an engineer and became a shopkeeper.

To be part, even a very minor part, of the revolutionary development which was destined to influence the thoughts, behaviour and lives of everyone, and which was to shrink the world so that events and happenings affecting people on the other side of the globe were known here almost as they took place, was tremendously exciting. Never again was England to be such an island, separate from the rest of a world inhabited by 'foreigners' regarded almost as a different species of the human race. It was indeed a revolution affecting the whole of mankind - and I was part of it.

Life in the infant radio trade was one of constant excitement - we were all the time sitting on the edge of our chairs waiting for the next announcement of still another invention or improvement in the apparatus we sold or the broadcasts it was designed to receive.

In 1924, all receivers were entirely battery-operated, requiring a 6V low tension acid-filled celluloid battery, known then as an accumulator, a multi-cell high tension dry-battery of 60, 100 or 120V, and a small 9V grid bias battery. The 'bright emitter' valves we used then operated on 4 to 6V and consumed about two-thirds of an ampere each. There were four types of valve: high frequency and low frequency amplifiers, a detector and a power valve. Though not very efficient they were at least an improvement on the ORA valve developed during the war with Germany, which they superseded in 1922-23. The three letters ORA stood for 'oscillates, rectifies and amplifies', and was a general purpose valve which, like most all-purpose contrivances, was not good at any of its functions.

I BECAME A SHOPKEEPER

Valves and Loudspeakers

The bright emitter valves were such heavy consumers of low tension current that the accumulator was quickly exhausted - usually lasting not more than a week - when it had to be taken to a radio shop or garage to be recharged (the transistor, a solid-state 'valve' which completely eclipsed glass-bulb valves, was 40 years in the future). As they were quite heavy, this was a considerable chore. Of course it was unthinkable to be without wireless while the accumulator was away being charged, so everyone had two accumulators, one in use and one being charged. Men carrying accumulators to charge (few had motor cars) was one of the common sights on the street.

The first much-heralded improvement was the invention of the 'dull-emitter' valve requiring only a 2V accumulator and taking less current - reducing enormously the burden of taking the accumulator to be charged. This was the first of many improvements in valve design on which, it is fair to say, depended most on the advances in receiver efficiency. Outstanding amongst the improvements was the development of the screened-grid type of valve, essential for the 'straight' circuits in use prior to the introduction of super-heterodyne receivers.

Loudspeakers

Initially, most listeners used headphones costing from £1 to thirty shillings a pair - several pairs were needed by a family. Sometimes a pair of headphones placed in an enamel bowl to reflect the sound was used as a makeshift loudspeaker for several people to listen to, but the volume produced was very low and not really satisfactory. The proper loudspeakers, needing a more powerful set to drive them, were invariably of horn design - a glorified trumpet; the sound quality was poor, but any number of people could listen.

One famous make, the 'Amplion', made by Grahams who specialised in ships' loud hailers, had some pretentions to a graceful appearance, having the horn made in wooden sections. It was the market leader for several years, the most popular model known as the 'Dragon' sold for five guineas. There must have been hundreds sold in Huddersfield alone, but when I tried to find one for a museum some years ago, I couldn't. Where had they all gone to?

After a few years the horn loudspeaker was superseded by the cone type, which not only could be housed in an attractive and compact cabinet, but also had the much vaunted and advertised 'mellow' tone. It did in fact reproduce some, but not all, of the lower notes which the horn speaker did not.

The cone speaker consisted of a shallow, nearly flat, cone of thin stiff material - usually impregnated paper - about 300mm in diameter. Coupled to the apex of the cone was a balanced-armature driving unit which vibrated in sympathy with the received signal. Great claims were made for the 'patent' construction of different cones, a famous one was the 'Sterling' made by Marconiphone which had a unique pleated paper cone - a kind of radial concertina of paper, driven by a unit at its centre.

However, the most famous, and the one we sold in greatest numbers (I was told that I sold more of them than any other dealer), was the 'Celestion'. It was housed in an attractive cabinet and used a unique patent cone of very thin crisp material stiffened with a spiral of very thin cane.

Costing five guineas in an oak cabinet, or five shillings (25p) more in mahogany, it was rather better than its contemporaries, but much inferior to the moving-coil loud speaker which supplanted it. Incidentally, the Celestion Company had the foresight to change to moving-coil design, and the firm still exists - the only loudspeaker manufacturer operating 60 years ago that has survived, I believe.

The first moving-coil loud speakers were sold in kit form. We bought one, 'Webson' by name. In great excitement it was assembled.

What a revelation! For the first time we heard true bass note reproduction! It was a bit short on the higher frequencies, but to our ears and those of the crowds which gathered round the shop door to listen to it, that deficiency didn't matter. Unfortunately, it needed a large 6V accumulator to energise its huge electro-magnet.

Coincidental with improvements in loudspeakers were advances in receiver and accessory design.

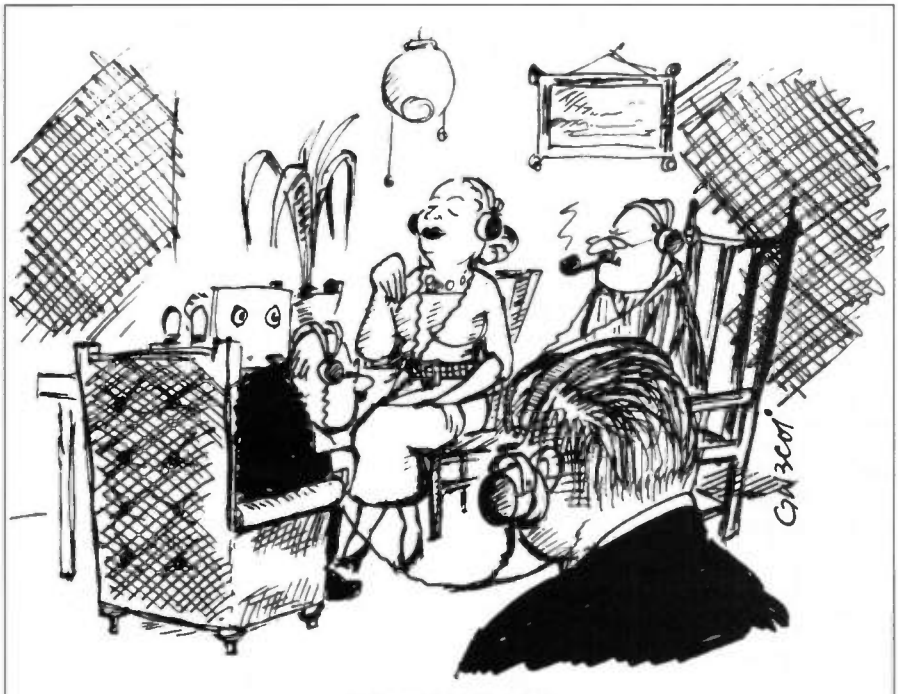
First came the introduction of the battery eliminator, a unit which when connected to a mains socket produced the high-tension current previously supplied by a high-tension battery. Its great advantage, of course, was that it cost next to nothing to run, in contrast to the considerable expense of frequently having to buy new batteries.

The next step was to eliminate the need for the low-tension battery - the accumulator - but as with nearly all radio improvements this advance depended on the invention of a new type of valve.

Philips in Holland produced the first 'all-electric' set in - I think - 1928-9. Known as a 'pair set', the receiver was separate from, but attached to, a power supply unit much like a battery eliminator.

The following year the design was improved to include both units in one small, compact rexine-covered metal box - it could hardly be called a cabinet; the loudspeaker was still a separate unit.

A year later, the mains energised moving-coil loudspeaker, which superseded the earlier type requiring a 6V accumulator, was developed in America by the Rola Company and imported into England. Being more compact than a cone type speaker it was feasible to fit a moving-coil speaker into the same cabinet as the receiver, and in



...tethered to the set...

I BECAME A SHOPKEEPER

1930/31 such receivers (basically what we have today) began to appear on the market priced around £20. These sets mostly had three valves - a high frequency, a detector and a power amplifier valve - plus a rectifier, connected up in a simple circuit to make what was known as a 'straight set'.

Receiver Developments

Though comparatively insensitive and unselective, these receivers were adequate for the prevailing broadcast conditions and transmitters operating on low power.

Attempts to overcome these disadvantages by using two or more high frequency valves were of limited success.

However, as the number and power of transmitters increased, so did the problem of interference. It became difficult to tune into a station without a background of another station spoiling reception.

The Universal Superhet

As usual if a problem arises it challenges a solution, and radio engineers came up with the answer: use a super-heterodyne circuit ('superhet').

Now universal, it was first regarded as an arrangement more suited to the research laboratory than commercial production. But with no other option available superhet designs using seven or eight valves, and consequently expensive to produce, first appeared in small numbers in 1932.

The price of these instruments, more than £30, restricted their sale at a time when that price represented three months wages for a working man.

Challenge Met

Again the challenge was met by the research departments of radio manufacturers and in 1933 newly developed types of valves made possible superhet circuits using only four valves, resulting in sets costing around £15.

Once more, receiver design and improvement followed advances in valve technology.

Refinement

It is interesting to note that in the first ten years of broadcasting, almost all the essentials of the modern radio receiver, except the replacement of the valve by the transistor, had been invented or developed. Progress in the 50 years since has been by way of refinement, the simplification of manufacturing techniques and in reduction in size.

No other industry has such a record of both scientific progress and reduction in cost as has the electronics industry.

The radio sets I was selling in the 1920s cost from four to eight weeks' wages of a manual worker; today, he can earn the wages to buy a set with far better performance in four to eight hours - a fortieth of the cost, or less. It is almost unbelievable! □

AIRBAND

☞7

Home wartime radar!). A more permanent radar is being constructed on this site; a copper earth mat made of 30 x 6mm strips is being buried.

Paul continues with details of North Sea coverage by Anglia Radar (125.275MHz) whose transmitter is actually out on an Amoco oil platform, with a microwave link back to the mainland at the gas control centre, Bacton. The Anglia radar coverage is superior to that from RAF Coltishall (125.9MHz) although helicopters must contact Coltishall when in the surrounding area.

Paul kindly suggests that he is only telling me what I already know but, on the contrary, I'm very pleased to receive this new information. As a general point, there's too much happening out there for one person to keep up with purely as a hobby. I am therefore reliant on your offerings of local news which I can then share out by printing it here. Keep it coming!

The next three deadlines (for topical information) are February 2, March 2 and March 30. □

Abbreviations

a.t.i.s.	automatic terminal information service
d.m.e.	distance measuring equipment
E	east
FL	flight level
ft	feet
kHz	kiloherz
km	kilometre
LATCC	London Air Traffic Control Centre
MHz	megahertz
mm	millimetre
N	north
n.d.b.	non-directional beacon
nm	nautical miles
RAF	Royal Air Force
s.i.d.	standard instrument departure
s.s.r.	secondary surveillance radar
u.h.f.	ultra high frequency
v.h.f.	very high frequency
v.o.r.	very high frequency omnidirectional radio range
W	west

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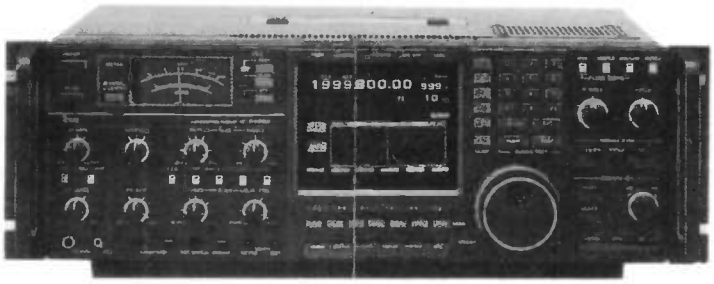

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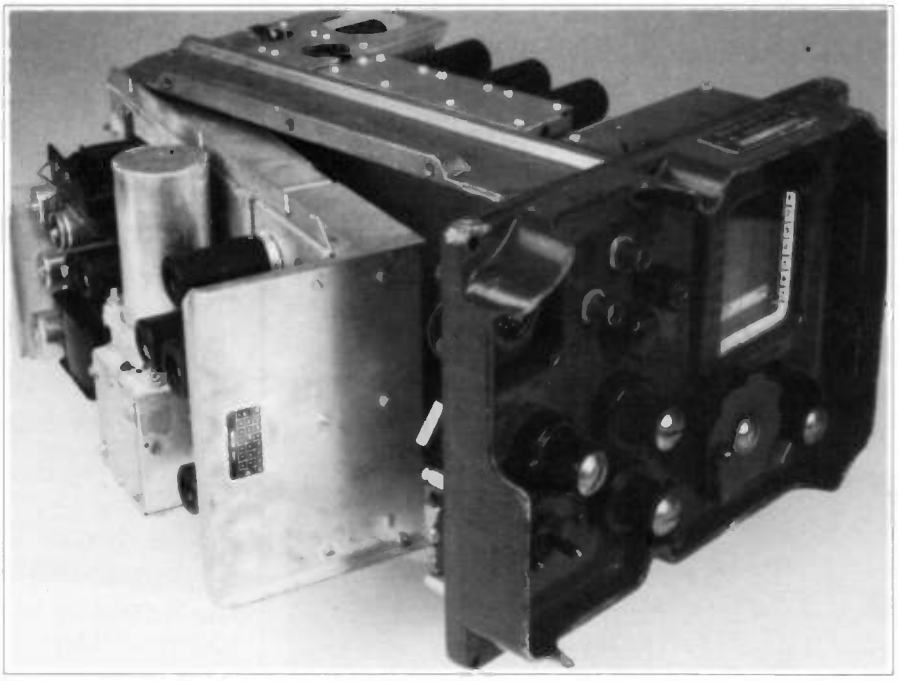
CONVERTING THE R210 RECEIVER

Tom Harrison GM3NHQ

Part 2

After reading the first instalment you are probably itching to get going on the practical conversion of your own R210 receiver.



The power supply chassis can be hinged away from the central spine, after undoing the six cheese-headed screws, to give easy access.

First we must get rid of the Plessey Mk IV multi-pin connector, PLA, on the front panel to make way for a standard mains input socket and phone socket. **Table 2.1** gives the relevant wire cutting and unsoldering details. It is worth leaving any redundant wires in place in the cable looms - just tape up the loose ends for safety. Once all the steps have been completed, remove PLA, making sure that the 82Ω (Grey, Red, Black, Silver) resistor, R53, is grounded again to chassis by its solder tag.

I made a small aluminium panel to fit into the recess left by PLA and filed it out to take the mains and phone sockets, leaving all the other coaxial sockets on the front panel untouched, but that is a matter of personal preference.

Once the sockets are fitted the mains input circuit can be completed. The idea is to get what will be the mains supply onto tags F5 and F6 on the main connecting strip with the fuse, FS1, in the Line to the ON/OFF switch SWCa, b. However, don't put mains onto it until you have changed transformer T1 for the mains transformer described later. On SWCb cut the brown wire that goes to the dial lamp and re-route it to the brown wire that went to PLA-F. That puts the dial lamp onto the rest of the heater circuit. The phones output leads, old PLA-L and PLA-K, are connected to the new phones socket.

So, now we have the phones socket connected and the input supply connected to the set through the fuse and ON/OFF switch and it is worth noting that at this point the set will still work off the 24V d.c. supply.

So why not try it just to make sure and give your confidence a boost!

Put the positive input to the new Line connection and the negative to chassis and check that the set is still alive.

Now for the main part of the conversion - mains operation.

Table 2.1 PLA Removal details

Pin	Modification
A	Cut at pin A only
B	Cut & remove
C	Cut & remove at F2
D	Cut at PLA & divert to SWA1
E	Cut & remove at F1
F	Cut at pin F only
G	Cut & remove
H	Cut & remove at F4
J	Cut at pin J only
K	Cut at pin K only
L	Cut at pin L only
M	Cut & remove to FS1

Mains Conversion

There are two ways of converting the set to mains - the 'easy way' and the 'very easy way'.

The 'very easy way' requires an external 240 to 24V or 240V to 48V transformer which can lie anywhere in the shack with a lead to the R210 (Cirkit have a 24V unit that will do nicely) and the modification to the p.s.u. can be done in a few minutes as set out in **Table 2.2** and **Fig. 2.1.**

However, I decided to do it the 'easy way', avoiding adding more wires to the 'rat's nest' that passes for GM3NHQ's shack and also because the 50VA Transformer Kits specified fit exactly in the position occupied by T1! This allows the existing p.s.u. chassis to be retained without resorting to 'panel bashing'. A new p.s.u. chassis can be made at a later date to give space for that s.s.b. filter you will probably want.

It is easier to list the items to be left on the p.s.u. chassis rather than those to be removed. There is a fair amount of wire cutting and unscrewing required to remove the hash filter box and all the vibrator components, but don't be put off by this. All the resistors, capacitors, ferrite beads, nuts and bolts are redundant for a.c. operation and will all swell the stock in the junk box.

The components asssociated with V15 (C130, R65 & 66) and the bias network (MR1, C117, 118 & 119, and R69 & 70), are mounted on the small tagboard beneath strip 'E' and these are left for further use, as are the h.t. smoothing capacitors, C127, 128 & 129, and choke L1.

The new h.t. rectifier is a bridge made up of four 1N4004 rectifier diodes, D1, 2, 3 & 4, mounted on a small tag strip. The transformer winding details are listed in **Table 2.3**. Newcomers should not be put off by the prospect of winding the new transformer by hand - the primary is already wound on the bobbin and the secondaries take less than an hour to do.

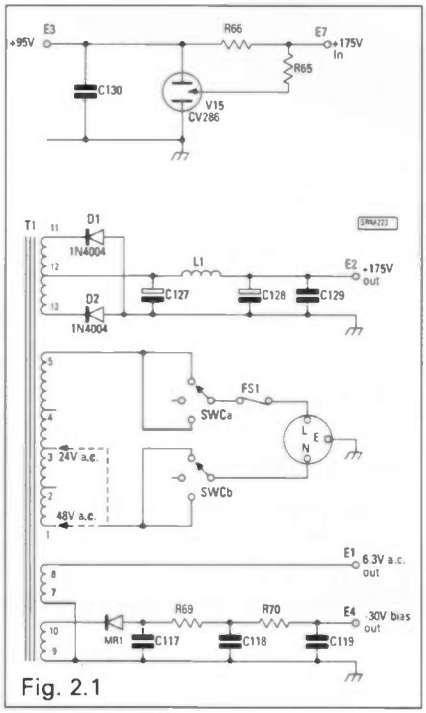


Fig. 2.1

CONVERTING THE R210 RECEIVER

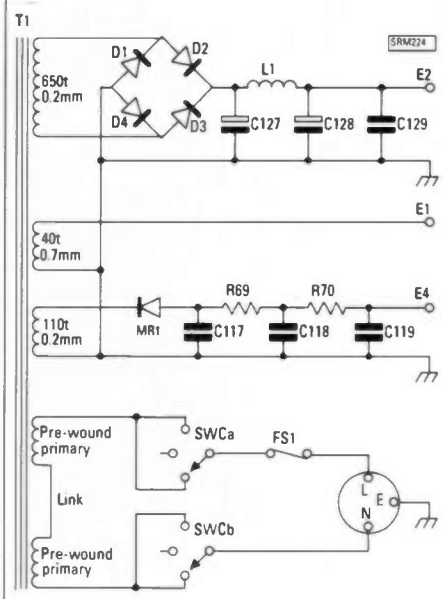


Fig. 2.2: Circuit diagram of conversion using new mains transformer.

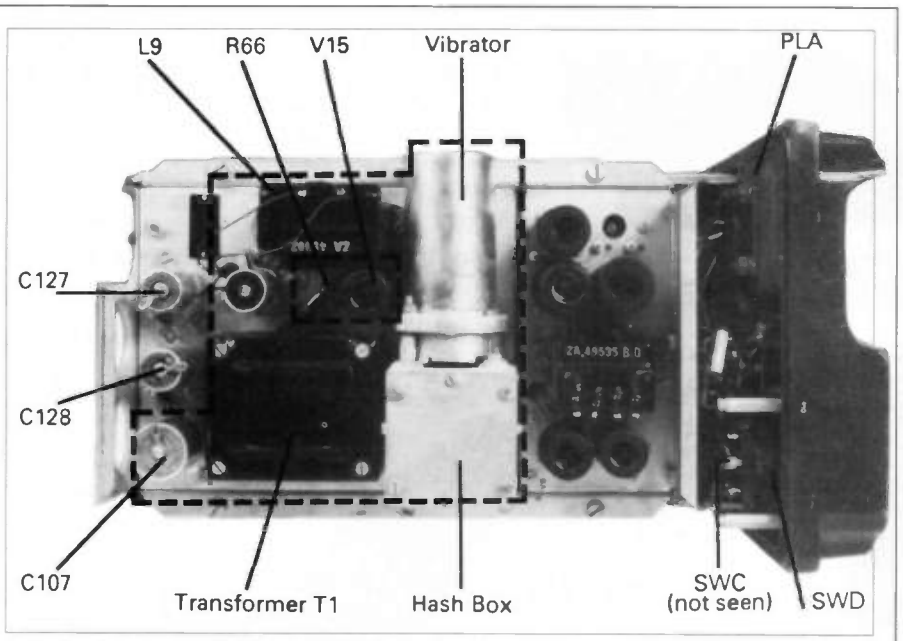


Fig. 2.4: The R210 Power Supply Chassis. Those components within the dotted box are removed for mains operation.

Table 2.2. External AC Operation.

Step	Operation
1	Pull out vibrator.
2	At Tag E6 remove lead to L9, C106, 107 & 138.
3	At T1, Tag 3, disconnect existing lead.
4	For 24V a.c. operation only, connect T1 Tag 3 to E6.
5	For 48V a.c. operation only, connect T1 Tag 1 to E6.
6	At T1 Tags 11 & 13, disconnect leads and connect diodes D1 & 2 as shown in Fig. 2.1.

Table 2.3. Mains Transformer Winding Details.

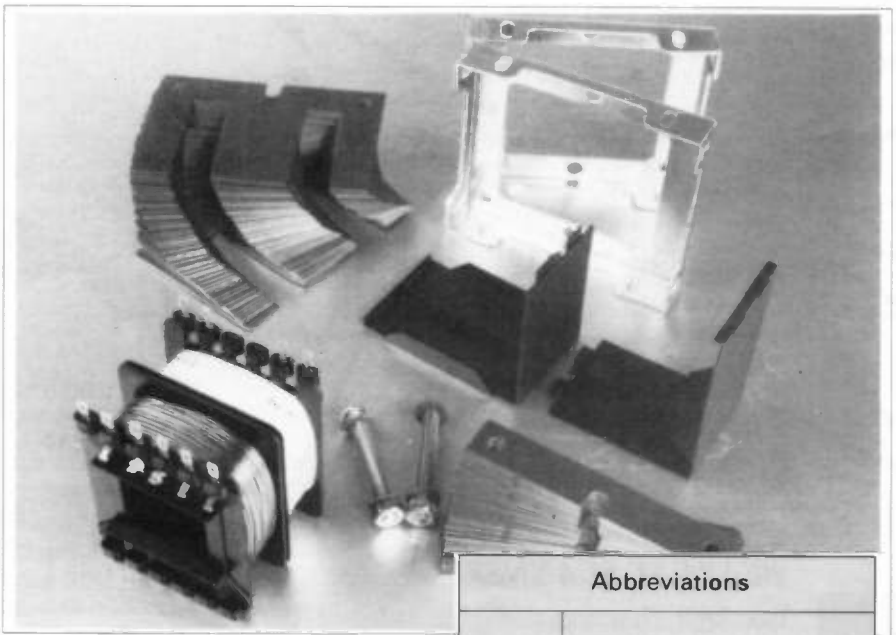
Winding	Turns	Wire Diameter (mm)
30V Bias 175V h.t. 6.3V heaters	110 650 40	0.2 0.2 0.7
Primary (Mains)	Already wound. Link 2 to 3 for 240V mains.	

Circuit Diagram

A circuit diagram of the power supply section of the receiver will be found very useful in carying out the modifications. Send a large, self-addressed, stamped envelope, clearly marked R210, to 'R210 Circuit Diagram', Short Wave Magazine, Enefco House, The Quay, Poole, Dorset BH15 1PP, for a photocopy of the power supply unit circuit diagram taken from the original maintenance manual. Do not enclose anything else in the envelope.

Whichever 'way' you choose for your mains conversion, check the outputs from the p.s.u. before you connect them to tagstrip 'E'.

You want 6.3V a.c. for E1, -30V d.c. bias for E4, +175V d.c. for E2 and you should have +95V d.c. regulated on E3.



The Transformer

If all's well, make the connections - and that's it!

In the final part a loudspeaker output will be described. □

Abbreviations	
a.c.	alternating current
d.c.	direct current
h.t.	high tension
p.s.u.	power supply unit
s.s.b,	single sideband
V	volt
VA	volts x amps (watts)
Ω	ohms

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SCANNING

Alan Gardener

BC200XLT Modifications

This month's column is of particular interest to Uniden/Bearcat owners as it gives details of some interesting and useful mods to the BC200XL scanner.

