FOR THE RADIO LISTENER

shortwave magazine

April 1992 £1.75 ISSN 0037 - 4261

DATA MODES ISSUE

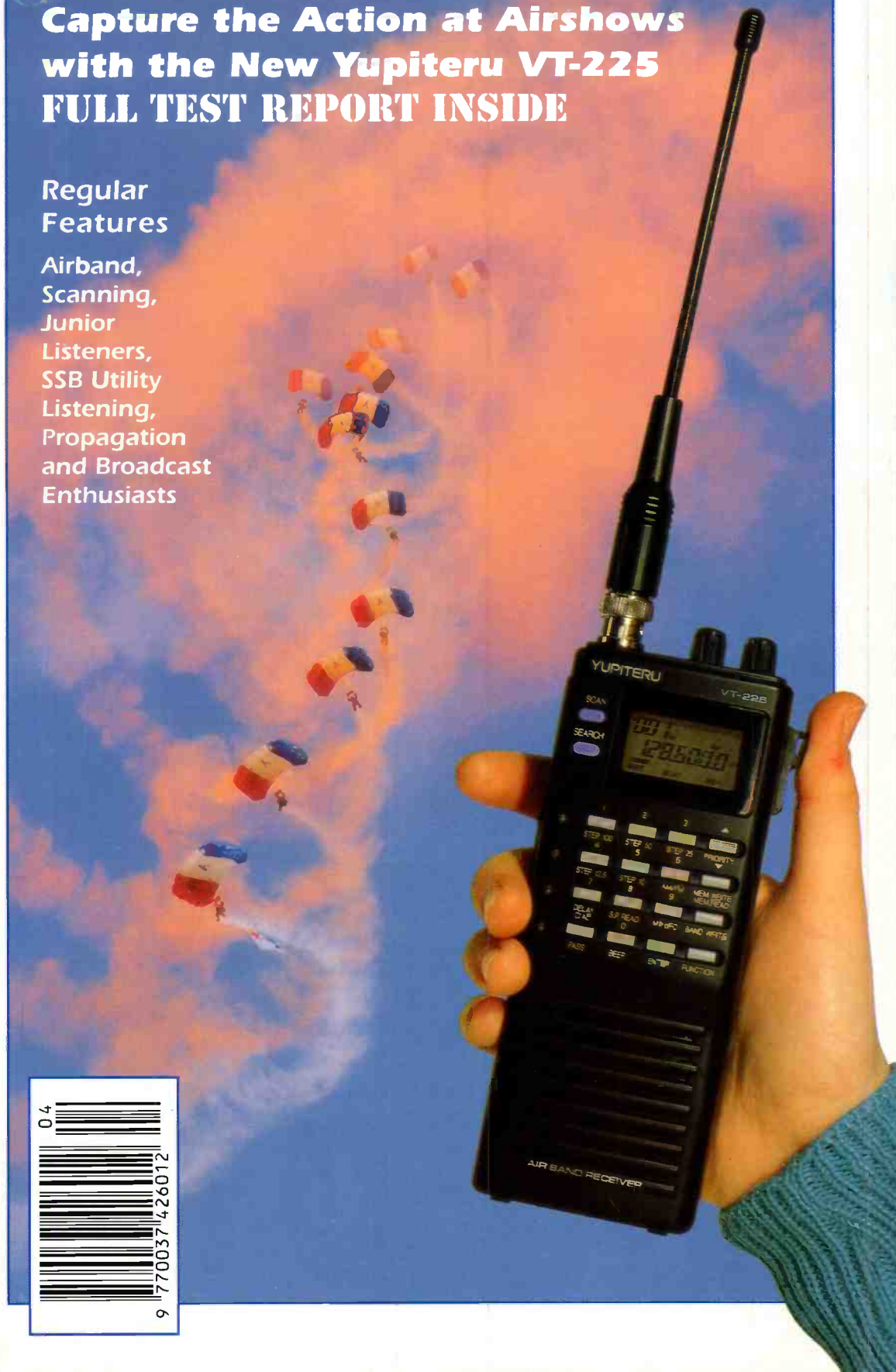
Typhoon Watching - Guam
Starting in Data Mode
More Advanced RTTY
Dewsbury DM-1000 Reviewed

Capture the Action at Airshows with the New Yupiteru VT-225

FULL TEST REPORT INSIDE

Regular Features

Airband, Scanning, Junior Listeners, SSB Utility Listening, Propagation and Broadcast Enthusiasts



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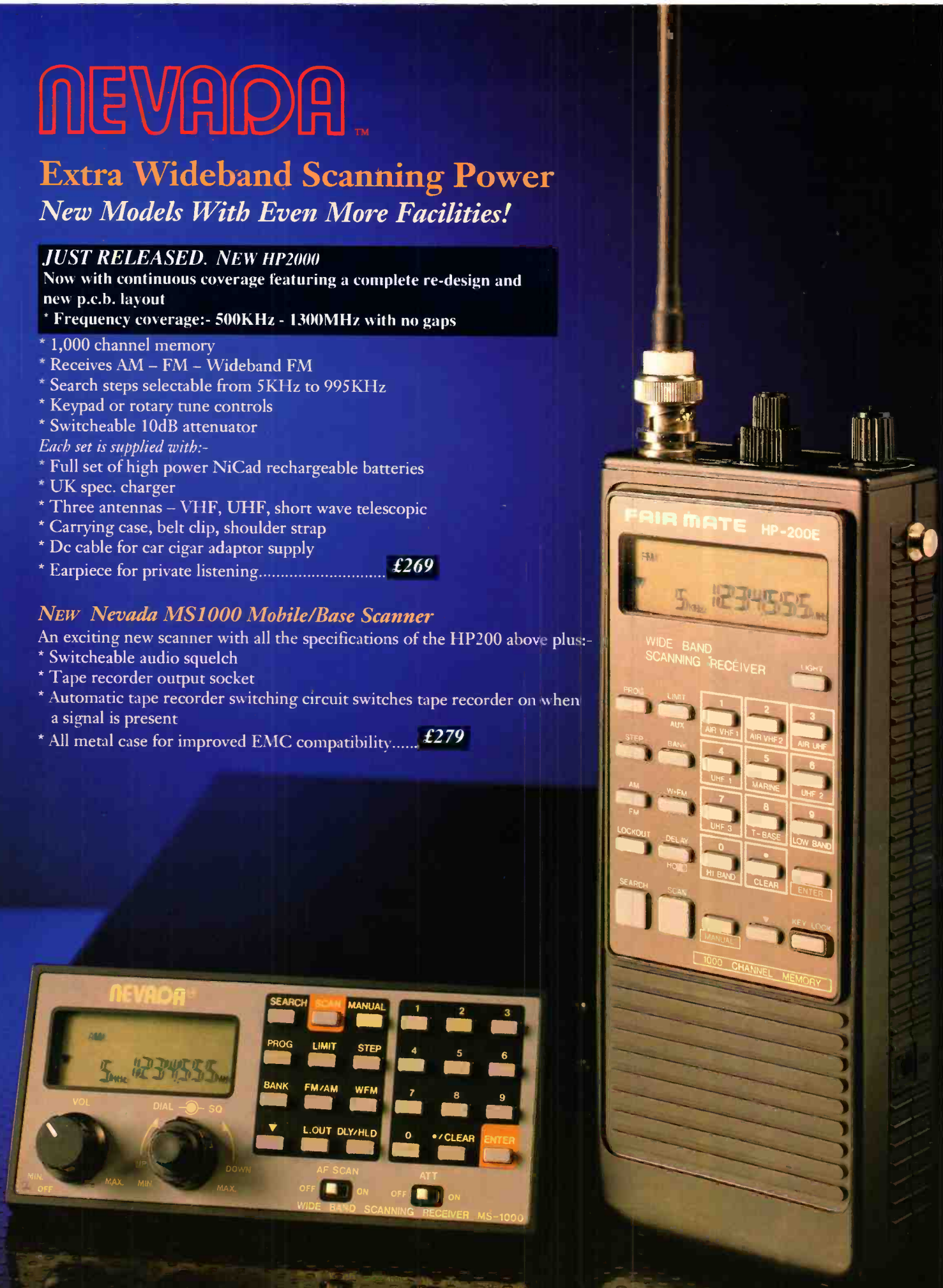

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short wave magazine

VOL. 50 ISSUE 4 APRIL 1992
ON SALE MARCH 26

(Next Issue on sale APRIL 23)

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 Short Wave Magazine is published monthly for $45 per year by PW Publishing Ltd., Enefco House, The Quay, Poole Dorset BH15 1PP. Second class postage paid at Middlesex, NJ. Postmaster: send address changes to C & C Mailers International, 40 Foxhall, Middlesex, NJ 08846.

contents

REGULARS

Cover:

The Yupiteru VT 225 is the subject of the *SWM* Test Report on page 34, where Chris Yates reveals all about this great little hand-held.
The cover shot shows the advantages of listening to the airband channels, hear those parachutists as they prepare to jump!

...GOOD LISTENING

editorial

The Airband Special Feature in the February issue went down particularly well, as you can see from some of the letters published this month.

For the rest of the year, we have several very interesting specials lined up for you. Next month we will home in on the religious broadcasters - those very popular short wave broadcast stations around the world listened to by many of our readers.

Novice Licence Review

The first year of the newly introduced Novice Licence will be the subject of a review by the Radiocommunications Agency. They would like as much input as possible from any readers, including instructors, who have had experience of the Novice Licence, Test or courses.

As at the end of January some 272 Novice Licences had been issued, mostly Class B. It is interesting to note, though, that a further 487 had passed the Test, but had not yet applied for a licence! I wonder why?

If you have any comments to make, then the Secretary of the Novice Licence Review Group, Room 613, Waterloo Bridge House, London, SE1 8UA, would like to hear from you.

Reaction

I know from your comments that you enjoyed the constructional articles that have appeared in SWM. Well, next month, all being well, I plan to start a series of articles detailing the construction of a novel receiver with reaction designed by well-known author, Ian Hickman.

This project will cover the 3.5MHz (80m) amateur band and should give constructors a great deal of pleasure as they listen to amateur single sideband and Morse transmissions on a receiver of their own creation.

SWM SERVICES

Subscriptions

Subscriptions are available at £21 per annum to UK addresses £23 in Europe and £25 overseas. Subscription copies are despatched by Accelerated Surface Post outside Europe. Airmail rates for overseas subscriptions can be quoted on request. Joint subscriptions to both *Short Wave Magazine* and *Practical Wireless* are available at £34 (UK) £37 (Europe) and £39 (rest of world).

Components for SWM Projects

In general all components used in constructing *SWM* projects are available from a variety of component suppliers. Where special, or difficult to obtain, components are specified, a supplier will be quoted in the article.

The printed circuit boards for *SWM* projects are available from the *SWM* PCB Service.

Back Numbers and Binders

Limited stocks of most issues of *SWM* for the past five years are available at £1.80 each including P&P to addresses at home and overseas (by surface mail).

Binders, each taking one volume of the new style *SWM*, are available price £5.50 plus £1 P&P for one binder, £2 P&P for two or more, UK or overseas. Please state the year and volume number for which the binder is required. Prices include VAT where appropriate.

Orders for p.c.b.s, back numbers, binders and items from our Book Service should be sent to **PW Publishing Ltd., FREEPOST, Post Sales Department, Enefco House, The Quay, Poole, Dorset BH15 1PP**, with details of your credit card or a cheque or postal order payable to PW Publishing Ltd. Cheques with overseas orders must be drawn on a London Clearing Bank and in sterling.

Credit card orders (Access, Mastercard, Eurocard or Visa) are also welcome by telephone to Poole (0202) 665524. An answering machine will accept your order out of office hours.

letters

Dear Sir

First may I thank you for such an enjoyable and informative publication.

I read with interest your novel feature regarding the construction of a short wave crystal set in the December issue.

Although I was unable to enter the competition as I had no time to make one until the Christmas holidays, I did indeed find the results quite staggering, with the reception of stations from all over the world obtained within the first few hours.

This simple project can help greatly with the understanding of radio; I spent some time finding the best coil arrangement, capacitor and diode. However, it also raised questions with regard to the more complex theory of radio, one example being the properties of inductors and tuning capacitor in the tuned circuit relating to the *Q* obtained. I found a great improvement using the toroidal coil over an alternative coil wound on a ferrite rod.

Perhaps *SWM* could cover these subjects in more depth in future issues.

The equipment I normally use is a Sony ICF-7600DS radio, a T and a pi a.t.u. with random wire antennas in the loft, Howes and Maplin audio filters, v.h.f. dipole in the loft, 15in and hexagonal loop m.w./l.w. antennas and an ERA Microreader MkII.

M. Smith
Warwickshire

Dear Sir

Following the two recent articles in *SWM* on the subject of non-directional beacons and aero Radiobeacons in February, I have become interested in this aspect of DXing.

I have found that I can indeed receive a substantial number of these stations and many of them have been logged in my s.w.l. logbook.

However, I have also found that I am able, with my receiving station, to DX these beacons well into Europe, but alas have no way of identifying a large number of them. Can any reader inform me as to where I can purchase a publications that will enable me to do this?

My thanks to Ben Nock, Percy Tannac and Colin Frowen (as well as *SWM*) for their articles on a very interesting aspect of the short wave hobby.

Leighton Smart GW0LBI/ GW20049
Trelewis

letters

Dear Sir
I feel I must congratulate, through your pages, the staff of the Tatung UK Service Division and C.M. Howes Communications.

A few months ago, the whip antenna on my Tatung TMR7602 (an excellent receiver) broke. Despite searches through various catalogues and a visit to my dealer I could not obtain another antenna the same length. Luckily in a TV servicing book I noticed the address of the Tatung UK service division and although it stated 'trade only' I though I would write. Imagine my surprise when I received a quotation within three days of me posting my enquiry. I sent off a cheque straight away and received my antenna after another three days. A truly fantastic service considering I am not 'trade'.

I must also congratulate the staff of C.M. Howes Communications. I posted an order to them for an antenna kit and was really pleased to receive my goods within five days. I understand large companies can meet speedy delivery times, but speedy dispatch like this from a small company and a service department (and the Post Office), in my view, certainly deserves congratulation.
A Hammond, Stroud

Dear Sir
The letter from John L Alton regarding his early experiences in the Royal Air Force was interesting, but as my memory serves me, being a wartime wireless operator mechanic, seems to contain errors.

The TR9, as I recall, was a fairly short range high frequency telephony transceiver, using 2V valves with an enclosed h.t. battery and a 2V rechargeable acid cell. It was crystal controlled and I am not sure how many channels it had. I know it could be operated on the 'darkie' or emergency frequency of 6.44MHz. There was certainly no box of coils associated with it.

A neat case of coils was, however, used in the 1082 receiver, used with the associated 1083 transmitter. This was the c.w. fore-runner before the 1154/1155 was introduced. The 1082 was a straight set 2 x r.f. - detector and 2 a.f. (five valves) with volume and reaction and 2 plug in coils with two tuning controls. I believe the aerial coils were coloured green and the anode coils red. The case contained the necessary green and red coils to cover the ranges covered by the set.

The 1083 transmitter consisted on two quite large valves (master oscillator and power amplifier) with associated coils. The heaters were driven by the main aircraft supply, h.t. was provided by a motor generator giving 1000V. A trailing antenna was used on one of the ranges.
R J Speed G3XPV
Shenfield

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.The views expressed in letters published in this magazine are not necessarily those of *Short Wave Magazine*.

Dear Sir
I am afraid that Mr J Alton in his letter in the February 1992 issue of *SWM*, is at fault with his equipment terminology. The TR9 was a self-contained remote controlled h.f. receiver transmitter, which was used mainly in fighter aircraft. It was replaced, first by the TR1133 and then by the TR1143, both of them four channel, crystal controlled v.h.f. sets.

The set Mr Alton refers to, was the R1082/T1083, which was the main h.f. rig for long distance communications in aircraft in the early days of WWII. The R1082 was a straight set, a 2V3 in the old definition, it had two r.f. stages, one untuned, a detector, two a.f. stages and an output stage. It had its own power supplies, a 2V accumulator for the filaments, a 9V grid bias battery, tapped every 1.5V and a 120V h.t. battery tapped at 90 and 60V.

The plug-in coils were for the r.f. and detector stages, they were colour-coded so that they could not be inserted incorrectly into the front of the set, this would have been quite easy to do in the cramped, noisy and dim conditions of a bomber aircraft, especially in a Hampden, which had a very narrow fuselage, if they had not been colour coded. Those readers who have come across the later T1154 transmitter with its red, blue and yellow tuning knobs, will understand this.

The companion transmitter was the T1083. This was a two-valve MO/PA also with plug-in coil sets, though much bigger than the receiver coil sets. The h.t. for this set came from a dynamotor that gave out 1300V, if my memory is correct.

This set-up lasted until the well-known R1155/T1154 came into general use. Intercommunications between the crew was handled by a separate two-valve a.f. amplifier, the A1134, also with its own power supplies.

I, myself, was a ground wireless operator mechanic, who spent all my time with fighter aircraft, although our training covered all equipment in use, even the ground station equipment.
J P Olway, Paignton

Dear Sir
I bought the February '92 issue to use with GB2SCB, a Scout Communicators Badge course. The item on airband beacons was of interest, so on January 27 (cold & foggy here) I had a listen using an FT-767GX with a 14MHz dipole at 30ft. I also used the audio peak filter and the narrow band c.w. filter to sort out some signals. Please thank Ben Nock.

Freq	Call	Time	Comment
301.20	CN	1350	Weak
301.20	SU	1351	Weak
310.50	PS	1356	Weak
311.77	KH	1358	Weak
316.97	OE	1401	Weak, Heathrow
317.53	VS	1406	Weak
318.90	LEC	1407	S2
322.71	WPL	1414	Weak
322.71	SBL	1414	Weak, on same freq as above
325.50	BAE	1415	Weak
335.40	WCO	1419	Weak
340.00	HAW	1420	S4, Hawarden
343.70	OLD	1422	S2
347.20	GX	1426	Very Weak
349.20	LPL	1427	S7, Liverpool
374.00	RNR	1433	Very Weak, Radnor
379.40	WFD	1438	Very Weak
387.50	MCR	1439	S5, Manchester
395.70	NE	1443	Weak, Heathrow
407.20	GAR	1446	Very Weak, Dublin

I have no idea of the location of most of these beacons, but had a fine hour making the list.

One other comment is about the Hawarden beacon. Its letter 'W' has almost no space between the first and second dash making it difficult to resolve, so how a non-Morse pilot reads it I don't know!.

Thanks for a nice mag. I always buy it when I am going to do a lot of listening. It's the best listeners' magazine.
Albert Heyes, Warrington

grassroots

rallies

* Short Wave Magazine & Practical Wireless in attendance *

April 5: The 6th Launceston Amateur Radio Rally will be held at Launceston College. Doors open 10.30am. **Maggie. Tel: (040921) 219.**

April 12: The Cambridgeshire Repeater Group are holding their annual rally at the Philips Communications Systems Catering Centre, St Andrews Road, Chesterton, Cambridge. Doors open at 10.30am. **Mike G6COQ. Tel: (0223) 440373.**

April 19: The Centre of England Easter Sunday Radio & Electronics Rally will be held at the National Motorcycle Museum, Bickenhill, near the NEC off the M42 at Junction 6. Doors open 10.30am (10am for disabled) and admission is £1 (concessions for RAIBC members and Senior citizens). Over 60 traders in three large halls, ample free parking, bring & Buy, talk-in on S22, bar & restaurant. **Frank Martin G4UMF. Tel: (0952) 598173.**

April 26: Bury Radio Society will be holding Hamfeast '92 at the Castle Leisure Centre, Bolton Street, Bury. **L.H. Jones, Mosses Community Centre, Cecil Street, Bury.**

May 3: The National Vintage Communications Fair will be held at the NEC. It's a one-day event for specialist collectors and others interested in buying and selling vintage radios, telephones, televisions, jukeboxes, gramophones, records and other related mechanical-music items, ancient or modern.

May 4: Dartmoor RC Rally will be held at St Paul's Church Hall, Yelverton. Doors open at 10.30am. Free parking, usual traders, refreshments, Bring & Buy. **George Spray. Tel: (0822) 853885.**

May 10: The 8th Yeovil QRP Convention will be held at the Preston Centre, Monks Dale, Yeovil. Doors open at 9am with admission £1.50 including a lucky draw programme. 10.15am - Chordal Hop to VK, 11.30am - An 80m Construction Project, 2pm - HF Antennas to Match Your Garden, 3.15am - Watch the Birdies. The convention closes at 5pm.

May 17: The annual Parkanaur Amateur Radio Rally will be held in the Silverwood Hotel, Lurgan, Co. Armagh. The rally will be open from 12 noon. Proceeds from the rally go to the Stanley Eakins Memorial Fund. **Jim Lappin. Tel: (0762) 851179.**

May 24: The 16th Annual East Suffolk Wireless Revival will be held at the Maidenhall Sports Centre, Maidenhall Approach, Ipswich. Doors open at 10am. There will be a massive Bring & Buy, car boot sale, antenna measurements and all the usual traders. **Syd Mason. Tel: (0473) 748515.**

***May 30/31**: RSGB National Rally at NEC Birmingham. This is the RSGB's 'big one'. More details when we get them!

Acton, Brentford & Chiswick RC: 3rd Tuesdays, 7.30pm. April 21 - Problems Relating to Remote Control of Small Loop Antennas, discussion led by G3OJX. Paul Truitt G4WQO. 071-938 2561.

Aylesbury Vale RS: Wednesdays. The Village Hall, Hardwick. April 1 - Aspects of VHF Antennas by G3MEH, 15th - Linear Amplifiers by G3RZP. Martin G4XZJ. (0296) 81097.

Barnsley & DARC: Mondays, 7.15pm. Darton Hotel, Station Road, Darton, Barnsley. April 6 - Talk by Radiocommunictions Agency, 13th - Theatre Lighting by G8SVX, 27th - Getting Started on Satellites by G4JJ. Ernie G4LUE. (0226) 716339.

Bromley & DARS: 3rd Tuesdays, 7.30pm. The Victory Social Club, Kechill Gardens, Hayes. April 21 - Antenna Matching Units by A.R. Bartle. Geoffrey Milne. 081-462 2689.

Chelmsford ARS: 1st Tuesdays, 7.30pm. Marconi College, Arbour Lane, Chelmsford. April 7 - RTTY/AMTOR Systems by G3EDM. Roy Martyr. Chelmsford 353221 ext 3815.

Conwy Valley RC: 1st Thursdays, 7.15pm. The Studio, Penrhos Road, Colwyn Bay, Clwyd. April 2 - Visit by Dragon ARC, 'Return Debate'. Merfyn Jones GW4NNL, 72b Princes Drive, Colwyn Bay, Clwyd. (0492) 530725.

Derby & DARS. Wednesdays, 7.30pm. 119 Green Lane, Derby. April 1 - Foolish Junk Sale, 8th - AMTOR, What it is & How it Works by G3XOF, 15th - Radar, the Early Years by G0KIU, 22nd - Video Show, 29th - Cheese & Wine Party. Richard Buckby. Ambergate 852475.

Dronfield & DARC: 1st & 4th Mondays, 7.30pm. Room 3, Gladys Buxton School, Oakhill Road, Dronfield. Other Mondays, socials at the Fleur-de-Lys, Main Road, Unstone. April 6 - Quarterly Club Committee Meeting, 20th - No Meeting. Piers Oldham. Tel: (0246) 290444.

Edgware & DRS: Watling Community Centre, 145 Orange Hill Road, Burnt Oak. April 9 - AMTOR & SSTV by G0FAB, 23rd - Informal. Hank Kay G0FAB. (081-205 1023).

Grafton RS: 2nd & 4th Wednesdays, 8pm. Holy Trinity Club Hall, at the rear of Holy Trinity Church, Granville Road, London N4. Rod G0JUZ. 081-368 8154.

Hastings E&RC: 3rd Wednesdays, 7.45pm. West Hill Community Centre, Croft Road, Hastings. Fridays, 8.30pm. Ashdown Farm Community, Downey Close, Hastings. April 15 - Junk Sale. Reg Kemp. 7 Forewood Rise, Crowhurst.

Hoddesdon RC: 1st & 3rd Thursdays, 8pm. Conservative Club (side entrance), Rye Road, Hoddesdon. April 2 - Social Evening, 19th - Mark Francis of Waters & Stanton. Roy G4UNL. 081-804 5643.

Horndean & DARC: 1st Thursdays, 7.30pm. Horndean Community School, Barton Cross, Horndean. April 2 - Brains Trust. S.W. Swain. (0705) 472846).

Lincoln SWC: Wednesdays, 8pm. City Engineers Club, Waterside South, Lincoln. April 1 & 29 - Activity Night, 15th - Amateur TV Demo by G7AVU, 22nd - Meteor Scatter by G4OLG. Patrick G0OSO, QTHR.

Manchester & DARS: Tuesdays, 7pm. Simpson Memorial Community Association, Moston Lane, Manchester M10 9NB. Roger G0KTR, QTHR.

Mansfield ARS: 1st Thursdays, 8pm. The Polish Catholic Club, off Windmill Lane, Woodhouse Road, Mansfield. April 2 - Satellite Communications by G4CUO and judging of home construction projects. Mary G0NZA. (0623) 755288.

Midland ARS: 3rd Tuesdays, 7.30pm. Headquarters Unit 22, 60 Regent Place, Birmingham B1 3NJ. April 21 - RSGB Talk, 24th - Atari Night, 27th - Computer Night. John Crane G0LAI. 021-628 7632 (evenings).

Norfolk ARC: Wednesdays, 7.30pm. The Norfolk Dumpling, The Livestock Market, Harford, Norfolk. April 1 - AGM, 8th - Radar by an Officer from RAF Neatishead, 15th - Informal & Committee Meeting, 22nd - Construction Contest, 29th - First HF NFD Briefing. Jack Simpson G3NJQ. (0603) 747992.

North Ferriby United ARS: Fridays, 8pm. North Ferriby United Football Social Club, Church Road, North Ferriby. April 3 - Discussion with G4VKK, 17th - Club Station on the Air, 24th - Packet Nodes by G6KIA. Frank Lee. (0482) 650410.

ARC of Nottingham: Thursdays, 7.30pm. Sherwood Community Centre, Mansfield Road, Nottingham. April 2 - AGM, 9th - Forum, 16th - Operators Guide to 144MHz by G7DII, 23rd - WAB Activity & Construction Evening, 30th - Electromagnetic Compatibility by G8SOZ. Rex Beastall. (0602) 733740.

Poole RAS: 2nd & last Fridays, 7.30pm. Lady Russell Coates House, rear of Jelico Theatre, Poole College of Further Education, Constitution Hill Road, Poole, Dorset. April 10 - AGM. V. Cotton. (0202) 760231.

RSGB City of Bristol Group: last Mondays, 7pm. The Small Lecture Theatre, Queens Building, University of Bristol, University Walk, Bristol. April 27 - RSGB Morse Testing System by G3ZJH. Dave Coxon G0GHM. (0275) 855123.

Salop ARS: Thursdays, 8pm. Old Buck's Head, Shrewsbury. Glenda G1YJB. (0939) 232090.

Saltash & DARC: 1st & 3rd Fridays, 7.30pm. TOC H Hall, Burraton, Saltash. B. Giles. (0752) 844321.

Sevenoaks & DARS: Sevenoaks DC, Council Offices, Argyle Road, Sevenoaks. April 27 - Direction Finding with the Dartford DF Club.

South Bristol ARC: Wednesdays. Whitchurch Folkhouse Assoc, Bridge Farm House, East Dundry Rd, Whitchurch. April 1 - CW Night, 8th - Visit to HTV Studios, 22nd - Weather Forecasting, How it Works by G0AWX, 29th - Mystery Subject by G3OUK. Len Baker. Whitchurch 832222.

Southgate ARC: 2nd & 4th Thursdays. Winchmore Hill Cricket Club Pavilion, Firs Lane, Winchmore Hill, London N21. April 9 - Grand Surplus Equipment Sale, 23rd - Club Construction Project. Brian Shelton G0MEE. 081-360 2453.

South Notts ARC: Fridays, 7pm. Highbank Community Centre or Fairham Community College, Farnborough Road, Clifton Estate, Nottingham. April 3 - Open Forum, 10th - Construction at Fairham College, 17th - Organising Contests by G4LPD, 24th - On the Air Night. Ray G7ENK. (0602) 841940.

Stockport RS: 2nd & 4th Wednesdays, 7.45pm. Room 14, Dialstone Centre, Lisburne Lane, Offerton, Stockport. April 8 - Test Equipment & Usage by G3NUQ, 22nd - Talk by Captain Thompson, Ex-*Queen Mary* Captain. John Verity G4ECI. 061-439 3831.

Stratford upon Avon & DARS: 7.30pm. The Home Guard Club, Main Road, Tiddington, Stratford-upon-Avon. April 13 - AGM & Surplus Sale, 27th - What's on 80m by G4PDP. A. Beasley G0CXJ. 060-882 495.

Three Counties RC: Alternate Wednesdays, 7.30pm. The Railway Hotel, Liphook, Hants. April 8 - Long Distance Microwaves by G8KQW, 22nd - AGM. Dave G4VKC.

Torbay ARS: Fridays, 7.30pm. ECC Social Club, Highweek, Newton Abbot. April 24 - Talk by SWEB. Walt G3HTX. (0803) 526762.

West of Scotland ARS: Fridays, 8pm. Scout Shop, 21 Elmbank Street, Glasgow. April 10 - Electronic Developments in WX Predicting by GM4JYZ, 24th - WWII Radio Networks & Clandestine Operating by GM3EXX. K. Fox. Jack Hood. (0698) 350926.

Wimbledon & DARS: 2nd & last Fridays, 7.30pm. St Andrews Church Hall, Herbert Road, SW19. April 10 - General Activity Evening, 24th - Oscillators by G3DWW. Chris Frost. 081-397 0427.

Wirral ARS: 1st & 3rd Wednesdays, 7.45pm. Ivy Farm, Arrowe Park Road, Birkenhead, Wirral.

York ARS: Fridays, 7.30pm. York City Social Club, Bootham Crescent, York. K.R. Cass G3WVO. 4 Heworth Village, York.

Club Secretaries:
Send all details of your club's up-and-coming events to;
'Grassroots',
Lorna Mower
Short Wave Magazine, Enefco House,
The Quay, Poole, Dorset BH15 1PP

junior listener

Readers' Letters

David Conway (Swanscombe) has a station he's trying to identify. It's on the air around 7.15MHz, but as he doesn't have a digital radio that can only be regarded as approximate.

On October 28, he started receiving it at 0925, when it was playing *Baby Love* by Danii Minogue. The announcer spoke in a foreign language - not David's strong point - but he did pick out the words 'Bad Company'. Yes David, they are (or were) a pop group, but somewhat before your time! The music this station plays is only pop music and as that's David's preference, he'd like to know more about the station.

Well David, the number of stations this could be is huge, there are at least 9 stations listed for 7.15MHz alone in the 1992 *WRTH!* Even stations like the BBC, Radio Australia and Radio Canada International can't be ruled out as they may be transmitting one of their many foreign language programmes. Let's see if anyone out there can help from their own log book.

Chasing Awards

The Scarborough Amateur Radio Society are celebrating their 60th anniversary. To commemorate the occasion, they have a Diamond Jubilee Award available. Like many groups offering awards, they are not only open to the licensed amateur, but can be claimed by listeners on a 'heard basis'. This means you have to log both side of a contact, noting both callsigns, both SINPO codes as well as the date, time and frequency. You should also make any comments that will help the Award Manager check out your log.

Many Awards are very attractive and can make a change from QSL card chasing. There is often details of all kinds of awards on the 'News' pages in *SWM*, these are usually open to listeners.

The Scarborough ARS Award is open for contacts between 1 January and 31 December 1992, so you've lots of time to get logging.

You must hear one contact with the Society's Headquarters Station, G4BP, and five contacts with members of Scarborough ARS. The contact between the two stations in each case can be on any mode and any band, but not via repeaters.

If you would like a list of Scarborough ARS members, then send an s.a.e. to the Awards Manager.

An extract from your log is good enough, as the Awards Manager will verify all claims. The Award will cost you £2.00 for your certificate. Once you've heard the right number of stations, send your log (and £2) to: The Awards Manager, G4BP, c/o 10 Lowdale Avenue, Scarborough YO12 6JW.

Don't forget to let me know how you get on.

Museum Artifact

Here's one of those gems of information you can astound your friends with should you go on a school trip to the Science Museum or the British Library in London.

The British Library has a new item in its collections - a recording taken from a gramophone cylinder that belongs to the Science Museum. It was originally recorded 103 years ago! Now recently recovered, it may be the only surviving recording of Queen Victoria - well before any of your time (mine too!).

The National Sound Archive was initially called in because the technology to play the cylinder has disappeared. Using a modern electric phonograph and a variety of filtering techniques, including a new Computer Enhanced Digital Audio Restoration (CEDAR) technique they managed to play it.

The cylinder has three bands recorded on it. One has the shadow of a woman's voice, but no words can be made out. Another has a man's voice and some whistling. The final band has a woman's voice, and through a lot of noise the words, "Greetings...the answer must be...I have never forgotten" can be heard. Now, Morse is known to have gone to Balmoral to show the Queen the newly invented Graphophone cylinder recording system.

The cylinder itself, together with the electric phonograph and a model of the Graphophone, are on display at the Science Museum. It was donated in 1929 by Sydney Morse's son.Is this how the next few generations will be regarding our favourite CDs? If you're interested, this recording can be heard (free) at the British Library National Sound Archive, 29 Exhibition Road, London SW17. It's open Monday to Friday 10am to 5pm (9pm Thursdays).

Clubs to Join

A few months ago I mentioned the British DX Club and the Radio Prague Monitor Club. I now have some details of another two clubs, both especially interesting for the beginner or younger listener.

BRT - Belgische Radio en Televisie - have an International Listeners' Club. You need to send for an application (ask for a schedule too) and then send them two reception reports per month giving details on one or more of their four foreign language programmes. You then receive a club membership card, their magazine *Club Echo* and their QSL cards. Nothing could be simpler.

The address for the application and a schedule (so you know when and where to listen) can be obtained from: BRT, PO Box 26, 1000 Brussels, Belgium.

The next club is the World DX Club. It was founded in 1968 and has about 450 members, mostly in the UK. For your membership, you get a 36-page, A4 magazine that covers broadcast stations listening, medium wave, short wave and f.m., QSLing and programme listening.

The magazine is mailed out just 10 days after the deadline, so the information is up-to-date. The subscription rate is £10 for 12 issues of the magazine sent first class post or 13 issues send second class.

If you're interested, send your subscription to: 17 Motspur Drive, Northampton NN2 6LY, unless you live the the USA, when you should send to: Richard D'Angelo, 2216 Burkey Drive, Wyomissing, PA 19610, USA.

I must admit, the bumper magazine I read kept me interested all the way through. I was especially envious of the short wave logbook - if only mine looked as good.

Jon Jones
PO Box 59
Fishponds
Bristol BS16 4LH

Did You Know

Deutsche Welle tops the list of all foreign broadcasting services in Tanzania. This is the result of a recent audience research survey by the University in Dar-es-Salaam.

It shows that 3.5 million Tanzanians representing 16% of the population listen regularly to DW - followed by the BBC World Service with 9%. The technical signal quality of DW was rated as 'clear' by 89% of those questioned.

You may be able to hear DW in English if you listen to their West Africa broadcasts at 0600-0650, 1100-1150 and 1900-1950UTC. Frequencies to try are: (11.78, 13.79 & 15.205MHz), (15.41, 17.8 and 21.6MHz) and (11.785, 13.78, 15.35 and 17.81MHz) respectively. These frequencies and times apply after March 29.

If you'd like to try out your German talents, then you can listen at almost any time of day, as there is a programme being beamed to Europe. The best way to find out when and where to listen is to ask the station for a schedule. In this instance, the address you need is: Deutsche Welle, Raderberggurtel 50, PO Box 100444, D-5000 Koln 1, Germany.

Help

If there is a station you would like to contact, but don't have their address, drop me a line and I'll find out the addresses and publish them in future issues of 'Junior Listener'. This isn't restricted to legitimate broadcast stations, if you've been listening to pirates or utility stations and want to QSL, let me know and I'll see what I can find out for you.

news

Insect Filter

The CW501 Insect Filter is capable of copying signals at extremely low levels, e.g. 45dB below the minimum level required by the human ear. As a result, very weak signals can be pulled out of the noise when the band conditions are going out. Input and output matching for wither 8Ω or 600Ω is included. The filter costs from £69.95. For more information, send an s.a.e. to:
R.S. Dodson G3PPB, The Haven, Lound Road, Blundeston, Lowestoft NR32 5AT.

Airport Information Radio Ceases

The Radio Authority have announced that one of its licensees, Airport Information Radio (AIR), has ceased broadcasting. The holder of the licence, Allied Radio, has decided to return its licence to the Authority.

The Authority believes that the setting up of AIR, which offered information to Heathrow and Gatwick travellers, was a useful venture and a worthwhile experiment.

The Authority will be considering over the next few months how to make use of the spare a.m. frequency.

Balun Transformers

Cirkit now stock the recently released pre-wound Balun transformers from Toko.

Available in three basic configurations - double balanced mixer, distributor and directional coupler - the transformers are wound with bi-filar wire to give an excellent degree of balance. These new coils can do away with the tedious and difficult winding process and, above all ensure that critical factor for any r.f. design - repeatability.

Mounted on a base to provide either p.c.b. or surface mounting, the core material is chosen for wide band applications, typically 6-600MHz, with individual examples up to 1.3GHz. Each type is available in a range of turns ratios.

The wide range of applications include: impedance matching, double balance mixing, signal splitting, wide band transformers, distributing and coupling of r.f. signals.
Cirkit Distribution Ltd., Park Lane, Broxbourne, Herts EN10 7NQ. Tel: (0992) 441306.

Satellite Computer Program

Swift Television Publications have just released the 'Satmaster' computer program for satellite engineers, technicians and enthusiasts. Based on a 3.5in disk for IBM PC compatibles with MS DOS 3.0 or higher, it is a fully fledged tool for all installation data, measurement and interference potential - and will give you full data of elevation, azimuth, offsets etc for any satellite from any location anywhere in the world! Input data on your own installation such as dish size, receiver location, etc. and it will tell you where to point and all the necessary angles, even advising the size of dish to install for optimum receive quality on a given satellite.

Programmed-in menus will guide you easily through your problems to a rapid answer with over 20 000 words of on-screen technical guidance. It's possible to plot your own primary and secondary dish lobe patterns, which in turn will guide in both prediction and the minimising of interference, and the eventual results both text and graph can be printed out or screen displayed. Cost for this unique program is £35.00 post free UK, add £2 for Europe and £4 elsewhere. Price includes a user manual.
Swift Television Publications, 17 Pittsfield, Cricklade, Swindon SN6 6AN. Tel: (0739) 750620

AOR Competition Winner

Mr. N. Evans*, What Scanner *Competition winner, outside Salisbury Cathedral with his prize, an AOR 2000 scanner donated by AOR (UK).

Greenweld Newsline

Because of the ever increasing amount of surplus stock being purchased, Greenweld are instigating a new service for all their customers - the Greenweld Newsline. By calling (0891) 505121, callers will get a recorded message giving details of stocks purchased during the last week. This will include items not advertised elsewhere because the quantity is too small. Every caller who places an order will be entitled to a free gift too, details are on the recorded message.

The calls are charged at 36p/min cheap rate, 48p/min other times.
Greenweld Electronic Components, 27 Park Road, Southampton SO1 3TB.

Ukrainian Broadcasts

The BBC's new Ukrainian Service, given the go-ahead last October, was joined by its first Ukrainian member of staff this week. Olexiy Solohubenko, formerly a radio broadcaster with Ukraine's Radio Kiev, will assist the service's first head, Elisabeth Robson, in preparing to put the new service on the air this spring.

As well as direct short wave broadcasts from London, BBC World Service will be looking at opportunities for rebroadcasting the programmes on Ukrainian radio stations. To start with there will be a half hour daily programme of news and current affairs. A second half hour every evening is due to be added in October.

Encapsulated Traps

The new G2DYM encapsulated Q-TEK traps are coil-capacity combinations designed to resonate in the various amateur bands. Being encapsulated in polyester resin makes them physically robust, electrically stable and non-hygroscopic. The ratio of length to diameter of the traps, plus low-loss materials results in high efficiency. Because of the high *Q* and impedance at resonance, the traps act as effective insulators in the band in which they are resonant.

The traps shown in the photograph are £15 each for 28, 21 and 14MHz; £18 for 7MHz and £20 for 3.5MHz. WARC band traps are £17.50 each. Special frequencies can be made to order. Post and packing is £1 each or £1.50 per pair.
G2DYM Aerials, Uplowman, Tiverton, Devon. Tel: (03986) 215.

Radio Habana

Radio Habana, Cuba broadcast to Europe in English on the following frequencies:

17.705MHz from 1900-2100UTC
9.760MHz from 2000-2100UTC
7.215MHz from 2200-2300

Listen out for *DXers Unlimited* with Arnie Coro, which goes out every Tuesday and Saturday evening.
Radio Habana Cuba, PO Box 6240, Havana, Cuba.

ISWL Publications

Guide to English Short Wave Broadcasts to Europe (Winter Schedules 1991/1992) is a new publications from the International Short Wave League. It is printed in a clear, bold face and provides data in a manner that is not only comprehensive but practical. The information is presented throughout in time order with aligning programme time periods, country and station names, frequencies, programme types - i.e. news, features, sport, religious or World Service transmissions. All frequencies are given in kilohertz.

The presented information reflects recent English language programme cut-backs by some stations and also the various altered schedules of others. Every care has been taken to ensure that the information provided is accurate and current. Some of the data has originated from direct observations by experienced League short wave listeners and DXers.

Notes f daily operation appear on page 20, this being followed by a three-page chapter entitled 'The DX Week' in which comprehensive broadcast details of the many programmes of interest to short wave listeners and DXers are listed on a day-by-day basis.

The booklet costs £1.00 or 2 IRCs from:
ISWL. 10 Clyde Crescent, Wharton, Winsford, Cheshire CW7 3LA.

Standard Frequency & Time Signal Stations of the World contains all the necessary data enabling immediate access to standard frequency and time signal station information. As such it is an invaluable reference work required for determination of immediately usable frequency communication paths and on occasions for the calibration of station equipment.

The chapters cover (a) an explanation of the various time systems, (b) transmission systems used, (c) standard frequency and time signal stations in frequency order from 16 to 22536kHz and from 95 to 171.13MHz, (d) callsigns in alphabetical order, including location and frequencies and (e) countries from Argentina to Venezuela in alphabetical order with frequencies, transmission times, addresses, systems used and QSL card policies.

This publication costs £1.75 or 3 IRCs (postage stamps to the value of £1.75 are also acceptable) from: **ISWL. 10 Clyde Crescent, Wharton, Winsford, Cheshire CW7 3LA.**

1992 Second Wireless Exhibition

From Saturday June 20 until Sunday June 28, the Fareham and District Amateur Radio Club will again be presenting a Wireless Exhibition on board HMS *Warrior 1860* with the kind permission of Captain Frazer Morgan, Captain of HMS *Warrior 1860*.

Exhibits on display will represent the advance of wireless communications from Marconi/Jackson days up to 1942. The exhibits displayed are being loaned by individuals, HMS *Collingwood* Wireless Museum and Mr Len Newman G6NZ. Admission will be by normal admission to HMS *Warrior 1860*.

TV DX News

The RTM Morocco TV logo has changed an is now a 5 pointed star with the large figure '2' in the centre - for RTM-2 - it is assumed that RTM-1 also favour this more western design from the previous Arabic style.

The financially troubled French La Cinq network may be rescued with two proposals, mainstream broadcasters Canal+ and TF1 have suggested a news channel with the other broadcast networks also supporting this move, approval is now awaited from the French authorities. Meanwhile the Italian TV magnate Silvia Berlusconai is involved with a European partnership to offer a popular TV programme channel over the La Cinq facilities, though with less French originated programme input than at present, though allowing the present La Cinq programme format to continue into the early Summer.

Many TVDXers must have seen the new German captions 'MDR' and 'ODR' on various channels in the recent excellent tropospheric openings late January/early February. With the demise of the E and W German TV networks on December 31 last into a single-state broadcasting network, the DFF became the MDR - Mitteldeutschen Rundfunk (based in Leipzig) and the ODR - Ostdeutsche Rundfunk (based at Babelsberg near Berlin).

Meanwhile, changes are afoot in Holland. The TROS broadcaster is considering ending terrestrial transmission in favour of cable operation only which would allow both satellite access and longer programming hours (the Dutch government will not allow access to both satellite and terrestrial transmission).

Via Andy Emmerson, we have valuable news from a Czech TV broadcast technician - so it has to be correct! A 10 year plan will see the whole transmission network convert to 100% PAL transmission and ceasing the present SECAM transmission standard. Though most receivers are dual PAL/SECAM numerous Russian made receivers still operate in only SECAM, the 10 year phasing period should then 'see out' the SECAM models. The next TV transmitter to be constructed in Bratislava will operate solely in PAL G (i.e. 5.5MHz sound/vision spacing as for western Europe). Meanwhile, in Poland, Lublin has its own local TV programme which transmits on the old TVP-2 transmitter Ch. R2 (OK for Sporadic-E, the TVP-2 service has transferred to Ch. R23). TVP Teletext carries BBC World Service information - World News page 103 and Financial Markets on page 104.

For f.m. DXers, the European 88-108MHz f.m. radio band will be available in Poland from 1996. There are several 'pirate' or 'free' f.m. stations operating in Poland. These are

Radio S in Poznan, Radio Fun in Cracow, Radio S and Radio Z in Warsaw.

Radio Delta in Bielska-Biala, Kormoran in Wegorzewo, Alex in Zakopane.

Radio Wa-Wa on 70.91 and 90.00MHz, Radio Jutrzenska on 98.1MHz - these two are in Warsaw. Meanwhile, Moscow has Radio Roks (a rock station) on 103.0MHz, this is relayed from a satellite feed ex Oslo.

On 30 December 1991, TVDXer Robert Copeman, Victoria in Australia received via Sporadic-E the 1W TV relay transmitter at Wingatui, New Zealand, identified as TV2 Ch. 1 and measured on his scanner at 45.28MHz!

Amateur radio operation at Band 1 50MHz is increasing - Estonia has allowed operation from October last up to 200W max e.r.p. though away from the Band 1 TV Tallinn region. In other States of the Union, 50MHz amateur operation is awaited eagerly once the authorities have made appropriate decisions. At the same time Sweden relaxed conditions on 50MHz operation allowing higher powers away from Band 1 TV areas. It's likely that Poland will allow 50MHz operation sometime during early Summer '92. Thanks to *Six News* for this information.

Finally the new Swedish TV4 network is now expanding and TVDXers may have noticed a few signals at in the recent openings.

Currently in operation are
Goteborg- -Ch. E46
Malmo - Ch. E47
Sundsvall - Ch. E50
Orebro - Ch. E58
Horby - Ch. E50
Norrkoping - Ch. E54
Uppsala - Ch. E52
Karlstad - Ch. E46
Stockholm - Ch. E42
Vasteraas - Ch. E51
During the first half of '92 the following will open:
Bollnas - Ch. E49
Gavle - Ch. E30
Skovde - Ch. E47
Borlange - Ch. E60
Vannas - Ch. E50
Boraas - Ch. E55
Helsingborg - Ch. E41
Karlshamn - Ch. E44
Alvsbyen Ch. E52
All of the above transmitters are main (high powered).

Roger Bunney

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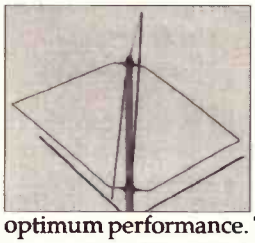


DX-One Electronic Antenna

£249 inc VAT

The World Radio TV Handbook said of the DX-One "... the best of its type available anywhere in the world." It has a frequency range of 50kHz - 50MHz (*3dB) and 10kHz - 75MHz (*6dB); it is both horizontally and vertically polarised, so low-angle (DX) signals suffer less selective fading. The output level from the antenna is adjustable in steps from +6dB to -4OdB for optimum matching. The extremely high intercept point (+66dBm 2nd order, +40dBm 3rd order) and a very low noise figure (12.8 dB) ensure optimum performance. The indoor unit contains a mains power supply, a step-wise attenuator and a very effective medium wave suppression filter. It also has two receiver outputs for feeding two receivers without mutual interference.

SP-2 Antenna Splitter

£152 inc VAT

A growing number of radio enthusiasts have two receivers, but no space for two separate antennas. The SP-2 is the answer for connecting two receivers to one antenna (be it active or passive). The SP-2 offers a very high degree of isolation between the two receivers (<30 dB). The SP-2 ensures that, within the frequency range of 50kHz - 50MHz), no unwanted mutual interference, heterodynes or signal loss will occur as a result of connecting a second receiver.

With a single receiver, the SP-2 offers a precision step-attenuator (0 - 40 dB) which helps to reduce receiver inter-modulation. Included is a very effective switchable medium wave suppression filter.

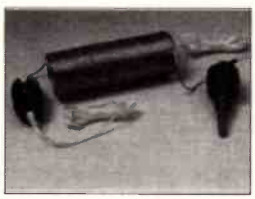
For those with space for a second antenna (e.g. one horizontal, one vertical), the SP-2 offers a simple way to switch between the two for comparison purposes.

Magnetic Longwire Balun

£36 inc VAT

This balun has been described in the trade press as the "most revolutionary development for shortwave listeners in the last 25 years". Quite a claim! But this antenna device does solve one of the most severe problems associated with random long wires; the input cable. An MLB allows you to use highly screened co-axial cable between the antenna and receiver WITHOUT energy loss due to impedance mismatch. Computers, light-dimmers, televisions, and fluorescent lights no longer cause interference problems. We recommend RG58/u 50ohm co-axial cable.

The MLB has been designed so that a very short length of antenna wire can be used and still be perfectly matched to the 50ohm antenna input of the receiver. Even an antenna of just 12.5 metres (41 feet) provides good results from 100kHz - 40MHz without the need for an antenna tuner. Static build-up on the antenna is allowed to leak away to earth potential - excellent for protecting receivers with FET front end circuitry. Static noise levels on long, medium, and the tropical short wave bands of 60 & 90 metres are considerably lower. The MLB is easy to mount on existing longwire or "T" antennas.



MLB Antenna: Mark I

£56 inc VAT

A complete passive wire antenna with a built-in MLB, the MLB Antenna: Mark I has excellent performance on long, medium, and short waves. It is 12.5 metres in length and can be mounted vertically or horizontally. Frequency range 100kHz - 40MHz.

The MLB Antenna: Mark I offers all the advantages of the Magnetic Longwire Balun like: coaxial feeder, broadband performance without an antenna tuner and static decoupling. Heavy duty and completely water-proof, it comes complete with nylon support cord, heavy-duty insulator, high-quality plastic covered antenna wire, PL 259 connector and a water-tight rubber sleeve to cover co-axial/MLB connection.

MLB Antenna: Mark II **£67** inc VAT

Similar to the Mark I, but 20 metres long. The MLB Antenna: Mark II offers improved performance at medium and long wave frequencies, although the high frequency performance above 30MHz is reduced.

THE LISTENERS' BOOK OF THE YEAR GETS EVEN BETTER

The new 1992 issue of 'Passport to World Band Radio' is now with us and it's even better than before. The 200 pages have risen to almost 400 and every section carries the unmistakable authority of the world's best short wave companion.

Broadcasts are listed as before; not only in frequency order but also by language, country of origin AND the times of broadcasts. There are no less than 56 pages of receiver reviews, including the latest NRD-535 and Drake R-8, together with news, views and general information.

If you own a short wave radio, you MUST have the 'Passport' by its side. The price last year was £12.95; we have kept the price the same this year at £12.95 (plus £1.55 p&p.). Send off today.