The BC200XLT has probably been one of the most popular selling scanning receivers during the last year or so. Like so many other scanners originally designed for the American market it does have the disadvantage of only receiving a.m. signals when tuned to the v.h.f. aircraft band. This is automatically selected when the scanner is tuned to the appropriate frequency range. The reason for this is that, unlike the United Kingdom where there tends to be a mixture of modes of transmission, very few services in America still use a.m. In order to simplify operation the manufacturer makes the selection automatic. This is a great pity as it does tend to limit the usefulness of what is otherwise an excellent hand-held receiver.

Strangely enough this may also cause an unforeseen problem for listeners in other countries as a result of the v.h.f. airband expanding by an extra 1MHz taking its top frequency limit from 136 to 137MHz. This means that any signals in the new section of the band will be received as f.m. making speech sound very distorted. It is anticipated that the manufacturers will change the internal programming in future models to overcome this problem.

Just over a year ago I promised to include details of a manual a.m. switching modification - well at long last here it is!

This was devised by regular reader **Dave Hicks** of Bewdley. Dave modified his receiver some time ago without any major problems and has now passed on the details. The modification still allows the automatic selection of a.m. on the v.h.f. aircraft band but in addition permits manual selection on other frequencies.

Method

Before you start on this modification please be sure of your own capabilities as the work involves some very fine work on the printed circuit board. Please also note that any modifications are likely to invalidate any existing warranty on the equipment.

The first step of the modification involves providing a suitable method of switching to a.m. Initially it was hoped that one of the existing controls such as the 'WX' switch could have been used. However, this does not seem possible because of the way in which the microprocessor controller scans the keypad and drives the l.c.d. display. This means that an additional miniature switch has to be fitted. The position of the switch is very much a matter of personal taste but Dave has fitted his in place of the existing earphone socket. This method avoids having to drill additional holes in the receiver casing, but other suggestions include gluing a reed relay type switch inside the case and operating it with an external magnet, fitting a touch switch i.c. inside the receiver with a small touch plate mounted on the case, replacing the mono earphone jack socket with a stereo version - using the spare set of contacts to connect an external switch - and finally using a switching supply derived from the l.c.d. backlight, a.m. being selected when the light is on.

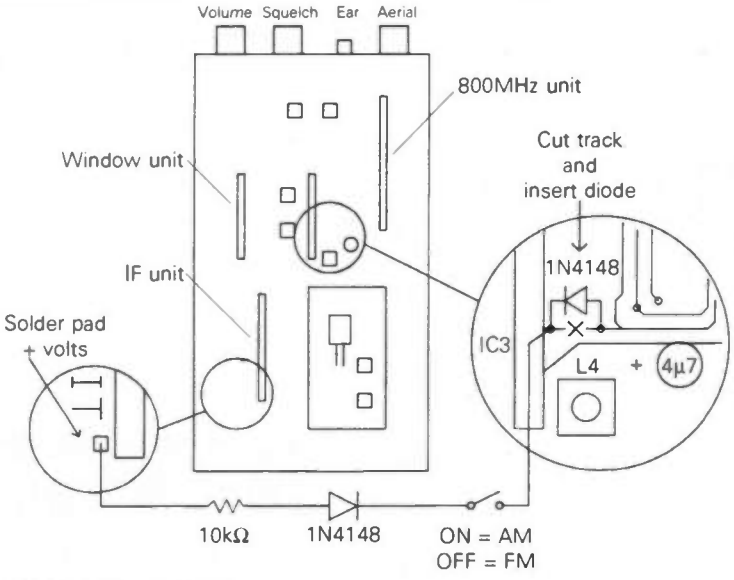

Fig. 1: BC200XLT Rear View

Note that whatever method is chosen the switch contacts have to be closed in the a.m. position.

Carefully remove the battery pack and outer casing and examine the circuit boards.

Find a suitable location for the new switch and fit it!

Using the drawing as a guide look at the main circuit board and find IC3.

Locate the screen-printed + symbol to the the left of the vertical 4.7µF electrolytic capacitor. Find the second track running horizontally above the + symbol. With a modelling knife or fine screwdriver cut the track at the point indicated with an 'X' in the diagram.

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 IC8.

Connect a fine insulated wire to the anode of the diode (the end without the band) and connect the other end to one of the switch contacts.

Next look at the bottom left of the main printed circuit board and locate the small, silvered pad at the bottom left of the words "IF UNIT".

Solder a miniature 10kΩ resistor to this point and connect the anode (the end without the band) of a second diode to the other end of the resistor.

Connect a fine insulated wire to the cathode (band end) of the diode and insulate the diode and resistor with some suitable sleeving. Tuck the insulated components in alongside the i.f. unit.

Run the insulated wire to the other switch contact.

Check that no components are shorting out and replace the case and battery pack. Re-power the receiver and check for correct operation.

With the switch contacts open operation should be as normal. Closing the switch contacts should select a.m.

One tip when using the modified receiver is to put all of the frequencies where a.m. is used into a separate memory bank. You can then manually select a.m. when that bank is chosen.

I would be very interested to hear from any readers who have suggestions relating to this or any other receiver modifications that they would like to share with others. My thanks to Dave for sending me this very useful modification.

What Can I Hear? Part 11

In last month's look at the radio spectrum we ended at 868MHz and the top end of a small band allocated to the new range of CT2 cordless telephones. The development of these cordless telephones is only likely to be the first step in a whole range of personal communication equipment much of which is likely to be operating in the 800-

1700MHz portion of the radio spectrum using sophisticated modulation and signalling techniques. There are several reasons why this particular portion of the spectrum has been singled out for expansion, the main one being that there are very few existing users in this part of the spectrum - which due to its propagation characteristics is really only suitable for very short range communications.

Until developments in component design made commercial production of equipment possible the major user of this portion of the spectrum was the military. The main use is to provide secure communication links between battlefield command and communication centres. The standard equipment used by the British Army to provide battlefield links is called 'Triffid'. This is used to provide a mobile 'trunk' circuit forming part of an overall communications network known as 'Ptarmigan'. Generally this equipment is only used for training purposes in Britain so most of the time the frequencies can be shared with other users. With the move towards a united European market in the 1990s it is important that any commercial personal communication system could be used in any of the European countries and for this reason several segments of the band have already been set aside for future developments.

ETACS

One of the bands which has recently been released by the military lies between 870-888MHz. This has been allocated for use by cellular telephones in the London area and is likely to be permitted in other cities soon. This is because the expansion of the cellular system has been much greater than originally forecasted resulting in peak time congestion of the system. By allowing this additional chunk of the spectrum, known as the ETACS band, it is hoped that demand can be met until the next generation of digital cellular phones, known as GSM, become available.

In order to permit a normal two way telephone style conversation cellular telephones need to be able to transmit and receive signals simultaneously. This is achieved by special filters built into the equipment which separate the transmit and receive signal paths. This is one of the reasons for the 45MHz split between transmit and receive frequencies. The larger the frequency difference the easier it is to separate the signals. The base stations always transmit 45MHz higher in frequency than the mobile stations and usually have eight or more channels operating from the same site. The channels are spaced at 25kHz intervals but are offset by 12.5kHz.

A few of the channels are used exclusively for control purposes. This is necessary because of the way in which the system operates. When a cellphone is initially switched on it has to identify itself to the network. This is achieved by the phone transmitting a digital data 'Burp' to the base station so that the control system knows in which cell the phone is located. The system can then route incoming calls to that cell directly rather than having to try all the cells in the network. As the phone is moved around it may leave one cell and move into an area served by another base station. Whilst switched on and in its idle state the cellphone constantly scans the control channels, by monitoring these signals it can check for incoming calls and ensure that it is receiving signals from the appropriate base station. By using directional antennas at the base stations it is possible to re-use the same frequencies many times, making it one of the most spectrum efficient communications systems currently in operation.

Fighting Crime

Amongst the cellular telephone bands there are a couple of other interesting allocations - the first of these lies between 888-889MHz. This is a recent allocation for low power and anti-theft devices. Transmissions in this band can be up to 0.5 watt in power and may be used for a variety of purposes. The most common use is likely to be in the fight against crime. Most major department stores now use some form of anti-theft tag attached to expensive items. This usually consists of a small plastic moulded tag which can only be removed by sales assistants when the item is paid for and if the tag is taken outside a pre-determined area an alarm sounds. Because the tags spend most of their life attached to items and need to be physically small it is not practical to power them with batteries, particularly when you consider how many of them would be required in a large department store - therefore the tag is designed to be passive in operation until it is excited by an external signal.

Not all systems are the same but the general method of operation is as follows. The tag usually has some form of tuned antenna built into it. This may consist of a simple dipole or coil etched on to a printed circuit board. Connected across the tuned circuit is some sort of non-linear device, usually a simple diode. Normally this circuit does absolutely nothing! However when it passes through one of the detection zones the tuned circuit receives a strong localised signal transmitted by the detection equipment. This causes the diode to conduct and because of its non-linear transfer characteristic generate signals at harmonics of the received signal. These harmonics are re-radiated by the tag and are received in the detection equipment initiating an alarm. Originally the detection equipment was not very reliable with items such as pocket calculators and transistor radios causing false alarms. However modern equipment is much more sophisticated and stable in operation.

A similar technique is being tested as an 'electronic dog tag' The animal in question has a small microcircuit implanted under its skin. It is anticipated that this could be performed under a local anesthetic by a vet when the animal is registered. When a hand-held version of the tag detection system is brought near to the animal the microcircuit is activated and a special code is transmitted back to the detector. This can then be used to identify the animal and its owner.

Other uses of the system include include 'tagging' of components on car assembly lines and perhaps a more emotive issue - the 'electronic tagging' of prisoners on remand. In this system the prisoner has a small tag attached externally to his or her arm/leg. The tag has to remain within a certain range of a control unit attached to a telephone line. If the tag moves beyond the specified range an alarm is raised by the control unit dialling a central control station.

Not So Smart Cards

Other further future use of this band may be for short range data transfer between 'smart' credit cards and cash machines. Imagine your credit card having a small keyboard and l.c.d. display. Instead of having to use the keyboard on a 'hole in the wall' machine you would simply tap out your PIN number and the amount of money you required on your card. Providing you were within a few feet of the machine - out would pop the money with your account balance automatically transferred to your card.

Alternatively forget cash altogether. You visit the supermarket, instead of handing over cash you are presented with a small keypad. You type in the amount of money to be paid and your PIN number. The cash machine electronically checks your card whilst it is still in your wallet and debits the cash, automatically updating the card details.

When you get home the card is electronically checked by a special 'Home-banking' unit which will give you a printout of the day's transactions. Meanwhile the gas, water, electricity, telephone and mortgage fees are deducted at today's rate and the electronically tagged car tax disc expires preventing you from starting the engine!

SCANNING

Personal radio

Returning to the spectrum the other interesting allocation lies between 933-935MHz and is proposed as a Personal Radio Service. This is intended to be a more upmarket version of the present Citizens Band allocation which lies between 934-935MHz. The CB service currently has 20 channels allocated to it spaced at 50kHz intervals. Some time ago the channel frequencies were changed slightly resulting in Channel 1 now being on 934.0125MHz.

Use of the 934MHz CB allocation is rather sparce - although the people who do use it are very dedicated. The chances are that if you are within range you will hear them, although at these frequencies a good antenna also helps. The DTI no longer permits equipment to be manufactured for use in this band. This is in order to make way for the new Personal Radio Service which may be mainly used by small businesses requiring local communications. Exactly how this will work has not yet been decided but it is apparent that some form of automatic channel selection will be utilised with each radio having a built-in electronic identification code. It is quite likely that some form of digital modulation will be used in order to maximise use of the limited number of channels.

By now you should be pretty confused by all the different types of communications systems likely to be using this portion of the spectrum - if you aren't then you haven't been concentrating! So just to recap here is a brief resume of what each is and does:

Citizens Band (CB) - A short range public communcations system. Operation is simplex on one of 20 manually selected channels. To be phased out over the next few years in favour of PRS.

Cellular - The existing mobile telephone system based on a large number of coverage cells providing nationwide coverage. Also referred to as:

TACS - Total Access Communications System. The name given to the British Cellular system.

FREQUENCY ALLOCATIONS 868-960MHz

Frequency (MHZ)	Service	
868.000		
	Government	
870.000		915.000
	Government	
	Cellular Telephones ETACS Mobiles Paired with	
888.000		933.000
	Low Power & Anti-theft Devices	
889.000		
	Home Office	
890.000		935.000
	Cellular Telephones TACS Mobiles Paired with	
905.000		950.000
	Government	
	Reserved for GSM Mobiles Paired with	
		960.000
915.000		
	Government	870.000
	Cellular Telephones ETACS Base Station Paired with	
933.000		888.000
	Reserved for Personal Radio Service	
934.000		
	Citizens' Band	
	Reserved for Personal Radio Service	
935.000		890.000
	Cellular Telephones TACS Base Station Paired with	
950.000		905.000
	Government	
	Reserved for GSM Base Station Paired with	
960.000		915.000

ETACS - Extended Total Access System. The name given to the extra channels used by the Cellular telephone system in cities.

CT2 - A new digital cordless telephone system for making outgoing calls only, if the handset is in range of one of the public base stations. Alternatively it can be used to receive incoming calls like a conventional cordless phone if you own your own home base station.

GSM - Groupe Speciale Mobile. The name given to the proposed new European Digital Cellular telephone system.

PCN - Personal Communications Network. One step beyond cellular telephones this is intended to be the pocket communicator of the future with world-wide communications available from a small calculator sized unit. It is likely to use digital modulation techniques and operate somewhere in the region of 800-1700MHz.

PRS - Personal Radio System. Otherwise known as SRR, Short Range Radio. Intended to be a short-range communications system. Each radio will have an electronic 'Callsign' and will automatically find a clear operating channel.

OK - That's all! As usual all letters to PO Box 1000, Eastleigh, Hants SO5 5HB. Until next month - Good listening. □

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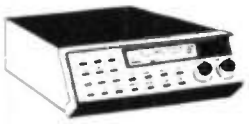

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SEE REVIEW PW SEPT 89

MKII MICROREADER

The Microreader is a small compact unit that allows anyone equipped with a suitable SW receiver, to read Morse & RTTY signals simply and without fuss. No computers, interfaces or program tapes are needed, just connect the Microreader to the ear or speaker socket & switch on. The decoded words appear on the built-in 16 character LCD display screen.

The Microreader contains all the filtering & noise blanking needed to allow reception even under bad conditions. A three colour bargraph tuning indicator makes precise tuning simple, while shift indicators take some of the guess work out of RTTY. Despite the fact the Microreader contains two fast processors (12 MHz), it is extremely quiet generating virtually no RFI. The Microreader can also if you wish, transfer the decoded messages to any printer, computer or terminal unit equipped with an RS232 port.

In the tutor mode, the Microreader will send random groups of characters with variable speed & spacing, or plug in your own Morse key to check your sending. In both cases the characters are shown on the display.

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ANTENNAS

F. C. Judd G2BCX

Part 12

Fan HF receiving antenna

Following on from last month, a couple more antenna variations are described - the h.f. fan and the loop.

Although the basic principle of this antenna is not new, the configuration presented here and illustrated in **Fig.12.1** has been devised by the author for short wave h.f. band reception over a wide frequency range with an almost constant bandwidth/magnitude. It can, however, be modified to either incorporate a smaller number of elements with 20° separation, or operate over different frequency bandwidths by changing the number of elements and respective lengths. If the lowest frequency is in the region of 2MHz the support masts would need to be wider apart, or the far end mast made higher. The system can be connected to a receiver via an unbalanced line (50Ω coaxial cable). The lengths of the half dipole elements can be obtained from:

$$L(m) = 71.18/fo(MHz)$$

where fo is the resonant frequency required.

For a reasonably uniform bandwidth/magnitude, and to simplify construction, a half dipole can be used for a maximum of every 5MHz of the required bandwidth. A practical arrangement with a frequency coverage of 5 to 25MHz is illustrated in **Fig.12.2.** It has five elements, lengths as shown, with 20° spacing between each.

Insulators should be used where indicated, especially to break up the support wires for the short elements unless nylon or polypropylene rope is used instead of wire. The lengths of the elements are given in metres do not have to be precise, a few millimetres or so either way will make no difference to performance. A suggested arrangement for terminating the elements - connecting these to the coaxial cable and the earth wire connection - is shown in **Fig.12.3.** At least one metre of the supporting post should be in the ground for security against strong winds.

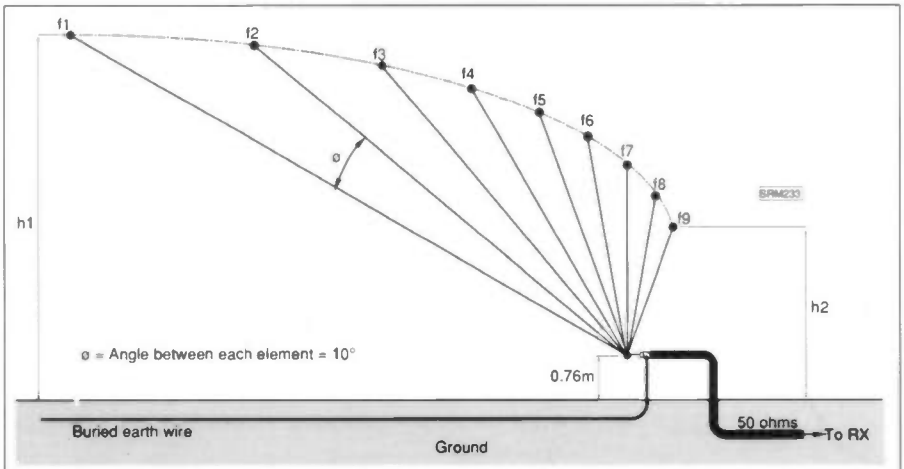


Fig.12.1: Basic arrangement of a fan antenna for h.f. reception over a wide frequency band, see text.

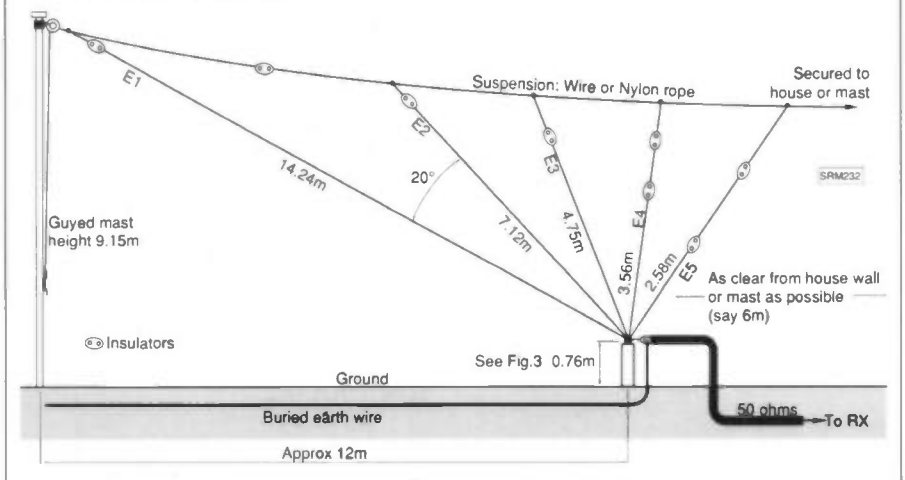


Fig.12.2: Working dimensions etc. for a fan antenna for h.f. reception in the range 5 to 25MHz; see also Fig.12.3.

Loop Antennas

Antennas consisting of one or more single-turn loops, one wavelength in circumference and resonant at operational frequency can be used for v.h.f. and u.h.f. application. A single loop, as in **Fig.12.4(a)**, has a radiation and/or reception pattern similar to that of a dipole and at right-angles to the line of the loop.

The directivity gain of a beam consisting of a one-wavelength circumference driven loop and a reflector loop, spaced about 0.17λ apart, is a little greater than that obtained with a 2-element (square loop) quad[15].

A single 'split' loop, λ/2 in circumference, as in **Fig.12.4(b)**, makes a very good direction-finding antenna for small bands of frequencies ranging from about 28MHz up to v.h.f., e.g. 145MHz. Providing the loop is properly matched and tuned, the nulls are very sharp and the radiation and/or reception pattern is therefore similar to that of a dipole but is in line with the loop[16]. A gamma-matched 0.5λ circumference split loop constructed for d.f. work (28 to 30MHz) is shown in **Fig.12.5.** It should be noted that at higher frequencies these loops are only suitable for d.f. work over short ground distances.

HF Loop Antennas

Apart from fairly accurate direction finding applications, loop antennas for the lower h.f. bands can be used for general reception and because of the 'directional' properties can help to reduce interference from unwanted signals close in frequency to those required. Also they are less prone to picking up machine-made electrical noise and 'natural' noise (static). However, these performance factors can only be achieved if the loop is tuned to resonance and enclosed in a 'split' screen, as in **Fig.12.6.**

Loop antennas of this nature are obviously not as efficient as linear resonant types, especially at frequencies above about 4MHz. Below this frequency a loop of reasonable size (50 to 75mm diameter) can draw energy from a fairly large area of a passing wavefront and thus establish a reasonably high signal-to-noise ratio[17].

Abbreviations

d.f	direction finding
h.f	high frequency
MHz	megahertz
u.h.f	ultra-high frequency
v.h.f	very high frequency
v.s.w.r	voltage standing wave ratio
λ	wavelength
Ω	ohms

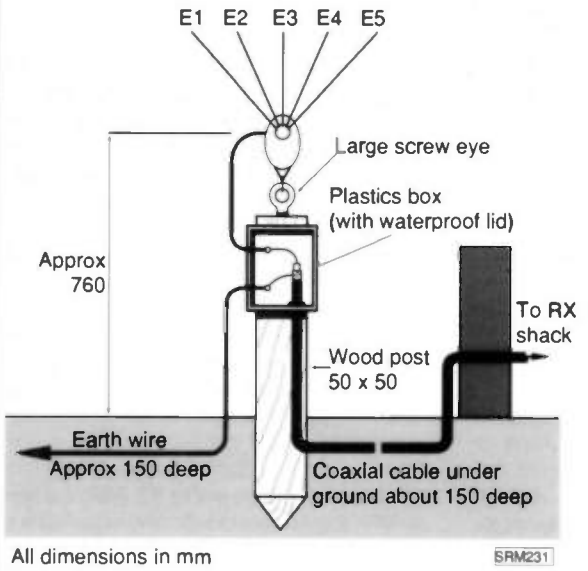


Fig.12.3: Details for terminating the half dipoles used in the fan antenna. Note: RX feed cable and earth wire connections in waterproof plastics box.

Fig.12.4: (a) single loop radiator with circumference of one wavelength and 'broadside' cosine radiation pattern; (b) single split loop λ/2 in circumference, cosine radiation pattern with maxima in line with loop.

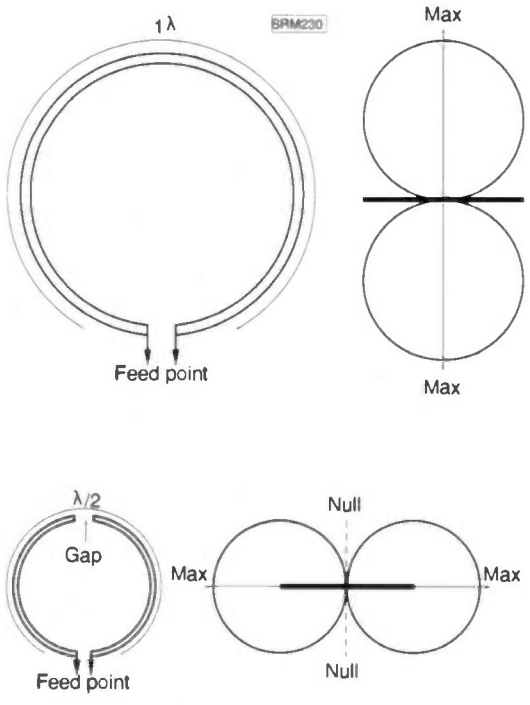
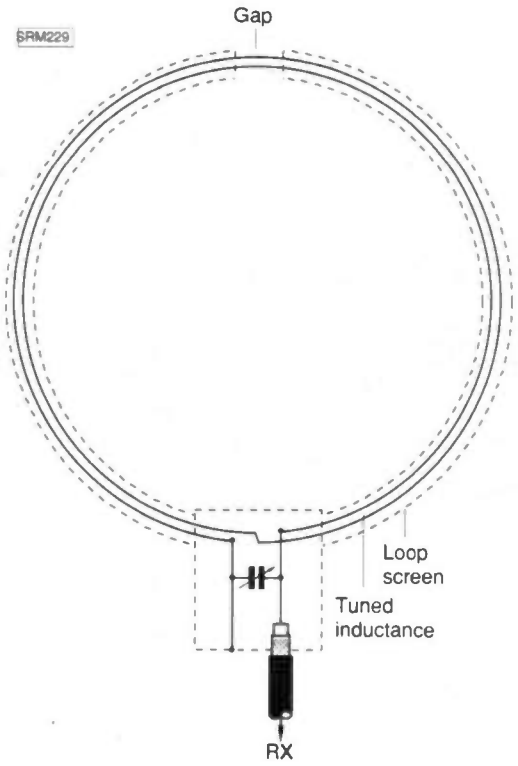


Fig.12.6. Lower and medium h.f. and h.f. loop antenna with tunable inductance inside a split screen; note that loop inductance may contain several turns of insulated wire depending on diameter and frequency of operation.

Fig.12.5. Gamma matched half-wave loop for d.f. work in the range 28 to 30MHz.