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The NRD-535 General Coverage Receiver

Latest in the line of NRD receivers, the NRD-535 is a triumph for JRC and represents a true step forward in features, performance and facilities for the dedicated listening enthusiast.

The smooth tuning is the first thing you notice and JRC has developed a direct digital synthesiser (DDS) system which tunes in 1Hz steps. The accuracy and stability are of laboratory standard. There is of course the front panel keypad for swift frequency setting.

All mode reception covers AM, USB, LSB, CW, FM, RTTY and even FAX with IF filter bandwidths to suit the modes.

For winkling out the weak stations, the NRD-535 excels. Pass band shift enables you to slide the IF filter around the signal so as to eliminate the adjacent signal and a totally new notch system gives tunable rejection with a 40dB notch depth. There is also an optional Bandwidth Control board.

For the keen broadcast DXer, There is also an optional plug-in ECSS board for locking on to an incoming AM signal and then picking off either sideband.

There are 200 memory channels, each of which stores, frequency, mode, bandwidth, attenuator and AGC settings, comprehensive frequency sweep facilities and no less than 16 different functions which can be programmed from the front panel by the user.

For the advanced user, the NRD-535 is fitted with a RS-232C interface for 28 computer controlled receiver functions. Available for demonstration at Matlock and the regional centres.

NRD-535 HF Receiver . . . . . **£1,095** inc VAT
CMF-78 ECSS option . . . . . **£202** inc VAT
CMH-530 RTTY option . . . . . **£104** inc VAT

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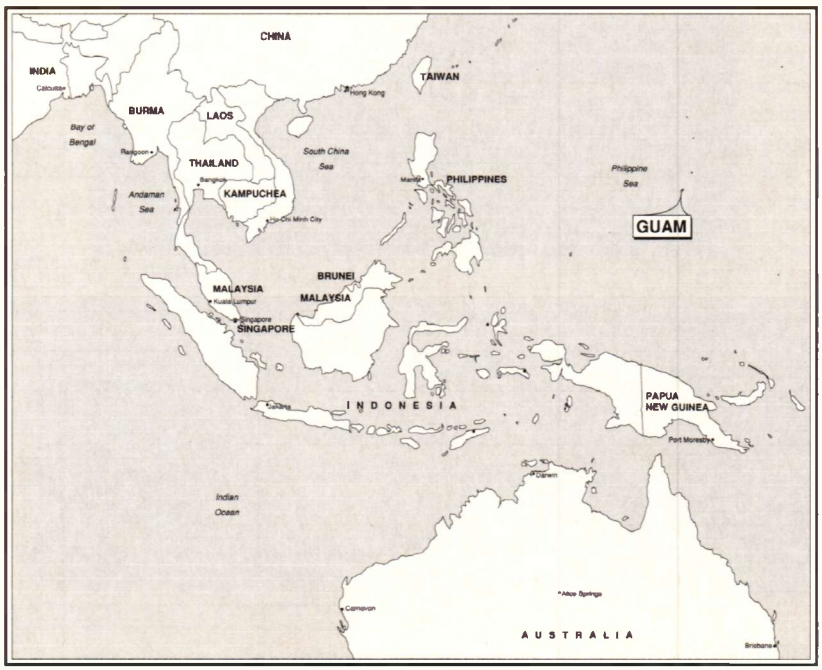
LONDON (MIDDX): 223/225 Field End Rd, Eastcote Tel: 081-429 3256 **NEWCASTLE**: Newcastle Intn'l Airport Tel: 0661 860418

US Naval Oceanography Command Center Guam



Guam is a relatively small Pacific island, just under twice the size of the Isle of Wight, with a significant strategic value. Howard Bird looks at the US Naval Weather Station on Guam and the supporting network. Why put a weather station way out in the Pacific? Typhoons are the main reason.

The first question I can hear you asking is, why Guam? Well, there are a whole host of reasons that I hope will become clear during the article. Let's start by placing Guam on the map. Guam is a relatively small island of about 541 sq.km. or just under twice the size of the Isle of Wight. The island form part of the Mariana group and is located on the edge of the Pacific Ocean about 2400km east of the Philippines. To help you locate it **Fig. 1** shows a map of the general area.

Like many of the smaller islands, Guam is self governing, but dependant on a larger nation which, in this case, is the USA. The island supports a population of some 134 000 people of which nearly 8000 are full time US service personnel. The heavy military presence is because Guam is an important Air Force and Naval base. It's location in the Pacific gives it a significant strategic value - hence the continued US involvement.

This may lead you to ask - why put a weather station way out in the Pacific? Probably the key reason for this is typhoons. Typhoon is the local name given to a violent mobile cyclone in the west of the northern Pacific. In other areas of the world they are more commonly called hurricanes.

Perhaps one of the reasons for having a local name is that this area of the globe gets more than its fair share of these destructive storms. On average, 25% of the worlds violent cyclonic storms occur in north western Pacific. When they start, they normally last between five and ten days. The destructive power of a typhoon is significant, as I'm sure you've seen from news reports. Just to put that in perspective here's some interesting trivia. The energy expended by a typical storm can be equated to half a million 20ktonne atomic bombs being exploded every day! Alternatively 8000 times all the electrical energy consumed by the USA per day! As you can see, the destructive power is really quite frightening.

However, that still doesn't explain why Guam was chosen as a weather station. Guam sits right in the typhoon area and holds the record for the lowest ever recorded atmospheric pressure. This was recorded in October '79 while Guam was in the eye of a typhoon. The pressure was measured at amazing 870mb. One unfortunate spin off of this low pressure is high tides. It's not unusual to see tides that are 3 to 3.5m higher than normal. This is one of the reasons why we so often see severe flooding associated with Typhoons.

This may all seem a little off track for this article, but I hope it helps to put the work of this station in perspective. Its key role is to monitor for and provide Typhoon warnings. Although the station's main purpose is to protect military shipping and operations, the information is of great significance to the civilian population.

FAX Signals

Existing utility enthusiasts will know of GUAM through its FAX transmissions that contain up-to-date reports on the interesting weather patterns in the Pacific. These reports include Typhoon warnings, where appropriate. The FAX station at Guam has a real mouthful of a name - U.S. Naval Oceanography Command Centre/Joint Typhoon Warning Centre, Guam!. To make life easier the military authorities have abbreviated this to NAV-OCEAN-COM-CEN/JTWC! Us mere mortals, however, know the station simply as GFAX.

Being a Naval Station, its prime responsibility is to provide information to the US

7th Fleet. It also supports many other Naval activities in the Western Pacific and Indian Ocean. The Guam FAX service is based around two continuous broadcasts that originate from the Fleet Numerical Oceanography Centre in Monterey, California. These broadcasts are distinguished by the areas that they cover. One concentrates on the Western Pacific while the other deals with the Indian Ocean. Because of the importance of Guam for Typhoon monitoring, these broadcasts are supplemented by local contributions.

The US Navy has its own coding system to identify the two circuits or transmissions. The code KFBV is used for the Pacific and K3SN for the Indian Ocean.

I'm sure many newcomers imagine that distributing a FAX signal is simply a question of connecting the signal to a transmitter and away you go. The real distribution system turns out to be really quite complicated. To give you an idea I've included a couple of simplified routing diagrams in **Figs. 2 and 3**. In simplifying the diagrams, I've excluded most of the intermediate stations and all the feeds that supply land based military establishments.

If we look at the Indian Ocean K3SN distribution first (**Fig. 2**), you can see that extensive use is made of the geostationary military satellites that serve the Western Pacific (WestPac Milsat) and Indian Ocean (IO Milsat). The WestPac Milsat provides the links to the Holt h.f. transmitter in Australia and the Totsuka Japanese transmitter. The Barrigada and Capas Tarlac transmitters are fed by conventional microwave links. These transmissions are supplemented by a direct broadcast to the fleet from the Indian Ocean Milsat. This satellite also feeds the Diego Garcia transmitter that's monitored by many UK listeners.

Covering the Western Pacific is a somewhat easier task as you can see from **Fig. 3**. The area is covered by three transmitters at Totsuka, Barrgada and Capas Tarlac. Because these stations are all located in the Western Pacific area, simple microwave feeds can be used for all transmitters.

These complex distribution networks give an indication of just how difficult it is to maintain good quality communications over large areas.

I'm sure many of you would like to have a listen around to see if you can hear any of these stations. To help you I've listed here the current operating frequencies for main transmissions from both networks.

Western Pacific Network

Apra Harbour, Guam (NPN): 5.258, 10.253, 16.0276, 19.858 & 23.008MHz.

Yokosuka, Japan (NDT): 4.963, 12.777 and 22.573MHz.

Indian Ocean Network

Apra Harbour, Guam (NPN): 5.262, 10.257 & 19.862MHz.

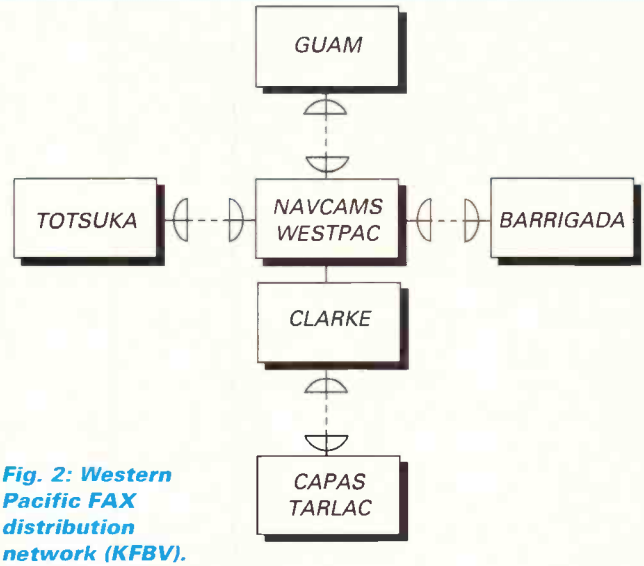


Fig. 2: Western Pacific FAX distribution network (KFBV).

Yokosuka, Japan (NDT): 4.967 & 22.577MHz.

Diego Garcia (NKW): 7.582, 12.806 & 20.302MHz.

Those with FAX reception facilities should look out for the broadcast schedules. These are transmitted in two parts at 1300 and 1315UTC. As well as containing the latest details of charts to be sent, these schedules also give the latest operating frequencies.

The main part of the Guam FAX broadcast comprises computer generated NEDSFAX charts that are supplied by the Fleet Numerical Oceanography Centre in Monterey California. When a typhoon has been detected, Guam intercept the main transmission schedule four times a day to give warnings. These warnings include details of the current position, wind speed and movement over the past six hours. The accompanying forecast gives the expected 12, 24, 48 and 72 hour positions.

One interesting note in the station manual points out the computer generated and local Guam charts may differ. If this occurs, the Guam version is the one that's right. The reason for this is that the typhoon monitoring is done from Guam so is likely to be more accurate than a remote computer generated model. I know many people who receive FAX charts have difficulty working out what some of the charts are trying to convey. To help overcome this I've listed here the key measurements contained on a number of the standard charts. Each section starts with the Guam abbreviation followed by the description.

FSNH 36 HR PROG BLEND: This is a 36 hour forecast of pressure centres, fronts, troughs, etc., oceanic winds and mid latitude isobaric contours.

MSPN 36 HR SIG WAVE HT PROG: This is a 36 hour forecast of significant wave heights (measured in feet) and the direction. The area covered is the North West Pacific.

FBNH 36 HR SIG WX PROG: 36 hour forecast of pressure centres, fronts, troughs, etc., significant cloud cover, significant weather and high winds/seas. The chart uses standard weather symbols.

GRADDY: This gives the ocean temperature, gradient and frontal positions for the North West Pacific.

MSST: Sea surface temperature analysis for the Northern hemisphere.

MSLD: This is a sonic layer depth chart.

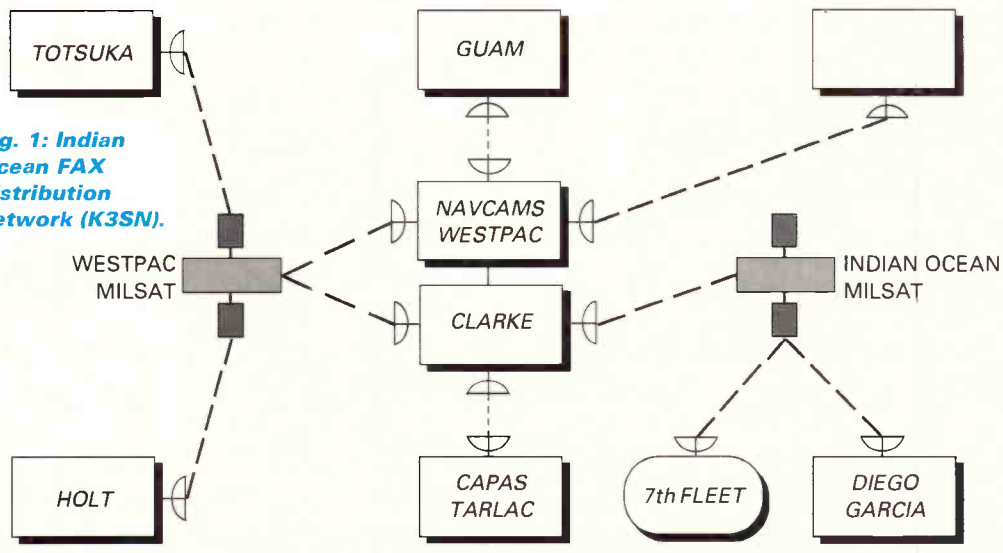


Fig. 1: Indian Ocean FAX distribution network (K3SN).

CZ PROBABILITY: 50% reliability of convergence zone probability analysis.

ASEH FINAL SFC ANAL: Surface analysis - isobaroic 20°N/20°S poleward - streamline tropical.

MSEH SIG WAVE HT ANAL:This gives an analysis of the significant wave height in feet.

NOGAPS: This is a preliminary surface analysis including 24, 36 and 48 hour prognosis.

NORAPS: 24, 36 and 48 hour surface prognosis.

In addition to these charts, GFAX transmits a number of satellite images. The images come from the Defense Military Satellite Program (DMSP) and the GMS satellite. The times to watch for satellite images are as follows:

Western Pacific Broadcast (KFBV): 0105, 0320 & 0640UTC.

Indian Ocean Broadcast (K3SN): 0150, 0320, 0450 & 0745UTC.

You'll need to either be an early bird or burn the midnight oil to catch these!

Summary

I hope this feature has helped you get a better understanding of just how a major weather FAX network operates. The system is very complex but plays a vital role not only in safety at sea and in the air but also in warning of potential disasters.

If any of you would like to QSL the address is: Naval Oceanography Command Centre, PO Box 12, FPO San Fransisco 96630, USA.

My thanks to Day Watson and the US Navy for supplying this information.

QSL Addresses

TANJUG World Service, Obilicev Venac 2, Postfah 438, Belgrade, Yugoslavia.

Swiss PTT, Berne Telecommunications Headquarters, Mobile HF Radio Services, Laupenstrasse 18, CH-3030 Berne, Switzerland.

Telecom (New Zealand), Awarua Radio, PO Box 1647, Invercargill, New Zealand.

Spanish PTT, Telefonica, Servico Maritimo, Paseo de Recoletos 41,3a, 28004 Madrid, Spain.

MCI International Inc, Chatham Radio/WCC, PO Box 397, North Chatham, MA 02650-0397, USA.

Romaradio PT, Statione Ricevente, Via Della Cesarina 282, 00139 Roma, Italy.

Qatar Public Telecommunications Corporation, PO Box 217, Doha, Qatar.

US Navy Peral Harbour, Naval Western Oceanography Centre, Box 113, Pearl Harbour, Hawaii, HI 96860-550, USA.

United States Coastguard NMA, Radio Station Miami, 16001 SW 117th Avenue, Miami, Florida 33177, USA.

Boufarik Radio 7TF, Station Radiomaritime, Attention Le Chef de Centre, BP234, 09400 Boufarik, Algeria.

Algerie Press Service APS, Attention Le Directeur Technique, 7 Blvd Che Guevara, Algier, Algeria.

Junccao Radio PRI, Estacao Costeira de Rio Grande, Rua Otacilio Charao 199, 96200 Rio Grande RS, Brazil.

Halifax Coast Guard Radio VCS, Ketch Harbour, Halifax County, Nova Scotia, Canada.

The Director, Beijing International Communications Station, Government Radio Administration, Si Chang An Chieh, Beijing, People's Republic of China.

Xinhua New China Press Agency, 30 Hsuanwumen Hsi Chieh, Beijing, People's Republic of China.

Alexandria Radio SUR, Manshia Square 9th Florr, Alexandria, Egypt.

Helsinki Radio OFJ-OHG, SF-01700 Vantaa, Finland.

Station Radionavale Le Regine FUG, La Regine Marine Nationale Centre de Transmissions du France-Sud, F1150 Bram, France.

Radiostation Forces Aeriennes FDY, Escadron Electronique 1/800, F-45 Orleans-Bricy-Air, Loire, France.

Hellenic Telecommunications Organisation, HTO Directorate of Technical Services, Radio Systems Dept, 15 Stadiou Street, GR-Athens 24, Greece.

Magyar Tavirati MTI Iroda, Fem Utca 5-7, PO Box 3, H-1426 Budapest, Hungary.

Kaijo Hoan Cho Maritime Safety Agency, Central Station JNA, Tokyo Centre, 2-1-3 Kasumigeseki, Chivoda-ku, Tokyo, Japan.

MAP RABAT, Ministere des Postes, Telegraphes et Telephones, Le Chef du Service des Transmissions, Rabat, Morocco.

WLO Radio, Mobile Marine Radio Inc, 7700 Rinla Avenue, Mobile, Alabama 36619-1199, USA.

NMF-NIK, United States Coast Guard, Communication Station Boston, Marshfield, Massachuetts 02050, USA.

AXI, Bureau of Meteorology, PO Box 735, Darwin, Northern Territory 0801, Australia.

Jordan News Agency, PO Box 6845, Amman, Jordan.

Shanghai Meteorological Bureau, 166 Puxi Road, Shanghai 200030, People's Republic of China.

KVM70, US Department of Commerce, National Oceanic & Atmospheric Administration, National Weather Service Pacific Region, Box 50027, Honolulu, Hawaii 96850-4993, USA.

SA Weather Bureau, Private Bag X097, Pretoria 0001, South Africa.

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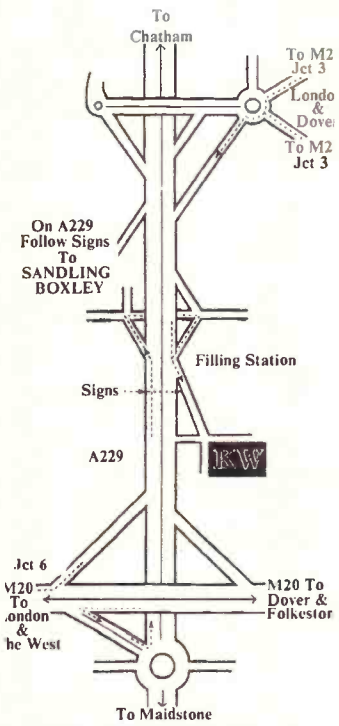

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Time Division and Frequency Division Multiplexing

Mike Richards, SWM's tame 'Decode' columnist, has received many letters asking about Time Division Multiplex and Frequency Division Multiplex. In this article he explains what it's all about.

Let's start with the abbreviations - t.d.m. means Time Division Multiplex, while f.d.m. is Frequency Division Multiplex. Very technical sounding words, but what does it all mean?

The division bit is obvious, it's the multiplex term that seems to confuse most people. In communications terms this simply means more than one communication channel. So from that we can conclude that a multiplex transmission carries more than one communication channel. From a commercial point of view, there are many pressures to get as much as possible out of any communication link. The reason is that the major cost with any link is that of installing and running the equipment associated with the link. This could be all the cables on a land line system or transmitters, receivers and antennas for a radio link. These pressures have inspired all manner of ingenious methods of increasing the usefulness of a communications link.

Early Systems

Before I deal with some modern examples, let's take a look at some of the early multiplex systems.

The first systems were all based around the wire communications links in use during the late 1800s. The links were fairly basic and used predominantly hand-sent Morse code. The first attempt to handle more than one communication came with the German Duplex system. However, this was quickly superseded by the highly successful Quadruplex system, designed by Thomas Edison in 1874. This system used eight operators handling four sets of messages. These were arranged as two messages in each direction. The success of this system can be gauged by the fact that it remained in service for some thirty-five years. This is a considerable achievement when you consider the rate of technological development during the late 1800s and early 1900s.

At around the same time, 1872 to be precise, Jean-Maurice-Emile Baudot was working on a time division multiplex system for use with the newly developed printing telegraph. Although little interest was shown initially, by 1877, the French Post and Telegraph authority had adopted the system. The key to this system was a rotating distributor with separate sectors for each teleprinter. The number of sectors determined the number of teleprinters that could use the link. In practice, there were several different configurations with a maximum of four teleprinters per circuit. The Baudot system was probably the first true time division multiplex system. This was because it shared the circuit by letting each channel have access to the circuit for a fraction of the available time. I've illustrated the system in **Fig 1.**

The next significant step, in terms of multiplexing, came in 1918 with the development of the first frequency division multiplex system. Although the basic principles had been anticipated by Bell in 1875, it was not until 1918 that technology had advanced enough to produce the high quality filters demanded by this system.

Before I get on with the modern examples, let's just outline frequency and time division multiplex.

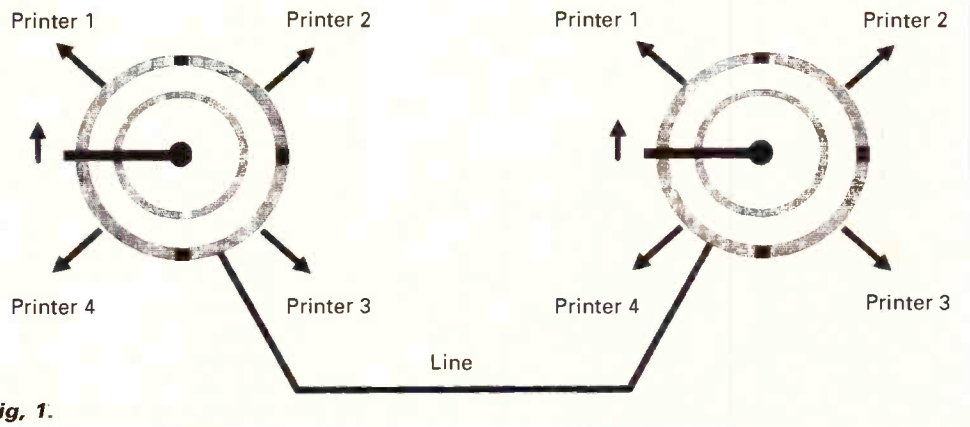

Fig. 1.

FDM

Let's start with a look at how we could utilise a basic speech band radio link using f.d.m. or frequency division multiplex. Incidentally, the term speech band means that the transmitter is designed to accept a standard telephone speech channel containing frequencies from about 300Hz to 4kHz. Now let's see how we could use this transmitter for RTTY signals. The simplest way would be to use the system adopted by many amateurs. Here the mark and space conditions of the RTTY signal are converted into two tones of around 1200 and 1400Hz. These tones can then be passed over the radio link in the same way as a speech signal. Many amateurs simply connect the output of their RTTY units direct to the microphone socket of their transceiver. Although this system works well, it doesn't use the full potential of the radio link. The reason for this is that the RTTY signal only requires a very small part of the available 300 to 4kHz speech band. I've shown this in **Fig. 2** To illustrate the point, a 50 baud RTTY signal will happily operate in a segment only 60Hz wide. From this you can see that the normal speech band could carry several RTTY signals with ease. What we need to do is divide the speech band in to 60Hz slots. This technique is called frequency division multiplex and takes us back to where we started. To further clarify the technique, let's look at a real example of an f.d.m. system.

One of the most common examples of f.d.m. is the multi-channel telegraph system used by many military and PTT operators. The system is known as m.c.v.f.t. which stands for Multi-Channel Voice Frequency Telegraph. There are many variants of this system, but the one I'll look at is the twenty-four channel 50 baud version

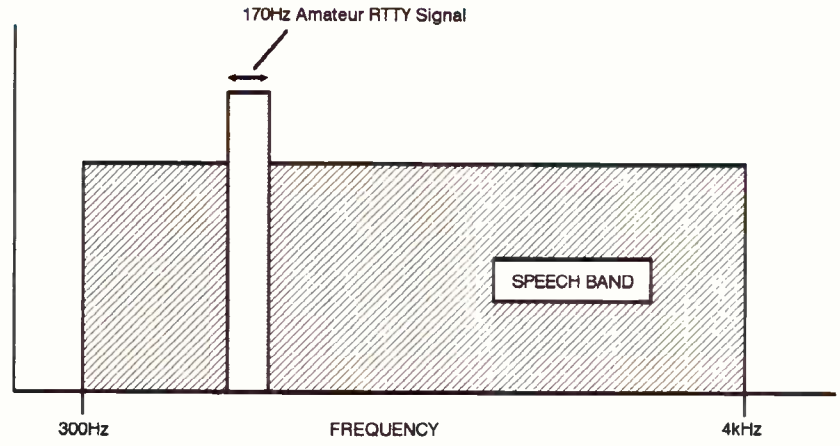

Fig. 2

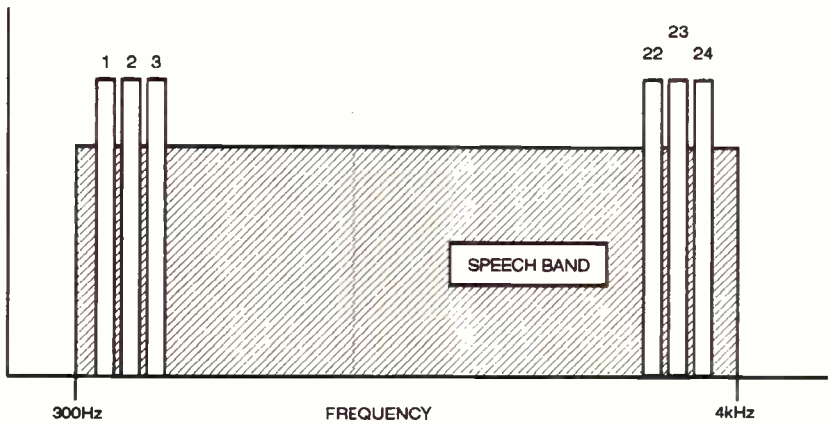

Fig. 3.

Fig. 4.

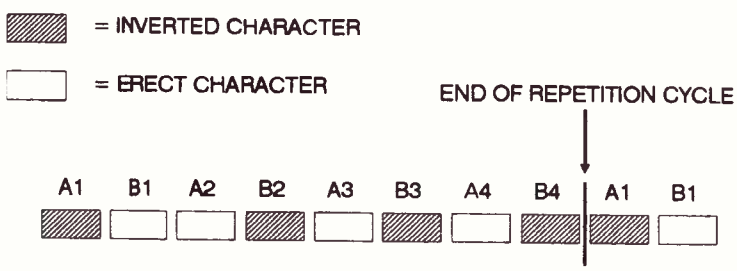

Fig. 5.

shown in **Fig. 3**. As you would expect, this method of f.d.m. enables twenty-four separate telegraph signals to be sent over one speech radio link. This is clearly a great improvement over our original single channel version!

Fitting all twenty-four channels into the speech band is done by spacing the channels 120Hz apart and using a shift of 60Hz between the mark and space frequencies. The twenty-four channels have centre frequencies that start at 420Hz and extend to 3180Hz. Using channel one as an example, the centre frequency is 420Hz giving mark and space frequencies of 390Hz and 450Hz respectively.

Although the system is quite simple to explain, decoding is not quite so easy. The problem lies in the close spacing of the channels. This means that very sharp audio filters are required to separate the individual channels for decoding. There are few systems available to the amateur that can handle this mode, but one example is the Code-3 from Hoka which includes this mode as an option. If you want to hear what an m.c.v.f.t. signal sounds like, try tuning to 18.6029MHz VoA, 18.535MHz RAF or 18.016MHz Rota.

TDM

Time division multiplex uses a totally different, and perhaps simpler principle, than the f.d.m. system I've just described. In essence all that happens is that several channels take it in turns to send their information over one circuit. In a practical system, the change-over between each channel is so fast that the user cannot detect it happening. The basic principle of a two channel system is shown in **Fig. 4.** This results in the systems appearing to have a number of completely separate channels.

The most common modern implementation of this on the h.f. bands is the ARQ-M system. This is used by many operators, but the most common is the French military telegraph network. The ARQ-M system supports either two

or four teleprinter channels and operates with channel speeds of between 50 and 100 baud. An added sophistication with ARQ-M is that the system is fully error correcting.

The secret of the error correction system lies in the code used to represent the characters of the alphabet. The ARQ-M system employs what is know as the International Telegraph Alphabet No. 3 or ITA3. This code uses a combination of marks and spaces to convey the characters. The unique feature of ITA3 is that each character always contains three marks and four spaces. It's this simple feature that's used to detect errors. At the receiving end the decoder checks every received character to see if it contains the right mix of marks and spaces. If all is well, the character is decoded and printed. If an error is detected, a signal is sent back to the transmitter asking for a repeat. This simple technique is used for most of the error correcting h.f. RTTY modes.

Let's now look at how channels are combined to build a two channel ARQ-M system. The process is basically very simple with the channels sent one after the other. However, in order for the synchronisation and error correction to work a couple of adjustments are made. The first is to send the information in groups of four or eight characters per channel. Breaking the data up in this way is necessary for the error correction process. If an error is detected the lost characters are repeated in the next complete block. So that the receiver can identify the start of a block, or repetition cycle as it's known, the first character is sent inverted. This means that it contains four marks and three spaces. The choice between four and eight character repetition cycles is entirely dependant on the propagation delay between the transmitter and receiver. It's therefore only the very long distance links that need to use the eight character system. Let's move on to take a look at how the two channels are combined in a four character repetition cycle system. I'll call the channels A and B for convenience. The transmission starts with A1 followed by B1 and so on upto A4 and B4. In order to help the receiving unit to identify the channels. A1 is sent inverted whilst A2-3 are sent erect. To differentiate between channels A and B, B is sent in the opposite sense. This means that B1 is erect whilst B2-4 is inverted. I can see that this sounds very complicated, so I've included a diagram in **Fig. 5** to help. Once you get the general idea, it's really quite straightforward.

If you want to try your hand at this mode, here's a few frequencies to check-out: 19.100MHz, 96 baud, 2 chan, French military. 22.915MHz, 200 baud, 2 chan, MoD Paris. 9.285MHz, 96 baud, 2 chan, Brazzaville.

Abbreviations

ARQ-M	Automatic ReQuest Repeat
f.d.m.	frequency division multiplex
h.f.	high frequency
Hz	hertz
kHz	kilohertz
m.c.v.f.t.	multi-channel voice frequency telegraph
MHz	megahertz
MoD	Ministry of Defence
RAF	Royal Air Force
RTTY	Radio TeleTYpe
t.d.m.	time division multiplex
VoA	Voice of America

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Mobile or base extra wideband scanning receiver covering 500kHz to 1.8GHz with 100 memory channels and receives AM, FM & WFM Modes **£499**

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Regency 7000 Base/Mobile Scanner. V. Sensitive Radio **£215.00**

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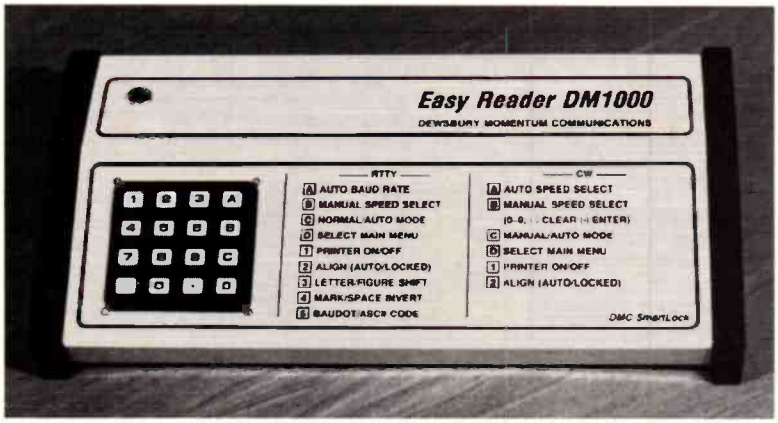
Dewsbury Easy Reader DM-1000 Review



Simple to operate decoding systems are always in demand by utility listeners. A recent addition to the market is the Easy Reader DM-1000 reviewed here by Mike Richards.

The DM-1000 is a complete decoding system for RTTY and c.w. signals. All that's required to get on the air is a receiver and a simple video monitor, making the DM-1000 very attractive to those who don't want to get involved with computers. One of the other attractions is a feature that Dewsbury have called SmartLock, providing fully automatic decoding of most RTTY and c.w. signals. Let's take a closer look at this interesting new unit.

Connecting-Up

Being a largely self-contained decoder, the external connections have been kept to a minimum. To help the operator keep a tidy station, all the sockets are tucked away on the rear panel. Connection of the audio signal from the receiver is made using a standard 3.5mm jack. Ideally, this signal should be taken from an auxiliary output on the receiver, though an external speaker socket would suffice. Using an auxiliary output has the advantage of providing a constant level signal, regardless of the setting of the volume control. Thanks to the inclusion of an automatic gain control circuit, the DM-1000 could accept signals varying between 200mV and 10V. This is a very large range that should make it suitable for use with many of the receivers on the market.

The power requirements of 9-13V at 600mA, were easily met by an optional mains unit. If you wanted to use an alternative power source,this could be connected via a 2.1mm coaxial power socket.

The only other connection required for operation to start was the video lead. The video output from the DM-1000 was a normal composite video signal suitable for most monitors. As the display was monochrome there's no need for expensive (and noisy) colour monitors. It's important to note, however, that the video was not suitable for direct connection to a TV. If you want to connect to a TV, you'll need an optional video modulator. To make sure the resultant display was easy to read, you could adjust the number of characters per line. The two options provided were 40 or 80 characters per line. This should be adequate to cover most requirements. The 40 character option is particularly useful when using the DM-1000 with a TV as the resolution is often poor. Also on the rear panel were connectors for a printer, RS232 and DMC COMNET interfaces.

The printer interface was a standard Centronics parallel port using a 25-way D connector. The use of a D connector meant that standard (i.e. cheap) IBM compatible printer leads could be used. To facilitate the use of a range of printers, the print width could be set by the operator. As with the video display, the two options provided were 40 or 80 characters per line.

The DMC COMNET and RS-232 ports were provided to support future developments of the DM-1000.

Instructions for the DM-1000 were contained in a spiral bound, thirty-page, A5 booklet. The operation of the unit was covered in plenty of detail, though I'd have liked to see a few more illustrations to brighten it up a bit.

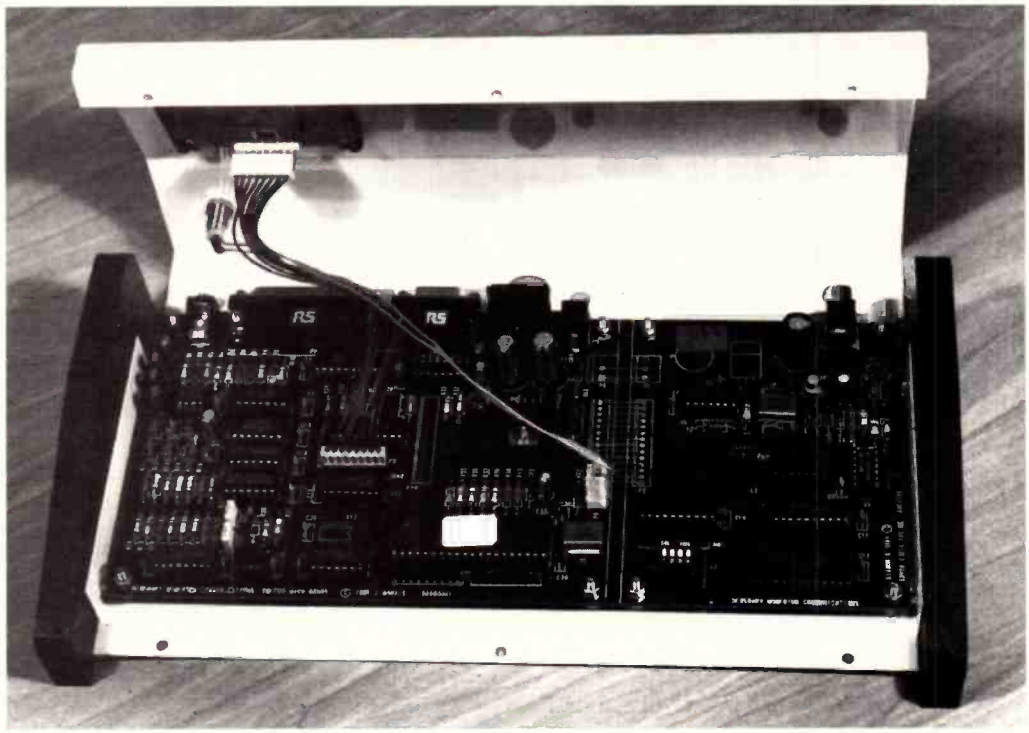
Menu Driven

Operation of the DM-1000 was controlled by the 16-button keypad on the top panel. Although this was simply marked 0-9 and A-D, it was able to control all the functions. The secret was in the use of a menu driven system that indicated the function of the buttons on the video monitor. Using this system each key could be assigned a different function depending on the mode selected. This was backed-up with a summary of commands printed on the top panel. One unusual point was that there was no conventional ENTER key, the function being carried by the stop key (.).

After the initial sign-on screen, the display gave a choice of receiving RTTY or c.w. modes. Once within the desired operating mode the key pad takes on differing functions depending on the specific mode selected.

CW Reception

Despite being one of the oldest radio communications systems, c.w. is still in constant use on the h.f. bands. The DM-1000 has been designed to make c.w. reception as easy as possible. Once the c.w. mode has been selected, you're presented with a blank screen except for a reverse video status line at the top of the screen. At the left-hand end was a very useful tuning indicator, comprising a vertical arrow that moved between two vertical markers. The arrow moves in response to the received signal and effectively shows the correct tuning point. To keep tuning simple, the DM-1000 is able to process the signal anywhere in the centre half of the tuning display. This is particularly useful if your receiver only has 100Hz tuning steps. I found that the review model was able to reliably decode signals



with side tones of between 500 and 1500Hz. This was an usefully wide range.

Another useful aid was the data indicator, also on the status line. This comprised a simple square that flashed in synchronisation with the incoming c.w. signal. Although not really a tuning indicator, it provided a useful indication that the DM-1000 was decoding the required signal.

The next section of the status line gave an indication of the selected mode which, for c.w., was basically auto or manual. If the manual speed selection had been chosen, the selected speed, in w.p.m., was shown on the display. The next item on the status line was the SmartLock indicator. SmartLock is the name given to the signal tracking system employed by the DM-1000.

The great advantage of the SmartLock system is that it can track incoming signals over a wide range. As I mentioned earlier, one of the advantages is the wide tuning range of the DM-1000. The second advantage is its ability to analyse an incoming signal checking for polarity and speed. Once the parameters have been established, the SmartLock continues tracking, so following any speed changes. As a further sophistication, the decoder could be locked on to the current parameters. This was particularly useful when conditions were very poor, as it prevented the SmartLock from hunting during heavy fading or interference.

Unlike some other systems, the DM-1000 did not inhibit printing while the SmartLock was calculating. The result of this is that garbage is printed when first tuning into a station. This only happens for a short period while the SmartLock analyses the signal. In most cases this took no more than about 5 seconds. If you try this on the amateur bands you may well find that it won't lock - don't worry it's the signal not the decoder. Although many amateurs send good quality c.w., there is still a lot of very poor c.w. to be heard on the bands. The main problem is not from new licensees, but the experienced amateur that develops a characteristic 'swing'. This completely disrupts the element spacing of the code, making it very difficult to resolve.

To help keep the display readable, the DM-1000 includes a word-wrap feature that ensures that words are not split across two lines. For occasions where the decoder gets confused by a signal you could hit the '2' button to restart the SmartLock.

Automatic RTTY Reception

To complement the c.w. modes, the DM-1000 includes fully automatic RTTY reception. This is a great boon for the newcomer to utility listening. All you have to do is approximately centre the signal on the tuning indicator and the DM-1000 does the rest. As with c.w. it starts by printing garbage but this changes to clear text once the SmartLock has finished processing. There was also the facility to reactivate the SmartLock process should the signal change. The SmartLock is very comprehensive in its operation as it selects the baud rate, shift and signal polarity. I can assure you that this operation can take quite some time if you have to do it manually - I speak from experience.

The status line for RTTY reception was similar to that used for c.w. The parameters shown were:

Mode, code, baud rate, SmartLock, polarity, figs/lets and printer status. This clear display enabled the operator to quickly evaluate the status of the decoder.

For operating under difficult conditions the SmartLock could be locked once the signals parameters had been established. This prevented the SmartLock from re-analysing the signal under noisy conditions. The baud rates supported by the DM-1000 were 45, 50 and 75 baud, thus covering most of the common transmission types.

Where the signal type is known, it's generally quicker to use the manual mode and set the parameters yourself. The setting of these parameters had been kept very simple and, for most, all that was required was a single key-press to toggle the setting. Another useful feature was the inclusion of a baud rate check facility. When enabled this gives a read-out of the baud rate of the signal being received.

The DM-1000 included the facility to receive ASCII transmissions at 110 and 200 baud. However, as there are virtually no transmissions using these formats, the mode is unlikely to be used.

Simple To Operate

With the review model connected to my Icom receiver and a suitable video

SPECIFICATIONS

Dimensions:	292(w) x 148(d) x 50mm (h)
Weight:	1.1kg
Power Supply:	9-13V d.c. at 600mA
Options:	RS232C serial interface
	u.h.f. modulator
Environment:	10 to 40°C
	Humidity 5 to 95% non-condensing
Audio Input:	200mV to 10V p-p 5kΩ
Video out:	Composite video 1V 50Ω
	80/40 characters/line
	25 lines
	50/60Hz operation
Expansion:	DMC COMNET port

Abbreviations

c.w.	continuous wave (Morse)
d.c.	direct current
Hz	hertz
kg	kilogrammes
kΩ	kilohms
mA	milliamperes
mm	millimetres
mV	millivolts
p-p	peak to peak
RTTY	Radio TeleTYpe
u.h.f.	ultra high frequency
V	volts
w.p.m.	words per minute
°C	degrees Celsius
Ω	ohms

monitor (borrowed from the Editor - thanks Dick), I was ready to decode. The DM-1000 lived-up to my expectations, proving very simple to operate. All you had to do was select either RTTY or c.w., tune into a signal and wait for the SmartLock to do its job. In most cases this took around five seconds which I thought was quite acceptable. You could also keep a check on what SmartLock was trying by watching the status line at the top of the screen. When tuning to a station where you know the format, it was worth switching to manual to speed up the process. Once you'd selected the baud rate, the only other variable was the polarity, this could be changed with a single key-press.

The DM-1000's ability to resolve difficult c.w. signals was very good and it was able to quickly lock onto most signals. The only exception being the amateur transmissions I mentioned earlier.

Although the tuning indicator was useful, its response took a little getting used to. This was because it responded to the decoding software rather than the signal direct. This put in a delay between a change of receiver tuning and the display responding. This minor disadvantage was offset by the very wide tuning tolerance of the DM-1000.

Conclusion

The DM-1000 has proved itself to be a very compact and capable decoder. It will have particular appeal to the newcomer due to its ease of use. The provision of just c.w. and RTTY modes has the advantage of covering most decodable transmissions, whilst keeping operation simple.

The use of software decoding also has advantages as the decoding modes and facilities can be upgraded by a change of software. This means that the DM-1000 should be able to keep up with new developments, thus giving the unit a longer life.

The DM-1000 is available from **Dewsbury Electronics**, 176 Lower High Street, Stourbridge, West Midlands DY8 1TG. Tel: (0384) 390063, price £199.95. My thanks to Dewsbury for the loan of the review model. ■

Starting In Data Mode

This article is intended to start you on the interesting hobby of listening to data mode transmissions. The range of decoding systems available is very comprehensive, catering for all tastes and budgets.

Let's start with a look at the type of receiver you will need.

Receivers

The minimum requirement is a short wave receiver that's capable of receiving single sideband signals. The range of receivers that fits the bill is understandably very large. At the bottom end there are receivers like the Panasonic RF-B45 that was reviewed last month. If you've a large budget there are many fine receivers to whet the appetite. The current leaders are the Drake R8E, JRC NRD-535, Icom IC-R71E, Yaesu FRG-8800, Kenwood R-5000, Lowe HF-235. If you're into real big money then the Icom IC-9000 at 4000.00 is a top of the range receiver. In between these extremes are a host of very respectable receivers. If you like to buy British, then the Lowe HF-150 and HF-225 are fine performers.

Although s.s.b. reception is the key feature for utility listening, there are one or two other parameters that can make life a lot easier. The first of these is the size of the tuning steps. Some of the popular signals, such as amateur RTTY, marine Telex and l.f. FAX use narrow shifts of 200Hz or less. This narrow shift means that accurate tuning is essential. If the smallest tuning steps on your receiver are 100Hz you can see that it would be very difficult to accurately tune one of these signal. Ideally you need a receiver with tuning steps of about 20Hz or less. However, if your receiver is fitted with a b.f.o. this can be used to bridge the gap where the tuning steps are wide.

With all utility signals, good filtering can produce significantly improved results. There are various types of filter but these can be broadly divided in to audio and r.f. filters. The r.f. filters form part of the receiver and may be switchable to give different bandwidths. The range of filtering options need to be carefully considered when selecting a receiver. In the vast majority of cases it's only the more sophisticated receivers that offer a choice of bandwidths. Some of these manufacturers include a range of filters as standard whilst others can supply them as optional extras. For utility listening I would recommend the following: 500Hz, 1.8kHz and 2.4kHz as being desirable in a sophisticated monitoring receiver.

With audio filters the listener has a much wider choice. This is because these filters can be mounted to the receiver so freeing the listener from dependence on the manufacturer. The prime function of the audio filter is adjustment of the audio bandwidth. It can also be very useful to have a variable notch filter. Two of the most popular audio filters are those from Datong and the BP34 from the makers of the Microreader, ERA Ltd.

Whilst still on the receiver, I ought to make a brief mention of antennas. the only difference between general short wave listening and utility listening is that of interference. Because all decoding systems use some form of computing power there is a higher level of potential interference than with a voice only station. If you're using a commercial self contained decoder, the increase is minimal. To minimise the effects of the interference it's generally advisable to choose an antenna with a screened down lead.

What Modes?

When thinking about joining the ranks of utility listeners, one of the first decisions you need to make concerns the modes you want to receive. There are a vast range of modes transmitted but fortunately the majority of decodable information is carried by just a small number. By far the most common is simple c.w. Despite it's simplicity, it's still used extensively by maritime operators. The next in popularity is RTTY which is used primarily for news agencies and weather data. The popularity of these two modes can be gauged by the fact that virtually every utility supplier caters for at least these modes. For those on a limited budget I would recommend starting with just RTTY and c.w. To be effective any program needs to be able to handle RTTY baud rates of 45, 50 and 75 with shifts of 170, 400 and 800Hz. For c.w. you need to be able to cope with speeds of between about 15 and 30w.p.m.

The next step up in receive modes is the Automatic Repeat ReQuest (ARQ) systems. Of these, the simplest and most common is the AMTOR and SITOR variants. From the listeners point of view, these two modes are the same. In simple terms AMTOR is the amateur version of SITOR. If you buy a decoder that can handle these modes you'll normally find that FEC is included. The difference between the two is that SITOR is used for links between two stations while FEC is a broadcast mode. This means it gets used to transmit traffic lists and the like.

If you've an interest in receiving weather charts and press photos, you need to consider a FAX decoder. I'll cover the various forms later, but you will need the following receive modes:

IOC288 and 576

Drum Speeds of 60, 90, 120 and 240r.p.m.

The next step up from the modes I've covered takes you into many advanced modes. If you are to be successful in receiving these you really need to have mastered the simpler modes first. One of the other snags with the more complex modes is that many of the stations spend many hours just idling with no traffic. even when they do transmit, the information is often encrypted. Despite these drawbacks, many listeners gain a great deal of pleasure from locating, indentifying and decoding these transmissions. Perhaps the most popular of these complex modes are ARQ-E, ARQ-E3 and ARQ-M.

Decoder Choice

This is perhaps the most difficult area for the newcomer. The first decision to be made is whether or not you want to get involved with computers. For most this is a simple and clear cut decision. If you don't have a particular interest in learning about computers I would suggest you avoid this route. This is because there are so many extra things that can (and will) go wrong. If your an enthusiast you'll learn a lot from getting the system going. Without this enthusiasm you could be in for a hard time! One of the most common problems with computer based systems is interference that can be very difficult to locate and cure.

If you've decided to avoid computers then you'll be looking for a stand-alone decoding system. One the most popular and well established is the ERA Microreader. This neat little unit provides automatic reception of c.w and RTTY using an internal liquid crystal display. The systems has been recently complemented with a large display to increase it's readability. To bring the unit right up-to-date they'll soon be expanding it to include SITOR. A new arrival in this market is the Easy Reader DM-1000 from Dewsbury Electronics.

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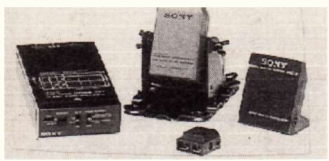

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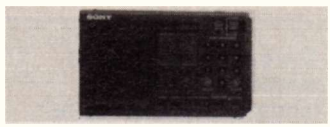

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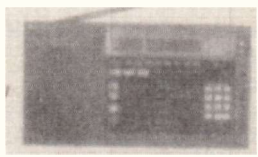

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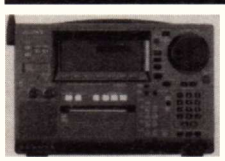

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Look up the review in this issue for more details.

Moving further up-market to the more sophisticated units, there are several to choose from. The Wavecom 4010 is certainly one of the market leaders with a very comprehensive set of receive modes. Unlike the Microreader the 4010 needs an external video monitor to display the decoding signals.

If it's mainly FAX you're interested in, the ICS FAX-1 is a very capable performer. This unit uses a printer as a display unit, so you'll need to take account of this in your budgeting.

At the top end of the self-contained FAX units is the AOR WX-2000 and ICS FAX-2. These two units are expensive, but provide top quality FAX images suitable for professional use. The FAX-2 has an added advantage as it can also receive RTTY and NAVTEX transmissions.

If you decide to go for a computer based decoding system there is a considerable choice available.

Technical Software have their popular RX-4 package providing RTTY, c.w., SSTV and AMTOR reception for many popular home computers. These include the BBC, Commodore C64, VIC-20 and Sinclair Spectrum. For more complex modes the BBC based RX-8 is a formidable contender.

Spectrum owners also have excellent support from J & P Electronics. At the top of their range is the RAMS IV package which provides RTTY, AMTOR, SSTV and c.w. reception.

There is not so much of a choice for Atari users but Grosvenor Software offer a RTTY, AMTOR and c.w. system.

For the widest choice of software the IBM compatible PC is the best choice. At the top of the range is the impressive Hoka Code-3 system. This features some twenty-four modes as standard, with many more available as optional extras.

For FAX reception both ICS Electronics and Comar Electronics provide sophisticated IBM based systems.

If you're looking for a good all round system at a modest price Grosvenor Software are well worth investigating. Their BMKMULTY package includes RTTY, AMTOR, c.w., SSTV and FAX.

There is also a very good range of public domain software available for IBM compatibles. This includes all sorts of utilities as well as some good basic decoding systems. A good starting point is the Public Domain Software Library.