A wide variety of commonly used antennas and their general performance has been covered in this series. It would seem logical to use the next, and final part for dealing with some of the more important aspects of transmission lines, matching and v.s.w.r. which applies to all transmitting antennas and, to some extent, those used for receiving only. □

References

[15]. Ring Beam Antenna for 145MHz, F.C. Judd, *Wires and Waves*, PW Publishing Co., or *Practical Wireless* Sept. 1983.
[16]. *Out of Thin Air*, PW Publishing Co.
[17]. *Antenna Book* (Chapter 16), ARRL, available from *SWM* Book Service.

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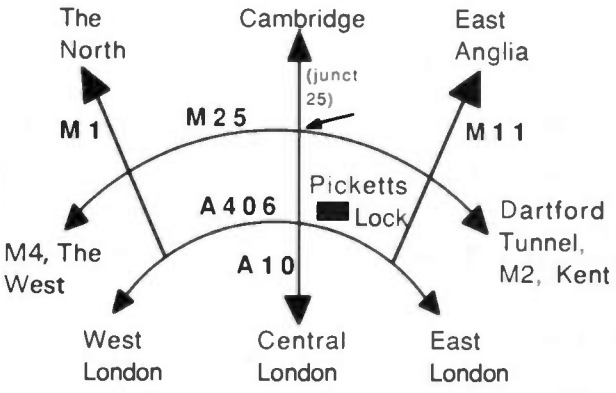

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FAIR MATE HP-100E HAND-HELD SCANNER

Jack Aldridge

The Fair Mate HP-100E is the latest in hand-held v.h.f./u.h.f. scanning receivers with many very useful features. Although not yet a name well-known in Europe, this may well change after the HP-100E.

The coverage of the HP-100E extends from 25 to 550MHz and 830 to 1300MHz in two bands with various tuning, searching and scanning options. One rather unusual feature is that all the normal optional extras are included in the price! Then if that wasn't enough, this hand-held has a memory capacity of 1000 - yes, one thousand!

Getting Started

As with most hand-helds the external connections were kept to a minimum. The antenna socket was of the BNC type which was plenty good enough quality to cope with the frequency range. The supplied antennas were two rubber covered helical 'rubber duck' types, with the shorter of the two designed for operation in the 830 to 1300MHz band. The normal power source was a set of four AA size NiCad cells which were included in the package. You could also use dry cells if you get stuck away from base with flat NiCads! An alternative method of powering the HP-100E is to use the supplied external power lead. The requirements are quite modest being 12V d.c. at approximately 150mA. The final external connection was for an earpiece or headphones and comprised the now standard 3.5mm jack. This is a facility which is particularly useful when operating portable. As the HP-100E is a new release in this country (we had the review model at the end of December) the manual supplied was only a draft copy but assuming the final version follows the same lines it should prove perfectly adequate. The instructions were very clear with extensive use made of key-by-key instructions for some of the more complex functions.

Controls

For a small hand-held scanner the HP-100E features an impressive, yet simple to use range of facilities. One of the facilities that is often omitted from smaller receivers is a rotary tuning control, however the HP-100E includes this facility with a small rotary control mounted on the top panel. This control has twenty click stops and changes the frequency either up or down with clockwise rotation for up and vice versa for down. The frequency steps used by this control and the search mode can be set by the operator to any value between 5 and 995kHz in 5 or 12.5kHz multiples - quite impressive!

An alternative method of manual tuning was to use the direct entry keypad. This was conventional in operation and the logic also inserted trailing zeros - another time saving feature. The reception modes available on the HP-100E were a.m., n.b.f.m. and w.b.f.m. these being selected by two buttons on the front panel. One was for selecting wide f.m. while the other had a toggle action between a.m. and n.b.f.m. Incidentally the selected receive mode was clearly indicated on the main liquid crystal display. One of the main features of the HP-100E was the inclusion of 1000 scanning memories. These were conveniently arranged into 10 banks of 100 memories. Programming these memories was very straight forward with the mode being automatically included with the frequency. Once you had programmed a selection of memories you could then use the scan modes to monitor activity.

With so many memories available the scan speed becomes critical and the HP-100E operates at approximately 20 channels per second which is pretty quick. In addition, the scan could be split-up so that rather than having to scan the whole 1000 memories you could opt to scan just one bank of 100, giving a complete scan every two seconds. As a further aid you could also choose to include any of the ten banks in the scan making it very versatile indeed. One point of interest regarding the memories was that they did not require battery back-up like most scanners, because the HP-100E used Electrically Erasable p.r.o.m. technology. Most receivers that require to retain information, such as memory channels and set-up information, use special memory devices that use very little power. These devices are then left powered up, even when the main power switch is off.

The power for these memory devices being supplied by some form of battery, often a lithium type. The Fair Mate however uses Electrically Eraseable Programmable Read Only Memory or EEPROM for short. These integrated circuits are capable of storing information and retaining it, even when the power is removed. Early versions could only be erased using ultra-violet light but these latest types can be erased or modified by the application of the appropriate electrical signals. This makes them much more versatile and consequently they are now finding their way into consumer electronics. One common problem when

scanning is the channel with a constant carrier present. The standard solution is to use the lock-out facility which is also provided on the HP-100E. This allows you to lock-out any channels on an individual basis. Once a scan has started it stops whenever a carrier is detected and once stopped, there are two options available, these are called DELAY and HOLD. When DELAY was selected the receiver stopped on a carrier and remained on that frequency for two seconds after the carrier has ceased before restarting the scan, whilst the HOLD option stopped the scan permanently. Another commonly used mode amongst scanning enthusiasts is the priority scan, this allows the operator to monitor one important frequency whilst scanning through a wide range of other frequencies.

The HP-100E included this facility and

Table 1

Bank	Frequency	Mode
1	108 - 142	a.m.
2	225 - 261.5	a.m.
3	275 - 364	a.m.
4	142 - 159	f.m.
5	156 - 162	f.m.
6	374 - 354	f.m.
7	361 - 363	f.m.
8	850 - 860	f.m.
9	25 - 550	f.m.
0	850 - 1300	f.m.

COMPETITION

I	F	S	S	S	C	W	S	D	Q	B	O	C	L	I	L	F	A	O	P	Y	J	J	V	B
F	D	G	W	T	E	D	S	E	Q	L	U	T	B	I	U	R	W	X	N	R	S	K	A	T
T	Z	O	G	O	O	R	M	G	S	R	E	A	R	O	Y	S	Y	V	Y	A	F	F	A	Z
Z	K	C	F	P	E	O	M	P	M	T	T	R	R	A	H	P	P	E	N	O	S	S	S	Y
Z	S	I	H	D	B	U	R	S	J	Y	B	X	E	X	N	E	A	N	D	C	K	R	H	S
I	H	F	L	N	R	D	F	S	Q	U	K	K	Q	V	B	S	E	F	A	O	T	B	R	J
D	S	O	L	T	Q	T	V	A	S	H	W	W	G	C	I	T	F	N	Q	R	C	I	Y	D
K	S	H	C	U	P	V	P	A	K	A	X	Z	X	M	N	E	N	O	O	R	F	E	U	D
M	V	E	O	C	S	Y	I	L	X	S	R	M	U	A	I	I	C	P	R	I	I	D	D	G
V	P	A	Y	R	T	Y	E	H	N	D	I	G	A	N	N	U	O	E	Z	M	W	J	K	L
S	A	C	R	Y	T	L	V	K	T	R	F	Z	O	G	W	C	F	V	R	Q	E	Y	U	A
J	F	U	G	P	Q	W	J	B	V	C	L	D	C	U	A	T	X	R	N	E	H	R	Q	E
E	K	V	U	S	E	Y	A	E	V	B	E	V	I	K	S	U	H	Z	T	T	S	Z	Q	B
S	D	T	D	E	H	N	V	V	U	M	X	D	X	Y	B	D	D	V	E	F	O	X	F	J
O	O	O	A	Q	N	U	I	T	E	P	G	N	Z	K	X	G	Z	G	Q	J	A	R	R	K
F	K	O	A	S	Y	T	T	L	X	S	W	T	M	D	E	A	U	B	Y	K	Z	X	S	B
L	A	I	C	E	W	O	C	T	O	D	H	C	L	F	P	E	V	C	L	P	F	I	F	G
K	C	I	M	L	T	Z	T	O	L	I	T	E	Z	F	D	K	Q	G	L	U	P	V	N	O
S	D	N	R	M	T	I	Z	O	M	E	D	G	S	E	N	O	H	P	D	A	E	H	Z	O
K	B	Y	W	B	O	C	L	O	P	Z	L	A	P	P	I	H	M	T	Y	B	P	E	Q	O
O	I	D	M	O	A	F	H	L	W	F	C	B	R	S	Q	O	X	X	E	E	L	Z	F	S
R	C	O	D	T	W	N	B	E	E	F	E	S	V	J	S	A	R	Q	W	K	Z	H	W	G
D	T	G	I	C	E	D	D	C	R	T	L	G	U	K	X	T	Q	M	B	J	C	M	U	S
Q	X	T	O	I	L	B	B	L	V	U	A	X	E	A	V	H	V	C	D	A	D	O	M	S
F	W	X	Y	B	T	S	Z	G	E	A	K	S	Z	N	O	X	E	J	X	M	J	S	S	A

WORDSEARCH

Find these hidden words in the above puzzle:

AIRBAND	ANTENNA	DECODE	DXTV	FAX	GRASSROOTS	HEADPHONES
MIR	RADIOLINE	RECEIVER	RTTY	SATELLITE	SCANNING	SHORTWAVE
SHUTTLE	SOCKET	SOLDER	SPECTRUM	SSTV	TRANSFORMER	TROPO

The 21 radio words listed have all been hidden in the diagram. They have been printed across (backwards or forwards), or up or down, or diagonally, but always in a straight line without letters being skipped. You can use the letters in the diagram more than once, but you do not have to use all of them.All you have to do is mark all 21 words, in ink please, on the diagram and post the complete page to Word Search, Short Wave Magazine, Enefco House, The Quay, Poole, Dorset BH15 1PP to arrive not later than Friday 16th February 1990. The first correct entry drawn out of 'the hat' will win a 1 year subscription to *Short Wave Magazine*. The Editor's decision is final and no correspondence will be entered into.

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FAIR MATE HP-100E HAND-HELD SCANNER

the priority channel could be any one of the 1000 memory channels and didn't have to be in the current scan bank or in memory one which is a restraint with many scanners. One of the main problems for newcomers to scanning is finding frequencies to store in the main memory. Finding these frequencies is normally achieved using the search mode. This allows the operator to search in preselected increments through designated sections of the frquency spectrum. The HP-100E was particularly well equipped in this area as it had ten separate search bands. These bands were selected using the direct entry key-pad and were marked with three buttons for air bands, three for police, one for marine and the remaining three for mobile communications. With so many search bands you could set one up for each band segment of interest, this could then be activated at the press of a button. To make like even easier, the ten search modes were set-up at the factory with the ranges shown in Table 1.

An additional useful feature was that you could link these search bands so that the search was continuous from band one right through to band ten. You could also lock-out any individual frequencies, which can be useful for bypassing those with a permanent carrier or noise. Once a new frequency had been found using the search facility, the HP-100E had provision for transferring that frequency to any of the 1000 memory channels without having to re-enter the frequency - another time-saving feature. Last but by no means least was the provision of an r.f. attenuator which can be very useful in the presence of strong signals.

Technical Information

The HP-100E used microprocessor controlled frequency synthesis technioques for the production of the local oscillator signals. For reception between 25 and 297MHz the first i.f. was +561.225MHz which was followed by a second i.f. common to all frequencies of 58.075MHz. For reception in the 297 to 600MHz band the first i.f. was +251.575MHz changing to -251.575MHz for the 805MHz to 1100MHz. The final band segment from 1100 to 1300MHz used a first i.f. of -561.225MHz. The final (third) i.f. was 455kHz for a.m. and f.m. with 10.7MHz being used for wide f.m. reception.

On The Air

I conducted these tests using both the supplied antennas and my own base station discone. For best results it is obviously preferable to use an external antenna but, being a portable receiver, the HP-100E is bound to be operated with the supplied "rubber duck" antennas. As expected the performance with these antennas was not spectacular, but probably adequate for portable use. I can imagine the air-band enthusiast monitoring on an airfield being perfectly happy with the performance. It is under these circumstances that the attenuator may also come in handy. I found that the fast scan rate combined with priority channel working meant that you could easily set the airfield approach frequency as the priority channel and monitor the ground control and adjacent air traffic control areas using a single bank scan. The performance using my base station discone was quite respectable for a receiver of this class. The sensitivity, while not spectacular, was perfectly adequate thoughout the extensive frequency range of the HP100E. I was very impresssed with the audio quality and would rate it among the best I have encountered in a handheld scanner. The two communication modes, a.m. and n.b.f.m., were rather "bright" but very clear. I was particularly plesed with the a.m. performance, as this is an area where many of the cheaper (and some of the not so cheap!) scanning receivers exhibit rather high distortion. It's performance on broadcast f.m. signals was also very good, although obviously short on bass, the clarity was excellent. Overall it was difficult to believe that the maximum rated output was a modest 100mW! I also enjoyed the frequency selection options provided on the HP-100E as they gave a level of versatility rarely found on hand-held scanners.

One of the features that I found to be particularly useful was the rotary tuning control. This was great for tuning around an interesting frequency or for quickly back-tracking during a search operation. The ten scanning banks also proved to be very handy making it very easy to locate new active channels in your area. Linked with this the frequency lock-out facility was very effective and simple to use, which meant that you could very easily lock-out the inevitable 'birdies' and constant carriers which tend to slow down search operations. The main l.c.d. was very clear with a good contrast ratio and the backlight, although being only a single light source, also worked well. The backlight was also controlled by a timer so that it automatically turned off after about ten seconds - useful for saving those batteries.

Summary

The Fair Mate HP-100E proved itself to be a very competent and easy-to-use little scanner during the review period. It's technical performance was well up to the standard one would expect from this type of receiver but the layout and features put it one step ahead of a lot of the competition.

If I were to highlight any one feature it would be the provision of the rotary tuning control as this was so much more "user friendly" than the normal UP and DOWN buttons supplied on many receivers. I have no doubts about recommending this scanner as good value for money for anyone needing a hand-held receiver.

The Fair Mate HP-100E can be obtained from **Nevada Communications, PO Box 70, Portsmouth Tel: (0705) 662145.**

The price is £299 including VAT. This includes the accessories (batteries, carrying case, d.c. adaptor, two antennas, ear piece and carrying strap).

My thanks to Nevada Communications Ltd. for the loan of the review model. □

SPECIFICATION

Frequency Range:	25 - 550MHz; 830 - 1300MHz
Frequency Steps:	5 - 995kHz in multiples of 5 or 12.5kHz
Modes:	a.m., n.b.f.m. and w.f.m.
Sensitivity:	n.b.f.m. 0.5µV for 12dB SINAD a.m. 2.0µV for 20dB S:N (60% mod) w.b.f.m. 3.0µV for 30dB S:N
Scan Speed:	20 channels/second
Priority Speed	2 seconds
Delay Time	2 seconds
Antenna:	BNC 50Ω
Channels:	1000 total in 10 banks
Audio Output:	Over 100mW at 10% or less t.h.d.
Power Sources:	4 AA NiCad or dry cells; External 12V d.c.
Power Consumption:	Standby 83mA; full audio power 105mA
Temp. Range:	-20 to +50 °C
Size:	170 x 35 x 65mm
Weight:	280g

STARTING OUT

Brian Oddy G3FEX

In order to evaluate the performance of an item of equipment measurements have to be made and the results recorded in terms which can be clearly understood. One commonly used term which often brings confusion to the newcomer is the decibel.

Most of us are used to thinking in terms of the actual value of a particular item based on a linear scale such as metres, grams, pounds, or in electrical units such as volts, amperes and ohms. Many of the responses in the human body, however, follow a logarithmic scale - they include our visual response to changes in levels of brightness and the way in which our hearing responds to changes in sound intensity. The decibel is a term associated with ratios of quantities based on a logarithmic scale and such a concept is often confusing or difficult for most of us to comprehend.

The need for a unit based on a logarithmic scale first arose during the early days of the telephone. In those days the electrical signals were conveyed to a distant point by two air spaced parallel wires supported on wooden poles along the route. Despite this low-loss construction, the inherent losses resulted in a reduction or **attenuation** of the signal, especially when long lines were involved. In order to assess the effect that the losses would have on the audibilty of the signal at the far end of the line, the telephone engineers decided to adopt the attenuation which occured along a one mile length of their overhead line as a reference, but they soon found that meaningful calculations could not be made owing to the response of the human ear - see Appendix.

Power Ratios

Another system was therefore devised, which involved taking the common logarithm of the ratio of two powers, one at each of two points in the line. This resulted in a new unit which they called a **bel (B)** in honour of Alexander Graham Bell, the famous pioneer in telephone work. The equation they evolved was: n_B = log10 (Po/Pi), where Po/Pi is the ratio of the output power (Po) to the input power (Pi) and n is the number of bels.

The important thing to note about this equation is that it is the ratio of the two powers that matters and not their actual values. For example, if Po is 10W and Pi is 1W their ratio is 10 : 1. The common logarithm of 10 is 1, so N = 1 bel. The same answer will be obtained if Po is 1000W and Pi is 100W, since their ratio is also 10 : 1, although there is a considerable difference in the actual powers involved.

The bel proved to be rather a large unit for general purposes, so the **decibel (dB)** was introduced, one decibel being one tenth part of a bel. Since there are 10 decibels to one bel, the original equation becomes: n_{dB} = 10 log10 (Po/Pi)

Note that if the answer is positive there is a power gain. A negative answer indicates a power loss or attenuation. One of the advantages of working with decibels is that they can be simply added or subtracted to obtain the overall gain or loss in a system.

If you care to get out your old school log tables, or a suitable calculator, you will be able to use this equation to establish the relationship between decibels and power ratios of up to 1000000 : 1 or more! You should be able to confirm that a power ratio of 100 : 1 = 20dB, since 10 log 100 = 20. Similarly that 1000 : 1 = 30dB; 10000 : 1 = 40dB; 100000 : 1 = 50dB; 1000000 : 1 = 60dB. At the lower end of the scale you will find that a 2 : 1 ratio = 3dB, since 10 log 2 = 3.0103. This is particularly useful, since it corresponds to doubling the power.

Note that if the two powers are equal there will be 0dB difference between them, since their ratio is 1 : 1 and the log of 1 = 0.

If one power level is in milliwatts and the other is in watts, express both powers in milliwatts before making the calculation.

Consider an example where Po = 1W and Pi = 10mW:

There are 1000 milliwatts to one watt, so the power ratio is 1000 : 10 or 100 : 1, consequently 10 log 100 = 20dB.

Some difficulty in using this equation may arise when the output power is less than the input power, since the ratio Po/Pi will be less than unity. To simplify matters it is usual practice to invert the ratio in these circumstances and then to place a minus sign ahead of the answer in decibels. As an example consider a system in which half the input power appears at the output. The power ratio Po/Pi = 1 : 2. By inverting the ratio it becomes 2 : 1, thus 10 log 2 = 3.0103 or +3dB. Change the sign and the answer becomes -3dB.

It is important to remember that the decibel is a ratio and that it can only be used as a measure of magnitude when a reference level is quoted. Special terms have to be used to indicate that a reference is involved.

One such term is often used in connection with the r.f. power output of a transmitter, namely dBW, which is the level compared with 1 watt.

Any power may be converted to dBW using: dBW =10 $\log_{10}$ (Power/1).

For example, if the unmodulated carrier power of a transmitter is 100 watts, this equates to 10 $\log_{10}$ (100/1) = 20dBW.

The term dBW is now used in the UK Amateur Radio Transmitting Licence to specify the maximum unmodulated carrier power permitted in the bands allocated to the holders of UK class A and class B licences. In most of the h.f. bands this is 20dBW, which equates to 100 watts. If the carrier is fully modulated the peak r.f. power in the envelope, known as the peak envelope power (p.e.p.), will vary from zero to four times the unmodulated value, since power varies as the square of the voltage - see 'Starting Out', *SWM* August '88. Bearing in mind that doubling the power equates to an increase of 3dB, four times the power will be an increase of 6dB, so the permitted p.e.p. is quoted as 26dBW = 400W. Some of the other power limits quoted in the licence are 14dBW = 25W, 16dBW = 40W, 22dBW =150W. Note that 0dBW = 1W, since the ratio is 1:1 and the log of 1 is 0.

Voltage and Current Ratios

So far, only power ratios have been considered, but power (P) is proportional to voltage (V) or current (I) squared, so it is also possible to express voltage or current ratios in decibels.

Since P = V2/R, it follows that:

$P2/P1 = (V2^2/R2) / (V1^2/R1)$

$P2/P1 = (V2^2/R2) (R1/V1^2)$

Provided that R1 = R2, then:

$P2/P1 = V2^2/V1^2$

hence $NdB = 10 \log10 (V2^2/V1^2)$

To square a log it has to be multiplied by 2, so the equation becomes:

2 x 10 $\log_{10}$ (V2/V1)) or 20 $\log_{10}$ (V2/V1).

If you care to try using this equation you will find that a voltage ratio of 10 = 20dB, since 20 log 10 = 20 x 1 = 20dB. Similarly a ratio of 100 = 40dB and a ratio of 1000 = 60dB. Note that when the two voltages are equal there will 0dB difference between them, since their ratio is 1:1 and 20 log 1 = 20 x 0 = 0dB. It is worth remembering that doubling the voltage corresponds to an increase of 6dB, since the voltage ratio is 2:1 and 20 log 2 = 20 x 0.3 = 6dB.

There are numerous applications in which the ratio of two voltages can be usefully expressed in decibels, but when using the equation do ensure that the resistances associated with the voltages in the circuit are equal.

As an example, consider an audio amplifier whose input and output impedances are the same. If the voltage applied to the input (Vin) is 10mV and the voltage at the output (Vout) is 0.4V, what is the voltage ratio in dB?

Voltage ratio in dB = 20 $\log_{10}$ (0.4/0.01)

= 20 log 40 = 20 x 1.6 = 32dB.

☞56

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AFR–1000

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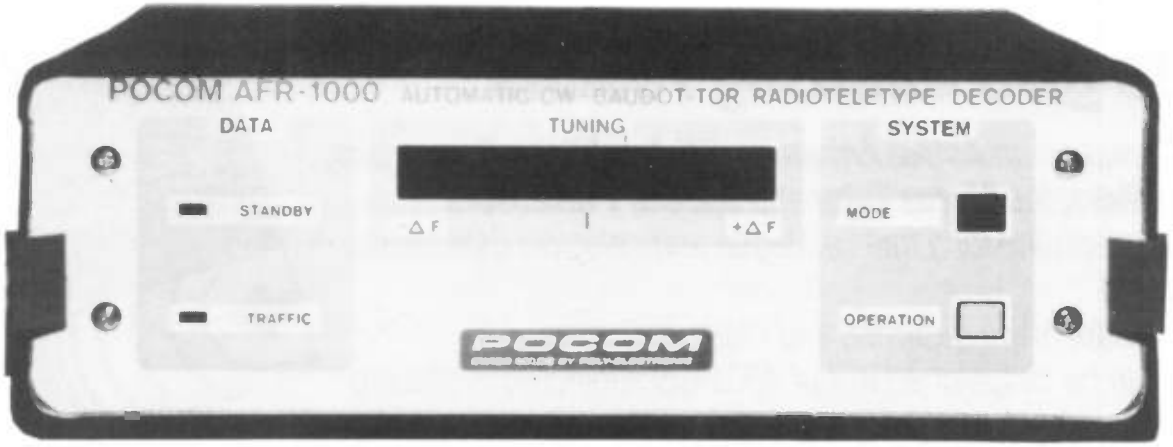
CW–RTTY Decoder



The microprocessor-controlled POCOM AFR – 1000 CW-RTTY Decoder automatically processes radio teletype signals in accordance with Baudot No. 1 and No. 2, ASCII, ARQ/FEC (SITOR/SPECTOR/AMTOR) and CW (Morse telegraphy) standards and corresponds to the latest state of the art. The AFR – 1000 Automatic Decoder is remarkable for its value for money. Its moderate price makes it particularly suitable for the cost conscious RTTY beginner, the AFR – 1000 is without doubt the easiest Decoder to use available on the market today. Unlike the other models in the AFR series, however, it cannot be upgraded for special codes.

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Access

RIGHT THE FIRST TIME

Rev. George Dobbs G3RJV

Part 5

Now you have made your crystal set, what else can you do to it? In this part George Dobbs explains how to add a simple amplifier to the output to drive a small speaker.

By the middle of the 1950s, I reckoned that I was probably the best radio set builder at school. I had progressed from various types of crystal set to to more ambitous valve receivers. My three-valve short wave receiver, which was housed in a wooden box, that had once been a drawer of a bedside cabinet, was my pride and joy.

Modern radio constructors are lucky. This should be the age of the constructor in amateur radio. To build my radios, I had to cut out an aluminium chassis and drill and file large holes to mount valves. Then route dangerously high voltages around the chassis for the power line, to say nothing of the heater voltages to the valves. I had to save up to buy the parts, because the relative cost of components to available money was much higher than these days. Old timers might call it 'real radio construction' but building radio receivers is much easier and cheaper these days.