Intelligent Terminal Units

These terminal unit offer an decoding system that's accessible to virtually all computer users. The Intelligent Terminal Unit contains its own microprocessor that handles all the decoding. The decoded output is then passed to the host computer via a standard serial port. The most famous of these is the AEA PK-232 which features RTTY, AMTOR, FAX, c.w., ASCII and Packet. The nearest competitor is the Kantronics KAM which features a similar range of modes.

Useful Addresses

Kelvin Hughes Ltd, Central Mail Order, Royal Crescent Road, Southampton, Hants SO9 1WB. Tel: (0703) 223772.

Grosvenor Software, 2 Beacon Close, Seaford, East Sussex BN25 2JZ. Tel: (0323) 893378.

Public Domain Software Library, Winscombe House, Beacon Road, Crowborough, Sussex TN6 1UL. Tel: (0892) 663298.

ERA Ltd., 5 Clarendon Court, Winwick Quay, Warrington WA2 8QP. Tel: (0925) 573118.

Technical Software, Fron, Upper Llandwrog, Caernarfon LL54 7RF. Tel: (0286) 881886.

J&P Electronics, Unit 45, Meadowmill Estate, Dixon Steet, Kidderminster DY10 1HH. Tel: (0562) 753893.

Hoka Electronics (UK), 26 Bury Road, Shillington, Beds SG5 2NY. Tel: (0462) 711600.

Klingenfuss Publications, Hagenloher Str 14, D-7400 Tuebingen, Germany.

Universal Shortwave Radio, 1280 Aida Drive, Reynoldsburg, OH 43068, USA.

Datong Electronics Ltd, Clayton Wood Close, West Park, Leeds LS16 6QE. Tel: (0532) 744822.

BARTG, Ann Reynolds, 169 Bell Green Road, Coventry CV6 7GW.

ICS Electronics Ltd., Unit V, Rudford Industrial Estate, Arundel, West Sussex BN18 0BD. Tel: (0903) 731105.

Comar Electronics, Unit 10, Samuel Whites Estate, Medina Road, Cowes, Isle of Wight PO31 7LF. Tel: (0983) 200308.

Dewsbury Electronics, 176 Lower High Street, Stourbridge, West Midlands DY8 1TG. Tel: (0384) 390063.

Abbreviations

AMTOR	AMateur Teleprinter Over Radio
ARQ	Automatic ReQuest repeat
ASCII	American Standards for Computer Information Interchange
c.w.	continuous wave (Morse)
FAX	facsimile
FEC	Forward Error Correction
Hz	hertz
kHz	kilohertz
l.f.	low frequency
r.f.	radio frequency
RTTY	Radio TeleType
SITOR	Simplex telegraphy Over Radio
SSTV	Slow Scan Television
w.p.m.	words per minute

Summary

As I hope you can see from this article there are many routes to utility monitoring. The golden rule is to try before you buy wherever possible. The ideal way to do this is to visit one of the many radio rallies that are held all around the country.
If you do decide to take the plunge, don't forget to keep an eye on my Decode column for all the latest news and products.

The Golden Years

The early Thirties were undoubtedly the golden years of broadcasting. The tedious business of adjusting the cat's whisker and getting used to ear phones had been abandoned and the 'wireless set' had become an essential part of the furniture. The valve had evolved to screen grid and pentode, which resulted in making reception louder and certainly more stable. In fact, as Stan Crabtree G3OXC explains, people were becoming accustomed to 'armchair listening'.

Amongst a nation of listeners, a few were keen to delve deeper into the intricacies of wireless and attempt to construct their own radio receivers. To these there was one idol - John Scott-Taggart.

From the early Twenties to the beginning of WWII, Scott-Taggart contributed some 500 articles to the popular technical press, starting with his first published design the ST100, sporting two valves in 1925.

He produced on average one design a year, each incorporating the new techniques in wireless as they were being developed until the appearance in 1937 of the ST900 with five valves.

Probably the best remembered were his ST100 and ST300 receivers that were fully covered in the mid-1930s in *Popular Wireless and TV Times*.

Full constructional details were given in all his designs, the 'bread-board' technique of the wiring being shown in illustrations and photographs. Layout was more leisurely and spaced out at this time as there was no need to compress everything to meet the needs of miniaturisation.

Inter-valve wiring did not necessarily travel via the most direct route. It was aesthetically pleasing to form the heavy gauge wire into right angles, following perhaps more rigidly the schematic circuit diagram. Resistors were often fitted into 'holders' and valves and condensers were supplied with screw terminals and connected by wrapping wire ends round the screws and tightening them with a knurled nut.

With the exception of valve cans, no one seemed to be bothered by screening.

John Scott-Taggart holding one of his designs.

Fullest Instructions

Scott-Taggart's articles contained the fullest instructions; even the template of the tuning dial was supplied; with all the then European broadcast stations printed on it. And for those with the time and inclination to go deeper into the subject he produced his *Manual of Modern Radio*. From its publication in late 1934 this book became the bible for all seriously minded wireless enthusiasts.

John Scott-Taggart was born in Bolton in 1897. In addition to a grounding as an electrical engineer he also qualified as a barrister at law at University College, London. He became head of the Patent Department of the Radio Communication Company in 1920 and in 1922 founded the Radio Press Ltd.

Between 1918 and 1934 he took out 30 patents in his own right relating to radio circuits in general and more specifically to aspects of valve manufacture. He became involved in RAF radar training during the early part of WWII and was awarded the OBE in 1975 for 'Services to Radio Engineering'.

In the preface to *The Manual of Modern Radio* the author stated that it was assumed the reader knew nothing whatever about radio or even electricity. An adequate understanding of radio could be achieved without a course in physics, chemistry and mathematics it was claimed. And Scott-Taggart went on to prove just that. Apart from some graphs showing valve characteristics (which were clearly explained in the text) there was no mathematical treatment. Even Ohm's Law was described simply as: 'The relationship between current, e.m.f. and resistance'. In some 380 pages, aided by 541 drawings Scott-Taggart went on to lay bare the theory, practice (and at that time the mystery) of radio reception.

Basic Background Knowledge

The writing may be considered 'middle-class' - which is understandable as the author was the son of a consulting engineer. It was written for that portion of the population who were genuinely interested in wireless and prepared to spend their leisure time acquiring basic background knowledge that would enable them to build their own radio or radio-gramophone. The

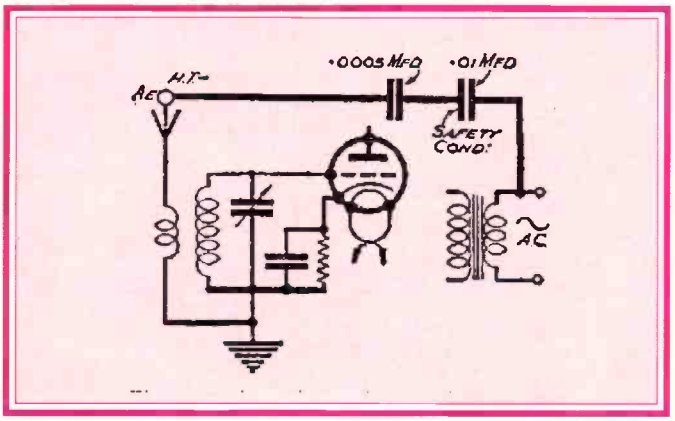


Fig. 1: Small circuit diagram showing aerial source from mains transformer.

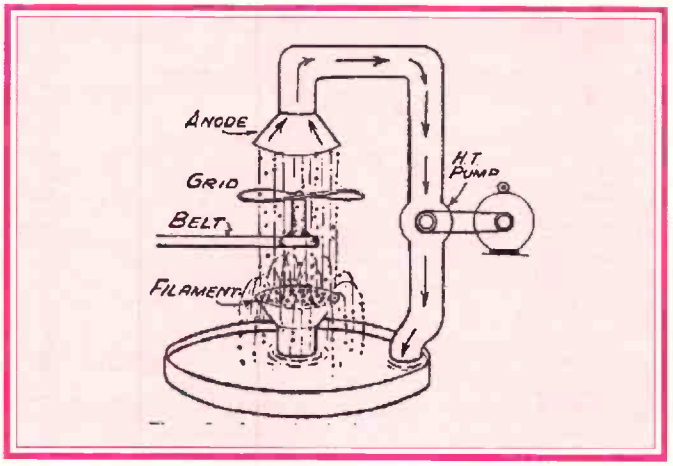


Fig. 2: A mechanical analogy explaining the action of the triode.

writing contrasts with the ease of style and 'user friendliness' of the F J Camm manuals that were to follow a few years later. But they were really for a different group of hobbyists. Whereas Camm's books appealed to the masses with straightforward, get-up-and-go text profusely aided by diagrams, Scott-Taggart's instructions were for the thinking man who perhaps wanted to know not only 'why' but 'how' a circuit worked.

Modesty was not one of Scott-Taggart's attributes, as those who recall some of his magazine articles may remember. Some of the introductory paragraphs in *The Modern Manual of Radio* are an example of his self-esteem.

'Between the stiff covers of this manual will be found a summary, supplemented by criticism when it has been found necessary, of the whole modern techniques of broadcast reception'. He later advises: 'Only very occasionally, if he reads from cover to cover, will he (the reader) have to leave a paragraph to a second reading'.

Easier to Digest

However, his descriptive text was far easier to digest than many academic textbooks of the era and he did have the knack of being able to explain wireless in the clearest of terms. And this without undue verbiage.

His *forte* was the thermionic valve and an example of his technique shows his use of a mechanical analogy to explain its operation. The triode is represented as a fountain (filament) with water being sprayed through a rose (space charge). When a pump is brought into action (h.t. supply) some of the water is sucked up to a funnel (anode) and ultimately goes back through pipes to the trough of the fountain. The grid was shown as a belt-driven propellor or fan which could either produce an updraught to help the water (positive charge) or a downdraught to hinder the flow (negative bias).

One or two recommended practices in the book, it must be admitted, would be frowned upon today. But they simply show the approach that was taken at this time.

One technique, of using the mains wiring as an aerial is certainly questionable and would appear to be downright dangerous. A set was described in which the feed to the aerial terminal of the receiver is taken from one side of the primary winding of the mains transformer through a capacitor. The reader was

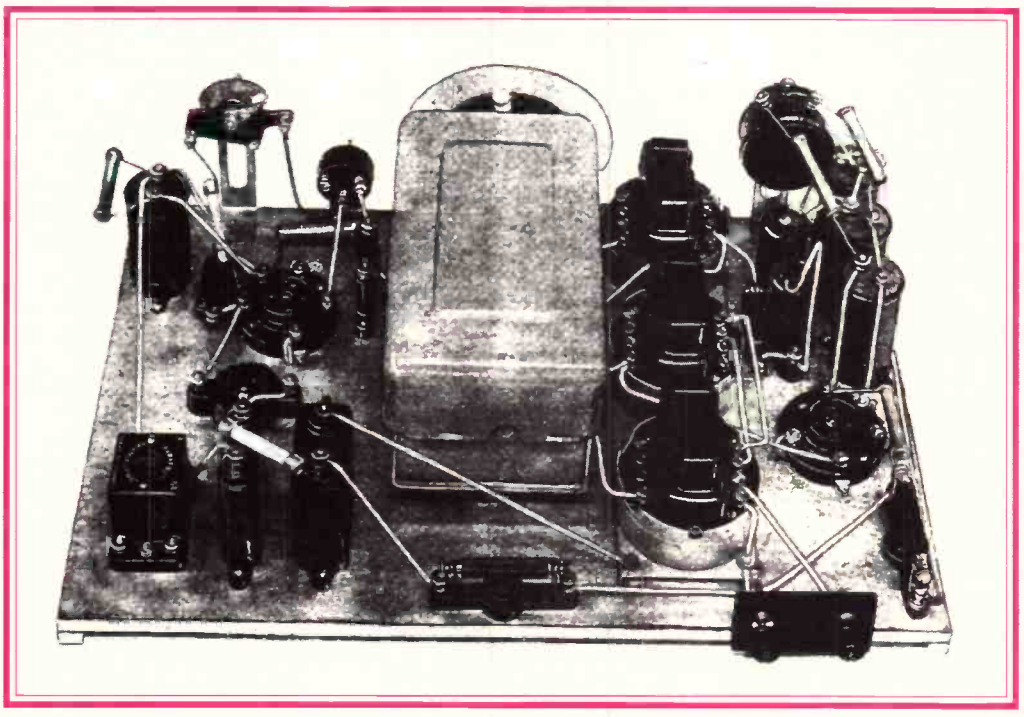


Fig. 3: A 'modern receiver' showing bread-board wiring techniques.

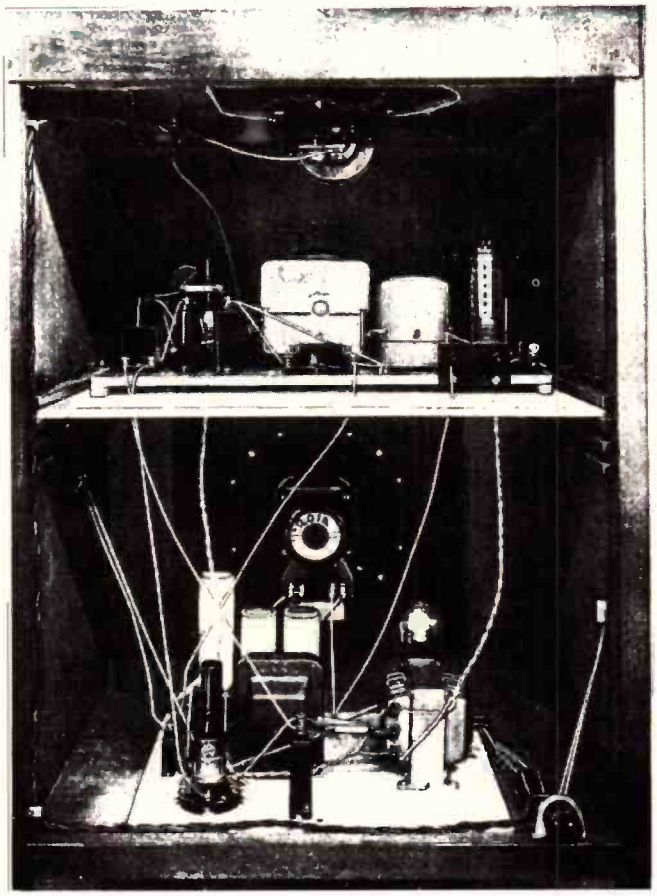


Fig. 4: The 'modern receiver' arranged as a radiogram.

warned that 'the condenser has to be flawless as regards insulation!' And to reassure the faint hearted it mentions that sometimes two condensers in series could be used for extra safety.

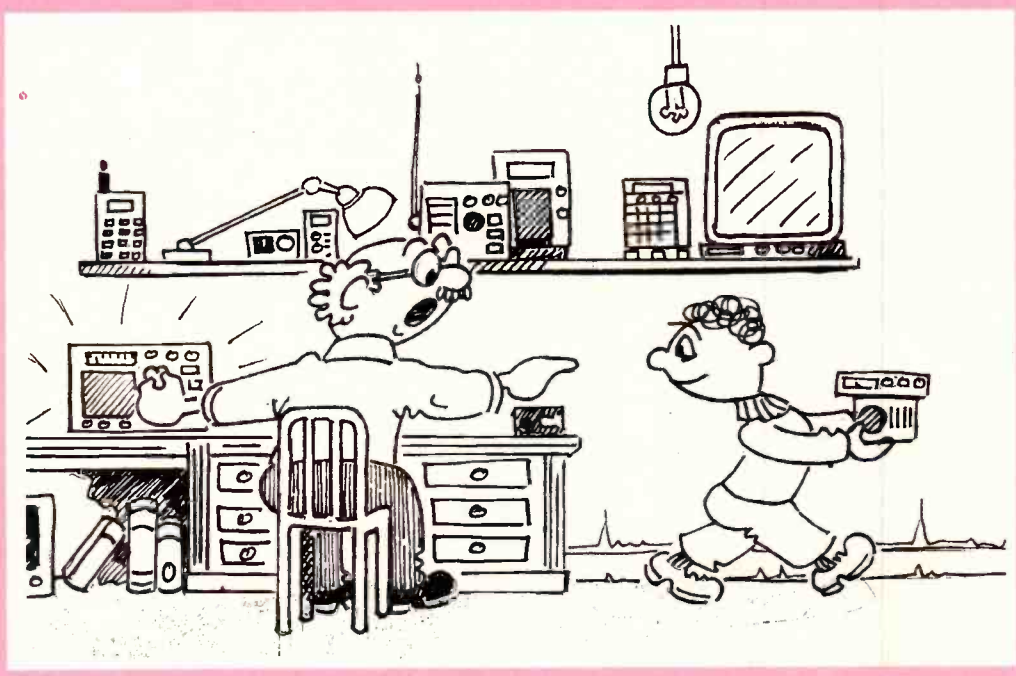
It is interesting to read of the latest inovations at this time. Short wave reception below ten metres; Iron core tuning inductances (i.f. transformers); the metal valve and the electrolytic condenser. Mention is also made of the 'Westector', developed by the Westinghouse Company and apparently the first metal rectifier to be used as a detector in a receiving circuit.

The Manual of Modern Radio is by no means rare and should be obtained for around £10 at the right bookshop. It is a joy to read even if only to reminisce about times and circuits long gone. For the older generation it may recall the first two-valver that was built with reaction control and probably explain to them some techniques that they were possibly a little hazy on (but reluctant to admit).

Undoubtedly the writings of John Scott-Taggart put many on the right road to an understanding of wireless as a hobby and possibly paved the way for a few to a career in the radio industry. ■

Listen With Grandad

By Leon Balen and David Leverett



Quick! Tell Grandma to 'phone your Uncle Jim and warn him that if he hasn't renewed his TV Licence yet, the detector van has just turned into his street!

Enjoy the antics of our newest addition to the* Short Wave Magazine *staff. 'Grandad' and his family will be appearing regularly from now on.

Do you relate to any of the situations the old chap gets into? If so then why don't you let the Editor know, there must be loads of strange and funny experiences you could share with our readers. £5 SWM Gift Vouchers for any published.

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Includes free AC supply aerial and case!

The classic portable for those on the move who want to keep in touch with the world broadcasts. In addition it gives good reception of SSB and is a travellers joy! All our stocks are genuine UK Sony.

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USB/LSB/CW/AM (sync) 30kHz-30MHz 12vDC/230V AC

NEW

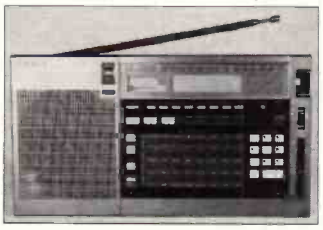
The HF-150 receiver is a high performance short wave receiver that we can recommend for those on a budget. Make no mistake, this receiver really does perform. Give us a call for more information.

SONY ICF-2001D £289

150kHz-30MHz + FM + airband USB/LSB/CW/AM (sync)

Includes free universal AC adaptor

If you want a truly portable communications receiver that performs as well as base station models yet fits into the domestic scene, look no further. At £399 it would be good value. At £289 it's an absolute bargain.



SONY ICF SW77 £349

150kHz-30MHz + stereo FM AM/SSB/CW

The SW-77 is the latest short wave portable from Sony. It integrates computer technology to provide a programmable data base of station names in its memory bank. Also included are 5 different timers and 162 preset stations. Fabulous!

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YUPITERU VT-150 £169

142-170MHz FM

Includes ni-cad pack and charger

The VT-150 is a purpose designed scanner that covers the marine, and 2 metre amateur band plus a bit more! There is no doubt that a scanner dedicated to a particular part of the radio spectrum will out perform one that is designed to cover everything. If your interest is in this frequency range, look no further. It's loaded with features including 10/12.5/25kHz steps, 30 memories, fast scan speed ultra sensitive front end, low battery drain, etc. It is supplied complete with re-chargeable batteries, AC charger, aerial, carry strap and handbook. A full 12 month's warranty is also included. ▶

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1MHz-1300MHz FM/AM/WBFM

Includes ni-cad pack and charger

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Specification:

Modes:	AM/Narrow FM/Wide FM
Steps:	5, 9, 10, 12.5, 20, 25, 30, 50, 100kHz
Antenna:	50Ω BNC
Supply:	6-15V DC (Internal 9V AA)
	24mA (Battery save.)
Dimensions:	110 x 53 x 37mm
Weight:	370g
Configuration:	AM/FM Triple conversion
Sensitivity:	NBFM -8dB (12dB SINAD)
	AM -2dB (10dB S/N)
Memories:	100 in banks.

UK "Gold Seal" Warranty Now With Every Unit Look for the sign on the box!

Up until now most handheld scanners have been large and cumbersome with low grade plastic cases using technology that has been around for several years. The arrival of the ALINCO DJ-X1 has changed all that. This brand new receiver is ruggedly built, compact, and above all, ultra sensitive. ALINCO are the first major manufacturer of communications equipment to produce a new generation of scanning receiver. All of a sudden its competitors seem drab, old fashioned and lacking in sparkle and performance.

The new exciting DJ-X1 should be available now at your local dealer. Try it out for yourself, experience the superior design and performance. Compare it with "yesterday's" models and find out just how far advanced the new ALINCO scanner is! But just to whet your appetite, here's a few of its features:

★ 3 scanning speeds ★ 3 scanning modes ★ 100 memories in 3 banks ★ Auto memory loading ★ Priority channel ★ Dual rate battery saver ★ Large battery pack ★ Rotary frequency control ★ Illuminated key pad ★ Auto illumination mode ★ Dual antennas ★ 5 programmable bands ★ Widest range of frequency steps ★ Super front end sensitivity ★ Memory lockout ★ Mode scanning ★ Auto power off ★ Wide range of battery packs ★ Wide range of accessories ★ Intelligent mode programme ★ Rapid tuning rates of 1MHz/10MHz.

***Each unit now comes with the UK Gold Seal Warranty. Look for the sign on the box!**

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22 Main Road, Hockley, Essex Tel: (0702) 206835

SWM TEST REPORT

Yupiteru VT 225

Airband Scanner

Chris Yates has been putting the latest airband scanning receiver from Yupiteru through the mill and reports on what he found in this exclusive test report.

There are airband receivers and airband receivers, but Yupiteru equipment is very much in a class of its own. Like Signal before it, I think that the name is destined to become synonymous with the best in aviation receivers.

That may sound a little over optimistic but it is a comment sure to be echoed by the many owners of the VT 125. This impressive hand-held first appeared on the UK market some eighteen months ago and has been a firm favourite ever since. Despite its small size the VT 225 packed a powerful punch with full a.m. coverage of all 200 navigation and 760 communication channels between 108.000 and 137.000MHz - plus a goodly portion of the adjacent p.m.r. band - with exceptional sensitivity. But, given this extended range, I could never understand why Yupiteru hadn't provided it with the ability to resolve f.m. signals, or for that matter, included the military allocation 225.000 to 399.000MHz. I need muse no longer, the soon to be introduced VT 225 provides all that and more.

First Reaction

Everything about the VT 225 smacks of quality engineering. the smart styling, positive feel key pad and superior sound quality are all indicative of a well thought out, well made machine. For the serious airband enthusiast this is very definitely the machine to have. At first glance the Yupiteru VT 225 differs little from its predecessor, the VT 125. Actually it is a touch wider and longer, the multi-function l.c.d. display and keypad have shifted to the right and there are five extra buttons to control scan, search, squelch override, key lock and the backlight. It has been billed as a v.h.f./u.h.f. airband receiver covering both the civil and military frequency allocations, but in a thoughtful move, the company have added an extra band - 149.500 to 160.000MHz. The international marine allocation forms a part of this band, making it possible to listen to communication between helicopters, lifeboats and ships during air/sea rescue missions - a very definite plus for those of us who eavesdrop on such activities. Of course, that dictates the VT 225 should be able to resolve n.f.m. signals. Although the Japanese handbook seems to suggest this is only possible from 108.000 to 160.000MHz, it is, in fact, feasible to select a.m. or f.m. throughout many of the military channels as well! Sales of early VT 125 receivers were restricted because they only allowed reception in 50 or 100kHz steps, making it impossible to hear such transmissions as Manchester Tower on 118.6215MHz. That was quickly corrected with the introduction of a MkII version and now Yupiteru have gone overboard with the provision of fully selectable 10, 12.5, 25, 50 and 100kHz steps on the VT 225. All that and an enlarged memory that can store 100 frequencies together with mode, step size and so on, makes this a very versatile hand-held indeed.

Powering Up

User friendly is a much overworked phrase, but it applies in every sense to the VT 225. in fact, getting on the air can be as simple as switching on and entering the first frequency.

There is very little in the way of complex programming, no need to physically switch between bands and the 16 dual-function, front panel keys are laid out in a logical fashion that is very easy to understand. What to listen to is very much a matter for personal choice, but for the purpose of this review I looked at two distinct areas of civil aviation - airways and airport control.

Living directly underneath the intersection of several major airways - Amber One and Blue One amongst them - and with an international airport almost on the doorstep, that dictates a fair degree of number punching on less well specified equipment than the VT 225. However, with the VT 225's ability to store up to 100 frequencies in memory, it was possible to enter all audible channels - some forty of them - and simply scan for activity.

The memories are arranged in banks of ten and whilst it is possible to scan all of them in one go, a useful feature allows the user to specify which bank or banks he wishes to monitor. With that in mind it was feasible to store airport and approach frequencies in two, whilst using the remainder for airways control, switching between them at will.

Band Write is the only confusing function on this receiver. At first glance it appears to be an autowrite facility, but allows occupied channels discovered during the frequency search to be downloaded into memory for scanning at a later time. It isn't, and therefore needs further explanation.

Most airband and scanning receivers have a limit function that allows the user to define lower and upper parameters of a frequency search. on the Yupiteru VT 225 this function is called 'Band Write'. It allows up to ten search bands to be committed to memory, but the

programming required to do his is, to say the least, somewhat complex and longwinded.

To make use of this facility it is first necessary to program mode, step size and lower frequency, then prod the FUNCTION key, followed by BAND WRITE and enter the upper frequency and band number (1 to 10).

At this point things got confusing because nothing actually happened! Only a degree of detective work revealed that it was important to select band number and search before the VT 225 sprung into life and went calmly about its business.