Then an advertisement in *Practical Wireless* stopped me in my tracks. A company was advertising transistors! To me these were the new wonder of the age, at a price I could just about afford. 'Red Spot Transistors' the advert said, 'Ten Shillings each'. I sent away for one transistor and so began my construction days in what we now call 'solid state electronics'.

The first transistorised circuit I built took me back to the crystal set again: it was an amplified crystal set. The next stage in this series has brought me back again to such a circuit. But there are differences, important ones, between my 1950s amplified crystal and the one we are about to build. That 'Red Spot' transistor is a low gain, leaky, germanium type transistor: the amplification was low and the transistor added noise to the signals. The transistor we are to use is not only cheaper but does the job very well.

What do we mean by amplification? The simple answer is that we are to take the signals louder. What we are to do with the next stage in the crystal radio is shown in Fig. 5.1. The radio frequency signals, which contain sound (or **audio**) waves are picked up by the antenna. The crystal radio tunes the required radio signal and the diode **detects** the audio signal. The **audio frequency signals** are those we can hear in the headphones. The 'loudness' of these signals depends upon their amplitude. The amplitude of the signals from a crystal set is low because it is powered solely by the radio waves themselves.

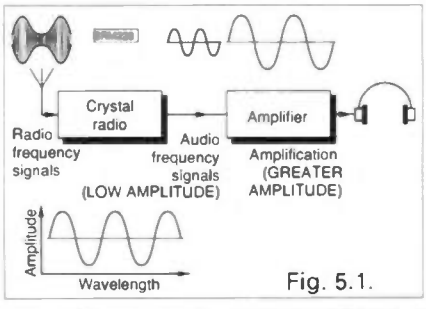
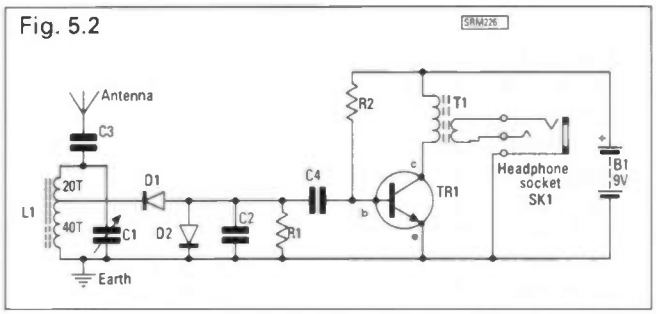


Fig. 5.1.

The amplifier is used to increase the amplitude of the audio frequency signals. The job of the amplifier is quite simply to increase the amplitude of the audio signals. The same signals come out of the amplifier as enter it, only they are bigger and will sound louder in the headphones. In the real world of electronic circuits amplifiers do change the signal in other ways: the sound may be distorted slightly and the amplifier may add its own noise to the signal.

Hi-fi fans will know that the goal of a good amplifier is to faithfully convey the signals from input to output with no change other than an increase in amplitude. Our little amplifier will not be in the hi-fi class but will do the job well enough for us.

Fig. 5.2



The circuit diagram of the Amplified Crystal Set is show in Fig. 5.2. It looks very much like the radio that we have already built. It is exactly the same as far as C2 and it still has the LT700 Transformer connecting the ouput to the headphones. The first big difference is that this circuit requires external power. A battery, B1, is required to power the transistor, TR1. The transistor is a BC183, an easily available, cheap, general purpose type. There are three other extra components: two resistors (R1 & R2) and a capacitor (C4).

The circuit works as a conventional crystal set from the antenna to R1. R1 acts as a resistive load for the two diode detector. It takes the place of the headphones in our earlier circuit, before we used a transformer. The audio signal from the detector appears across the resistor R1. The capacitor, C4, acts as a **coupling** capacitor. It couples the crystal set to our new amplifier stage. In an earlier part of this series, I described how a capacitor can pass alternating currents but blocks direct current. C4 allows the audio frequency (alternating) signals to pass to the transistor but blocks the direct current from the battery supply preventing it entering the crystal set circuit.

The audio signals appear at the **base** of the transistor. The **emitter** is connected to the negative side of the battery supply, which is also ground (or earth). The resistor, R2, gives the base of the transistor the **bias** it requires. This is a small voltage required to make the transistor work correctly. The amplified signal emerges at the **collector** of the transistor. The transformer, T1, couples, and matches, the output from the transistor, to the headphones.

The layout for the circuit is shown in Fig. 5.3. The layout remains unchanged as far as C2. In the diagram only the new components have been designated with values. It is essential to connect the transistor as shown, as this is the only way round that it will work. A snap-on battery connector will be required for the battery, which is the small 9V PP3 type. As before, the centre connection of the transformer (T1) is not used and must be snipped off or bent up out of the way. Note that five link wires are used in this layout.

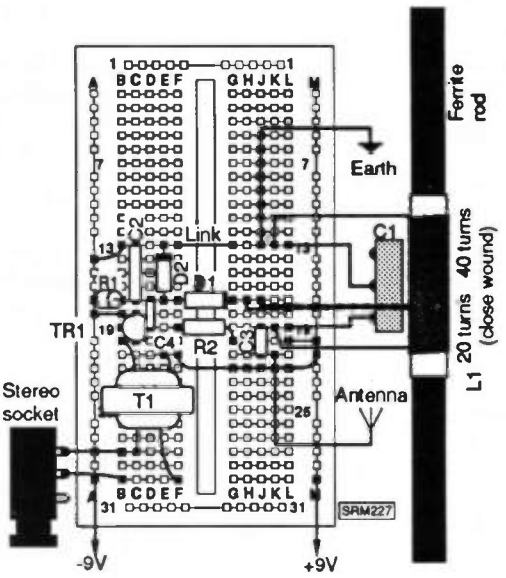
Plastics covered single strand wire is best but 5A fuse wire may be used. If bare wires are used they must not touch any other bare wires or leads in the layout.

The battery must be connected the right way round. If not the radio will not work and the transistor could be damaged. An on-off switch for the battery has not been included because it is easy to snap the battery connector on and off. The single transistor draws so little current from the battery that even if it were left on all the time, the battery life would still be very long.

The added amplifier will make the crystal set much more like a 'real' radio. The local and stronger national signals will be received at a comfortable listening volume in the headphones.

In my location, using an outside antenna, I could connect a small loudspeaker in place of the headphones and hear Radio 2 loud enough for use in a small room. That is much better than I ever achieved with my old Red Spot Transistor! □

RIGHT THE FIRST TIME



Parts For Adding The Audio Amplier

R1 4.7kΩ 0.25W resistor (YELLOW-VIOLET-RED)
R2 .1MΩ 0.25W resistor (BLACK-BROWN-GREEN)
C4 0.01µF miniature disc-ceramic capacitor (Maplin YR73Q or similar)
TR1 BC183 The BC183 or BC183 (A, B or C) types are suitable available from Electrovalue, but the cheapest source I found was Marco Trading. **Avoid** the BC183L transistors (Maplin) because the lead-out connections are not the same.
B1 9 Volt Battery (Type PP3)
Snap-On Battery Connector (Maplin HF28F or Electrovalue BCAL or Marco BAT/CLIP/PP3.

Marco Trading, The Maltings, High Street, Wem, Shrewsbury SY4 5EN. Tel: (0939) 32763 (Catalogue available for £1) can supply most of the components required for this series.
Maplin Electronics, PO Box 3, Rayleigh, Essex SS6 8LR. Tel: (0702) 554161.
Electrovalue Ltd., 28 St Judes Road, Englefield Green, Egham, Surrey TW20 0HB. Tel: (0784) 33603.

Inductors (coils)

No doubt you recall at school, wrapping a coil of wire around a nail to make a simple electromagnet. When a battery is connected to such a coil the nail becomes a magnet: this principle is used in solenoids, electric motors and electromagnetic coils. When current passes through a coiled wire a magnetic field is produced, the alignment of the north and south poles of the magnet depending upon the direction of the current flow.

If an alternating current is passed through such a coil the poles will constantly be changing ends and since it takes time for the magnetic field to build up and decay, the magnetic fields will interfere with each other. The coil will resist rapid changes in current flow but allow a steady direct current to flow freely.

Hence an inductor passes direct current but opposes alternating currents. Note that this is the reverse of a capacitor and this characteristic is used in the capacitor/inductor tuned circuit.

The circuit symbol for an inductor which is very similar to the actual appearance of the component is shown in Fig. 1a.

An inductor is simply a number of turns of wire wound onto a former or core. This series begins with an inductor used as a tuning coil made from enamelled copper wire wound onto a ferrite rod former. An inductor which contains a lot of turns may have the turns wound in a pile and be called a **choke**.

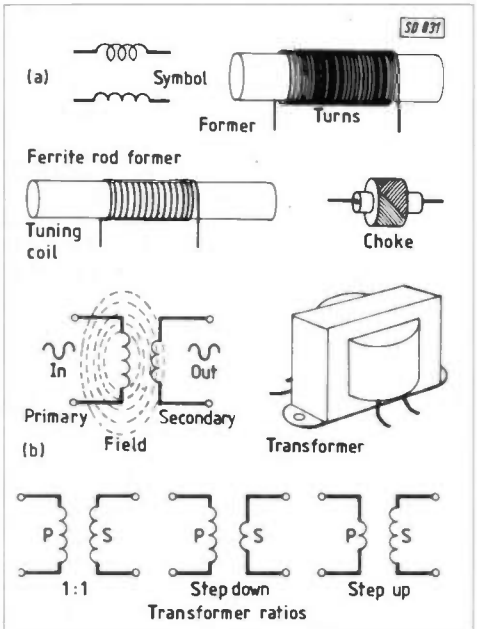


Fig. 1

A very common use for inductors is the **transformer** (see Fig. 1b). If an alternating current is passed through an inductor a changing field is produced. Another inductor placed close to the field will accept magnetic energy from the field. The first inductor (called the **primary**) has **induced** a field in the second inductor (called the **secondary**). The transformer will transfer alternating current but not direct current.

Transformers have the ability to transform voltage and current to higher or lower levels. This depends upon the ratio of the number of turns. If the ratio is 1:1 then the voltage out is equal (but with slight loss) to the voltage in. If the secondary has less turns, the output voltage is lower and if the secondary has less turns, the output voltage is higher.

Since it is not possible (unless we have all missed something!) to get power from nothing, if the voltage is increased the current capability is decreased. If you are not sure how that works look up 'power' in a text book with Ohm's Law Theory.

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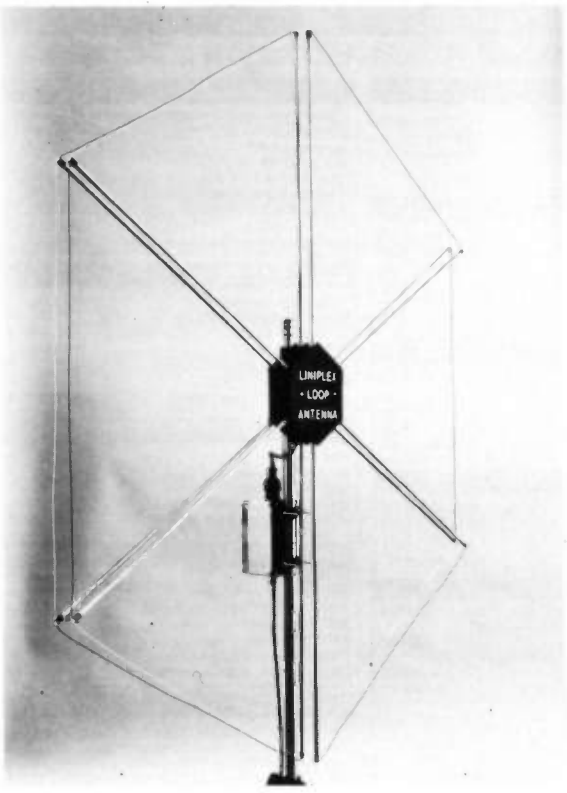

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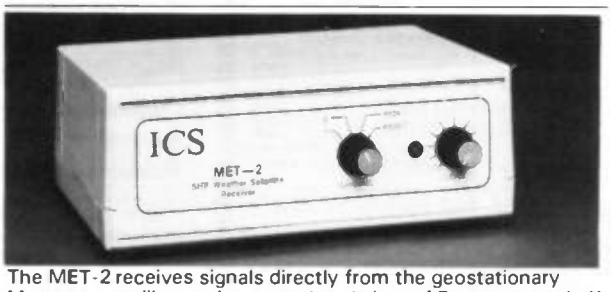

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PO Box 4, Newtown, Powys SY16 1ZZ

Let's talk - in answer to the query from Mr **Chapman** of Grimsby - about the parameters to be thought about when evaluating a receiver. These, I may say, include Sensitivity, Stability, Selectivity, Tuning Rate, Dynamic Range, Reset Accuracy and Gain. Things like the bands covered are a matter of accepting that to get what YOU want, you will almost certainly have to accept coverage of what Mr Average SWL is said by market researchers to require; while the 'bells and whistles' are mere gimmicks to fill vacant slots in the available memory. It must also be borne in mind that 'one man's meat is another's poison,' so your personal balance on the relative importance of these design parameters will be different to mine, and different again to Joe up the road.

That being said let's look at these points. First, sensitivity: most receivers at h.f. and v.h.f. are sensitive enough that they are limited only by the level of noise in the environment; natural static on the lower bands but from about 15MHz upwards where static levels generally are lower, by man-made noise pollution. However, any practical receiver will generate some noise of it's own, and that is the bottom limit in the total absence of external noise. A severe test on this is to take a receiver, put a 50Ω resistor across the antenna and earth terminals with short leads (i.e. antenna removed), and switch on in s.s.b. mode to 28MHz band. Set maximum RF GAIN, and a comfortable level on the AF GAIN, listening to the 'sharsh'. Now tune the Antenna Trim or Preselector controls and note that you can find a peak of noise at some point. If you're in doubt try the same test on Top Band or 3.5MHz where the peak should be more marked, then go back and try again on 28MHz. If you can hear that peak of sharsh you've got all the Sensitivity you can use.

Now to Gain; use the same test; you will find you have RF GAIN at maximum, and AF GAIN at close to maximum for the test to yield a comfortable listening level. What we can't measure but we hope the designer has done right, is the distribution of that gain. Ideally all the Gain would be later than the volume control, but practically it is distributed fairly evenly after the high-selectivity stage of the i.f. Surplus gain is not only useless, but will probably degrade the overall performance by causing overload to occur needlessly.

Now we must consider Tuning Rate and Selectivity. Most general-coverage receivers are expected to listen to a.m. signals, and have therefore a.m. selectivity - about 8kHz wide. Single sideband Selectivity implies about 2.5kHz wide, while for c.w. one may go as close as 250Hz. In each case the response should dip down 60dB or more as steeply as possible on each side. Obviously, in the a.m. filter used for c.w. reception, we could have 16 signals, where a flip to c.w. filtration would knock out fifteen of them! Likewise for s.s.b.; you might have two s.s.b. signals side-by-side, both in the a.m. filter passband. If you've never had a s.s.b. or c.w. filter in your rig, then you would almost certainly think as you tuned through this cacophony that if your Tuning Rate was slower, you'd be able to sort 'em out. Not so. If you can find a clear s.s.b. signal and tune it in without great difficulty, then improvement in Tuning Rate won't winkle anything extra out of the rumpus on the band; but the addition of a narrower filter will work wonders for s.s.b. signals. Paradoxically, once you have the narrower filter embodied, you may then find some need to improve the tuning rate, depending on your own habits; this is because you can tune clean over a weak one now, because you have learned to rotate the tuning knob too fast! As for improving Tuning Rate, a receiver may be given Bandspread by adding external gearing or by fitting a larger knob - but anything you do in this line will be limited, because as you magnify the spread so you magnify the 'backlash' in the system, and it will be annoyingly evident! We may see this Tuning Rate parameter referred to in terms of

Fine Tuning

Stability and Reset Accuracy are a third pair to go hand-in-hand. Stability divides in two ways: the Wanderies and the Wobblies. Wanderies we can define as the sort of long-term ageing drift that makes a mockery of the dial calibration; Wobblies include warm-up drift, drift between overs and similar short term effects. The wanderies aren't a real nuisance, so long as we know its there, but the wobblies very definitely ARE a pain. A signal or a receiver that drifts between overs is the worst for a transmitting station, leading to at best a frantic chase on each over and lost contacts at worst. Really, one wants to make the equipment stay within better than 100Hz per hour after the first ten minutes of warm-up. Now, turning to Reset Accuracy, here we want to be, say, keeping a sked tomorrow, and to know when we tune the receiver to the desired frequency for our sked, contact will result. Notice how the operator can come into this. My receiver may have a dial that says 3.695 when it means 3.7MHz - but if I allow for the error it disappears from consideration.

Finally, Dynamic Range. This is a measure of the receiver's ability to recelve a weak signal in the presence of near-by Big Ones. For example, you are listening to a sub-microvolt DX signal at one end of the band when Joe Blow two doors away opens up with a CQ at the other end. Obviously if you're both near the middle of the band the problem is even worse. A stage in the receiver is being overloaded, usually the first mixer. Immediately it overloads, the resulting non-linearity causes every signal at its input to mix with every other one, yielding an excess of noise at the output, which drowns out our weak wanted signal. Hence the RF ATTENUATOR control; if the stage is being overloaded by 1dB, then addition of 1dB of attenuation should bring the stage out of overload. Immediately the noise will drop and the weak signal become audible. Unfortunately most receivers give you attenuation in a 20dB lump, but you can also try a whiff of RF GAIN reduction. for a smaller quantity. Dynamic Range is given in dB and you want about 100dB. Alternatively you may come across references to Input Intercept or Output Intercept in plus dBm.

These are the important ones. If your receiver has all the gimmicks, but lacks in these areas, then it's no damn good regardless of what the advertisers blurb says!

Active Antennas

A. W. Bartram (Folkestone has recently returned to the fold; he was DX chaser back-along in the pre-WWII era. Mr Bartram lives in a flat, and so he bought an 'active antenna' and wants to know what it is and does. It is fairly well know, we think, that it is always far easier to hear a station, than it is to work him. Hence most s.w.l.s tend to have simpler antennas as compared with transmitting amateurs. Taking this to it's bottom limit, imagine a wideband amplifier having no inherent noise, and an infinite Dynamic Range; clearly it would work quite well on a very small antenna. If you package the amplifier into the base of the antenna, you would have an ideal active antenna. In a practical case, the amplifier would have some inherent noise, and less than infinite dynamic range. In addition, as it is wideband in nature, amplifying a strong signal appearing near the wanted signal may overload the receiver proper, with the result we have already discussed. In fact such an apparently simple object is a mass of compromises. In essence, if one's receiver has enough sensitivity as proven by the check already mentioned, any extra gain can only serve to degrade the overall reult in a crowded band, but of course it may be useful in pulling a weak one out on a near-empty band.

Conditions

November 1989 seems to have been one of the best ever; during the whole month the solar flux figure stayed above 200 which hasn't happened since the late 1950s; and in addition the geomagnetic indices stayed low for most of the month, so conditions added up to what may well have been the best month for a very long time!

Letters

Having - we hope - cleared up Mr Chapman's problems, suffice it to say that he has a Philips D2999 recelver at the moment, and is considering a change. We know the feeling well; most of us have a perfectly good rig in the shack, but after a few years we get a yen for a change, and when that happens we don't so much reason it out as anaesthetise our minds from the pain in the wallet, as the marketing tribe know all too well!

Further down his letter Mr Bartram mentions that he has been playing around with an old airband converter which uses Mullard Type 4W6 devices which Mr Bartram can't get information on. We have written with some suggestions but frankly we've never heard of these device numbers. Has anyone out there got a clue?

Turning to the activity from **Phil Boorman** (Sittingbourne) we find his available shack time has been split fifty-fifty between h.f. and v.h.f. activity. Phil has a Cushcraft A3 triband beam up. Alas for Phil, the shift work loused things up somewhat, and the ZLs at 59+ were entered into other people's logs - Tain't fair! he cries. However, on 28MHz Phil did scratch up CU3URA, CW8B from Uruguay, EA9TP, HL5FMF and HL0Y both on short path, JA0BFZ, OA4AV, OH6MFD, TA3F, TI2DU, V31BB, VE3NOV, VE5XO, VE6ATT, VP5T, VP9AD, and all W areas save W6. Listening to the 29MHz f.m. repeaters in the States sorted out W2, W3, W5 stations. On 21MHz, ZL1AMH and ZL1BGB were audible on long path for 55 minutes before Phil had to leave them. He uses all the bands 1.8-30MHz regularly, with the beam or a half-sized G5RV fed by way of an a.t.u., and of course v.h.f. as well.

At this juncture, **Dale Dhuglas** of Glasgow stick to 28MHz like a limpet, which is why he logged JT0DX, RZ0Y/UA9YX, HS4WW, BY8AC, all W call areas, CN0A, PJ5JR, V47K, F5/KC1F, 6W7OG, ZP5XHM, PJ1B, KP2A, 3DA0BK, EL7X, YV5ANF, PZ5JR, and VP9AD. A single foray on 14MHz yielded KC4AAA who is noted as having come across with a fast QSL card.

Next we turn to John Heys in Hastings, and John says most of his time has been spent on 50MHz whenever the band opened, with over 120 Ws logged in, plus VK4 and VK6, ZS6, ZS3, HC2, KP2 (American Virgin Is) and VE1-3. However, he did also look on Top Band where UA6WDT, UL7AAE, UI8LA, UF7FWA, YO3APJ, HG9R, IS0XIE, CT1NK, LY2BTA (the pre-WW2 prefix for Lithuania, now revived - the suffix letters of the call appear to be unchanged so this was previously UP2BTA), 4X4NJ, OH0MM, ZB2X, LZ9A, 5N3A, OY9JD, VE1ZZ and EA8BTU; all on this band of course thanks to a knowledge of CW. To round it off, John tried the odd foray on 40 and 20, but the pay dirt again was on 28MHz: UL8AWL, UL8CWW, 9M8XX (Sarawak), YB9LC (Timor), P40V, PZ1DR, HR2/KB5CGA, CO2PX, YJ8NMB and 5T5SR. As for 21MHz, loggings here included FY4FM (Cayenne), HK0BKX (San Andreas), PJ4/K3IP, XF4T (Revilla Gigedo and a new one), J6DX (St Lucia, JY9MO, NL7G, AL7CQ, 9Y4VU, YV4ABR and CN0A.

Ted Trowell was one of those we ran across at Leicester last year when we managed a good old natter-and-set-the-world-right session; in his current letter Ted notes activity on Top Band, 7, 14, and 16MHz. From Ted's Sheppey location PAs on Top Band are normally workable in daylight, to the envy of those a little further west who can hear him but are quite unable to copy the stations he is working. However, locally there has been a continuous S7 frying noise, normally noted on Top Band but now spread to all the h.f. bands too and making life unpleasant.

Now we come to **Pat Parmentier**

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in Belgium; Pat uses all the traditional bands, but doesn't mention the WARC allocations. Pat is an all-CW type, and on 3.5MHz, for instance he mentions UJ8JI, UM8MBA, ZL4IE, ZS8MI, UA1OIQ, S9AJD, VU2IN, CO3LX, D44BC, 3C0GD, and V31BB. Not a bad haul for any band that, although to be sure he reckons the ZS8MI contact was with old Marion Island Slim. Personally, we aren't so sure that this one might not just have been genuine, since at the relevant time ZS8MI was indeed active. On 28MHz, Pat secured FY5YE, FS/KC1F, K4PI/PJ7, C6A/AA5AV, 5C2CW, 3C1AG, FP5HL, BZ1OK, KX6OI, 9M8XX, 9M8AX, P40V, FH5EJ, C56/G3OXC, ZP5AA, CW0L, ON5NT/5N0, 5U7QL, S9AGD, A35ML, KH8/SM7PKK, JW1MFA, JY9SR, KL7KJ, 3C0GD, and DF3EC/ZS9 for Walvis Bay.

Finale

We can always use some more letters, especially if you have news which can help other SWLs; for example, while you may have copied a station's QSL address, there will be some poor soul who missed it in the QRM, or even more annoying lost the bit of paper as wifey 'tidied up' the place. In fact if enough would support us with listings we might well run a QSL Corner to show these addresses.

Set Listening Period

Mean time, we are going to run some more SLPs. On the third weekend in each of February, March and April, take a six-hour period of operation. One point for each station logged multiplied by the number of continents heard, multiplied again by the number of bands used. Each month, send in the result with your letter and comments, in time for the next 'Seen & Heard' deadline, which appears each month in the usual place. And may the best man - or woman - win!

THE NEXT DEADLINES ARE FEBRUARY 19 & MARCH 19

DECODE

Mike Richards G4WNC
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Associated Hobbies

I'm always interested to hear about some of the more unusual aspects and applications of our hobby and this month a letter from Andrew Seed reveals a new angle. Andrew is particularly interested in radio astronomy and cosmology which involves monitoring most of the radio spectrum. This includes Solar activity, v.l.f. for atmospheric conditions and v.h.f./u.h.f. for radio stars and pulsars. Andrew points out that one of the main advantages of radio astronomy over its optical cousin is that you are not restricted by cloud cover - a phenomena which is all too common in the UK!

The main limiting factor is of course our old friend - man-made interference, which, with the spread of technology into the home, is very much on the increase.