Aside from the normal air/ground/air communications activities, the civil aviation frequency allocation is crammed full of almost continuous Atis, Volmet and Oceanic Track broadcasts, not to mention some very peculiar noises.

To avoid locking onto these transmissions whilst searching for activity it is possible to command the receiver to ignore them by using the Pass function. That also applies to scan mode where individual channels can be locked out.

Programming errors are dealt with very easily. Corrections are made with a prod of the C/AC button using the UP/DOWN keys to select the offending digit and then simply inserting the correct number, followed by the ENTER command.

As with most airband receivers and scanning equipment the VT 225 has a priority function. Held in memory zero, I invariably leave this monitoring the international distress frequency 121.500MHz - a practice that has resulted in some fascinating and occasionally harrowing listening.

On Air

Whilst the majority of these features are now de rigeur amongst better quality high priced equipment, the Yupiteru VT 225 stands apart from the rest in its performance on the air.

The quoted 0.5µV sensitivity figure is very much on the conservative side - a fact evidenced by its ability to pull in transmissions inaudible on other equally sensitive equipment.

that resulted in my being able to monitor aircraft cruising at 33000ft out to the FIR boundaries with Denmark, Holland and France at S2, S5 and S5 respectively on the built-in signal strength indicator and using a loft mounted dipole cut for the civil airband.

Living in the low Pennines presents particular problems when using equipment with the helical antenna supplied. However, here too the VT 225 performed admirably well under adverse conditions.

With Manchester International Airport some 56km away, many of the receivers I've road tested over the years failed to bring in even a glimmer of activity from controllers, but this machine allowed me to hear both sides of the conversation with reasonable clarity.

Turning to the military allocation a fast search through the lower part of the band revealed some fascinating activity. The Red Arrows exercised with air to air comms on 243.450MHz, whilst a succession of USAF Military Airlift Command flights could be heard in communication with Eastern Radar (285.900MHz).

Sensitivity was equally good at u.h.f. with traffic monitored descending into Valley, Finningly, Fairford and Mildenhall to name but a handful of airfields.

In fact, in terms of sensitivity the VT 225 compared favourably with the grand-daddy of aviation receivers - a Signal R535 - which I've often used to monitor Shuttle activities with a suitably cut crossed dipole.

That being the case, I couldn't help wondering whether it would perform equally well, but with no mission flying during the review period it was not possible to find out.

Whilst a.m. or n.f.m. is readily selectable throughout the receiver's v.h.f. range, at u.h.f. narrow band f.m. is locked out in four specific frequency bands - 253.000 - 255.000MHz, 262.000 - 266.000MHz, 271.000 - 275.000MHz and 380.000 - 382.000MHz. These are mobile telephone allocations in Japan and I understand that the importers, Nevada Communications, have arranged with Yupiteru to have these restrictions removed on VT 225s intended for the UK market.

Conclusions

One final and pleasing aspect of the VT 225 is the quality of sound reproduction. In such small receivers this is very often compromised by lack of space for a reasonable speaker arrangement. By ingenious design the VT 225 suffers none of the afore mentioned drawbacks and sound reproduction is on a par with, or even better than, many of its larger and somewhat more expensive brethren.

That, together with a well thought out list of features comparable with top flight equipment, makes the Yupiteru VT 225 both a pleasure to use and own.

The receiver comes complete with its own helical antenna, a set of four 1.2V NiCads, charger, external power cord, earphone and carrying strap. At £229 including VAT it is worth every single penny. Thanks are due to Nevada Communications for the loan of the very first unit into the country. ■

SPECIFICATIONS

Frequency Coverage:	108.000 - 142.000MHz 149.500 - 160.000MHz 222.000 - 391.000MHz
Step Size:	10, 12.5, 25, 50 & 100kHz
Modes:	a.m. & n.f.m. (see text)
Sensitivity:	a.m.: 0.5µV (S/N 10dB) f.m.: 0.5µV (SINAD 12dB)
Antenna Impedance:	50Ω (b.n.c. socket)
Power Requirements:	Internal: 4 x 1.2V NiCad cells. External: 12V d.c. or Mains power unit
Current Drain:	150mA. 60mA charging.
Audio Output:	100mW (4.8V into 8Ω for 10% t.h.d.)
Dimensions:	559 x 147 x 38mm.
Weight:	280g.

propagation

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

Please remember that, under normal circumstances, radio or television signals transmitted within the v.h.f. Bands II (88.5-106MHz) and III (175-230MHz) and the u.h.f. Bands IV (471-608MHz) and V (615-856MHz) have a limited range and travel, line of site, through the troposphere. As you know, the latter, being the home of the earth's weather, can cause signals to increase their range considerably when certain changes, linked to high atmospheric pressure, take place.

With this in mind, I suggest that you read the following Band II reports in conjunction with the tropospheric section in my 'Television' column elsewhere in this issue and don't forget that tropospheric-openings may be fine for DXing, but, because the v.h.f. and u.h.f. bands are shared between a multitude of stations, the domestic listener or viewer may be enduring interference from other stations while these conditions prevail. In recent years broadcasters have helped to limit the grumbles by explaining the cause of such interference in their weather reports.

	December						January																				
Beacon	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
DF0AAB	X	X	X		X			X	X	X	X	X	X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X	X
DK0TEN																															X
DL0IGI	X	X	X		X		X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X
EA3JA	X	X						X	X	X	X	X	X		X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X
HG5GEW		X					X	X								X	X		X				X	X		X		X		
IY4M	X	X	X		X	X		X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X
KC4DPC	X	X	X					X	X	X	X	X	X	X	X	X			X	X	X	X	X		X	X	X	X	X	X	X
KD4EC	X		X		X			X	X	X	X	X	X	X	X	X			X	X	X	X	X		X	X	X	X	X	X	X
KF4MS	X	X						X	X	X	X	X	X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X	X
KJ4X	X		X			X		X	X	X	X	X	X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X	X
KW7Y									X			X	X																		X
LA5TEN		X						X												X											
NX20	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X
N2JNT	X		X					X	X	X	X	X	X	X	X	X				X	X						X	X	X	X	X
N4MW			X					X	X	X	X	X	X	X	X	X			X	X	X	X	X			X	X	X	X	X	X
OK0EG										X				X																	
OH2TEN	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
PT8AA	X	X			X			X	X	X	X	X	X	X	X	X				X	X					X	X	X	X	X	X
PY2AMI	X	X			X	X		X	X	X	X	X	X	X	X	X		X	X	X	X	X			X		X	X	X		
SK5TEN	X	X						X			X				X	X	X			X	X		X			X	X	X	X		X
VE1MUF											X	X	X								X										
VE2HOT	X		X											X	X	X					X	X	X			X		X			
VE3TEN	X	X	X					X	X	X	X	X	X	X	X	X			X	X	X		X		X	X	X	X	X	X	X
VK2RSY	X	X				X			X			X			X	X		X	X	X	X			X	X			X	X		
VK5WI																															X
VK6RWA																															X
VK8VF	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X		X	X	X			X	X		X
WA4DJS		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X
WA6APQ	X				X	X	X					X	X	X	X	X											X	X	X	X	X
WB4JHS								X	X																						X
WC8E	X	X	X		X			X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X		X	X	X	X	X	X
WJ9Z								X	X	X	X	X	X	X	X	X			X	X	X	X	X			X	X	X	X	X	X
W3VD	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			X	X		X	X	X	X	X	X	X	X	X	X	X
W8UR	X												X	X	X	X						X					X	X	X	X	X
W9UXO	X							X	X	X	X	X	X	X	X	X			X	X	X	X	X			X	X	X	X		X
YO2X		X	X			X	X	X	X			X			X	X			X	X	X	X	X		X	X	X	X	X		X
ZS1LA		X			X			X	X		X		X		X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X
ZS6PW	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Z21ANB	X	X	X		X	X	X	X	X	X	X	X						X													
5B4CY	X	X	X		X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X

Fig. 2.

Tropospheric

The predominantly high pressure and the persistent frost and fog in January and early February contributed to the tropospheric conditions which opened Band II on several occasions. **George Garden** (Edinburgh) heard a short repetitive tune played fairly rapidly around 88 and 104MHz throughout the evening of the 10th and wonders if it was some sort of radio-beacon being propagated by the lift. **Simon Hamer** (New Radnor) received stations from Belgium, Germany and Holland on February 3. **Andrew Jackson** (Birkenhead) received programmes from Holland (NOS1) on the 29th. **Michael Larsson** (Cheadle) logged BBC (Yorkshire) and a German station on the 2nd, programmes from France, Germany, Ireland and all Scandinavian countries on the 3rd, France, Germany, Norway & Sweden on the 4th, France, Germany, Ireland (Century) and all Scandinavia on the 9th, BBC (Wales), Denmark & Ireland on the 14th, BBC (Derby & Humberside) & Ireland on the 15th, Ireland on the 16th, BBC (Wales), Germany & Holland (NOS2) on the 21st, BBC & Radio Cymru (Wales) on the 24th, France on the 26th, Aire FM (Leeds), BBC (Wales), Germany & Ireland on the 28th, BBC (Yorkshire), Holland & Ireland on the 29th, BBC (Wales) & Holland on the 30th and BBC & Radio Cymru (Wales), Germany & Holland on the 31st. But now to the sun and other activity in the earth's atmosphere.

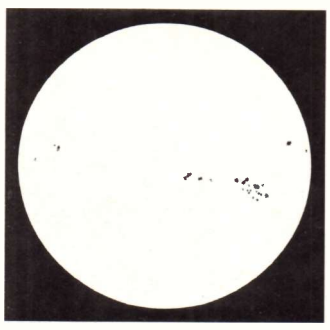


Fig. 1: Patrick Moore's drawing of a cluster of sunspots observed on 3 January 1992.

Solar

Ron Livesey (Edinburgh), using a 2.5in refractor telescope and a 4in projection screen, located 4 active areas on the sun's disc on December 8, 24 & 26, 5 on days 9, 23, 27 & 29 and 6 on the 4th, 10th, 11th & 13th. **Patrick Moore** (Selsey) made a drawing of the 'cluster' of sunspots that he observed at 1015 on January 3, **Fig. 1**.

With his spectrohelioscope at his observatory in Sevenoaks, **Cmdr Henry Hatfield** located 4 sunspot groups, 14 filaments, a 'hedgerow' prominence on the NE-limb, a medium 'mushroom' prominence on the SE-limb and 4 other quiescent prominences at 1235 on the 10th, 3gps, 14fs & 7qps at 1210 on the 21st and, despite high cloud, he observed 4gps, 17fs & 9 small qps at 1240 on February 3. Also on the 3rd he noted that the two groups near the W-limb and a long chain group near the E-limb were both active. Henry's 136MHz radio telescope recorded individual bursts of solar noise on January 13 & February 2 and continual noise storms on January 31 & February 3. **Tony Hopwood** (Worcester) recorded 'juicy' solar flares at 1302 on the 14th and at 1910 & 1632 on the 28th & 30th respectively. Tony found propagation unusual from the 22nd and said, "there were periods before noon and after sunset when the m.u.f. (maximum usable frequency) jumped to well over 20MHz giving enhanced h.f and v.h.f. reception, including TV and radio signals in the 70MHz band".

Auroral

In December, Ron Livesey, the auroral co-ordinator for the British Astronomical Association, received reports of 'glows' for the overnight period on days 1, 10, 12, 16, 26 & 28, 'arc or band' on the 1st & 10th, 'rayed arc' on the 27th, 'rayed bundles' on the 27th & 29th, 'active, moving and pulsating' on the 9th, 27th & 29th and 'coronal' or 'half sky' on the 29th from observers ranging from Southern England, through Scotland to Goose Bay in Canada. The 'ray bundles' were seen from Hampshire and Sussex on the 27th. Auroral reflected radio signals were copied by Tony Hopwood, in the 144MHz band, on December 27. **Doug Smillie** (Wishaw) heard them weakly on the 2nd, 17th & 28th.

For the benefit of newcomers, auroral reflected c.w. signals sound like a low pitched 'rasp' and s.s.b. transmissions are best described as a 'ghostly' whisper. The pitch of the former is often so poor that in radio terms it is simply described as tone-A. Doug compared his radio-aurora reception for 1990 and 1991 and found far more activity in the latter year with peaks of 12 days in June and over 10 in October & November. **Gordon Foote** (Didcot) heard the German beacon DK0WCY (10.144MHz) give a weak auroral warning on January 13. "It's remarkable how consistently readable this beacon proves to be", said Gordon, who seldom missed it during his daily observations last year.

Magnetic

The various types of magnetometers used in December by Tony Hopwood, **Karl Lewis** (Saltash), Ron Livesey, **David Pettitt** (Carlisle) and Doug Smillie recorded between them magnetic storm conditions on days 1, 2, 4, 9, 10, 13, 16, 17, 18, 20, 27, 28, 29, 30 & 31.

Propagation Beacons

Finally, my thanks to Gordon Foote, Henry Hatfield, **Ted Owen** (Maldon), **Fred Pallant** (Storrington), **Ted Waring** (Bristol), **Ern Warwick** (Plymouth) and **Ford White** (Portland) for their 28MHz beacon logs which, when amalgamated, enable me to prepare the chart seen in **Fig. 2**. Fred Pallant and Ern Warwick heard the German beacon DK0TEN (28.257MHz) on January 25 for the first time in a long while. Henry Hatfield remarked that EA3JA was 'very loud' on January 12 and Tony Hopwood reported 'good reception' at times from WWV (Boulder) on 20MHz up to 2100.

ssb utility listening

Graham Tanner, 42 David Close, Harlington, Middlesex UB3 5EA.

Thanks for all the letters, especially those commenting on my first column. The February offering was completed in about eight days, those since have had the benefit of much more time and more information from readers. Peter is on the mend, and well on the way to a full recovery; he may be back in 'the hot seat' by the summer.

G5RV

Of the dozens of letters that I have received, at least a third of them have asked, "What is a G5RV antenna?"

The G5RV was designed at least 40 years ago, and is principally a transmitting antenna for use on all the h.f. amateur bands, but it works equally well across the whole of the h.f. spectrum when connected to a good receiver through an a.t.u. It is basically a long-wire dipole 31m long, which is fed by 10.3m of 300Ω ribbon cable feeder. The top of the ribbon cable connects to the centre of the dipole, one side of the ribbon cable connects to one 'leg' of the dipole, and the other side connects to the other 'leg'. At the bottom end of the ribbon cable is a balun to convert the 300Ω feeder to 50Ω to match standard coaxial cable. The whole antenna should be installed as high as possible, and as straight as possible, with the ribbon cable hanging vertically.

They are simple to make yourself, the only difficult part being the balun. The parts should cost about £10 - 20, but then you have to build it yourself. A far better idea is to visit you local amateur radio dealer, where they usually only cost about £15 - 20 anyway.

Several letters commented on the way my G5RV is installed in my loft, and asked how good was reception with it being coiled round in a circle. Well, I have nothing to compare my 'circular G5RV' against, other than the telescopic antenna on my ICF-2001D, and the G5RV wins every time. It is suspended around the loft space where it is lightly tacked to the rafters. I cannot have an external antenna, so I have to make-do with a loft antenna; if you can, I would recommend that you try a G5RV antenna.

The Americans are Coming!

Many readers spend a lot of time listening to the USAF GCCS stations. This is probably because their callsigns are easier to understand, they speak English and there is so much to listen to and listen for.

One of the most frequent uses of the GCCS stations is for an aircraft to report its ETA and destination to a regional command centre, or 'Theater Airlift Control Centre' (ALCC). The most frequently heard ALCCs are European ALCC ('Phantom' at Ramstein AB in Germany), South American ALCC ('Furious' at Howard AFB in Panama) and 21st Air Force ALCC ('Format' at McGuire AFB in New Jersey, USA). These all have a co-located metrological station (metro) who provide a weather service for aircraft. During the Gulf Crisis, a temporary ALCC was established at Dharhan in Saudi Arabia ('Crayon'), that ALCC is still there today, but is not heard so frequently now.

Mainsail

An aircraft wishing to contact an ALCC will first try to call the most suitable GCCS stations by name, and if that fails, will try the general call of 'Mainsail' (almost a 'CQ any GCCS station'). Once the aircraft is in radio contact with the GCCS station, they will request a 'phone-patch' to the ALCC, and when the ALCC and aircraft can hear each other, the relevant information is passed. This is usually the aircraft's flight-number, its destination (using the ICAO four-letter code for the airfield) and what time it expects to be there. The aircraft will also pass its cargo and passenger offload at the airfield; the cargo is given either by weight (in pounds) or number of pallets, while the passengers are always referred to as 'pax' (pronounced 'packs'). VIPs and high-ranking officers are always referred to as 'DVs', for example government officials are usually 'DV 2s'. Does anyone know what the 'DV' signifies?, it may be 'duty VIP', but I'm not sure.

After the ALCC has confirmed the details, they will break contact and the aircraft will then ask the GCCS station to connect to a suitable metro. In Europe, the metro station is known as USAFE Metro (pronounced 'you-safe-ee mee-tro'). The metro station will read the weather forecast for the aircraft's destination, and will usually ask the pilot for a 'PIREP'. This is a weather report from the aircraft's current position; when the aircraft gives its position as a lat/long; you now know where it is now and where it is going to. This also gives you a clue as to which h.f. or v.h.f. that the aircraft is using, or is likely to use. The pilot's weather report is fed into a computer to aid weather forecasting for other aircraft and also the general public.

Many of your reports also mention the ICAO four-letter airfield codes that are given by aircraft. A full list of these, for the whole world, can be found in the Klingenfuss *Air and Meteo Codes* book (available from the *SWM* book service).

Head Dancer

This is the h.f. callsign for EC-135 aircraft (military Boeing 707) often mentioned in logs. The callsign belongs to one of a limited number of USAF aircraft that are used to control the deployment of fighter aircraft over long distances. Several times a year, the USAF will send a number of fighter aircraft from the USA to overseas bases. Deployments are known as 'Coronets, those that cross the Atlantic are 'Coronet east' and those that cross the Pacific are 'Coronet west'.

These fighter aircraft usually use an EC-135 aircraft to 'shepherd' them during their flight, and to provide h.f. facilities for the fighters - there's not much room for a h.f. long-wire on a fighter! The fighters would typically be 12 or 18 aircraft arranged in flights of six aircraft, each 30 minutes apart. The fighters will need to be re-fuelled several times during their journey, so the EC-135 can contact the tanker aircraft using h.f. when required. All these fighters and tankers occupy a huge amount of airspace, so the EC-135 co-ordinates this with ATC using h.f./v.h.f./u.h.f. As the flights progress, the EC-135 will use a USAF GCCS station to regularly contact TAC HQ at Langley AFB in the USA ('Raymond 01'). The EC-135 will pass a set of information known as a 'JJ report', which details the progress of a flight of aircraft. This decodes as follows:

Item 1: the number of the message sent to Raymond 01

Item 2: callsign of the lead aircraft in the flight, sometimes only the number is given

Item 3: the number of the refuelling taking place

Item 4: 'on-boom' time (UTC) for first aircraft in this cell to refuel

Item 5: 'off-boom' time for last aircraft in this cell to refuel

Item 6: ETA at destination - normally ommitted

Item 7: amount of fuel (in thousand of pounds) given to each aircraft in this flight (e.g. 4.8 - 4,800lbs)

Item 8: latitude/longitude for start and end of refuelling

Item 9: any other information relevant to this aircraft, usually 'Ops Normal'

By noting the details of items 7 & 8 from several JJ reports, you can determine which way the aircraft are travelling, how many there are, and also if they are likely to be passing overhead your area.

'Head Dancer' will also request phone-patches to 'Raymond Metro' (also at Langley AFB) to collect the weather for the fighters eventual destination airfield and various alternative and diversionary airfields on route. These are not named by 'Raymond Metro', they are just referred to by number, starting at 1. As the flights progress, airfield weather reports are dropped and added where required. At the start of the flight the weather reports will be (for example) for fields 1 to 5, but towards the end of the flight the reports may be for fields 10 to 20.

So why am I telling you all this? Well the USAF will soon be starting these deployments across the Atlantic into Europe, so the 'Head Dancer' callsign might be heard quite regularly. Remember that 'Head Dancer' will also crop-up on the NAT-A/NAT-B frequencies when crossing the Atlantic.

More Mystery Signals

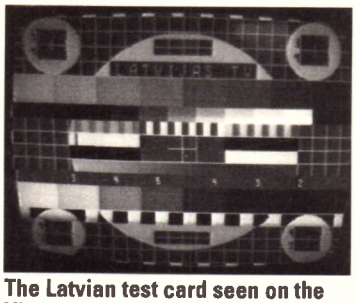
A letter and tape from **S Hosegood** in London contains details of a large net of stations heard during the afternoon of December 7 on a frequency of 4.478MHz u.s.b. The accents are all English, and it sounds like some sort of Army manoeuvres or training net. The callsigns are mostly four-digit letter/number combinations (e.g., F77B, M19C), and many others join and leave the net as time goes by. There are mentions of tanks, APCs, helicopters, aircraft, artillery and various 'enemy sightings'. One theory is that this was a school CCF training session, but the voices sounded too adult for CCF members, and also the 7th was a Saturday (may be significant?). Any ideas? Can anyone provide a list of frequencies and modes used by school CCFs today?

Last month, I briefly mentioned some unknown voice transmissions on 6.736MHz u.s.b. I now know that this is being used by UN forces in the Western Sahara. I am not sure if the troops are Australians or New Zealanders, but they have been active most evenings passing general messages. They have also been heard on 6.753MHz u.s.b. On February 15, one UN station was heard trying to contact MARS station AFA2XD on 11.176MHz u.s.b. when he was called by another UN station and they both QSYed to 'channel 30'...any ideas?

Next month, I hope to include some information on the 'Mystic Star' network, and some more NASA frequencies.

satellite tv news

Roger Bunney, 33 Cherville Street, Romsey, Hants SO51 8FB



The Latvian test card seen on the Visnews Moscow circuit at 11.51GHz 14°W.

One of the many test patterns feeding out of the Moutiers switching centre during the Winter Olympics at Albertville.

Logo for satellite communications company seen over Eutelsat II F1 13°E 11.17GHz by Peter de Jong.

The Middle East Broadcasting test card via Eutelsat II F1 13°E 11.55GHz horizontal received by Peter de Jong using a 900mm dish.

Canal Plus on Telecom will change scrambling to Nagravision, so if you're thinking of a Canal Plus decoder at this time - don't! The Canal Plus group have leased seven transponders on Telecom 2a for Euromusique, TV Sport, Cine-Cinefil, Planete/Canal Jimmy/ Canal J, Cine Cinema and Canal Plus itself. Standard SECAM will still be used.

Bindu Padaki from Bangalore advises that Pakistan TV PTV-2 is now conducting test transmissions over AsiaSat and that RTM-3 Malaysia is also expected to start a new service following the completion of tests last Autumn.

Des Sherwell (Maidenhead) is active in both Ku/Telecom (10.9-12.7GHz) and C Band (3.675-4.2GHz) and has observed that Arabsat 1a is drifting to the east though transmitting all the time. By mid-February, it had drifted past 26°E (from the registered 19°E home) and still drifting! Interesting, Des spotted a new channel on Russia's Gorizont bird at 40°E called 'The Global Entertainment Television Service', operated by Brightside Network Systems Inc out of Atlanta, Georgia (Atlanta is the home of CNN).

A similar sighting from **Ken Kirkley** down in Botswana, he has seen BNS on both 40°E and 14°W (both Gorizont craft), the service is currently on test for 3 hours daily, 6 at weekends, increasing to 24 hours by early July, when the C Band general entertainment and movie service will scramble. Global have leased transponders from Intersputnik on both Gorizonts and a Global beam on the Canadian ANIK E-1 bird that will provide virtual worldwide coverage at C Band. BNS will supplement the CNN news service.

The 'All African Channel' (ATN) also downlinks from Gorizont 14°W with a basic service provided from Malagasy though the advertisement sales agency address is in J'burg.

Ian Waller (Lincoln Satellite) holidayed in Senegal and noted the local terrestrial TV is transmitting a Band 3 service from the French Canal Horizons programme, though oddly encrypted in Nagravision system G, whereas local TV transmits in System K.

Rumours circulate that the South African Broadcasting Corporation (SABC) who provide a B MAC TV service from Intelsat 66°E is to transmit in the clear from April '92. Feedback from Harare following the news of J'burg reception from Astra, results in Harare have been very poor which suggests that the South African reception is enhanced by side lobe radiation.

BBC World Service TV (by satellite) has been hit indirectly by strike action in Gibraltar, writes **George Gaskin**, resulting from management strife and enforced staff redundancies. World Service TV and the SIS transmissions are being 'blacked' until the GBC staff are satisfied.

Nicholas Earley from Victoria, Australia has invested in a 1.5m dish with related equipment and is receiving many signals from the AUSSAT satellites - including BBC TV Breakfast Show, BBC news, etc., thought to be en-route to Ch.9 Sydney. Nicholas says that the BBC advise their World Service TV will be targeted into Australia probably early '94.

A local newspaper cutting suggests that Hong Kong Telecom International is to offer a compilation of CNN/HBO/ ESPN for transmission down from Indonesia's Palapa satellite to offer competition to the AsiaSat 1 Star TV service. Interesting to see that Singapore cable service is allowing CNN to operate on its facilities provided it shares with other programming sources, the BBC were offered but sought exclusive cable carriage only, the Singapore government refused and opted for CNN.

Orbital Slot News

Several new TV channels have appeared over the past few weeks, Show TV is active on Eutelsat II F2 10°E (11.575GHz vertical) and is a Turkish orientated service though so far content seems to be from the MTV pop music channel. Show TV is uplinked from France.

Teleon is now operating with a 24 hour general programme format for Turkish nationals in Western Europe, again on 10°E at 11.596GHz horizontal in the clear with its main office at Istanbul, Turkey.