Andrew's utility decoding is achieved using a Spectrum computer and the RX-4 program from Technical Software. As you would expect, Andrew uses a number of receivers which include a Trio, Matsui and a number of home-brew models.

The video monitor is a 14in TV and this appears to be the prime source of interference in Andrew's station. The worst case being when the lead between the receiver and the RX-4 interface is connected. The solution to this type of problem is never easy and usually involves a fair amount of experimentation. It may be worth contacting Technical Software first as they obviously have plenty of experience with this type of problem. In the meantime here are a few points that may be worth checking:

1) Ensure that all signal interconnecting leads are good quality screened cable.

2) Make sure all equipment is well earthed at a single point and all earth leads radiate from that point with no cascading of earths.

3) Try including some extra inductance in the lead between the RX-4 interface and the receiver. This can be achieved by winding the lead around some ferrite rod or a ferrite ring.

There are of course many other things that can be tried, many of which have been previously discussed in this column.

If any other readers use utility monitoring as part of their hobby, please drop me a line with the details.

Readers Letters

Bill Oxford works in the Dammen Port Container Terminal in Saudi Arabia and has had an interest in short wave listening since his days as a Merchant Navy Officer. His station currently comprises a Philips D2999 receiver, Sony AN1 active antenna and an IBM compatible computer running 'PC HF FAX'. I must say I'm pleased to hear of someone using the D2999 receiver as I thought it was rather good when I recently had a chance to play with one.

Bill reports very good results with the American PC HF FAX program which comprises a simple decoding module which is built in to a RS-232 plug and a software package. The minimum computer requirements are: 384K RAM, MS DOS 2.1, serial port and Hercules, CGA, EGA or VGA video. The audio output from the receiver connects directly to the RS-232 plug decoding module. The program has several useful features including an oscilliscope type tuning display, disk image storage and image manipulation.

The latter feature of image manipulation is where computer based FAX systems can really score as this feature allows you to zoom in on parts of the image and alter the contrast and even reverse the image. The ultimate of course is to be able to process the image to remove interference, but as yet I don't think there are any of these packages available for the popular consumer market. If anyone is interested in the PC HF FAX the US address is: Software Systems Consulting Radio Group, 1303 S. Ola Vista, San Clemente, CA 92672, USA, phone (714) 498-5784.

Bill also relates the story of an interference problem that he managed to cure recently. As usual all the tests seemed to indicate that the interference was coming from the monitor. Bill had virtually given up on a cure until he did a few rearrangements in the shack and found that the interference had dissappeared. On investigation he found that instead of being powered via the 4-way surge protection block, the computer was plugged directly into the mains. Further checks showed that the earth wire was missing from the protection strip and it was this that was causing the interference! Needless to say this has now been corrected and all is well. Bill also points out that the snap-on interference chokes I mentioned recently can also be obtained from Tandy Stores at approximately 7.50 each.

Harry Jubb is becoming a regular corresondent and this month he has supplied a number of useful loggings for the frequency list. Harry also asks if I know of any frequencies used by UK and Irish press agencies. Unfortunately this is not an easy one, the problem being that most of the major European press agencies now use satellite links or multi-channel telegraph links which can onlu be resolved with quite sophisticated equipment. Having said that, you may well find some of these press frequencies listed in commercial frequency lists but they are actually very rarely used. This is because they are actually their reserve frequencies for use in the event of problems with the satellite links. If any readers have details of active UK or Irish press stations please drop me a line. By the way, Harry's station comprises a Saisho 5000 receiver with a 10m long wire antenna in the loft which he hopes to improve on shortly.

Kevin Bates of Derby has recently upgraded from a Spectrum +3 to a Commodore Amiga and PK-232 intelligent terminal unit. This has been complemented by a change of receiver to an Icom. Kevin reports very good results with his new set-up, though he is still learning how to operate it effectively.

Fred Dinning of Dunlop in Ayreshire is a keen listener with a very impresive station comprising the well respected NRD525 receiver feeding a Pocom AFR2010 decoder with all the optional modes fitted. For FAX reception the ICS Electronics FAX-1 is employed with good success. Fred's second receiver is a Racal RA-117 which is complete with the synthesiser, panadaptor and preselector making it very versatile. One of the big advantages of this type of monitoring station is that there are rarely any problems with interference as all the components were originally designed to operate in a radio environment. The result being that he can comfortably decode signals down to S1/S2.

Ken Longley of Dover uses the popular ERA Microreader II and a Trio R-5000 receiver for his utility decoding and is achieving very encouraging results judging by the loggings he sent me. Ken did intitially have some trouble with the R-5000, but was extremely pleased with the after sales service from the UK agents Lowe Electronics. Ken has also made a small stand for his Microreader to improve the viewing angle. As with most new users of the Microreader Ken started with c.w. and having become familiar with its operation, has now moved on to RTTY monitoring.

Graham Atkinson of Douglas, IOM uses a Yaesu FRG-8800 receiver complete with v.l.f. and v.h.f. convertors. The computer is a Commodore 64 running the J & P FAX system and S.S.T.V. from Technical Software. The latest addition is a PK-232 intelligent terminal unit with the COMFAX and COMPAC drivers. Graham reports some good results from this set-up, though he is suffering some interference problems at the moment. His second probem concerns the COMFAX driver where he is having problems when in HOST mode with the driver returning to the title screen every 20 seconds or so. Unfortunately I haven't any direct experience of this driver, so the best bet is either to contact the suppliers or see if anyone responds via the column.

Bert Balmforth of Renfrewshire uses the popular Sony ICF-2001D portable receiver for his monitoring, which at present is primarily FAX. The decoding program used is the one from J & P Electronics running on a Spectrum computer. If Bert's letter to Santa has been answered he should now be using the J & P RTTY program to expand his listening activities!

The Telereader CWR880 integrated decoder is used by **Alwyn Saul** of Leamington Spa. The receiver is a Yaesu FRG-8800 which is fed by a half size G5RV antenna and Yaesu antenna tuner. Although the results to date have not been spectacular, Alwyn feels that this is due primarily to his lack of experience with these new modes. I'm sure he is right as the the equipment he is using should work well.

In addition to a lot of newcomers joining this fascinating hobby, there are a number of listeners who are now re-discovering utility listening,

SEEN & HEARD

one of these is **Ken Ballance** of Parkside Stafford. One of the main factors contributing to this renewed interest is clearly the technological advances which enable small compact decoding units like the Microreader to be produced at affordable prices. Ken currently uses his Icom IC-735 amateur transceiver and the afformentioned Microreader for utility stations. One point he makes is that he can often read c.w. signals that the Microreader can't. This is to be expected, as an experienced ear-brain combination is by far the best c.w. decoder available. The only time when computer decoding scores is with very high speed c.w., but this is only usually effective if the original c.w. is machine generated.

Another very valid point that Ken makes is that not all that sounds like RTTY is RTTY! This is very true as all experienced listeners will know and is the reason why my frequency list is so popular. My list contains stations where the mode has been clearly identified by readers so making the selection of the appropriate decoding parameters simplicity itself.

Maurice Lloyd from Blackpool writes with some good results from my frequency list. The first two frequiencies he tried - 10.635MHz Cairo Air and 6.972MHz Agerpress were both resolved perfectly at the first attempt. I was pleased to hear this, as one of the prime reasons for producing the list was to help newcomers by listing only those frequencies that are regularly active and receivable in the UK. Maurice also asks if there is an update service available. In order to keep our costs and time within reasonable limits this is unfortunately not practical. However if your list is more than three months old you will find that the list has been updated. I will also investigate changing the database program so that the last update date is indicated on the printout. You could then check which version of the list you have by checking the date on your copy of the list against that printed in the column as the latest update.

EC3Y

Regular readers will remember that I recently mentioned a query from Norman Hartford concerning the station EC3Y. Well this raised a certian amount of interest amongst readers, so I have some additional information. **Geoff Halligey** reports that the station has been on the air for at least ten years and currently uses the following frequencies: 8.1584MHz, 9.1612MHz, 13.582MHz and 13.6315MHz. The call is usually sent continuously but occasionally interrupted at about 32 and 40 mins past the hour, to send a four figure group and some Z codes. He appears to be in communication with another station as he will occasionally send OK OK. Another odd feature is that he usually closes down at around 1657UTC after sending .....ZNN. At weekends this close down extends from Friday evening till Monday morning. The early morning start time is unclear but he has been heard as early as 0430UTC. From the frequencys and strengths received the station is probably located in Spain, which would also align with the callsign.

So the mystery continues - if you have any other information on this station please drop me a line.

Soviet Arctic/ Antarctic Meteo Centres

Jan Nieuwenhuis has kindly provided a printout of all the current Soviet Arctic/ Antarctic Meteo Centres, SAAMC which I'm sure will prove useful to listeners. The list is reproduced here as frequency, baudrate, callsign and name:

7.485MHz, 50, UDY, Novvy Port
8.653MHz, 50, RNO, Moscow
9.280MHz, 50, RUZU, Molodezhnaya
10.14MHz, 50, RUZU, Molodezhnaya
10.35MHz, 50, ULV, Moscow
10.38MHz, 50, RBW43, Murmansk
10.83MHz, 50, ULV, Moscow
11.035MHz, 50, UKS, Barentsburg
11.13MHz, 50, ULV, Moscow
12.793MHz, 50, RNO, Moscow
13.505MHz, 75, UGE2, Bellinghausen
13.505MHz, 50, RUZU, Molodezhnaya
13.865MHz, 50, RUZU, Molodezhnaya
13.995MHz, 50, ULV, Moscow
15.830MHz, 50, RUZU, Molodeznaya
17.163MHz, 50, RNO, Moscow

I would be very interested to hear readers comments on these weather stations over the next few months. If this proves to be successful, I may be able to include a regular feature where I pick a particular service and list all the known frequencies used by that service. My thanks to Jan for supplying this information.

Frequency List

Finally this month we move on to the frequency list, which can be obtained by sending three first or second class stamps to the address at the head of the column. I would also be very grateful to receive your own loggings so we can keep the list alive and flourishing. These loggings don't have to be exotic stations, far from it, I need plenty of good strong reliable stations to help newcomers.

So on to this months selection of frequencies using the standard format of frequency, mode, speed, shift, callsign, time and notes.

6.347MHz, c.w., ?, ?, HWN, 1003UTC, Paris Naval
6.39MHz, c.w., ?, ?, IDQ, 1938UTC, Rome Naval
7.52MHz, RTTY, 75, R, ?, 2000UTC, Beljing Xinhua
7.85MHz, RTTY, 50, ?, ZAA, 2005UTC, ATA Tirana, Albania
8.55MHz, c.w., ?, ?, CTP, 1453UTC, Lisbon NATO.
10.55MHz, RTTY, 50, ?, EGRR, 1255UTC, Bracknell
10.79MHz, RTTY, 50, 425Hz, RKA25, 1641UTC, Tass Moscow
13.0912MHz, ARQ, 100, 170, Y5M, 1634UTC, Rugen DDR marine
14.7MHz, RTTY, 50, ?, REB24, 1955UTC, Tass Moscow
16.25MHz, RTTY, 100, R, APN, 1305UTC, Moscow press
16.403MHz, RTTY, 50, R, ADN, 1316UTC, Berlin press

That's all for this month but keep those letters and loggings coming and let's look forward to a very peaceful 1990.

INFO IN ORBIT

Lawrence Harris
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Tape recordings

My offer to supply cassette tape recordings of Meteosat for those wishing to see a frame or two on their own equipment was taken up by several readers. One package came all the way from Norway, **Sindre Torp LA60P** from Helligvaer who sent me a pre-paid cassette and asked for any satellite recordings that I could supply. During the space of about 20 minutes I recorded a Met 3/3 pass, NOAA 10, Meteosat-4 and GOES-E. I will be interested to know how Sindre gets on with the recordings.

It should be remembered that recordings of the Russian Mets made on one track tape will not normally produce a synchronised picture. The electronics of a frame store, or similar device, usually requires the APT signal to have the picture information encoded on the 2.4kHz sub-carrier without using 100% modulation for either black or white levels. The Russian Mets do not meet this criterion and so those particular APT satellites will not produce a properly synchronised picture. It is interesting to note that the Cosmos oceanographic research satellites do conform to this standard and so pictures recorded from Okean 1 will allow replay. In the case of e.g. Met 3/3 you will find that the picture rapidly tilts, though you can usually identify land masses during the playback of recorded day time passes.

Recording Met Passes

This is why I, and many other monitors, use a stereo tape recorder to record the APT signal on one track and a reference 2.4kHz signal on the other. Then for playback the reference signal is fed into the framestore, or computer, and an almost perfect picture results. This is how I was able to record overnight pictures from Met 3/3 during its first few passes over the UK while I was asleep!

Sindre has a Siemens HF-1048 FAX-recorder modified to receive weather satellite pictures and is now working on the receiver and down-converter for Meteosat. If the HF-1048 has an input for a reference signal then it may be possible to playback both the recorded APT signal and a 2.4kHz signal to produce a synchronised picture. This would of course have a Doppler shift tilt on it because the satellite is moving quite rapidly, but it could still work.

Another request for a cassette tape of satellite sounds came from **Harry Wagg** of Birkenhead who has just built both the Maplin receiver and decoder but has found that he cannot erect an outside antenna. Harry writes to say that his tests with an indoor crossed dipole were not successful and so he needs a tape to test the finished equipment. I wish Harry well and hope that he can find some way of having an outside antenna erected. I mounted a simple dipole on the side of my house and it allowed me to receive satellites passing over my westerly horizon so perhaps Harry can think about some form of wall mounting? Also, don't discount the possibility that the connections within the dipole might be broken - mine were!

A letter from **Pat McAlister G3YFK** who lives near Shrewsbury, requested a tape of APT sounds for trying out his equipment which he confesses has not been used much recently because of lack of time.

It has certainly been a record few weeks for letters! **Brian Pemberton** wrote from St Helens on Merseyside about his satellite receiving equipment. He ordered the system from Maplins and while he was pleased that they sent most of it very quickly, it seems that the casings were made elsewhere and were subject to some delay. Brian suggests that purchasers should check on the availability of all the components rather than face the frustration that he had in following it up.

Unfortunately Brian has also had problems with the Post Office. He followed up my offer of Kepler elements several weeks ago and I duly sent him a set of my latest. It seems that they never arrived. I would add that I have responded quite quickly to most requests for Kepler elements so if anyone has previously written to me for these, let me assure you that all were sent within a couple of days. I will drop a line to my local PO since there have been other similar cases.

A last query from Brian over the use of his satellite software. He explains that his latitude is about 53.28 degrees north but that his software assumes a latitude of 52 degrees north - does it matter he asks? The short answer is no; the difference in time should be within a minute or so. I am surprised though that the software apparently doesn't allow him to change the latitude and longitude. A few years ago I produced some software for people, using the Amstrad CPC6128 computer in which I carefully set these parameters after checking their addresses. As mentioned though, the difference is small anyway.

SEEN & HEARD

Meteosats 1 to 4

Readers of this column will know that the current Meteosat satellite transmitting WEFAX images and other data is number 4. Meteosat 3 was used from August 1988 until 19 June 1989 when the switch to Met-4 was made. At that time I described how we were able to receive pictures and signals from both Met-3 and Met-4 as the controllers did their tests during the check-out period between launch and June. Currently Met-3 is ready for operation as a back-up spacecraft and is positioned at longitude 3 degrees west in its geostationary orbit.

Meteosat-2 is now running low on fuel (used for regular re-positioning) and will be removed from geostationary orbit in a few months time. Although launched back in 1981 its imaging system is regularly exercised and, so I understand from the reports, is working well. I would love to know just when these checks are done! Tuning in to Met-2 and receiving a picture would be most interesting.

During early December I tuned in to have a look at the D2 picture which includes the UK. This format is broadcast twice per hour, at 10 minutes past the hour and 18 minutes to the hour. There was an ominous monotone signal - no picture modulation. I waited for the next scan to start but there was nothing! I presumed that the controllers were having a major problem and so I listened in for several hours (not continuously!) Finally an administrative message came up announcing that the scheduled break for radiometer decontamination and system tests was in progress. I have to admit that I had not seen the bulletin board for some days and it shows how much one can miss Meteosat data.

Meanwhile Met-4 (also known as MOP-1) has fuel for its 5 year lifetime and its signal strength is excellent.

Future Meteosats

The current MOP-1 (Meteosat Operational Programme) is due to be continued with future launches. MOP-2 (Meteosat-5) is undergoing environmental tests, with an expected launch date in April 1990, and MOP-3 is due for launch in September 1993, and there is the possibility of a further extension as well. Anyone wondering about setting up a Meteosat system can rest assured that we shall be able to tune in for some years yet! My thanks to the European Space Agency for providing some of the data included here.

GOES

A few months ago I mentioned that spacecraft operators for Meteosat and the American GOES were discussing the possibility that Met-3 might be drifted over the the USA to help to fill the gap caused by the failure of the GOES imager on GOES-6, the west WEFAX relay satellite. This has now been agreed.

The imager failed in January 1989, as the controllers had expected it would, and this left GOES-7 as NOAA's only geostationary imaging satellite. Fortunately this satellite is in full working order with no fuel shortage.

Because of the need to watch out for winter and summer storms this satellite is regularly drifted between 108 degrees west (winter storms) and 98 degrees west (summer storms). It is now at the winter storm position and so pictures relayed from the GOES-E satellite that we can receive here in the UK are from that position. I understand from NOAA information bulletins that the next GOES satellite will probably not be launched before December 1990.

As mentioned in this section some months ago, the GOES wefax transmissions include pictures taken by the polar orbiting NOAA 11 weather satellite and include summary pictures of almost the whole planet. This column has previously published a selection of pictures from GOES-E and future columns will include more. I know that several readers are also looking at GOES wefax pictures so do send me some of your own work for inclusion in the column.

The current signal strength that I receive from my GOES dish has again dropped significantly. Some months ago it was very good and I wonder whether the problem of insufficient fuel is responsible. The fuel shortage may mean that GOES-E is not kept properly pointing to the right position.

Polar Weather Satellites

The American NOAAs 9, 10 and 11 have remained in full operation as far as our APT pictures are concerned. Readers of this column will be aware that the NOAAs also transmit high resolution images near Meteosat frequencies, but unlike Meteosat, the dish receiving the signal needs to be moved to keep pointing at the satellite. Various periodicals print the occasional picture from the HR signals and they are magnificent. They are used by research and monitoring organisations for detailed study of vegetation and other fields.

Around mid-November I noted in my log book that the signal strength from several polar orbiters was fluctuating rapidly. The morning pass of NOAA 10 on the 18th was quite wild and I wondered whether perhaps activity in the ionosphere caused by possible solar flares might be responsible. Those of you who hear of such activity that can affect satellite v.h.f. propagation might drop me a line for inclusion here.

A review of satellite pass times was asked for by Harry Wagg of Birkenhead (mentioned previously) so I'll mention again that the NOAAs are in sun-synchronous orbits meaning that they pass over the UK at about the same time each day. NOAA 9 passes northbound during the mid-afternoon period so in winter, with low sun illumination, we get poor visible light pictures. Some 12 hours later NOAA 9 passes the UK going southbound.

NOAA 10 is our morning southbound picture provider passing around 9am, give or take about 40 minutes, and will come over Greenland and provide good quality pictures of the days weather! Some 12 hours later we see it travelling northbound. Finally NOAA 11 passes over the UK about 3 hours earlier than NOAA 9 and so provides us with reasonable visible pictures even in the middle of winter.

Russian Mets

We still have a fleet of Mets providing us with pictures though only Met 3/3 is giving us both visible and infra-red pictures. This latest addition to the Russian meteorological satellite system was launched in late October as I detailed last month.

For those who are keen to hear the first transmissions from any new Russian weather satellite I will mention that they do seem to be switched on during the late evening and during the easterly pass, while over Russia.

Recent passes of Met 2/18 have been in darkness over the UK and so we haven't heard many signals from it. I did listen in during a late afternoon pass and heard just 30 seconds of APT when it emerged from northern twilight and then switched on just before los. So it is still operating, as are Mets 2/16 and 2/17.

Frequency Summary

NOAAs 9 and 11 provide APT on 137.62MHz

NOAA 10 transmits on 137.50MHz

Met 2/16 and 2/17 transmit on 137.40MHz

Met 2/18 transmits on 137.30MHz

Met 3/3 transmits visible then infra-red APT on 137.85MHz.

Thanks

I have received some very complimentary letters from readers including our American friends. It is good to know that its not just me that reads this column! I propose to try to keep the information as up-to-date as possible and always welcome suggestions and comments - and pictures - from everyone.

BAND II DX

Ron Ham
Faraday, Greyfriars, Storrington, West Sussex RH20 4HE

Late autumn usually produces a settled period of high atmospheric pressure coupled with fine cold weather and morning fog. Just the right ingredients for a spell of v.h.f. DX, however, many of you may have noticed that when the shafts of sunlight start breaking up the prevailing fog, Fig. 1, DX signals begin to weaken thus indicating that temperature is one of the contributors to a tropospheric opening.

More To Listen For

Francis Hearne (Bristol) tells me that LBC (London) has a new service called Crown FM, on 97.3MHz intended for the over 25s and another for the over 55s called Talkback Radio, in the medium wave on 1152kHz. While listening to Fox FM on 102.6MHz, in mid-November, Francis discovered by accident the test transmissions from the new ILR station, Orchard FM, on the same frequency, which, as from the 26th, is intended to serve the Taunton area of Somerset. Orchard FM was included in the report from Simon Hamer (New Radnor) who also heard 'Classics 98 Dublin', Ireland's newest independant station on 98MHz.

Tropospheric

Crown FM was pounding in to me around 1700 on the 23rd because, after a fine frosty day the high pressure of 30.3in (1026mb) began falling at midday and, as expected, Band II opened up. A tune through the band with my ex-military R216 receiver, fed by a chimney mounted dipole, revealed strong signals across the south coast from Invicta Radio to my east in Kent to GWR in Swindon and Red Dragon Radio in Cardiff to my west. From the north I logged Crown FM, GLR and 210 FM, co-channel 'warbles' on 91 and 92.1MHz and at least 10, predominantly German, voices from the continent.

The pressure remained high, with cold frosty weather (24° F in the garden) until the afternoon of the 27th when a slight fall began. I checked the band at 1100, with my Plustron TVR5D and its own rod antenna, while parked in Chichester and reception was normal, however, further checks at 1300 and 1545 found co-channel 'warbles' around 92 and 95MHz and French stations around 98 and 100MHz. At 1900, I tuned the band at home and heard strong voices on five spots between 88 and 97MHz of a language I did not recognise plus 4 French stations between 98 and 104MHz.

The pressure climbed again and reached a peak of 30.7 (1039mb) at midday on December 1 and this, coupled with fog and frost, was no doubt responsible for the very strong signals that I received from Belgium, France and Germany at 1130 on November 28 and the various co-channel 'warbles' and several French stations that I heard from the car-park of Wakehurst Place, (Ardingly, Sussex) at midday on the 29th. Around 1800 on the 29th DX signals were so strong that BBC Radios Bristol and WM and a Belgian station were fighting for predomonance around 95.6MHz. Early on December 1, signals from five French stations, plus BBC Radios GWR and WM were pounding in at home as they were at 1300 on the 2nd, when I tuned the band and counted five French stations, seven voices that I could not identify and that Belgian plus Bristol and WM around 95.6MHz.

At 1500 on December 2, **George**

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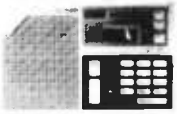
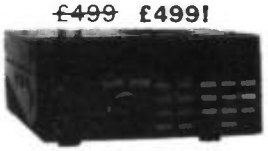
ICOM R7000 ~~£989~~ **£890!**  25MHz – 2GHz	YAESU FRG 8800 ~~£649~~ **£585!**  160kHz – 30MHz	SONY ICF7600DS ~~£159~~ **£145!**  150kHz – 30MHz	KENWOOD R2000 (Glass case display model) ~~£595~~ **£539!**  150kHz – 30MHz
ICOM R71E ~~£855~~ **£769!**  100kHz – 30MHz	YAESU FRG9600M ~~£499~~ **£499!**  60 – 950MHz	SONY ICF2001D ~~£299~~ **£275!**  150kHz – 30MHz + Air	KENWOOD R5000 (Glass case display model) ~~£875~~ **£799!**  100kHz – 30MHz

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SEEN & HEARD

Garden (Edinburgh) was DXing high on Cairn O' Mounth and "found loads of stations above 100MHz." Among those he logged were BBC Radios Lancashire and York, ILR Marcher Sound and Manx Radio. Hearing the latter was a great surprise for George who told me that the programme presentation was "very lively" and the signal "very strong". George said the pressure was high and the weather cold with plenty of fog and he heard one announcer say that it was very foggy in Yorkshire.

Band II was wide open again during the morning of the 7th, it was packed with ebbing and flowing signals from Germany to Wales and France to Birmingham and possibly more. I counted over 20 foreign voices

plus two in Welsh and heard the idents from BBC Radios Bristol, Gwent and WM and ILR Chilton, GWR and Red Dragon Radio. "Between December 3/4 there was a severe congestion of stereo f.m. stations from Norway, Sweden, Denmark, E. and W. Germany, Luxembourg, France, Holland, Belgium, Ireland and distant parts of the United Kingdom," said **Simon Hamer**.