'Free Choice TV' appears over Eutelsat II F1 13°E though perhaps not so free since it aired with Sat-Box encryption and now into scrambled D2MAC as from early February, based in Holland. Another Dutch satellite programme 'D2-TV' is now operating a test programme with 16/9 wide screen format in D2MAC over Eutelsat II F3 16°E. Soft porn broadcaster 'Adult Channel' opened January 31 from Transponder 26 on Astra 1B using after-midnight downtime on the Comedy Channel. Daytime downtime on the same transponder is now absorbed by the 'TV Asia' channel for some 4/5 hours daily though more transmission hours are now being discussed with SES Astra. A Chinese channel is expected Summertime '92 over Astra.

Discovery Channel aired over Intelsat 27°W is introducing 'The Learning Channel' from early March which uses a 2 x 3 hour programme format (the 1200-1500 hour sequence repeating the next day but at 0900-1200 and so on). Programme strands will be educational, 'healthy' leisure and schools. The 7 days a week service will include both US and bought-in European material. After Astra 1D is launched '93, SES have confirmed an order for Astra 1D to be co-orbital with the other 3 Astra birds at 19°E to act as an in-orbit spare lest one of her sister craft becomes faulty.

By the end of March '92, industry pundits speculate that Filmnet will be transmitting in Eurocrypted D2MAC and thus ending the several years of blatant decoder piracy throughout Europe.

British Aerospace (BAE) have dropped BMAC scrambling on the Sportcasts service and has gone to Videocrypt, mainly due to cost, ease of decoder acquisition and minimal size compared with the 19in rack configuration that tends to echo BMAC. Until all subscribers have realigned their dishes onto Eutelsat II F3 for the new Videocrypt service, BAE Sportscast will continue to downlink in parallel (double illuminate) with her original transponder on Eutelsat I F4 7°E.

American firm Scientic Atlanta is now upgrading several earth stations for use over Eutelsat II F3 with digital video for programme exchanges between the UK, Eire, Italy, Greece, Cyprus & Tunisia.

Despite the recent publicity in the Maxwell Communications Empire, Maxsat is going ahead with its satellite linked supply service for industry and broadcasters. Before Christmas Maxsat provided uplinking from the Dutch Summit talks and now Maxsat provides regional linking from the ITN Westminster studio into local ITV studios - the service started mid February.

Orbital Sightings

Most of the period has been dominated by the many satellite feeds from the Winter Olympic Games in the French Alps. We are seeing an increasing number of news inserts preceded with 'VTM SNG1' (or '2') usually on the latest Eutelsat II F3 bird at 16°E, the SNG operation is based in Brussels and are operating the standard mobile uplink truck with related playout equipment though I have only seen VTM operating in the 12.5GHz Telecom band to date.

The usual Visnews Moscow Bureau playout takes place several times a day over Gorizont 15 at 14°W 11.51GHz left hand circular - the first one of the day is normally 1050UTC. At other times, when the transponder is not in use, an unmodulated carrier is continuously transmitted. For the past few weeks, Gorizont has been devoid of carrier when not actually downlinking news material. Why is not known, but Gorizont craft are replaced fairly frequently and it may be that no.15 is nearing replacement.

If the 14°W bird is heavily booked with playouts ex Moscow, then the Soviets will fire up Gorizont 12 at 11°W to carry the extra business, often Gor 15 is carrying 625 line PAL and Gor 12 is passing NTSC 525 line material into the London bureau of NBC, ABC news.

amateur bands round-up

Paul Essery GW3KFE, PO Box 4, Newtown, Powys SY16 1ZZ

In Hull, **Frank Hermann** runs a Sony ICF-2001D and wonders why he doesn't hear as much as other readers. Frank has to make do with either the whip antenna or the throw-out wire that came with the receiver, as climbing to put up an outside antenna is not really 'on' for him. My first suggestion would be to see if the antenna can be matched to the receiver with some sort of antenna tuner and secondly to be aware of the advantage of varying listening times.

Nothing like a listen on 10MHz, avers **Mike Birch** of Thirsk; it was c.w. from 9K2MU, SU1HV, ZA1TAE, P40V, JJ1VKL/4S7, 4K2CC, 4K3BB, UM8MBA, OD5/LA4GHA, 8P9EM, HI8A, U0AG, OX3FV, VK4XA, HK7/SM5HV, K6DDO, WA6ZJC, W6KUT, K6STI, JH2CLV, JA9FHB, JA1GRM, JA5MHD, JG6MQI, ZS6QU & KL7U.

John Heys of Guestling likes to mix his modes; thus on Top Band, the c.w. signals of W1HMD, WJ2D, WZ1F, KZ2S, WB9Z (Illinois), IV3PRK, UA6LGP & UB5NBJ were copied. On 3.5MHz s.s.b. John located DL7HZ/TK, UB4WXL, KZ1AB, VE1RO, ZL2APW & VC1PBM, while on 7MHz c.w. there were RI8AA, K2LE, XE3LPS, 4Z4DX, UA0LK (Vladivostok), UI8LB & 3X0HNU for an all-time new one; on s.s.b. it was UW9CD, AP2KAH, CU2BD, ZL2APW & UA4FFL. 14MHz s.s.b, accounted for 4K2CC in Franz Josef, while 21MHz c.w. did for JR6UDM YB2UDH, VP2EY, 3A2LR & s.s.b. YB2ARO. Finally 28MHz where other than XE2FGC it's all s.s.b. with ZA1TAH, J73VE, 4Z4DX, YB3OSE, 8P9CU, 3B8GA, 7X2VXK, AP2MYC, AA4VK/KP1 (Navassa) for another all-time new one, CZ2SS (Prince Edward Is), VC1PBM (another of the special Christopher Columbus prefixes) & 7P8FE.

No doubt about it, the possession of a better antenna that will stay in the air is the most important part of the set-up, as **Angie Sitton** has discovered in Stevenage. This is doubly important if you are in one of the areas infested with piped TV signals which down-converts the u.h.f. signal to v.h.f. where a harmonic of the receiver (or transmitter!) oscillator comes up smack in the middle of the TV band. In Angie's case this knocks 28MHz operation for six, but she manages on the other bands. 3.5MHz yielded c.w. from W1MK, CE3CRG, UL8LWA, ZA1ZAB, 4U1ITU, LX/DK7QB & UO5ON. 7MHz c.w. gave K4EWG, K1ZZI, WB3EPC, W1ESC, K1RU, W4XJ, K4JPD, K4CRF, KE2WY, N4BZX, WR4I, K1JKS, NQ2F, AB2E, W1GUE, NF2M, WO3Z, KT3I, W1TBY, KE3H, NT3U, W3KR, WT2A, W4FMZ, VP2V/AA5DX, EP/HA5BUH, VC1HA, VK8JP/MM (in GJ!), UO5ON, UA9CT, UA0SPB & RA9QX. 14MHz came with WE6V, K3BI, W4XJ, G3KDP/QRP, RA4RDC, RW9HYY, UA9EZ & RL7LCT. 21MHz for WA2SON, N4MHQ, WB3AVN, VE2EXP, UL8PXB & lots of smaller fry. Up to 28MHz where s.s.b. logged from WA4DZE & 9H4CM; but reversion to c.w. for N1GLG, W1GUE, W2ERJ, WA2SON, K3NUD, WA3EJL, K3MQH, NE3P, N4JYV, K8XF, WB8E, NB8G, W8GJU, K8MP, W0RWS, VE3KLM, VE2GDI, VE3HX, RY0U, UD6GF, UO5ON, RA9CEJ, UA9FIB, 7S0Z (an SM in drag!), EP/HA5BUH and the usual smaller stuff.

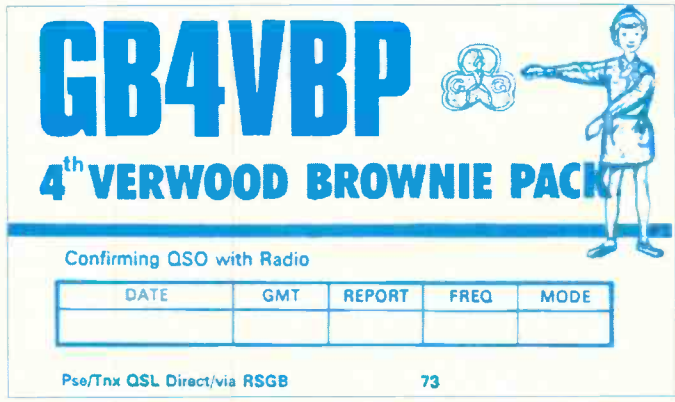
Ron Gallier (London N1) is looking toward retirement to Southend area, so his outlook over the water should produce some interesting signals, even though restricting activity for the moment. Other than the European stuff, it's ES4NG, VO1XC, L3WW, 4N3QQ, KA5ZTI, GM3XOQ up in Shetland, KA5ZTI, KA8EUE, W3NDB, K4CFF, N8QLW, ES1QD working various Ws, 7Q7XX being called without success by various G stations, A92BE and umpteen others. What is particularly interesting about Ron's list is that he slips in the odd c.w. signal among the sideband ones, so is obviously looking at both ends of the band.

D.L. McLean reckons conditions have been pretty super, with the bands staying open longer than one would expect. On 3.5MHz he reports AD1G, UL7FXC, VO1VE, VY2MC, W3TWW, 3A2LU. On 14MHz it's AP2JZB, C56/G3RZ, CU2YA, F8HB/EA6, FO4DL, J73WA, KG4DD, KH6WU, P30JE (=5B4JE), RE1A/RZ4HZZ on Kotlin Is IOTA Eu-133), S42U, S79KMB, V63NW, VE7FJE, VE7GDJ, VK3ZJ, VK6LG, VS6VO, VU2JJQ, WQ7B in Montana, XX9AS, Z22JE, ZA1TAG, ZS1DZ, ZS500A, ZS6AZQ, ZL2RR, 3B8CF, 3B8GA, 4S7EF, 5H3DC, 5T5CJ, 5N8LRG, 5Z4FM, 7Z1AB, 9J2EG, 9L1MR, 9M8FH, 9X5SW, all between 1500-2000UTC. 18MHz gave 0Y9JD, PT7BZ, VU2RX, Ws, Z21HJ, ZS1AVU & ZS5VDK. On 21MHz we find AA4VK/KP1, DU9RG, CY1TX, J37ZA, OH0NA, PJ2HB, PZ1EL, TF3IM, VE2JRK for Zone 2, XX9AS, 8P9CU, 9K2IC, while for 24MHz the scalps included A92BE, AA4VK/KP1, AP2KAH, CE8ABF (Tierra del Fuego), ES5D, GD4WBY, HK0HEU, HR2JEP, IS0JBY, JA2KSI, OY9JD, P43HM, PJ8AD, RO5OP, T77J, TK5XN, TU2YH, UO5GQ, VC1YX, VO2GUY, VP2EY, VP2V/KB5GL, VU2RG, Ws, WA4DAN/KP1, XE1ENK, Z21HJ, 3X0HNU, 5T5CJ, 6W1QJ, & 7P8EN. Finally 28MHz which produced A47RS, BZ4RC, DU1PX, HI8A, K7OBX (Arizona), V31DX, VP2V/KB5GL, VS6VO, VU2YK, WA4DAN/KP1, W5IJU (IOTA Na 56), XX9AW & ZA1TAH.

Albania

I hear there is a problem over the ZA licensing. It seems ZA1HA, ZA1QA, ZA1DX are all OK. However, it also seems there is confusion in Tirana about what a radio amateur is, and who should issue licences. Therefore, the DXCC Desk will only accept as valid those ZA operations which have been approved by the Albanian PTT.

On the same topic, the picture in Papua New Guinea and Bougainville is confused. VK2BVS seems to have 'negotiated a licence' with the rebel government, and to have decided first to use 'AA22' as his call. Then, after someone had suggested he read his own VK licence for the structure of amateur callsigns, C1A. He was heard to say that he was using 150W but had authority for 10kW!!



GB4VBP is a regular Thinking Day On The Air special event station.

More Letters

Another correspondent to tackle the c.w. signals this time was **Gerald Bramwell** in Manchester; so I'll mention the c.w. pickings first. Top Band gave UZ2FWA, DL1YD, DK8ZB, PA3BAS, ON4UN, OK1KSO, OY1JD & 3.5MHz showed UO5GQ, G4VDJ, PA3BUD, SM6CPY, HA8FM, LZ1XJ. On 7MHz various Europeans, UA6AJB & TF3CGN were noted. Now to telephony. Top Band showed most of Europe, and some nearer bits of what was the USSR. On Eighty, K2JMY, KO1F, VE2CMT, WA3AFS, WB4DBB, KG4W, VC1XA, VO1QF, KD9SV, KA1TRY, CY1FG, K1FF, K1ZM, KC1KQ, W3HHG, NX8H, WA4PGM, W4MYA, VO1CMR, W4QCU, WB9Z, VE1HK, VE1ZZ, AA2DU, UF6FAL, UF6FU, Europeans, VK6OK, 9K2LX, 5H3OH, PT7CB, EA8YG, JA5IU, JA6IEF, ZF8AA, 4X6YY, FM5ON, 9M2DM, 9X5NH & FM5CD. 7MHz shows no Ws, VE2HQ, VE1BMD, UH8EA, UL7VCE, UV6LAV, RY0I, Europeans, FM5DN, HL2KAT, PY2ELZ, J88AB, CN8NS, DU1EIB, PY2EA, TA7M, 4X6LD, JA5PEE, PT7ZK, PT7BSH, HK0YZY, KP5MOX, 5H3OH, VP2EY, YK1AO, CN8LI, PT7CB, JR5JAQ, 9Q5TE, VK7TS, EA8TH & 4S7/ON4IPA. 14MHz shows an enormous string of N. Americans, a shortage in Europeans, & then TA1R, LU, PYs, PT7WK, JY3ZH, 4X1MO, CN8NS, HI8FHD, 9V1XQ, 7X0MR, CO6CG, HK4CYR, OX3KM, EA8BTA, YV5DPO, FM5CW, ZS1AU, 9X5HG, P43LJP, CE7EK & 8Q7DV. On 18MHz Gerald noted lots of Ws, some short skip plus EA8ZO, EA8BRW & VK3QI. On 21MHz, the N. Americans & Eus had YC1KF, J69AI, & 9Q5TE added. 24MHz turned up 3C1EA, 3A2LZ, Europeans and a string of Ws; and to round off on 28MHz Gerald offers most of the W call areas, plus ZA1TAG, EA7DLP & SU3AQR.

Now to **J. Scott**, of Glasgow G44. Again, packet radio has been given a run-over with success on h.f. and straight listening too; the latter, on 14MHz produced YB5DPO, IT9VPT, VK3AB, ZL3GQ, RA6AH, VK3AWB, VK5TT, VE6CWW, AA4VK, EA7GOP, KR2R, K3RX; 7MHz dealt out TK5BF; 21MHz PZ1ES; 28MHz UA6AGZ, W2TA, and lots of Europeans on 14/21/28MHz.

Peter Cain comes next, from Newcastle upon Tyne. Peter sticks to sideband, and on 3.5MHz he snaffled JA6IEF, TI4CF, 9Q5TE & 9X5NH, before heading for 7MHz & CN8LI, FM5EP, HL2KAT, TI4CF, TR8XX, UH8EA, 8R1RPN, 9K2HF & 9Q5TE. 24MHz got a visit, for CO7JC, D44BC, JT1CO & XT2BW, while 18MHz snagged up 5U7M, VK7KO, VK7GK, KP4YD & CN8NA. Now to the two main areas; 14MHz with AL7IY, AP2AJ, A41KR, BY5RA, HL1AZC, JT1BV, JY5GA, J88AQ, KH6FKG, KL7GU, KL7XD, OD5VT, OX3KM, P43LJP, TF3TF, TF5BW, TI2IDX, VE8CB, VS6VO, VU2JJQ, VU2RAK, XU8BKG, XW1QL, XX9AS, YI0V, Z22JE, 3B8CF, 3B8GA, 3D2HH, 4S7VK, 5H3DC, 5N8LRG, 5T5CJ, 9J2EG & 9L1MR. 21MHz showed up AP2AJ, A61AC, A92EV, BZ4RBV, CM7FC, CM7RJ, CN2LR, CO7JC, CO7KR, CP8HD, D44BC, HI8FHD, HI8LC, HL1KIB, HL9AA, HL0AFE, HZ1AB, JX9EHA, J37XC, J73WA, J88AQ, KP2BH, OA4QV, OD5MM, OX3KM, PJ2HB, PZ1DY, P29NMD, SU5BA, TF3IM, TU2JL, VE6MV, VK1PJ, VP2EY, VU2JYY, VU2QQ, WP4AZT, XW1QL, XX9AS, YK1AO, 4K2CC, 4K4BEU, 4S7NMR, 5N8GRI, 8P9CT, 8Q7DV, 8R1UN, 9K2HF & 9X5SW.

Mark Grubb (Newark, Notts) raises a good question, 'What is DX?' My own reaction to that is, whatever turns you on. For a brand new listener, even the chap down the road is DX, while the advanced listener who has logged 300 countries or more may not even switch on unless he is sure of a New One. However, in general forget about Europeans unless they are of the rarer sort, once you have them all in your log. Rare Europeans, plus other continents and, of course, new prefixes first time they show - and with the latter, please stick around and find what the prefix is for 'cos for long odds someone else will want to know!

That's all for this time. Send your news and views to the address at the head of the screed, to reach me by April 7, May 6, June 5 & July 10 respectively.

dxtv round-up

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

It is not unusual for tropospheric openings to outweigh everything else during the mid-winter period. But this January has been exceptional as summed up by **David Glenday**, a very experienced DXer from Arbroath, who remarked, "overall it's been the best January for tropospheric DX that I've come across". There is much more about this later after we have discussed the happenings in the ionosphere.

Band I

"We have had fairly regular F2/TEP reception from SE. Asian region in November," wrote **Lt. Col Rana Roy** (Meerut, India) who found that the pictures were clear at times thus giving him a chance to get a few idents before the events tapered off in December. He logged these ionospheric disturbances almost daily from November 2 to the 29th and again on December 1, 2, 4 & 12. Despite the smeary and distorted images, typical at such times, he positively identified pictures from Bangkok (TV3) on Ch. E2 (48.25MHz) and Chinese TV on Ch. C1 (49.75MHz) during the period.

At 1400 on November 19, he received 525-line pictures from an unidentified source in SE-Asia on Ch. A2 (55.25MHz) and several times he heard the Thai language on the sound channels. From the fluttering pictures he was able to recognise, often only briefly, adverts, American football, announcers, boxing, a digital clock, films (among them an American movie dubbed in Thai), plays and news. Good examples are the distorted caption, **Fig. 1** and the clear picture, **Fig. 2**, that Rana received from Bangkok's TV3 at 2224 on November 5 and at 2201 on the 12th respectively.

Bob Brooks (Great Sutton) reports seeing unidentifiable 'F2' type signals on Ch. E2, at 0910 and 1240 on January 28 and 0950 on the 31st. At 1250 on January 8, **Simon Hamer** (New Radnor) identified 'F2' pictures from Dubai and Iran, on this channel and unidentified 'pings' of signals, via meteor trail reflection, on Ch. R2 (59.25MHz) at midday on the 8th and from Norway (Hemnes), on Ch. E3 (55.25MHz), at 1245 on February 3.

Satellite TV

Among the signals that Rana Roy received from Asiasat are captions from Burmese TV, **Fig. 3** and the Hong Kong based 'Star TV', **Fig. 4. Peter de Jong** (Leiden) logged a caption from Netherlands Broadcasting on Eutelsat II F2 at 1602 on December 8, a test-card from Spain, **Fig. 5**, via Eutelsat II F3 (16 E) at 1820 on January 14 and a programme from Turkey, **Fig. 6**, from Eutelsat II F2 at 1030 on the 19th.

Weather

Ever since wireless communications began, the prevailing weather has always been a topic of conversation between operators whatever their modes of transmission. This was proved again by the slow-scan television caption, **Fig. 7**, received by **John Scott** (Glasgow), on the 14MHz band in January. "The weather here is cloudy and cold, the temperatures are between 14°C in the day and 2°C at night. Whenever we do have the sun, it is very weak," wrote Rana Roy on January 16.

The slightly rounded atmospheric pressure readings, **Fig. 16**, for the period December 26 to January 25, were taken at noon and midnight from the barograph installed at my home in Sussex. The pressure was predominantly high throughout with persistent fog and many frosts. The rainfall for January was low at 0.94in with the heaviest amounts in my rain gague on the 4th (0.26in), 9th (0.30in) and 26th (0.20in).

George Garden (Edinburgh) was not surprised to find DX coming in with very high pressure and dense freezing fog patches lasting until the end of January. "On the evening of January 25 the pressure rose from 30.5in to 30.8in and fog started to form. However, at lunchtime on the 26th the pressure rose to 31.0in before settling down to 30.9in by late evening," wrote **Andrew Jackson** from Birkenhead.

Picture Archives

For the benefit of our new readers, Andrew sent photographs of a test-card from Denmark (TV2 NIBE), **Fig. 8** and a caption from Holland, **Fig. 9**, both in full colour, that he received in the u.h.f. band during tropo-openings in November 1990 and April 1991 respectively.

Tropospheric

Mike and **Wendy Evans** (Buckhurst Hill), using a Thomson TS2551 receiver (top left, **Fig. 10**) with an indoor antenna logged test-cards from Belgium (BRT TV1 & RTBF) and Holland (NED) and winter sports from Germany in Band III on January 11. However, the same set, fed by a Fuba XC391 rotatable antenna mounted 6m above their roof, proved very rewarding with u.h.f. DX between the 10th & 15th. In that time, they saw a variety of programmes and idents from stations in Belgium (RTBF2), Denmark (TV2), France (A2, Canal+, FR3/RES, TF1 & TV6), Germany (ARD1, HR3/FFTM, NDR, N3, RTL+, SWF, WDR2 & ZDF1 & 2), Holland (NED1 & 2, Fig. 11) and Sweden (TV2 & 4). These signals came from Schoten and Wavre in Belgium, Nibe, Tommerup and Vordingborg in Denmark, Amiens, Avignon, Bergerac, Boulogne, Brest, Chartres, Clermont-FDN, Dunkerque, Lens, Lille, Marseille, Tours & Sens in France, Aurich, Badn, Bremen, Dortmund, Dusseldorf, Fernsehen, Flensburg, Hamburg, Hanover, Harz/Gottingen, Hessen 3, Hoher MeiBner, Neumunster/Schleswig, Osnabruck, Saarbrucken-Schocksberg and Ueizen in Germany and Goes, Lopik, Markelo and Smilde in Holland. Mike and Wendy's wide range of receivers for DXTV can be seen in **Fig. 10**.

John Woodcock (Basingstoke), using a D100 converter, received pictures from Germany (RTL+) during the afternoon of January 13. While the predominantly high pressure system of 30.7in was beginning to move on the 28th, I received watchable pictures from Ireland's RTE 1 on their Ch. I (215.25MHz) in Band III. At 2145, I saw their logo, adverts for ESB, Galatee and Xtra Vision and the start of *This Is Your Life* filmed in Dublin. There was a fair bit of co-channel interference on the u.h.f. band during the evening of the 30th. At 0445 on the 31st I saw three, very strong, Dutch test-cards (PTT NED3) between Chs. 30 and 50. By 1120, the Belgian test-card (BRT TV1), inscribed with 'NICAM-STEREO' and

Fig.1: Bangkok.

Fig. 2: Bangkok.

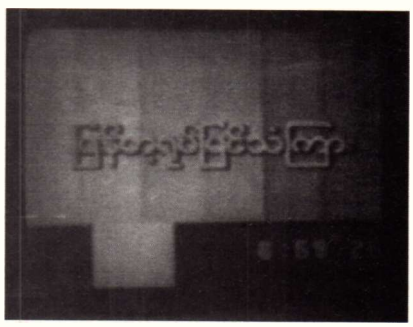


Fig. 3: Burma.

Fig.4: Netherlands via Eutelsat II.

Fig. 5: Spain, via Eutelsat II.

Fig. 6: Turkey, via Eutelsat II.

Automatic Solution

Enthusiastic airband listeners are well aware of the usefulness in making tape recordings of communications. However, for some time the physical connection of an automatic tape recorder has proved difficult due to problems of complex interfacing and incompatibility. In response to this, AOR have manufactured a connecting lead to provide an "Automatic Solution" to your recording requirements.

Whether attended or not, the **AR3000A** will switch On/Off a tape recorder when an `active' channel or frequency has been located then clears. This enables you to have a second listen to `brief transmissions' and provides a permanent record of communications. If unattended, the AR3000A plus tape recorder enables you to return home with the knowledge that nothing has been missed. This facility also lets you review the day's communications within a matter of minutes.

The ready-made lead is called the AOR CR400 and will plug directly into a suitable cassette tape recorder. Although we do not suggest a specific tape recorder, make nor model, we have tested the compatibility of the Realistic CTR-82 (Tandy) cassette recorder. It works very well in conjunction with the AR3000A / CR400 and the effectiveness cannot be questioned.

The AR3000A has a built-in real time clock and timer circuit to further add to it's flexibility. You may program the receiver to switch on and start monitoring at a preset time while unattended.

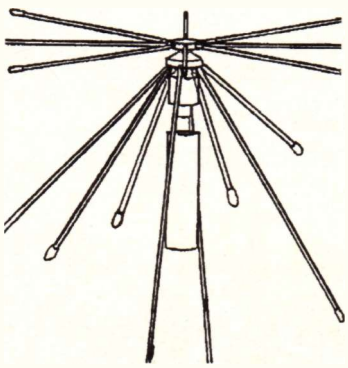
The AR3000A offers an extremely wide frequency coverage from 100 kHz to 2036 MHz. In simple terms this means that one minute you can be listening to Radio 4 on 198 kHz in the longwave band, key in a new frequency 5.505 MHz USB and you may listen to the European VOLMET weather forecast service. In a similar area of the shortwave band key in 5.680 MHz USB and you can monitor the search and rescue coordination frequency. The possibilities are endless, key in 133.7 MHz for Amber 1 commercial air corridor travelling North/South across most of the country, key in another frequency for your local tower, approach, radar or Air Traffic Information Service.

UHF airband is also well within the range of the AR3000A, sensitivity in this area being extremely good when compared to other units on the market today. The 400 memory channels and rapid rate of search and scan makes the receiver ideal for searching the vast frequency expanse of the UHF airband and saves hours of manual tuning.