After all this talk of very high pressure, the weather buffs among you may like to know that as I concluded this piece at 1100 on the 14th, my barograph was reading low at 29.4in (995mb) and from 1800 on the 13th to 0930 on the 14th, my raln gauge had collected 1.19in of badly needed rainwater.

TELEVISION

Ron Ham
Faraday, Greyfriars, Storrington, West Sussex RH20 4HE

Band I

"We are having regular 'F2' reception from Malaysia (Ch. E2) and Bangkok (Ch. E3) in the evening between 1900-2230. We have also had a 525-line reception on Ch. A2 from the east, probably an American station," wrote **Lt. Col. Rana Roy** (Meerut, India) on November 7. Although, like most of us, Rana found these signals strong, smeary, distorted and fluttery he identified American films dubbed in Malay, adverts, car-racing, dancing, football, hockey and table-tennis.

"Plenty of 'F2' reception," wrote **Bob Brooks** (Great Sutton) in his log for the month prior to November 16. "I believe some are from Ghana, Dubai, Malaysia, Iran and North Africa," added Bob who also received captions, programmes and/or test cards from Czechoslovakia (Bratislavia), Finland (YLE TV1), Hungary (MTV), Italy (RAI) Norway (Bagn, Gamlem, Hemnes, Melhus and Steigen), Spain (TVE), Sweden (SVT), Switzerland (+PTT SRG1) and the USSR during periods of Sporadic-E on October 30 and November 1, 2, 4, 6 and 7.

Neil Purling (Hull) received test cards and programmes from Czechoslovakia (CST 1SR-P), Germany (ZDF), Italy (RAI UNO), Spain, Switzerland (+PTT SRG1) and the USSR, via Sporadic-E on November 6 and then had his share of 'F2' DX when he recognised smeary and/or multiple images of a news reader at 0830 on the 12th, a clock from the USSR at 1040 on the 13th, a test pattern and a presenter, most likely from the USSR, at 0915 and 1202 respectively on the 14th, an unidentified test pattern at 0900 on the 28th and Ice Hockey at 0815 on the 29th. While the Sporadic-E was in progress around 1300 on the 6th, Neil saw various Spanish (TVE) captions and a football match between Castelan and Madrid and a later studio discussion on the game.

In Arbroath, **David Glenday** noted a mixture of 'F2' signals across the band from Chs. E2 to R1 (48.25-49.75MHz) during the mornings of November 22, 23, 24, 29 and 30 and December 1. He also logged an unidentified test card, via Sporadic-E, on Ch. E3 at 1247 on November 22 andI found another mild 'F2' smeary muddle on Ch. R1 early on December 1 and a fluctuating test card, via Sporadic-E on Ch. E2, from Sweden (Kanal 1 Sverige) with a digital clock showing 1105 at 1005 on the 7th.

Edwina and **Tony Mancini** (Belper) logged a test card from the USSR on November 1 and on the 20th, Simon Hamer (New Radnor) saw a burst of picture from Czechoslovakia, on Ch. R1, via meteor trail reflection.

Picture Archives

Last May, June and July saw both Sporadic-E and troposepheric openings as shown by Rana Roy who saw an announcer from Dubai, Fig. 1, on Ch. E2 at 1900 on May 20 and a caption from the USSR, Fig. 2, on Ch. R1 at 1835 on June 17. The Sporadic-E disturbance on June 15 was widespread because in Scotland David Glenday received a clock caption from Spain (TVE Aragon), Fig. 3, on Ch. E3 (55.25MHz) while hundreds of miles away in Basingstoke **John Woodcock** was watching a subtitled film, Fig. 4, which he thinks was of Nordic origin. Next day, Neil Purling logged a TVE Madrid announcer, Fig. 5 and Rana was again watching Dubai, Fig. 6.

George Garden (Edinburgh) was at his favourite high spot on Cairn O' Mounth during the tropospheric opening on May 22 when an advert, British film with subtitles, and a Dutch caption, Figs. 7, 8 and 9, from Nederlands 3 were prominent among the u.h.f. signals he received. David Glenday watched a film about Pearl Harbour, Fig. 10, from a German SAT 1 relay on Ch. E52 and captured two fine examples of co-channel interference on u.h.f. signals from Sweden, Fig. 11, on Ch. E23 and Germany, Fig. 12. on Ch. E21, on July 6 and 7 respectively. David suggests that the "background" signals came from Bilsdale on the Swedish test card and Craigkelly on the German caption.

Fig. 1: Dubai

Fig. 2: USSR

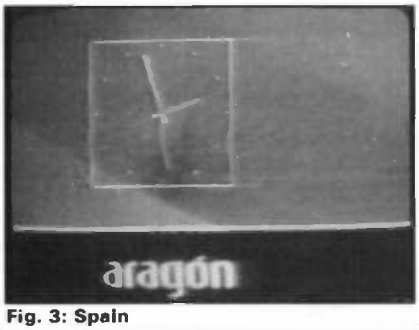

Fig. 3: Spain

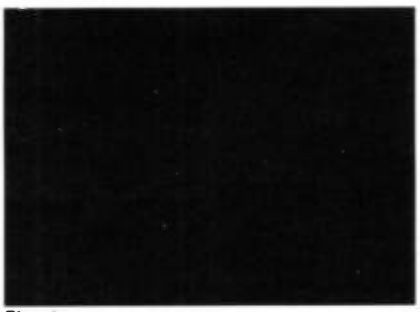

Fig. 4.

Fig. 5:Spain (TVE Madrid)

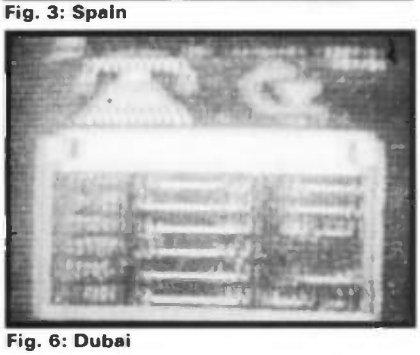

Fig. 6: Dubai

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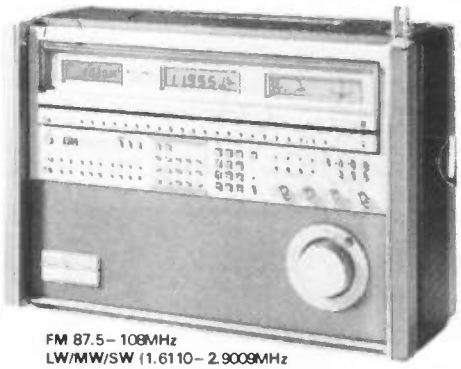

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Fig. 7: Netherlands

Fig. 8: Netherlands

Fig. 9: Netherlands

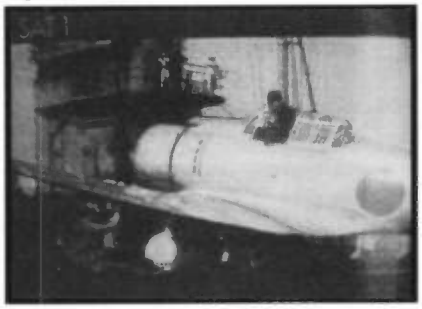

Fig. 10: Germany (SAT 1)

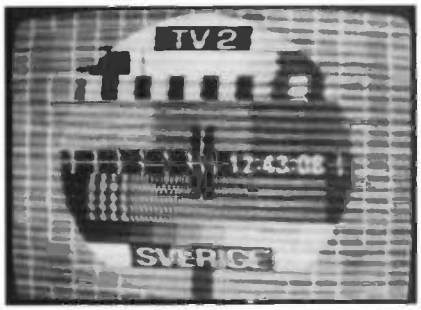

Fig. 11: Sweden

Fig. 12: Germany

Tropospheric

During the tropospheric openings on September 11, 13, 17, 20 and 24 to 27 and October 14 and 15 to 18, Rana Roy, from his home in Meerut, received strong and often colour pictures in Band III from Agra, Bhatinda, Jallandhar, Kanpur, Kasauli and Lahore and among the programmes seen was Breakfast TV, a cartoon "Lippy Lion", news in Punjabi from Lahore, an Urdu play, prayers, the Quran being taught to children and a variety of test cards including one from Kanpur with the caption "Doordarshan Relay Kendra Kanpur Welcomes You". Bob Brooks received pictures in Band III from France (Canal+) at 1125 on November 6 and France and Ireland (RTE) on the 15th and I received strong negative pictures from Canal+, using my Plustron TVR5D with its own rod antenna, while parked near Goodwood, Sussex, around 1600 on the 27th. I guessed something was brewing up because of the co-channel interference which appeared on some u.h.f. stations during the previous evening and at times on the 28th. I used the Plustron again while parked at Wakehurst Place Gardens, near Ardingly, Sussex at 1400 the 29th when Band III was open and received a couple of very strong negative pictures from France and the Belgian test cards RTBF1 on Ch. E8 and BRT TV1 on Ch. E10. Later, 1730 onwards, I received both these Belgian stations in good colour from home, plus varying amounts of co-channel interference in the u.h.f. band which appeared again at times on the 30th. By midday on a very foggy and frosty December 1, the pressure was 30.7in (1039mb) and pictures were coming in from Belgium on Ch. E10 and France (Canal+) on Ch. C5. By midday on the 2nd, the ex-RAF altimeter in my car was showing 1043mb (30.8in) and a picture, in colour, from Holland was steady around Ch. E5 in Band III.

Between 1700 and 1900 on November 25, George Garden used his gear on a piece of high ground, overlooking the sea, outside Inverbervie and logged a very strong caption from Border TV's Eyemouth transmitter on Ch. E23, fading pictures from the Tyne Tees transmitter at Chatton on Ch. E49 and steady, with flaky colour from Border TV's Selkirk transmitter on Ch. E59. David Glenday received pictures from Germany (ARD1 SWF1) and Denmark (DR) in Band III and Denmark and Holland in the u.h.f. band on November 27 and u.h.f. signals from Belgium (BRT1) England (Crystal Palace) and France on the 28th and 29th and December 2, Holland and West Germany (ZDF and NDR3) on the 1st, Belgium, England (Emley Moor, Crystal Palace and Sandy Heath), Holland and West Germany on the 3rd and England (Chatton, Crystal Palace, Emley Moor and Sudbury) and Holland (NED3) on the 4th. "There has been no fog here in Arbroath and I suspect that all the fog down south may have soaked up the best of the DX! The barometer has been above 30.7in - rising to over 30.8in on the 2nd and 3rd," said David. Among David's best results in November was East Germany on Ch. E34, Luxembourg (Ecoutez RTL) on Ch. E27, RTL+ on Ch. E59, SAT.1 on Chs. E21, 48 and 49 and, an exciting moment on the 16th, when an announcer appeared briefly on Ch. E/R34 with the name Juri Larischow in both Cyrillic and Latin characters. "The tropospheric conditions were obviously causing the BBC and IBA some problems! After midnight on the 4th of December I received TV South at "local" strength on Ch. E39! As there are no TVS transmitters on E39 I presume that Chatton (BBC1) was re-radiating the TV South signal! Other transmissions from Chatton were also going through a bad time," said David.

"Scandinavia stole the show, a re-run of the Viking era, hi!", said Simon Hamer about the DX on December 2, after logging news from Denmark, cartoons from Norway and a film about Penguins from Sweden on several spots in Band III. He also saw the programmes *Nyhederne* (news) from Denmark and *Bornejournelen* (children's journal) from Sweden on a number of u.h.f. channels. The signals were so strong that Simon was able to receive a noise-free picture from Sweden's TV2, on Ch. E30, using the set's own telescopic rod antenna. He also received the regular u.h.f. networks from Belgium, East and West Germany and Holland. Simon's u.h.f band was full again on the 4th with pictures from Belgium, Denmark, France, East and West Germany, Holland, Ireland (RTE), Poland (TVP) and Sweden.

SSTV

The slow scan television equipment and software used by **Fred Steggall** (Woolwich) includes the Drae, Dragon/G4BMK, Hamvision and the Sinclair Spectrum with Scarab or G1FTU programmes. Among the print outs Fred sent me showed that prior to December 5 he received pictures from stations In Denmark, Germany, Italy, Poland and Scotland and such captions as, "MY QTH BRESCIA ITALY KKK", "MY NAME IS GIUSEPPE OK", "RIG TS-940 KENWOOD + SPECTRUM ZX+", "PSE QSL VIA DARC", "NAME: EDGAR QTH: APPENWEIER", "MY NAME IS LUDWIG" and "HELLO NICE TO SEE YOU ON SSTV".

LONG MEDIUM & SHORT

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

A recent survey of the frequency changes made by broadcasters in the h.f. bands has revealed that many of them only moved by a few tens of kilohertz or less. In this age of multi-hundred kilowatt transmitters and high gain antennas, such small changes seem to be pointless.

The main effect is not an improvement in reception but total confusion as far as the listener is concerned, since they have to take part in a game of "hide and seek" in an attempt to find their favourite broadcasts. Hardly the way to provide a service is it? If you agree, perhaps you could make your views known to the broadcasters concerned when you send them a reception report.

Long Wave DX

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

Long wave reception is often affected by the arrival of the sky wave component of the radiated signal after dark, since it may bear a different phase relationship to the ground wave. The exact nature of the effect will vary at different locations since the distance between transmitter and receiver is not constant. Only the sky wave signal from some of the more distant transmitting stations may reach the UK.

In London, **Phil Townsend** has been comparing reception during daylight and after dark. High levels of

SEEN & HEARD

Long Wave DX Chart

Freq kHz	Station	Location	Power (W)	DXer
153	Bechar	Algeria	1000	H*
153	DLF Donebach	Germany (W)	500	A,B,C*,D*,E,F,G*,J
153	Brasov	Romania	1200	F
162	Allouis	France	2000	A,B,C*,D*,E*,F,G*,J
171	Medi 1-Nador	Morocco	2000	F*
171	Kaliningrad	USSR	1000	E,F,J*
177	Oranienburg	Germany (E)	750	A,B,C*,D*,E,F,G*
183	Saarlouis	Germany (W)	2000	A,B,C*,D*,E*,F,G*,J
189	Motala	Sweden	300	A,B,F,H
198	BBC Droitwich	UK	400	B,D*,F,G*,J
198	BBC Westerglen	UK	50	A,E,F
198	Leningrad	USSR	150	F
207	DLF Munich	Germany (W)	500	A,B,C*,D*,E,F,J
207	Azilal	Morocco	800	F*
216	Roumoules	Monaco	1400	A,B,C*,D*,E*,F,G,J
216	Oslo	Norway	200	A,B
225	Konstantinow	Poland	2000	A,B,C*,D*,F,G*,J*
234	Junglinster	Luxembourg	2000	A,B,C*,D*,E,F,G*,J
234	Kishinev	USSR	1000	F
245	Kalundborg	Denmark	300	A,B,C*,D*,E,F,G*,J
254	Tipaza	Algeria	1500	A*,F*,J*
254	Lahti	Finland	200	A*,D*
254	Atlantic 252	S.Ireland	500	A*,B,D*,E,F,G,H,I,J
263	Burg (R.Volga)	Germany (E)	200	F,J
263	Moscow	USSR	2000	A*,E,G
270	Topolna	Czechoslovakia	1500	A*,D*,E,F,G,J
281	Minsk	USSR	500	A*,F,H*

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

DXers:
A: Kenneth Buck, Edinburgh.
B: David Edwardson, Wallsend.
C: Sheila Hughes, Morden.
D: Eddie McKeown, County Down, N.Ireland.
E: Ike Ddoom, Glasgow.
F: Philip Rambaut, Macclesfield.
G: Mark Selby, Aldershot.
H: Tim Shirley, Bristol.
I: Chris Shorten, Norwich.
J: Phil Townsend, London.

electrical noise usually exist in towns and cities. so it is quite surprising that he could hear twelve broadcasts during daylight. Phil found that the reception of Donebach 153, Allouis 162, Konstantinow 225 and Burg 263 improved after dark and the transmissions from Moscow 171 and Tipiza 254 then became audible, although they were well down in the noise. In contrast, the signals from Saarlouis 183 and Kalundborg 245 deteriorated and those from Roumoules 216 became inaudible.

In Edinburgh, **Kenneth Buck** also noted changes after dark, but they did not follow the same pattern, for example the signal from Roumoules improved from SIO 343 to 433. Improvements in the reception of Munich 207, Konstantinow, Junglinster 234, Moscow 263, Topolna 272 and Minsk 281 were noted. The broadcasts from Tipiza could only be heard via the sky wave path after dark. The transmission from Kalundborg rated as SIO 555 by day or night - perhaps the sea path accounted for that, although the reception of Oslo 207 improved after dark!

Changes of a different pattern were observed by **Philip Rambaut** in Macclesfield. Although the reception of Motala 189 and Junglinster improved after dark, the signals from Kaliningrad 171, Konstantinow and Kalundborg deteriorated. There was no change in the signal level from Donebach, Allouis, Oranienburg 177, Saarlouis, Munich 207, Roumoules, Burg and Topolna 270. Medi-1 171, Azilal 207 and Tipaza could only be received after dark.

Please note that the frequency of the stations operating between 245-281kHz will be changed on 1/2/90 to comply with the final stage of the l.w. band plan. The upper band limit will become 279kHz. No doubt the broadcasters concerned will be glad to receive reports, as even small changes in frequency can affect the efficiency of their antenna system.

MW Transatlantic DX

Writing from Wakefield, **Mark Thompson** says "Compared to last month the transatlantic DX has been very poor here, with six stations heard and only two identified. Most nights little or nothing was heard at all". He logged VOCM in St.John's, Newfoundland 590 as SIO 222 at 0639 and the Carribean Beacon, Anguilla 1610 as SIO 243 at 0150.

The only broadcast from the USA to reach **Tim Shirley** (Bristol) stemmed from WINS in New York 1010 at 0200. He also logged CFNB in Fredericton, NB 550 at 0300; CHOK in Sarnia, ON 1070 at 0430 and CFGO in Ottawa, ON 1200 at 0700.

A 17 day DXpedition to the north of Scotland in September and October'89 enabled **Mark Hattam** (Wembley) to log some 70 Canadian and 76 N.American stations! The conditions favoured S.America during the first week, but from 0430 there were openings to the Canadian provinces of Manitoba, Saskatchewan and Alberta. A peak in conditions occured on 28/9 and KNZ in Los Angeles, California 1070 was heard loud and clear at 0550! Mainly east coast stations were heard during the second week. Mark used a Drake R7A + RV75 v.f.o. + Sherwood SE3 sync a.m.detector and three 400m terminated antennas.

Other MW DX

During the transition period between daylight and darkness **George Millmore** (Wootton, I.O.W.) picked up a 10kW transmission from Ariero, Madeira on 603. He says that over many years he has noticed that some stations can be heard during this period which cannot normally be received at other times of the day or night. All of his entries for the chart were compiled during the transition period 1600-1700.

Some low power transmissions were also noted in the report from **Ted Walden-Vincent** in Gt.Yarmouth. They originated from Barcelona, Spain 828 (20kW), rated as SIO 233 at 1948; Lerida, Spain 936 (2kW) - SIO 333 at 2000; also Venezia, Italy 936 (20kW) - SIO 333 at 2135.

MW Local Radio DX

There are some long hauls noted in the chart this time! A good loop

Local Radio DX Chart

Freq kHz	Station	ILR BBC	Power (kW)	DXer
585	R. Solway	B	2.00	C*,H,K,N
603	Invicta Snd(Coast)	I	0.10	E*,G,J,Q
603	R. Gloucester	B	0.10	G,K,M,Q
630	R. Bedfordshire	B	0.20	I,J,Q
630	R. Cornwall	B	2.00	G,N*
657	R. Clwyd	B	2.00	E,F*,G,I,M,Q
666	DevonAir R	I	0.34	G,Q
666	R. York	B	0.80	I,Q
729	BBC Essex	B	0.20	G,J,Q
738	Hereford/Worcester	B	0.037	G,Q
756	R. Cumbria	B	1.00	F*,H,K
756	R. Shropshire	B	0.63	G,Q
765	BBC Essex	B	0.50	G,J,Q*,Q
774	R. Kent	B	0.70	G,J,L*,Q
774	R. Leeds	B	0.50	F*,H*
774	Severn Sound	I	0.14	N
792	Chiltern R	I	0.27	G,Q
792	R. Foyle	B	1.00	A*,H
801	R.Devon	B	2.00	A*,G,I,Q
819	Hereford/Worcester	B	0.037	I,Q
828	2CR	I	0.27	G
828	Chiltern R	I	0.20	J,Q*,Q
837	R. Leicester	B	0.45	E,G,J,Q
855	R. Lancashire	B	1.50	F*,H*,Q
855	R. Norfolk	B	1.50	E,G,J,Q
873	R. Norfolk	B	0.30	E,G,H,J,Q
936	GWR (Brunel R.)	I	0.18	Q
945	R.Trent (GEM-AM)	I	0.20	B*,Q
954	DevonAir R	I	0.32	G,N
954	R. Wyvern	I	0.16	Q
990	R. Aberdeen	B	1.00	C*,F*
990	Beacon R. (WABC)	I	0.09	Q
990	R. Devon	B	1.00	G,K
990	Hallam R.(C.Gold)	I	0.25	Q
999	R. Solent	B	1.00	E,G,J,Q
999	R.Trent (GEM-AM)	I	0.25	Q
1026	R. Cambridgeshire	B	0.50	E,J,Q*,Q
1026	Downtown R	I	1.70	F*,H
1026	R. Jersey	B	1.00	G,J
1035	R. Kent	B	0.50	G,J,Q*,Q
1035	NorthSound R	I	0.78	C*
1035	West Sound	I	0.32	H
1107	Moray Firth R	I	1.50	H
1107	R. Northampton	B	0.50	E,G,J,Q
1116	R. Derby	B	1.20	Q
1116	R. Guernsey	B	0.50	G,J,Q
1152	R. Broadland	I	0.83	Q
1152	R. Clyde	I	3.60	F*,H
1152	LBC (L.Talkback R)	I	23.50	E*,G,J,Q*,Q
1161	R. Bedfordshire	B	0.10	I,Q
1161	R. Sussex	B	1.00	G,J
1161	R. Tay	I	1.40	C*,H*
1161	Viking R.(Gold)	I	0.35	Q
1170	R. Orwell	I	0.28	Q
1170	Ocean Sound	I	0.12	E,G,J
1242	Invicta Sound(Coast)	I	0.32	E*,F*,G,I,J,Q
1251	Saxon R	I	0.76	E,H,Q
1260	GWR (Brunel R.)	I	1.60	G,Q
1260	Leicester (GEM-AM)	I	0.29	Q
1278	Pennine R.(C.Gold)	I	0.43	H
1305	R. Hallam (C.Gold)	I	0.15	D*,Q
1305	Red Dragon R	I	0.20	G
1323	Southern Sound	I	0.50	E,G,J,Q
1332	Hereward R	I	0.60	E,Q
1332	Wiltshire Sound	B	0.30	E,G
1359	Essex R.(Breeze)	I	0.28	D*,Q
1359	Mercia Snd(Xtra-AM)	I	0.27	Q
1359	R. Solent	B	0.85	G
1368	R. Lincolnshire	B	2.00	Q
1368	R. Sussex	B	0.50	G,J
1368	Wiltshire Sound	B	0.10	G,Q
1431	Essex R.(Breeze)	I	0.35	Q
1431	Radio 210	I	0.14	G,J,Q
1449	R. Cambridgeshire	B	0.15	Q
1458	GLR	B	50.00	G,J,N*,O*,Q
1458	GMR	B	5.00	H
1458	R. Newcastle	B	2.00	F*
1476	County Sound Gold	I	0.50	E*,G,J,Q
1485	R. Humberside	B	1.00	Q
1485	R. Merseyside	B	1.20	F*,H
1485	R. Oxford	B	0.50	Q
1485	R. Sussex	B	1.00	E*,G
1503	R. Stoke-on-Trent	B	1.00	G,Q
1521	R. Mercury	I	0.64	E*,G,J,Q
1521	R. Nottingham	B	0.50	Q
1530	R. Essex	B	0.15	H*,Q
1530	Pennine R.(C.Gold)	I	0.74	H*
1530	R. Wyvern	I	0.52	G,H*,Q
1548	R. Bristol	B	5.00	F*,G
1548	Capital R. (Gold)	I	97.50	E*,G,J*,O*,Q
1548	R. Forth	I	2.20	H,P
1548	R. Hallam	I	0.74	F*
1557	Chiltern R	I	0.76	A*,F*,Q
1557	Ocean Sound	I	0.50	G,J
1584	R. Nottingham	B	1.00	Q
1584	R. Tay	I	0.21	F*,H
1602	R. Kent	B	0.25	G,J,Q

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

DXers:
A: Leo Barr, Sunderland.
B: Tony Batchelor, Truro.
C: Peter Easton, Edinburgh.
D: Robin Harvey, Bourne.
E: Sheila Hughes, Morden.
F: Eddie McKeown, Co.Down.
G: George Millmore, Wootton, I.O.W.
H: Ike Odoom, Glasgow.
I: Roy Patrick, Derby.
J: Mark Selby, Aldershot.
K: Tim Shirley, Bristol.
L: Chris Shorten, Norwich.
M: Alan Smith, Northampton.
N: Mark Thompson, Wakefield.
O: Phil Townsend, London.
P: Ted Walden-Vincent, Gt.Yarmouth.

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Medium Wave DX Chart

Freq kHz	Station	Country	Power (kW)	DXer
531	Ain Beida	Algeria	600	C*,E*,H*
531	Leipzig	Germany (E)	100	E*,F*
531	Oviedo	Spain	10	F*
540	BRT-2 Wavre	Belgium	150/50	C*,E*,F*,G,H*,M
549	Les Trembles	Algeria	600	H*
549	DLF Bayreuth	Germany (W)	200	F*,G*,H*
558	Espoo	Finland	100	I*
558	Valencia	Spain	20	F*
567	RTE-1 Tullamore	S.Ireland	500	E*,F*,G,H*
567	West Berlin	Germany (W)	100	F*
576	Stuttgart	Germany (W)	300	E*,F*,G,H*
585	Orf Wien	Austria	600	G*,H
585	FIP Pans	France	8	F*
585	RNE-1 Madrid	Spain	200	F*,H*
594	Pleven	Bulgaria	250	F*
594	HRF Frankfurt	Germany (W)	400	E*,F*,G*,H*
603	Lyon	France	300	F*
603	Aricira	Madeira Islands	10	F*
603	BBC-R4 Newcastle	UK	2	G
612	RTE-2 Athlone	S.Ireland	100	E*,F*,G*,H*,J*
621	RTBF-1 Wavre	Belgium	300	E*,F*,H,L*
630	Vigra	Norway	100	E*,M*
639	Libilce	Czechoslovakia	1500	H*
639	La Coruna	Spain	100	F*
648	BBC Drfordness	UK	500	E*,G,H,L*,M
657	Burg	Germany (E)	250	H*
666	Lisboa	Portugal	135	E*,G*
675	Marseille	France	600	E*
675	Hilversum-3 Lopic	Holland	120	C*,G*,H
684	RNE-1 Sevilla	Spain	250	C*,G*
702	Aachen/Flensburg	Germany (W)	5	H*
711	Rennes 1	France	300	H*
711	Heidelberg	Germany (W)	5	G*
720	BBC-R4 Lisnagarvey	N.Ireland	10	E*,L*
720	BBC-R4 Lots Rd London	UK	0.5	H
729	RTE-1 Cork	S.Ireland	10	G*,I
729	Oviedo	Spain	50	G*,H*
738	Poznan	Poland	300	E*,H*,J*
747	Hilversum-2 Flevo	Holland	400	C*,E*,H*,L*
756	Brunswick	Germany (W)	800/200	E*,G*
765	Sottens	Switzerland	500	G*,H*
774	BBC-R4 Enniskillen	N.Ireland	1	E*
774	RNE-1 San Sebastian	Spain	60	G*
783	Burg	Germany (E)	1000	E*,G*,H*,I*,L*
792	BBC R.Ulster	UK	1	K*
801	BRF via Munich	Germany (W)	420	E*,G*,H*,L*
810	SER Madrid	Spain	20	H*
810	BBC-Scot.Westerglen	UK	100	E*,G*,L*
819	Sud-Radio	Andorra	900	E*
819	Rabat	Morocco	25	H*
828	Barcelona	Spain	20	M*
837	Nancy	France	200	H*
837	R.Popular, Sevilla	Spain	10	H*,L*
846	Rome	Italy	540	H*,L*,M*
855	Murcia	Spain	125	G*,H*
864	Paris	France	300	H*
873	AFN Frankfurt	Germany (W)	150	C*,G*,H*,M*
882	BBC-Wales Washford	UK	70	E*,G,H
891	Algiers	Algeria	600/300	H*,M*
900	Milan	Italy	600	A*,G*,H*,M*
918	R.Intercont. Madrid	Spain	20	H*
918	R.Ljubljana	Yugoslavia	600/100	G*
927	BRT-1 Wolvertem	Belgium	300	G*,H
936	Venezia	Italy	20	M*
936	Lerida	Spain	2	M*
945	Toulouse	France	300	H*

Freq kHz	Station	Country	Power (kW)	DXer
954	Dobrochov	Czechoslovakia	400	H*
963	Pori	Finland	600	D*,E*,G*,H*,J*
972	NDR/WDR Hamburg	Germany (W)	300	C*,E*,G*,H*,M*
981	Alger	Algeria	600/300	G*,H*
990	RIAS Berlin	Germany (W)	300	H*
1008	Hilversum-5 Flevo	Holland	400	C*,H,L*
1008	Malaga	Spain	10	G*
1017	Wolfsheim	Germany (W)	600	E*,G,H*,L*
1044	DDR-1 Burg	Germany (E)	250	C*,E*,H,L*
1071	Brest	France	20	H
1080	Katowice	Poland	1500	H*
1098	Bratislava	Czechoslovakia	750	H*
1098	Bologna	Italy	60	C*,E*,G*
1107	AFN via Berlin	Germany (W)	10	H*
1107	AFN via Munich	Germany (W)	40	C*,G*,M*
1125	Zagreb	Yugoslavia	200	H*
1134	Zagreb	Yugoslavia	300	E*,H*
1143	Century R. Dublin	Ireland (S)	?	E*,
1143	Kaliningrad	USSR	150	C*,G*,H*,M*
1161	Strasbourg (F.Int)	France	200	E*
1170	Bernburg	Germany (E)	20	H*
1179	Solvesborg	Sweden	600	D*,E*,G*,M*
1188	Kuurne	Belgium	5	H*
1197	BBC-R3 Enniskillen	N.Ireland	1.0	E*
1197	Minsk	USSR	50	H*
1206	Wroclaw	Poland	200	E*,G*,H*,J*
1233	Prague	Czechoslovakia	400	H*
1251	Siofok	Hungary	135	H*
1260	Valencia	Spain	20	E*
1269	Neuminster	Germany (W)	600	E*,G*,H*
1278	Strasbourg	France	300	H*
1278	RTE-2 Dublin/Cork	S.Ireland	10	E*
1287	Litomysl/Liblice	Czechoslovakia	300/200	C,E*,G*,H*,L*
1296	Kardzali	Bulgaria	150	H*
1314	Kvitsoy	Norway	1200	D*,E*,H*,L*
1323	R.Moscow via Leipzig	Germany (E)	150	E*,L*,M
1332	Rome	Italy	300	H*,L*
1341	BBC-Ulst.LisnagarveyN.Ireland	100	G,L*,M	
1350	Nancy/Nice	France	100	G*,H*,L*
1359	RBI Berlin	Germany (E)	250/100	J*,M
1368	Manx Radio, Foxdale	I.O.M 20	E*,G*	
1377	Lille	France	300	H*
1386	Kaunas	USSR	1000	L*
1395	R.Tirana via LushnjeAlbania	1000	H*	
1422	Heusweiler	Germany (W)	600	H*
1422	Saarbrucken	Germany (W)	1200/600	E*
1431	Dresden	Germany (E)	250	E*,G*,H*
1440	Marnach	Luxembourg	1200	E*,G*,H*,M*,N*
1467	TWR Monte Carlo	Monaco	1000/400	E*,O*
1476	Wien-Bisamberg	Austria	600	E*
1494	Clermont-Ferrand	France	20	H
1494	Leningrad	USSR	1000	G,I*
1503	Stargard	Poland	300	C*,G*,H*,J*,L*
1512	BRT Wolvertem	Belgium	600	B*,C*,D*,G*,H*,J*,L*
1512	Jeddah	Saudi Arabia	1000	K*
1521	Radio Manresa	Spain	2	G*
1530	Vatican Radio, Rome	Italy	150/450	H*,M*
1539	DLF Mainflingen	Germany (W)	700	E*,G*,H*
1557	Nice	France	300	H*
1575	RBI via Burg	Germany (E)	250	G*,H*
1584	Pamplona	Spain	2	G*
1593	Langenberg	Germany (W)	400/800	E*,G*,H*,L*

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

DXers:-
A: Leo Barr, Sunderland.
B: Jim Cash, Swanwick.
C: Sheila Hughes, Morden.
D: Rhoderick Illman, while in Oxted.
E: Eddie McKeown, Co.Down.
F: George Millmore, Wootton I.D.W.
G: Ike Odoom, Glasgow.
H: Mark Selby, Aldershot.
I: Tim Shirley, Bristol.
J: Chris Shorten, Norwich.
K: Mark Thompson, Wakefield.
L: Phil Townsend, London.
M: Ted Walden-Vincent, Gt.Yarmouth.
N: Julian Wood, Buckie.
O: Carl Yates, St.Helen's.

antenna must be high on the list of desirable items of equipment for any Dxer contemplating this aspect of our hobby. If space is a problem, then the compact "Sooper Loop" which Dave Mayhew desIgned may be the answer. The full constructional details were published in the July'86 issue of *Practical Wireless* - back issues are available from PW Publishing Ltd in Poole.

Superior results however can be obtained with the large Hexagon Spiral Loop design by the late John Ratcliffe - see April'89 *SWM*.

In Northampton, **Alan Smith** has just put his new Hexagon Spiral loop to the test and he was delighted to find a great enhancement in reception. Using the loop with a Matsui MR 4099 portable, good reception of the 100W transmission from BBC Radio Gloucester on 603 was noted and he was very surprised that BBC Radio Clwyd 657 (2kW) was loud and clear during the morning!

An IBA test transmission on 1413kHz for an incremental station in Hounslow (Sunshine Radio) was logged by **Simon Hamer** in New Radnor during daylight. Further reports on this would be welcome.

Short Wave DX

During an increasing number of days, reception in the h.f. bands has been disturbed by the effects of solar flares. Such effects are bound to continue long after we have reached the peak of the present sunspot cycle, which some forecasters now suggest will occur in March '90.

Apart from during these disturbed periods, reception in the **25MHz (11m)** band is generally excellent and often the signals are so potent that it is easy to forget the vast distances they have travelled! In Truro, **Tony Batchelor** rated the transmission to Europe from Radio RSA Johannesburg, S.Africa 25.790 (Eng 1400-1600) as SINPO 55544 at 1535. The broadcasts in Arabic from Voice of the UAE in Abu Dhabi 25.895 were logged as 45554 at 1202 by **David Edwardson** in Wallsend.

In the reverse direction, **Dick Moon** (George, S.Africa) rated the BBC broadcasts to Africa via Daventry, UK 25.750 (Eng 1100-1615) as 44544 and those from RFI via Issoudun, France 25.820 (Fr to Africa 0900-1500) as 23221. The broadcasts to America from Radio Norway Int., Oslo were logged by **Alan Roberts** in Quebec, Canada. At best he rated 25.730 (to N.America 1400-1500) as 45555 and 25.740 (to C.America 1400-1500) as 35555. He says Radio For Peace Int., Costa Rica drifts from 25.945 to 25.950 (Eng 1845-2300) - ratings varied from 15311 to 25333.

The effects of solar flares also disrupted reception in the **21MHz (13m)** band during some days, but at other times potent signals from many areas reached the UK. Although Radio Australia's transmissions via Carnarvon on 21.525 (Eng 0100-0900) are beamed to Indonesia, Malaysia

SEEN & HEARD

and Singapore they have often reached the UK. At 0825, **David Middlemiss** (Eyemouth) rated them as SIO 333.

During the day there are many broadcasts to Europe. They include the Voice of Israel, Jerusalem 21.780 (Eng 1100-1130), rated as SIO 544 at 1115 by **Ron Pearce** in Bungay; Radio Kuwait, Sulaibiyah 21.675 (Ar ?-1800) - SIO 433 at 1242 by Philip Rambaut in Macclesfield; Radio Japan via Moyabi, Gabon 21.700 (Eng, Jap 1500-1700) - 54445 at 1500 by **Ted Agombar** in Norwich; Radio RSA Johannesburg, S.Africa 21.590 (Eng 1400-1600) - 54444 at 1520 by **Chris Shorten** in Norwich; WHRI Noblesville, USA 21.840 (Eng 1500-1700) - 55444 at 1600 by Tony Batchelor; UAE Radio Dubai 21.605 (Ar, Eng 0615-1730) - 44544 at 1605 by David Edwardson; WYFR via Okeechobee, Florida 21.615 (Eng, Ger, It 1600-1845) - 44544 at 1610 by John **Nash** in Brighton; Radio RSA Johannesburg, S.Africa 21.535 (Du, Eng 1800-2000) - SIO 444 at 1830 by John **Coulter** in Winchester; Radio HCJB Quito, Ecuador 21.470 (Cz, Ger, Eng, Sw, Norw, Da, Fr 1800-2130) - 43344 at 1920 by **Cliff Stapleton** in Torquay.

Some of the broadcasts beamed to areas outside Europe may also be heard here. Those logged were Radio Austria, Vienna 21.490 (Eng to Middle East 0500-0800), noted as 25323 at 0532 by **Kenneth** Reece in Prenton; BBC via Ascension Island 21.660 (Eng to S.Africa 0700-0815) - 34333 at 0748 by **Rhoderick Illman** while in Oxted; Radio Prague, Czechoslovakia 21.705 (Eng to S.E.Asia 0730-0800) - 55555 at 0754 by **Jim Cash** in Swanwick; BRT Brussels, Belgium 21.810 (Eng to Africa 1000-?) - 35333 at 1000 by **David Wratten** in Cambridge; Voice of the UAE in Abu Dhabi 21.735 (Ar to Middle East 0600-1600) - SIO 454 at 1330 by Kenneth Buck; RNE Spain 21.555 (Sp to C.America 0930-1900), heard at 1400 by **Ike Odoom** in Glasgow; Radio Sweden, Stockholm 21.655 (Fr, Eng, Sw to Middle East 1500-1630) - 54554 at 1540 by **Andy Cadier** in Folkestone; Radio Pakistan, Islamabad 21.740 (Eng to Middle East 1600-1630) - 34433 at 1600 by **Darran Taplin** in Tonbridge; WCSN Scotts Corner, Maine 21.640 (Eng to Africa 1600-2000) - 33243 at 1800 by **Eddie McKeown** in Co.Down.

The effects of solar flares also disrupted long distance reception in the **17MHz (16m)** band during several days, but quite often the broadcasts from Radio Australia to S.Asia via Carnarvon 17.715 (Eng 0100-0915) were heard in the UK during the early morning. Considerable variations in reception were noted in the reports, but the SIO 233 rating by David Middlemiss at 0820 gives a fair indication of their signal at best. From time to time their broadcasts to C.Pacific areas via Shepparton 17.795 (Eng 2200-0800) also reached the UK. Kenneth Reece logged this transmission as 24333 at 0542.

The broadcasts from Radio New Zealand, Wellington have been attracting the attention of many UK Dxers. At present their transmissions to the Pacific area are on 17.730MHz (Eng 1730-2005) and on 17.705MHz (Eng 2245-0045, 0230-0630; also 0045-0230 Sat/Sun only). During some mornings their transmissions have been audible in the UK. At best, their signal may peak to 23333, as noted by Chris Shorten at 0445. An information sheet from Radio New Zealand has been sent on to me by **Edward Broadsmith** (Worcester), which indicates that their new 100kW transmitter will be brought into service on January 24th. This will coincide with the Commonwealth Games which are being held in that country from January 25th. Note that their schedule may be changed in February.

Many of the broadcasts to target areas outside Europe were logged, including Radio Beijing, China 17.710 (Eng to S.Pacific 0830-1000), noted as 33333 at 0835 by **Sheila Hughes** in Morden; Radio Moscow, USSR 17.565 (Eng to Middle East, Africa 1000-1300) - SIO 444 at 1125 by John Coulter; WSHB Cypress Creek, USA 17.555 (Eng to C.America 1400-1600) - SIO 333 at 1435 by Alan Smith; RTM Tanger, Morocco 17.595 (Fr, Eng to Middle East 1400-1700) - 54544 at 1600 by **John Sadler** in Bishops Stortford; Voice of Israel, Jerusalem 17.590 (Eng to W.Europe, USA 1900-1930) - 34333 at 1900 by Cliff Stapleton; VOA via Greenville, USA 17.785 (Eng to W.Africa 1600-2200) - 34333 at 2003 by **D. Taskis** in Romford; Radio Nederlands via Bonaire, Ned.Antilles 17.605 (Eng. Fr. Du to W.Africa 1830-2125) - 55454 at 2039 by Jim Cash; WHRI Noblesville, USA 17.830 (Eng to C.America 1800-0000) - 23343 at 2224 by Andy Cadier; Voice of Turkey, Ankara 17.760 (Eng, Tur to S.E.Asia 2300-0500) - 34433 at 2332 by **Carl Yates** in St.Helens.

Some of the many broadcasts to Europe were noted, namely the Voice of Israel, Jerusalem 17.575 (Eng, Fr 1100-1200) - SIO 545 at 1120 by **Darren Beasley** in Bridgwater; UAE Radio Dubai 17.775 (Eng 1330-1400) - SIO 444 at 1330 by Kenneth Buck; Radio Surinam Int. via RNB Brazil 17.755 (Du, Eng 1700-1750) - SIO 433 at 1739 by Philip Rambaut; RCI via Sackville, Canada 17.875 (Hung, Cz, Uk, Eng, Fr, Russ 1800-2100) - 44444 at 1935 by Ted Agombar; Radio HCJB Quito, Ecuador 17.790 (Cz, Eng, Ger, Fr, Sw, Norw, Da, Sp 1800-2230) - 33433 at 2130 by Eddie McKeown; VOFC via Okeechobee, Florida 17.612 (Ger, Eng 2100-2300) - 24444 at 2200 by David Wratten.

Despite the effects of solar flares, good reception over long distances has been noted in the **15MHz (19m)** band. Much to the delight of Dxers

Tropical Band Chart

Freq kHz	Station	Country	UTC	DXer
2.340	Fuzhou	China	2200	F,J
2.560	Xinjiang	China	2315	F
3.200	TWR	Swaziland	0600	N
3.205	R.Vale do Rio Maderia	Brazil	2300	D
3.210	R.Mozambique	Mozambique	0532	M
3.215	R.Drange	S.Africa	1713	M
3.230	ELWA Monrovia	Liberia	2140	J
3.270	SWABC 1, Namibia	S.W.Africa	1848	C,D
3.315	AIR Bhopal	India	2359	F
3.365	GBC Radio 2	Ghana	2035	J
3.905	AIR Delhi	India	1755	J,L,M
3.915	BBC Kranji	Singapore	1734	C,F,H,L,M,Q
3.925	AIR Delhi	India	1614	F
3.955	BBC Daventry	England	2242	C,D,H,I,M,N
3.965	RFI Paris	France	2130	C,H,I,J,N,P
3.970	RFE Munich	W.Germany	0038	H
3.975	BBC Skelton	England	1930	A,C,D
3.980	VOA Munich	W.Germany	2130	C,G,H,J
3.985	R.Beijing, China	via SRI Berne	2105	C,F,H,I,N,P,S
3.985	SRI Berne	Switzerland	1900	C,D,G,H,J,M,P
3.990	RFE Munich	W.Germany	2130	J
3.995	DW Cologne (Julich)	W.Germany	2029	C,D,J,N
4.010	R.Frunze	USSR	1758	L
4.060	R.Moscow Kharkov	USSR	2130	J,K,P
4.220	PBS Xinjiang	China	2312	F,N
4.495	R.Contumaza	Peru	2300	N
4.500	Xinjiang	China	2312	F
4.635	R.Dushanbe Tadzhik	USSR	1847	F
4.650	R.Santa Ana	Bolivia	0100	D
4.735	Xinjiang	China	2320	B,F,K,N
4.740	R.Afghanistan	via USSR	0547	F,M
4.750	PBS Xizang, Lhasa	China	2325	F
4.760	Yunnan Kumming	China	1532	F
4.760	ELWA Monrovia	Liberia	0553	C,F,M
4.765	R.Moscow	via Cuba	0550	M
4.770	FRCN Kaduna	Nigeria	0550	M
4.785	RTM Bamako	Mali	0612	M
4.785	R.Tanzania	Tanzania	1812	M
4.785	R.Baku	USSR	1755	C,F,J,M
4.790	TWR Manzini	Swaziland	1816	H,M
4.795	R.Moscow, Kharkov	USSR	1755	C,J,M
4.795	R.Moscow, Ulan Ude	USSR	0550	H,M
4.795	R.Peace & Progress	USSR	2220	B,R,S
4.800	LNBS Lesotho	Maseru	1821	M
4.810	Voz de Galapagos	Ecuador	0250	N
4.810	R.Yerevan	USSR	1750	C,F,J,M
4.815	R.Beijing	China	1510	F
4.815	R.diff TV Burkina	Ouagadougou	0616	C,F,J,M
4.820	Khanty-Mansiysk	USSR	0100	F,M,N
4.825	R.Moscow Yakutsk	USSR	1755	J
4.830	Gaborone	Botswana	1830	C,F,J,M
4.830	R.Tachira	Venezuela	2350	F,K,M
4.835	RTM Bamako	Mali	2150	C,J,M
4.840	PBS Heilongjiang	China	2150	F,J
4.840	AIR Bombay	India	1840	F
4.845	ORTM Nouakchott	Mauritania	2150	C,F,J,M
4.850	R.Yaounde	Cameroon	2111	C,H,M
4.850	R.Tashkent	USSR	1811	F,L,M
4.855	R.Sana Yemem	Yemen	2024	A
4.860	R.Chita	USSR	2106	C,J
4.860	Kalinin	USSR	2120	C,E,H,J,M
4.865	PBS Lanzhou	China	1535	F
4.865	Caracol	Colombia	0550	M
4.865	V of Cinaruco	Colombia	0613	C,F
4.865	R.Mozambique	Mozambique	0620	M
4.870	R.Cotonou	Benin	2030	C,J,M
4.875	R.Tbilisi	USSR	0211	M
4.880	SABC Radio 5	S.Africa	1750	C,J
4.885	R.Clube do Para	Brazil	0812	F
4.885	R.Beijing	China	1530	F
4.885	Voice of Kenya	Kenya	1840	J,M
4.895	R.Moscow, Kalinin	USSR	1750	J,M
4.895	R.Moscow (Tyumen)	USSR	0052	H
4.900	SLBC Colombo	Sri Lanka	1647	Q
4.905	R.Relogio, Rio	Brazil	0000	F
4.905	R.Nat.N'djamena	Chad	2000	C,F,J,K
4.905	R.Beijing	China	2300	N
4.910	R.Zambia, Lusaka	Zambia	1750	J
4.915	R.Ghana, Accra	Ghana	2020	C,F,J,M
4.915	Voice of Kenya	Kenya	1840	J
4.930	R.Moscow, Ashkhabad	USSR	1840	H,J
4.930	R.Moscow, Tbilisi	USSR	0100	N
4.935	Voice of Kenya	Kenya	1750	C,F,J,D
4.940	AIR Gauhati	India	0216	M
4.940	R.Kiev	USSR	1840	C,H,I,J,M
4.940	R.Moscow, Yakutsk	USSR	2330	N
4.945	Caracol, Neiva	Colombia	0730	C,F,M
4.945	R.RSA, Johannesburg	S.Africa	0615	M
4.958	R.Baku	USSR	2020	F,J,M
4.975	R.Uganda, Kampala	Uganda	2020	C,J
4.975	R.Dushanbe	USSR	0221	F,M
4.980	PBS Xinjiang	China	2347	F
4.980	Ecos del Torbes	Venezuela	0015	C,H,K,M
4.985	R.Brazil Central	Brazil	0631	B,C,M
4.990	AIR via Madras	India	0007	F,K
4.990	FRCN Lagos	Nigeria	1840	C,F,H,J,M,N
4.990	R.Yerevan	USSR	2155	J
5.005	R.Nacional, Bata	Eq.Guinea	2120	C,J,K
5.005	R.Nepal, Kathmandu	Nepal	0030	F,K
5.015	R.Moscow Arkhangelsk	USSR	0319	M
5.015	R.Moscow Ashkhabad	USSR	0013	H,M
5.015	R.Moscow Vladivostok	USSR	2010	J
5.020	La Voix du Sahel	Niger	2030	F,J,M
5.030	R.Impacto	Costa Rica	0500	M,D,Q
5.035	R.Bangui	C.Africa	2010	J
5.035	R.Alma Ata	USSR	0224	M
5.040	R.Tbilisi	USSR	1928	C,F,H,M,N
5.045	R.Cultura do Para	Brazil	0228	M
5.047	R.Togo, Lome	Togo	2010	J,M
5.050	SBC Singapore	Singapore	1601	F
5.050	R.Tanzania	Tanzania	1750	J
5.055	RFD Cayenne(Matoury)	French Guiana	0735	M
5.057	R.Tirana Gjirokaster	Albania	2010	A,B,C,F,H,J,M
5.060	PBS Xinjiang	China	1515	F
5.075	R.Beijing	China	2120	J
5.075	Caracol Bogata	Colombia	0548	C,F,M,Q
5.353	Ecos del Putamayo	Colombia	0135	N
5.800	PBS Xinjiang	China	1547	F

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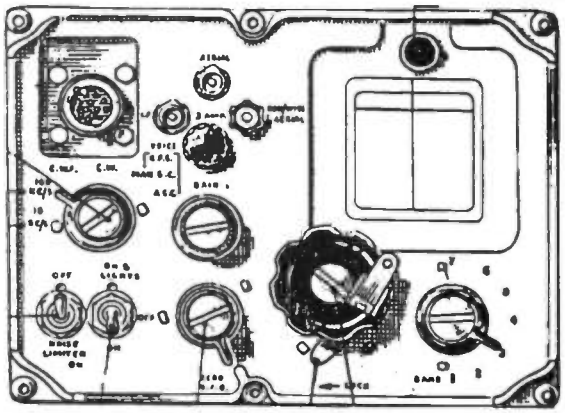

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Derek Carter at his listening post in Cambridge.

the broadcasts from Radio New Zealand, Wellington on 15.485 (Eng to Australia, Papua New Guinea 0230-0630) have reached our shores during some mornings. Kenneth Reece has been monitoring their frequency on a daily basis and he noted variations in the reception ranging from inaudible to 23332 at 0544. Earlier however, he found that their signals were often obliterated by co-channel interference.

Some of Radio Australia's broadcasts have also been reaching the UK. During some mornings their transmission to S.Asia via Carnarvon 15.415 (Eng 0900-1100) has been received here - Alan Smith rated it as SIO 333 at 0945. During the early evening their broadcast to Asia via Darwin 15.245 (Eng 1530-1830) may be heard - David Edwardson rated it as 34543 at 1738. Listening at 2200, Cliff Stapleton picked up their transmission to the S.Pacific area via Shepparton 15.240 (Eng 2100-0730) at a remarkable 54544. Their broadcast in Chinese to C.Asia via Darwin 15.170 (2200-0000) was rated as 33333 at 2333 by **Leo Barr** in Sunderland.

The propagation conditions may enable some of the broadcasts to be heard well outside their intended target area, e.g. Radio Veritas, Manila, Philippines 15.445 (Tel, Si, Ta, Beng, Eng, Hi, Ur to Asia 1300-1630), noted as 43433 at 1500 by Sheila Hughes; Radio Kuwait, Sulaibiyah 15.495 (Ar to N.Africa 0500-2300) - SIO 444 at 1735 by Kenneth Buck; BBC via Daventry, UK 15.070 (Eng to N.Africa 0800-2030) - 55444 at 1800 by **Ken Whayman** in New York; Radio Nederlands via Talata Volon, Madagascar 15.560 (Eng to E.Africa 1830-1925) - 43333 at 1838 by Rhoderick Illman; Africa No.1, Gabon 15.475 (Fr, Eng to W.Africa 1600-2100) - 44444 at 1857 by David Wratten; Radio RSA Johannesburg, S.Africa 15.150 (Eng to Africa 1900-2000) - SIO 323 at 1940 by John Coulter; VOA via Monrovia, Liberia 15.445 (Eng to Africa 1600-2200), noted as "fair" at 2100 by **Robin Harvey** in Bourne; KUSW Salt Lake City, USA 15.650 (Eng to Canada 1500-2200) - 34333 at 2138 by Eddie McKeown; VOA via Tinang, Philippines 15.185 (Eng to E.Asia 2100-0100) - 23343 at 2231 by Andy Cash; BBC via Ascension Island 15.400 (Eng to Africa 1700-2300) - 33433 at 2300 by **Peter Easton** in Edinburgh.

Throughout the day numerous broadcasts are beamed towards Europe. Those noted stemmed from Radio Japan via Moyabi, Gabon 15.325 (Eng, Jap 0700-0900), rated as 54444 at 0720 by Chris Shorten; RNB Brasilia, Brazil 15.270 (Eng, Ger 1800-1950) - 44343 at 1800 by Ted Agombar; WRNO New Orleans, USA 15.420 (Eng 1600-0000) - 24432 at 2000 by John Sadler; VOA via Tangier, Morocco 15.205 (Eng 1700-2200) - SIO 555 at 2015 by Ron Pearce; Voice of Israel, Jerusalem 15.640 (Eng 2000-?) - 44344 at 2022 by D.Taskis; Radio Korea, Seoul 15.575 (Ar, It, Eng, Sp, Port, Ger 1645-2300) - 35343 at 2030 by John Nash; RAE Buenos Aires, Argentina 15.345 (Ar, Ger, Fr, It, Sp, Eng 1700-2300) - 34323 at 2135 by Jim Cash; Radio HCJB Quito, Ecuador 15.270 (Cz, Ger, Eng, Sw, Norw, Da, Fr 1800-2200) - SIO 444 at 2147 by Darren Beasley; WWCR Nashville, USA 15.690 (Eng 1700-0200) - SIO 444 at 2225 by **Alf Gray** in Birmingham; WINB Red Lion, USA 15.185 (Eng 2003-2245) - SIO 322 at 2244 by Philip Rambaut.

Quite a few of the broadcasts in the **13MHz (22m)** band are intended for listeners in Europe. Those noted originated from Radio Jordan, Amman 13.655 (Eng 0500-1315), rated as 43322 at 0820 by Andy Cadier; RCI Montreal, Canada 13.670 (Pol, Eng, Fr, Ger, Cz 1600-2230?) - SIO 423 at 1808 by Philip Rambaut; Radio Kuwait, Sulaibiyah 13.610 (Eng 1800-2100) - 43333 at 1930 by **Derek Carter** in Cambridge; WCSN Scotts Corner, Maine 13.770 (Eng 2000-2200) - 33333 at 2015 by Ted Agombar; Voice of Israel, Jerusalem 13.750 (Eng ?-?) - 24232 at 2025 by Jim Cash; RBI via Leipzig, GDR 13.610 (Eng 2015-2100) - 32333 at 2041 by Leo Barr; SRI via Schwarzenburg, Switzerland 13.635 (Ger, Fr, It, Port, Eng, Sp to Africa 1845-2200) - SIO 444 at 2123 by Darren Beasley; Voice of the UAE in Abu Dhabi 13.605 (Eng 2200-0000) - 55444 at 2200 by David Wratten; WRNO New Orleans, USA 13.720 (Eng 2100-0000), heard at 2300 by Tim Shirley; WHRI Noblesville, USA 13.760 (Eng 1700-0000) - 33333 at 2300 by Eddie McKeown.

Many are beamed to other areas, but some may also be heard here: Radio Nederlands via Flevo 13.700 (Eng to Middle East, E.Africa 0430-0455) - 23333 at 0439 by Kenneth Reece; Radio Moscow, USSR 13.715 (Eng to Middle East 0800-0900), logged as 44444 at 0830 by Chris Shorten; KSDA Agat, Guam 13.720 (Bur, Ta, Mal, Hi, Tel to S.Asia 1400-1700) - 35443 at 1600 by John Nash; Radio Pakistan, Islamabad 13.665 (Eng to Middle East 1600-1630) - 44433 at 1606 by Darran Taplin; Radio Prague, Czechoslovakia 13.715 (Cz, Ar, Fr, Eng, Ger to Asia, Middle East 1400-2125) - SIO 454 at 1828 by Kenneth Buck; Radio Austria, Vienna 13.730 (Ger, Fr, Eng to S.Africa 1700-2100) - 44444 at 1735 by Rhoderick Illman; WYFR via Okeechobee, Florida 13.695 (Fr, Eng to USA 1200-2245) - 24433 at 2230 by Peter Easton.

The **11MHz (25m)** band is used by many broadcasters to reach listeners in Europe. They include Radio Australia via Shepparton 11.910 (Eng 0400-0630) - 43333 at 0550 by Chris Shorten; Radio Bucharest, Romania 11.940 (Eng 1300-1356) - 45554 at 1312 by Jim Cash; Radio Pakistan, Islamabad 11.570 (Ur, Eng, Fr 1645-2015) - 45423 at 1720 by John Nash; RCI via Sackville, Canada 11.945 (Hung, Cz, Russ, Uk, Eng, Fr, Pol 1800-2130) - 43334 at 1945 by Ted Agombar; Radio Beijing, China 11.500 (Eng 2000-2215) - 54333 at 2013 by **Mark Selby** in Aldershot; Radio Portugal, Lisbon 11.740 (Port, Eng, Fr, It 1700-2130) - SIO 444 at 2020 by Alf Gray; RHC Habana, Cuba 11.800 (Esp, Eng, Fr 1840-2100) - 55433 at 2036 by John Sadler; Radio Japan via Moyabi, Gabon 11.835 (Eng 2100-2130) - SIO 444 at 2115 by Darren Beasley; AIR via Aligarh, India 11.620 (Hi, Eng 1945-2230) - 43444 at 2200 by Cliff Stapleton; VOFC Taipei via Okeechobee, Florida 11.805 (Chin, Fr, Ger, Eng 1900-2300) - 43443 at 2230 by Carl Yates.

Broadcasts to other areas stem from the BBC via Daventry, UK 12.095 (Eng to N.Africa 0500-0915), logged as 43343 at 0600 by Ken Whayman in New York; Radio HCJB Quito, Ecuador 11.925 (Eng to S.Pacific 0700-1130) - 42222 at 0810 by D.Taskis; Radio Prague, Czechoslovakia 11.685 (Eng, Cz to Australia, Pacific 0730-0930) - 33433 at 0905 by Rhoderick Illman; Radio Australia via Carnarvon 11.765 (Chin to C.Asia 1030-1300) - SIO 111 at 1035 by Philip Rambaut; also via Darwin 11.800 (Jap, Eng to E.Asia 1000-1330) - SIO 322 at 1200 by Alan Smith; Voice of Mediterranean via Cyclops, Malta 11.925 (Eng, Ar to N.Africa 1400-1600) - 33323 at 1437 by Leo Barr; FEBA Radio, Mahe, Seychelles 11.865 (Hi, Eng to S.Asia 1400-1555) - 33333 at 1500 by David Wratten; WRNO New Orleans, USA 11.965 (Eng to C.America, USA 1400-1600), heard at 1530 by Tim Shirley; Voice of Greece, Athens 11.645 (Eng to USA 1500-1550) - 54444 at 1537 by Andy Cadier; Radio Peace and Progress, USSR 11.850 (Eng to Africa 1630-1700) - 43343 at 1630 by Sheila Hughes; Radio Kuwait, Salaibiyah 11.990 (Ar to Middle East 1500-2300) - SIO 444 at 2045 by Kenneth Buck; Radio Damascus, Syria 12.085 (Ar, Sp, Port to S.America 2215-0030), noted as "fair" by Robin Harvey; Voice of Israel, Jerusalem 11.605 (Eng to USA 0000-0030) - SIO 444 at 0000 by David Middlemiss; VOA via Colombo, Sri Lanka 11.705 (Eng to E.Asia 0100-0300) - 23433 at 0150 by Kenneth Reece.

Some of the broadcasts from distant places were logged in the **9MHz (31m)** band: Radio New Zealand, Wellington 9.850 (Eng to Australia, Papua New Guinea 0800-1105) - SIO 333 at 0900 by Simon Hamer; Radio Australia via Shepparton 9.655 (Eng to Europe 0700-1030) - 54333 at 0912 by Mark Selby; also via Shepparton 9.770 (Eng to S.E.Asia 1000-1100) - SIO 333 at 1025 by Alan Smith; Radio Pyongyang, N.Korea 9.977 (Eng to USA 1100-1200) - 24533 at 1120 by David Edwardson; FEBA Radio, Seychelles 9.590 (Eng to S.Asia 1500-1600) - 22332 at 1542 by David Wratten; Voice of Vietnam, Hanoi 9.840 (Eng to Europe 1600-1630) - 43533 at 1615 by John Nash; BBC via Kranji, Singapore 9.740 (Eng to S.Asia 1515-1830) - SIO 322 at 1630 by Philip Rambaut.

Radio Australia's **7MHz (41m)** broadcasts have been received here quite well during some days, but they were seldom mentioned in the latest reports! From 1200 their Shepparton station beams to S.E.Asia on 7.205 (Eng 1200-1430) and quite often their signal reaches the UK. Kenneth Reece logged it as 33333 at 1230. At 1430 their Carnarvon station takes over 7.205 for a broadcast to Europe and S.Asia (Eng 1430-2030) and in general the reception of this transmission is good, the 45544 rating noted by David Edwardson being fairly typical. From time to time their broadcast to C.Asia via Darwin on 7.120 (Chin 1030-1430) may also be heard here - Philip Rambaut logged it as SIO 222 at 1201.

Radio Australia also broadcasts to Europe in the **6MHz (49m)** band, but their transmission via Carnarvon on 6.035 (Eng 1530-2030) often suffers from adjacent and co-channel interference. Listening at 1830, Philip Rambaut noted it as SIO 322.

Station Addresses

BBC Radio Bristol, 3 Tyndalls Park Road, Bristol BS8 1PP.
ILR Southern Sound, Franklin Road, Portslade, Brighton BN4 2SS.
Radio France Int. Emisslons en Ondes Courtes, Boite Postale 9516, F-75786 Paris, France.
Broadcast Service of the Kingdom of Saudi Arabia. PO Box 570, Riyadh 1116, Suadi Arabia.
RTL Luxembourg, Villa Louvigny, Parc Municipal, Luxembourg-Ville, Luxembourg.
VOFC, International Service, 53 Sec. 3 Jen Al Road, Taipei, Taiwan, Rep. China.

INDEX TO ADVERTISERS

LW MARITIME RADIO BEACONS

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

Several listeners who have tried this aspect of our hobby for the first time have been disappointed to find that they can only receive the beacons which are relatively close to their location. No doubt the high level of electrical noise which exists in some areas can mask the more distant signals, but more often the heart of the problem lies in the receiving equipment.

Most receivers are relatively insensitive in this part of the spectrum, but that problem can be overcome by employing a good v.l.f. convertor ahead of the set - see page 51, November '89 *SWM*. However that is only half the answer, as even the best receiver cannot be expected to produce worthwhile results unless it is used in conjunction with a good antenna!

Some DXers favour a long length of wire, tuned to resonance with a suitable antenna tuning unit (a.t.u.), but others prefer a good loop antenna, since the inherent directional characteristics can be put to good use. The signal from a wanted beacon can be peaked up, or an unwanted one can be largely eliminated or "nulled out" by simply rotating the loop. The directivity can also be used to reduce the effects of local radio frequency interference (r.f.i.)

Disappointing results were noted by **Kenneth Buck** during his initial checks of the band in Edinburgh. He set about improving his home built t.r.f. receiver and then added a large loop antenna. His latest results are most encouraging - see chart. Much improved results have also been obtained by **Mark Thompson** in Wakefield. He converted his 1m square m.w. loop to the l.w. band by rewinding the main loop with 14 turns of 22 s.w.g. enamalled wire. A two turn coupling winding enables the loop to be connected to his JRC NRD 525 receiver via a short length of coaxial cable. By using a 900pF variable capacitor, the loop can be tuned from 130 and 313.5kHz.

It is perhaps also worth mentioning that the time of reception can also be important. Some of the more distant beacons noted in the chart can only be received via sky wave paths after dark, but reception during peak viewing hours may be marred by the r.f.i. produced by the line timebase in a nearby colour TV receiver. The line oscillator generates a saw-tooth waveform with a repetition frequency of 15.625kHz which contains copious harmonics, consequently multiples of 15.625kHz are radiated as r.f.i.

Several readers have informed me that they have been unable to identify a beacon which sends 'di-di-dah-di-dit, di-dah-dit' as its ident on 291.9kHz. This stems from a lighthouse on the north coast of France at Point de Ver. This beacon has the call letters ER, the E being accented.

Long Wave Martime Radiobeacon Chart

Freq kHz	Call	Station Name	Location	DXer
285.0	GY	Castle Breakwater	Channel Is	F*
287.3	BC	Bloscow Roscoff	N.France	F
287.3	CM	Cromer LH	Norfolk	F*,G*,H*
287.3	DG	Douglas Pier LH	I.O.M	B,G*
287.3	EC	St.Helier	Channel Is	D
287.3	FN	Walney Island	off Lancs	G*
287.3	GA	Outer Gabbard LV	off Suffolk	G,H*
287.3	GR	Goeree	Holland	F*,G*
287.3	LV	Dudgeon LV	off Norfolk	G*
287.3	PS	Point Lynas	Anglesey	B,G*
287.3	SK	Smith's Knoll LV	off Norfolk	G*,H*
289.6	D	Rota	Spain	F*
289.6	FD	Fidra LH	F. of Forth	B
289.6	LP	Loop Head	S.Ireland	F
289.6	TN	Thyboron LH	Denmark	B
291.9	CP	St.Catherines Pt	I.D.W	D*,E,G*
291.9	FG	Pointe de Barfleur	N.France	E,G*
291.9	KD	Kinnairds Head LH	Aberdeen	B,G*
291.9	NR	N.Ronaldsway LH	Orkney Is	B
291.9	DM	Stroma Pt LH	Caithness	B
291.9	RN	Reykjanes	Iceland	F
291.9	SB	Sumburgh Head	Shetland Is	B
291.9	TI	Cap d'Antifer	France	E,G*
294.2	AH	Altacarry Head LH	Antrim	B
294.2	DA	Pladda LH	Is of Arran	B
294.2	LG	Eilean-Glas LH	Is of Harris	E
294.2	MW	Mew Island LH	off Co.Down	B
294.2	OR	Digh Sgeir LH	off Is Rum	B
294.2	RN	Rinns of Islay	Is of Islay	B
296.5	HM	Hanstholm	Denmark	B
296.5	LA	Lista LH	S.Norway	B
296.5	NK	Inchkeith	F. of Forth	B
298.8	AD	Ameland	Holland	G*
298.8	BL	Butt of Lewis	Is of Lewis	B,G*
298.8	LK	Sule Skerry LH	off Orkney	G*
298.8	MF	Muckle Flugga LH	Shetland Is	G*
298.8	PE	Penlee Pt	UK	E
298.8	QS	Casquets LH	Channel Is	D,E
298.8	RD	Roches Douvres LH	Channel Is	E
298.8	SP	Start Point LH	S.Devon	E,G*
301.1	CN	Cregneish	I.D.M	C
301.1	GE	Skarvoy Egersund	Norway	B
301.1	HD	Hirsholm Main LH	Denmark	B
301.1	NF	North Foreland LH	E.Kent	C,D*,E,G*,H
301.1	PY	Point of Ayre LH	IOM	B
301.1	SR	Skerries LH	Anglesey	B
301.1	SU	South Rock LV	Co.Down	G*
301.1	TO	Isola del Tinto	Italy	F*
301.1	VS	Grosser Vogelsand	Germany	D
301.1	WK	Wicklow Head Light	Co.Wicklow	B,D*
303.4	FB	Flamborough Hd LH	E.Yorkshire	B
303.4	FP	Fife Ness Point	Fife	B
303.4	LT	Longstone LH	Berwick	B
303.4	SJ	Souter Light	Sunderland	A,B
305.7	CB	Corbiere	Jersey CI	E
305.7	CS	Calais Main LH	N.France	E,H
305.7	FS	Fall's LV	off Kent	D
308.0	BD	Barra Head LH	Is of Barra	B
308.0	GL	Eagle Island LH	W.Ireland	B
308.0	HE	Hestehoved	Denmark	G*
308.0	HK	Texel	Germany	G*
308.0	MZ	Mizen Head LH	S.Ireland	G*
308.0	RR	Round Island LH	Nr Cornwall	B,E,G*
308.0	TY	Tory Island LH	N.Ireland	B,G*
308.0	VL	Vlieland	Norway	G*
310.3	AL	Pointe d'Ailly LH	France	E,G*,H*
310.3	DU	Dungeness LH	S.Kent	C,D,E,G*,H*
310.3	GD	Girdle Ness	Aberdeen	B
310.3	PH	Cap d'Alprech	France	C,D,E,G*,H*
310.3	VI	Cabo Villano	Spain	G*
312.6	FN	Feistein	Norway	B
312.6	GU	Geltungane	Norway	B
312.6	KH	Kish Bank	E.Ireland	B,G*
312.6	MA	Marstein	Norway	B
312.6	NB	Nab Tower LH	off Sussex	D*,E
312.6	PT	Souter Pt	Durham	B
312.6	RB	Cherbourg	France	D*,E
312.6	UT	Utsira	Norway	B
312.6	VR	Utvaer	Norway	B
318.5	KL	Kolkasrags	USSR	F*
318.5	SY	Soerve	USSR	F*
319.0	LEC	Stavanger	Norway	B
414.0	FK	Frederikshavn Bkw	Denmark	F*

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

DXers:
A: Leo Barr, Sunderland.
B: Kenneth Buck, Edinburgh.
C: Andy Cadier, Folkestone.
D: John Coulter, Winchester.
E: Fred Pallant, Storrington.
F: Tim Shirley, Bristol.
G: Mark Thompson, Wakefield.
H: David Wratten, Cambridge.

Equipment Used

Ted Agombar: Grundig Yacht Boy 700 + 20m random wire.
Leo Barr: Matsui MR4099 + internal antenna.
Tony Batchelor: Sony ICF 2001D + Maplin ATU + 30m random wire.
Darren Beasley: Steepletone MBR7 + 20m random wire.
Kenneth Buck: Home-built superhet + random wire or t.r.f. receiver.
Andy Cadier: Saisho SW500 + Datong active antenna.
Derek Carter: Matsui MR4099 + random wire.
Jim Cash: Sony ICF 2001D + AN-1 active antenna.
John Coulter: Yaesu FRG-7 + random wire.
Peter Easton: Kenwood R5000 + ERA BP34 audio filter + random wire.
David Edwardson: Trio R600 + trap dipole 22m long.
Alf Gray: Codar Mk 2 + Pre-selector + Ex-Army Rod antenna + a.t.u.
Simon Hamer: Lafayette + Sooper Loop or Grundig S1400 + a.t.u. + 22m wire.
Robin Harvey: Matsui MR 4099 portable.
Paul Hawkins: Trio R1000 + Howes active dipole.
Sheila Hughes: Panasonic DR48 + 15m wire; Vega 208; Sony ICF-7600D + loop.
Rhoderick Illman: Sony ICF-7600DS + 15m random wire.
Eddie McKeown: Tatung TMR 7602 portable.
David Middlemiss: Yaesu FRG-7 + random wire.
George Millmore: Tatung TMR 7602 portable or Racal RA17L + random wire.
John Nash: Kenwood R5000 + random wire.
Ike Odoom: Philips D2935 portable.
Fred Pallant: Trio R2000 + random wire in loft.
Roy Patrick: Lowe HF 125 + 20m wire.
Ron Pearce: Hitachi KH 2400 ten band portable.
Philip Rambaut: Int.Marine Radio R.700M + random wire.
Kenneth Reece: Icom R9000 or Kenwood R5000 + delta loop.
Alan Roberts: Panasonic RF B40 portable + whip.
John Sadler: Accadamy 202 portable + built-in whip.
Mark Selby: Realistic DX440 + ATU + 60m random wire or Panasonic RFB-40.
Tim Shirley: Trio R600 + random wire.
Chris Shorten: Matsui MR 4099 portable + 10m sloping wire.
Alan Smith: Matsui MR4099 + Hexagon Spiral Loop.
Cliff Stapleton: Trio R1000 + 30 random wire or 19m dipole in loft.
Darran Taplin: Eddystone 680X + Global ATU + 25m dipole.
D.Taskis: Sony ICF 2001D + built-in whip or AN-1 active antenna.
Mark Thompson: JRC NRD525 + 1m loop or 20m random wire.
Phil Townsend: Lowe SRX-30 + ATU + random wire.
Ted Walden-Vincent: Grundig Satellit 1400SL + random wire.
Ken Whayman: Realistic DX-440.
Julian Wood: Trio R2000 + random wire.
David Wratten: Philips D2999 + loop or Trio R2000 + ATU + 30m random wire.
Carl Yates: Realistic DX-440 + 15m random wire.

STARTING OUT

☞30

With careful design, an audio amplifier will faithfully reproduce any input signal within a specified band of frequencies, e.g. 20Hz - 20kHz. Slight variations in level may exist between these limits and they are usually specified in dB relative to the mean level. In contrast an r.f. amplifier may only respond to a narrow band of frequencies, since the associated tuned circuits have a maximum response at their resonant frequency - see pages 37, 38 *SWM* October '89. The bandwidth is usually defined as the points where the signal voltage has fallen to 0.707 of the maximum. The points where the signal voltage is halved (-6dB) and where it is one thousanth of maximum (-60dB), provide a good indication of the shape of the response.

Special terms are sometimes used to indicate that a reference is involved, for example the term dBV is the level compared with 1 Volt and dBμV is the level compared with 1 microvolt. The terms are directly related and a few calculations should enable you to establish that 1μV = 0dBμV = -120dBV and that 1V = 0dBV = 120dBμV. These terms are often used in service manuals to indicate the level of test signal that should be applied to a particular part of a circuit during alignment or other checks, so as to ensure that the performance of the equipment will meet the specification.

Appendix

The human ear is a very sensitive device which can detect very small movements of the air molecules.

A young healthy ear may be able to perceive compressions and rarefactions of the air at frequencies in the range 20Hz to 20kHz, however with increasing age the upper limit tends to fall and it may be below 10kHz by the time the person is 50 or 60.

The ear is most sensitive to sounds between 1 and 4kHz. At higher and lower frequencies there is a considerable reduction in the sensitivity.

The difference in intensity between the loudest bearable sound and that which is only just perceptible is very great, the ratio being about 10 million, million to one!

The sound pressure produced by a loudspeaker or an earphone is proportional to the power applied to it. If the power is doubled or halved (3dB), the change can be easily detected, however, smaller changes may be less obvious. Although a sudden change of 2dB may be just detectable, a change of 1dB will not be discernable. ☐

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VISA

1/4

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