The high sensitivity offered by the AR3000A receiver provides reception over surprisingly large areas when connected to a suitable external aerial such as the DA3000 discone. Your listening need not be restricted to the airbands alone. World-wide monitoring of other popular bands is just as easy, whether you wish to listen to our own BBC World service, VOA Voice of America or similar transmissions from most countries of the World. Marine band both VHF and the long distance shortwave services, Amateur band transmissions ranging from a local enthusiast just down the road to America, New Zealand and the remote areas of the World... all are available on the AR3000A.

To further enhance the versatility of the AR3000A two computer control IBM-PC compatible software packages are also for the AR3000A. The first of these is the AOR Spectrum Coordinator offering sophisticated search, scan and data-base facilities plus 3,000 memories and an integrated logbook. The second is ACEPAC-3A offering scan, search and a graphical display of band activity.

The **DA3000** is a wide band 16 element discone aerial especially designed to complement the AR3000A receiver. It has a useable frequency coverage of 25 to 2000 MHz. Build quality is excellent combining aluminium and Stainless-Steel. The aerial is supplied with approximately 15 metres of coaxial cable terminated in a BNC connector ready to plug directly into the AR3000A. The DA3000 has an easy to follow instruction sheet and is supplied with `V' bolts and clamps to ease installation, however a small additional support pole will be required.



The **WA5000** ultra-wide range receiving aerial is designed for areas where space is a problem and provides coverage from VLF to SHF. A MOS power FET amplifier is utilised to provide superior performance on the shortwave bands between 30 kHz and 30 MHz.

The total length on the WA5000 is 1.3 metres and is fed by an SO239 standard connector located in the aerial base mount and out of the direct effects of the weather. Approximately 15 metres of terminated coaxial cable is provided ready to plug in and start using. The aerial is powered by 12V DC @ 100 mA (mains power supply provided), this being fed up the coaxial cable. A small interface box is included for connection to the power supply and AR3000A receiver. Where you have limited space, the WA5000 makes an ideal companion to the AR3000A receiver.

R.R.P. AR3000A £765.00, CR400 £9.99, AORSC £75.00, ACEPAC-3A £119.00, DA3000 £69.00, WA5000 £150.00 including VAT.

All Trade Marks acknowledged.

If you are unable to obtain supplies of AOR products from your local dealer, you may order directly - we have a fast mail order service.

Access VISA

For a complete set of leaflets and price list please send a S.S.A.E. (34p). Other models available including hand-portable receivers.

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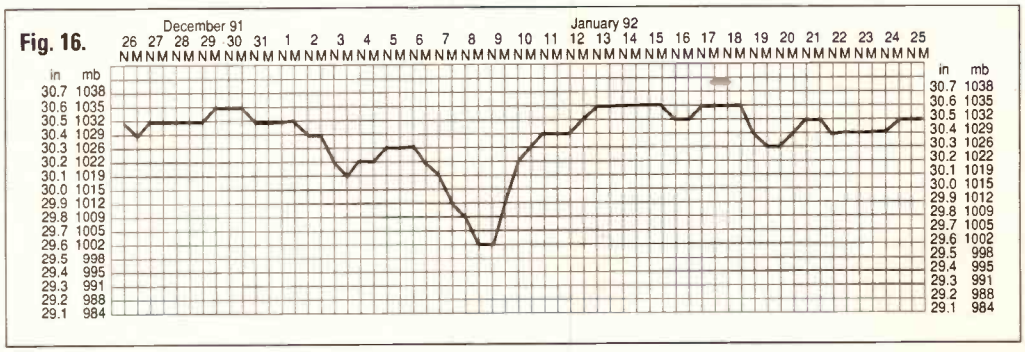
E&OE

Fig. 16.



'ZIE TELETEKST P249', was pounding in on Ch. E10 and at 1700 there were strong programmes on Chs. E8 and E10.

Programmes were seen again in Band III, on Chs. 6, 7, 8 & 10 at 1945 on the 31st and test-cards from Belgium and Holland at 1302 on February 1. Test-cards from Holland's PTT NED 1 & NED 3 appeared in the u.h.f. band at 1304 on the 1st and 0345 on the 2nd respectively. At midday on February 1, **Fred Pearce** (Driffield), using a Deluxe D100 converter and chimney-mounted rotatable v.h.f. TV antennas, logged a Belgian test-card (BRT TV1) on Band III.

During the openings on January 27, 28, 29, 30 & 31, David Glenday received test-cards and/or programmes from Belgium (BRT & RTBF), Denmark (DR), Germany (ARD1), Holland (NED1), Ireland (RTE), Norway (NRK) and Sweden (SVT1) in Band III. On these days plus the 14th, 15th and 20th - 23rd he logged pictures from Belgium (BRT2, Canal+ Belgique, RTBF-TELE21), Denmark (TV2), England (Crystal Palace, Sandy Heath, Sudbury, Sutton Coldfield & Tacolneston), France , Germany (ARD1, MDR3, NDR3, RTL+, SAT1, SWF3, WDR3 & ZDF), Holland (NED1, 2 & 3) and Ireland (RTE2) in the u.h.f. band.

In addition, he saw the German captions 'Deutscher Fernsehen ARD', 'MDR Fernsehen' and 'hessentext' and for the 27th he remarked, "all local DX within 300km radius arriving at VERY high strength - tropospherics all day". David added, "The new Mitteldeutscher (MDR3) programmes have been seen here a few times, including colour bars on E34".

The good conditions on January 14, 20, 21 & 31 yielded for Simon Hamer pictures in Bands III and/or IV & V, from Belgium, Czechoslovakia (CST1 & 2), Denmark, France, Germany, Holland, Ireland, Norway, Sweden & Switzerland (PTT/SRG1). Among the programme idents he saw were *HEUTE* (news) and *SPORT AKUELLE* from Germany. **Michael Larsson** (Cheadle) looked for u.h.f. DX in the UK on the 28th, 30th & 31st and his reward was pictures from the BBC (Midlands 1 & 2, Wales 1 & 2, West 1 & 2 and Yorkshire) and from the Independents (Ch4 Midlands and West, HTV (Wales), S4C (Wales) and Tyne Tees).

A good v.h.f./u.h.f. haul too for Andrew Jackson, also using a D100 converter. He logged pictures from France (Antenne 2) and Switzerland (+PTT/TSI 1 Teletext) on the 13th, Germany (ZDF) on the 14th, Germany (ARD1, HR3, MDR & ZDF) and Holland (PTT NED3) on the 15th, Belgium (RTBF1), Denmark (TV2) and France (Canal+) on the 20th, Denmark, France and Holland on the 21st, Belgium (BRT1 and RTBF1) on the 26th, Ireland (RTE1 and Network 2) on the 28th, Belgium, France, Germany and Holland (NED2 & 3) on the 29th, 30th and 31st and Belgium England (BBC1 South from Hannington) and HTV West from Mendip and Holland on February 1. Throughout the period Andrew proved the value of rotating his antenna to get the full benefit of the good conditions.

During the evening of the 31st, **Tony Hopwood** (Upton-on-Severn) reports co-channel interference on his local TV booster at Malvern a mere 4km away which is normally unaffected. Band III provided the DX for Bob Brooks in January when he saw a clock, showing 1300 followed by the news from an unidentified source on Ch. E12 between 1200 and 1215 on the 8th, programmes from Ireland's RTE throughout the 15th and 24th and February 1, a programme from France (Canal+) and a test-card from Denmark (DR) on the 28th, a test-card from Belgium (BRT TV1) and a film from France on the 29th and a cartoon and news from Belgium's BRT and RTBF respectively and a cartoon, logo (ZTM), and a travel film from unidentified stations on the 31st.

SSTV

Among the slow-scan television pictures copied by John Scott, around 14.230MHz, in January are calling signals from stations in Germany, **Fig. 12**, Holland and Ukraine, a sign-off from Spain and an often seen type of operator's drawing, **Fig. 13**.

Fred Pearce received good pictures from Russian stations on the 14MHz band on the 11th and 21st. David Glenday, using a Lowe HF-225 receiver with its own rod antenna and a BBC computer with Technical Software's RX8 program, logged signals from Germany, Russia and Scotland around 14.230MHz and 'CQ', **Fig. 14**, and operator ident, **Fig. 15** captions from DL7TR on 21.34MHz. The text on the picture in **Fig. 15** reads "THATS ME BURKHARD" who was sending these pictures, from the antenna on his roof in **Fig. 14**, to WA2KUK in the USA. Judging by the number and variety of captions and drawings that I have seen I have come to the conclusion that the SSTV fraternity are an inventive and most humorous bunch.

Fig.7: SSTV.

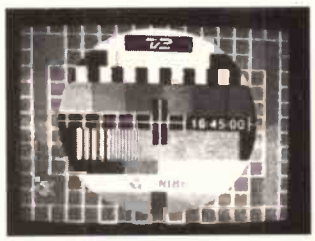


Fig. 8: Denmark.

Fig. 9: Holland.

Fig.10.

Fig. 11.

Fig. 12: SSTV Germany.

Fig.13: SSTV.

Fig. 14: SSTV Germany.

Fig. 15: SSTV Germany.

airband

Godfrey Manning G4GLM
c/o The Godfrey Manning Aircraft Museum,
63 The Drive, Edgware, Middlesex HA8 8PS

Yes I really do run an aircraft museum! It is a small offering, but dedicated to demonstrating the principles of flight, radio navigation, engineering, etc. There are no whole aircraft (due to lack of space) and nothing historic. The exhibits aren't behind glass, either. Instead, you will find a range of representative aircraft components that have mainly been rewired or otherwise modified to give a simulated demonstration of their function. One reader was incredulous that the museum really existed. So come and see for yourself! To arrange an appointment to view, call me (weekday evenings before 2200 local) on 081-958 5113. To ask that genuinely urgent piece of advice or to make a last-minute submission to 'Airband', that's also the number to ring. The museum and this column share the objective of helping you to enjoy your hobby through a better understanding; anyone reading this will, I am sure, benefit from a visit.

Competition Results

Only four entries were received so it must have been suitably hard this year! Most off course was **N. Winter** (Hull) who diagnosed an MBB 105 - a rather larger machine than the one pictured in January. Due to the difficulty, I will accept Hughes 300 or Schweizer 269 and **Patrick Boone** (Devon) and licensed pilot **John Weston-Smith** (Kent) both got this but gave the wrong location. So, the winning entry, complete with tie-breaking location (which was the PFA Rally at Wroughton) is from **R. Spooner** (Middlesbrough) and the Editor has kindly agreed to send a suitable prize. Well done all competitors for your efforts; hope you enjoyed it.

Pleasure Flight

Despite my appeal in February, only four more readers expressed an interest in going on a pleasure flight and so this project has lapsed through lack of response. Perhaps economic circumstances aren't encouraging enough at the moment. So, thanks to **John Ware** (Redhill), **David Head** (Malvern), **M. Hilditch** (Milton Keynes) and **Bill Henderson** (Shoreham-by-Sea).

Bill saw a DC-3 approaching 25 at Shoreham. In fact, he couldn't miss it since the approach passes low over his roof-top! G-AMRA was apparently shooting an episode of *Poirot* which, not being a follower of that medium, I assume to be something to do with television.

Conspicuity Code to Change

This is quite an important change and, as old habits die hard, the previous tradition could linger on and cause confusion. Before detailing what the conspicuity code is, I must refresh your memory about secondary surveillance radar (s.s.r.).

Primary radar has the drawback that the reflected signal is weak. The power from the antenna goes off into the distance and perhaps a tiny proportion actually hits something (such as an aircraft). The reflection also glances off at many different angles and so the amount of power getting back to the antenna is tiny and can be hard to detect.

Secondary radar sends out an interrogation pulse, but the reply is listened for on a different frequency. If an aircraft's s.s.r. transponder picks up the interrogation pulse (on 1030MHz) it replies with its own, high-power, transmission (1090MHz). Further, this transmission can carry a code number. The possible numbers have four digits, each taking a value from 0 through to 7 inclusive. In the cockpit is a control box on which the pilot sets the code.

Typically, air traffic control assigns a code to each flight that appears on the radar screen; the pilot is told to 'squawk' a particular number. The pilot sets this 'squawk' code on the cockpit control box and the code numbers then appear next to the aircraft's image on the radar screen.

Not all flights are under radar control. If you have a transponder but aren't receiving a mandatory control service, you can still 'squawk' the conspicuity code. This enables any radar operator to see your aircraft and make allowance when instructing other aircraft that are under control. For example, you might be flying just outside a control zone, in which case the radar controller will see you clearly and can be confident that you won't get in the way of flights inside the zone.

Formerly the conspicuity code was 4321 but it is now 7000 throughout Europe - pilots take note and read AIC 18/1992. Do not dial up the emergency code 7700 by mistake! Code 7000 means 'Should you see me on your radar screen, don't worry, I'm keeping clear of your traffic'. Another interesting code, 2000, is applied in a 'non-s.s.r. environment' such as Greek controlled airspace. Here, control depends on position reporting, i.e. it is procedural. Radar is not employed for control purposes. However, there may be military or other uses of radar and so a transponder setting is advisable. Code 2000 means 'Here I am, just in case you want to know - but it isn't certain that my controller is actually looking at me'.

Follow-Ups

J.P. Olway G3RMA (Paignton) agrees with my conclusion in February that s.s.b. is really a particular version of a.m. I did emphasise the point, though, that a receiver specifically designed for the job will be necessary before s.s.b. can be resolved.

In truth, a.m. is actually amplitude modulation with carrier and both sidebands. Single sideband is really a.m. with the carrier and one sideband suppressed. Any other variation of a.m. is also possible - for example, both sidebands but vestigial carrier. But, I must make it clear, you won't encounter any such special combination on the airbands.

The broadcasters have confused things further by muddling up modulation mode and frequency band. Instead of v.h.f. they mistakenly refer to f.m. and instead of medium wave they say a.m. The marketing departments of receiver manufacturers have exacerbated this situation by marking their waveband switches with f.m. and a.m. instead of v.h.f. and m.w. or l.w. as the case may be. No wonder the average non-technical broadcast listener is confused!

HF

Tim Christian (North Walsham) follows the allocation of h.f. channels with interest. Just to show how congested this part of the spectrum is, he introduces a new frequency: 8.891MHz for Karachi, Bombay and Delhi (MID-2). Unfortunately, it clashes with North Atlantic D (NAT-D) although its use in the new area is intermittent. As well as ground to air, h.f. (such as this channel) is also used for the various stations in the area to pass traffic information to each other. We're coming to the end of the current sunspot cycle peak, so the existing MID-2 allocation at 10.018MHz is predicted to become less effective when the m.u.f. declines. Tim wouldn't be surprised, then, if the new frequency replaces this higher one. MID-2 also has 5.658MHz available.

As a reminder, NAT-D is one of the North Atlantic areas controlled jointly by Shanwick and Gander. It has 2.971, 4.675, 8.891 and 13.291MHz available for handling aircraft on the more northerly tracks.

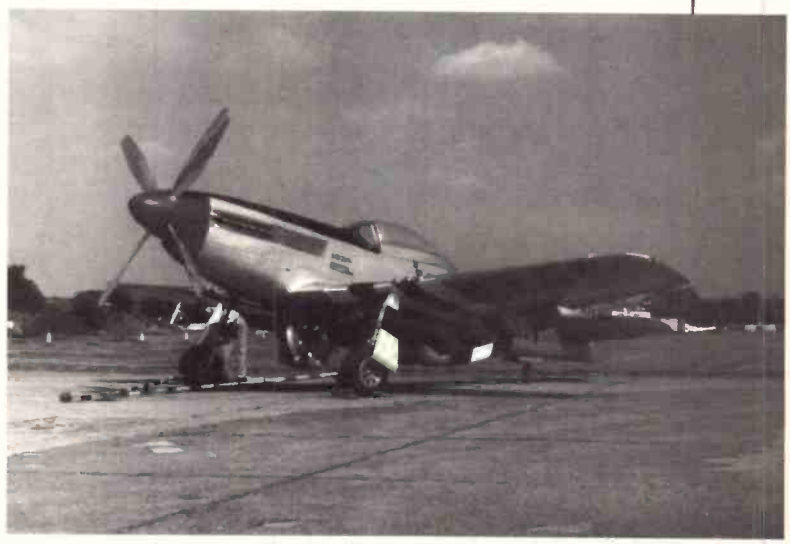
As an aside, Tim wonders what happened to Interflug - the airline of the former East German Republic. Since reunification I believe that it has been absorbed into Lufthansa who are rapidly replacing many of the Eastern Bloc aircraft types with more modern Western ones. The Editor has recollections of a flight from East Berlin to Leipzig on a fully loaded Interflug Antonov 24. Acceleration towards takeoff speed started outside the terminal building, continued round the perimiter track and takeoff appeared to be achieved by the simple expedient of retracting the undercarriage! Needless to say, he returned to E. Berlin by a more civilised form of transport - train.

Operational News

At Cranfield, runway 08/26 has been withdrawn (AIC 3/1992). Building works have restricted the available space here which is why the PFA rally can no longer be held on this aerodrome.

A personal involvement in airfield operations provides work for **Brian Tollervey** (Gosport). He's an electrician at a small field and mostly works on lighting maintenance. A quiet aerodrome such as this presents few problems of access to the runway in between movements. So how do they cope at Heathrow? Basically, any low-priority work can be done at night when

CONTINUED ON PAGE 46 ➡



Godfrey Manning photographed this immaculate P-51D Mustang at North Weald.

scanning

Alan Gardener
PO Box 1000, Eastleigh, Hants SO5 5HB.

Several readers have written to me asking what they can do to minimise the effect of strong signals interfering with reception. This mainly tends to occur in urban areas where it is often difficult to avoid problems with interference due to the large number of transmissions from local sources.

Albert Barker of Sussex has problems with a national paging system on 153MHz interfering with marine reception at 156MHz, **Mike Totham** of Gloucester has problems with both paging systems and links from a local Police HQ, **Bert Allerton** of Sheffield finds paging systems on 138MHz interfere with satellite reception at 136MHz and finally **R. Jackson** of Cheshire finds that a local taxi company prevents reception on just about any frequency.

When very strong signals are amplified in the r.f. stages of a receiver they can overload the proceeding stages and produce spurious signals on other frequencies. In really bad cases, the unwanted signal can be so strong that it will cause the receiver to 'block' preventing the reception of weaker signals. One way of minimising this problem is to restrict the number of signals which are allowed to reach the receiver. Most designs only have to tune over a small range of frequencies. This makes it easy to design a bandpass filter stage to reject any unwanted signals outside the required frequency range before they can cause any trouble.

The problem with scanning receivers, particularly those with continuous coverage, is that they have to tune over a much larger frequency range. This makes it difficult to design, and expensive to produce bandpass filters which will 'track' the frequency the receiver is tuned to whilst at the same time being capable of rejecting unwanted signals.

One alternative is to use a notch filter to reduce the level of the unwanted signal. This is only really practical when the receiver is used in a fixed location and the frequency of the interfering signal is known. I featured two different designs of notch filter in the December 1990 column which I found to be effective in dealing with strong signals from paging systems on 138MHz and f.m. broadcast stations in the 88 - 108MHz band. These filters produce fairly broad notches that are very effective in removing signals at spot frequencies, but have the disadvantage of reducing the level of other signals which are close in frequency. The only way to improve this situation is to increase the *Q* of the tuned circuit. This is not quite so easy to achieve in practice as it involves constructing the filter from very low loss materials. This may necessitate silver plating some components, which is not practical for most of us.

I found the best solution was to obtain a suitable filter on the surplus market, which could be modified to operate on the desired frequency. The best place to find such devices are at amateur radio rallies. Many of the companies who sell ex-p.m.r. equipment usually have duplexing filters, removed from commercial base stations, which they are prepared to sell at a reasonable price. Try and avoid large designs that are likely to use quarter wavelength lines and concentrate on the more compact designs using helical resonators. These are generally used for mobile equipment operating in the range 138 - 460MHz. If you need to provide a notch at a lower frequency I have seen duplexers designed to operate at frequencies as low as 70MHz but you may need search around in order to find one.

One of the most suitable types I have found was manufactured by Airtech Ltd and has the type number M450-4A. This is a 4-section unit which is designed to operate at around 450MHz. The case measures 130 x 80 x 180mm and has three N type sockets mounted on one end. Internally the unit consists of four small cylinders, each with a BNC 'T' connector at one end and a small tuning plunger at the other. The cylinders are interconnected by short lengths of coaxial cable which form part of the filter network. The original purpose of the unit was to allow simultaneous transmission and reception of signals with the same antenna providing the two frequencies were more than a few megahertz away from each other. Although the unit contains several BNC connectors the most important parts as far as we are concerned are the cylinders, which contain helical resonators. These work rather like conventional quarter wavelength stubs, but the line is coiled in order to make the unit as small as possible. In addition to reducing the size, coiling the line also suppresses any resonances at odd multiples of the fundamental frequency, which is a distinct advantage in this application. The outside dimensions of each cylinder are about 80mm long and 40mm in diameter, with one end secured by four screws. If the end is removed the helical resonator is revealed. This consists of about six turns of thick silver plated copper wire wrapped around a Perspex core. The end attached to the cylinder is capacitively coupled to the inner of the BNC 'T' connector which is mounted on the end of the cylinder. The other end of the resonator is not connected to anything but has a hole down the centre of the Perspex core which the fine frequency adjustment plunger fits into.

In its unmodified state the resonator will tune over the range 430 - 470MHz but if more turns are added to the end of the coil or if a new coil is wound the operating frequency can be made to go as low as 120MHz providing one end of the coil is directly connected to the inner of the BNC 'T' connector. I use one which I have modified to tune to 145MHz. The resonator has been replaced with a new 16 turn coil of silver plated wire, which is about 15mm in diameter and 50mm long. One end is connected to the BNC connector and the mechanical rigidity has been improved by filling the gaps in-between the turns of coil with epoxy resin. The unit is connected in series with the coaxial cable feeding the receiver and the sliding plunger adjusted to notch out the offending signal. This has to be done very carefully as the notch is very sharp and only a small movement can shift the frequency by several megahertz.

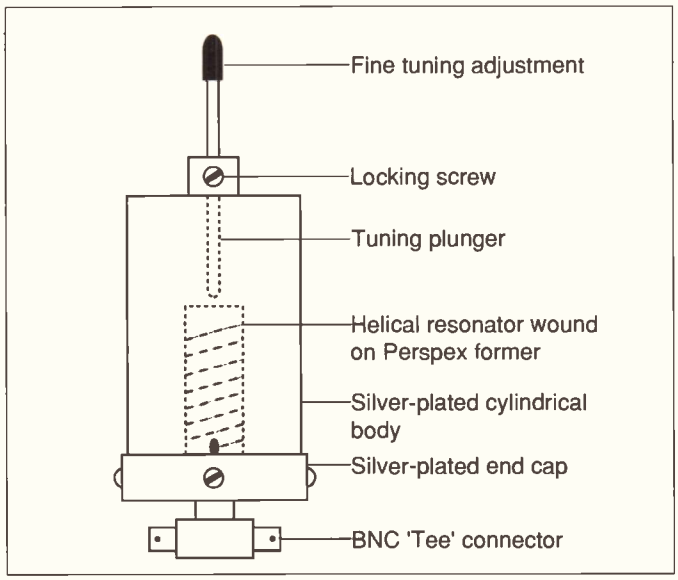


Fig. 1: Typical helical resonator.

By now you may be wondering if all of this effort is worth it. All I can say is that a lot depends upon how much of a problem interfering signals present. I have several base stations operating within 100m of my house and I am still able to use a pre-amp ahead of the receiver without any major problems, although I do have to use four separate notches. Before I fitted them the receiver squelch used to mute each time one of the stations transmitted making listening almost impossible. In this sort of situation any improvement is worthwhile and a lot cheaper than moving house.

Active Deflectors

Mark McDermott of Aberdeenshire is one reader who doesn't have problems with interference, mainly because he can't hear anything to start with. He lives at the bottom of a 60m cliff on the north-east coast of Scotland, and as you might expect he doesn't hear much on his scanner. However, reception from the top of the cliff is great, so he wonders if it is possible to relay signals from the top of the cliff to his house without having to buy miles of coaxial cable. He heard a couple of amateurs talking about using two antennas as a passive relay to provide radio coverage in a blind spot, and wondered if this technique could be used to help him.

Well Mark, many similar systems are already used to provide TV reception for small isolated communities where the cost of building a conventional relay station would be prohibitive. These operate in one of two ways, the first is to receive the signal at some suitable location, amplify it and then re-transmit it via another antenna aimed at the target area. This system is often referred to as an active deflector. It can only be used under certain conditions where there is good isolation between the transmit and receive antennas and there is no likelihood of the re-transmitted signal interfering with the direct signal. If more gain is required or if there is a chance of interference then the second method has to be used. In this case the signal has to be changed in frequency before it is re-transmitted and the equipment is referred to as a transposer. In both cases some form of power supply is required, which in many cases is provided by either solar cells or wind generators which are used to charge lead acid car batteries.

It may be possible to build an wideband active deflector, but it is not a project for the faint hearted and is not likely to be particularly cheap, but if you want to have a go then the following notes may give you some idea of what is involved. The first step is to determine what loss there is between the relay site and the house. This depends upon the distance and frequency and is given by the formula:

dB (loss) = 32.5 + {20 x log D(km)} + {20 x log F(MHz)}

So if we assume that there is an unobstructed path between the top of the cliff and the house of about 1km then we obtain loss figures of 60.5dB at 25MHz, 72.5dB at 100MHz, 84.5dB at 400MHz and 92.5dB at 1GHz.

In order to make the system effective we need to overcome this loss with a combination of both antenna and amplifier gain. In order to keep the antennas to manageable proportions the majority of this gain has to be obtained in the amplifier. The most gain you are likely to achieve with a wideband antenna such as a log periodic beam is around 6dB so if we use one vertically polarised for reception at the relay site, and two others horizontally polarised, one at the relay site for transmission and the other at the house for reception, we should be able to obtain about 18dB gain. Which means that we still have to find about 70dB worth of gain from elsewhere! Trying to obtain more than this amount of gain is not easy as the final amplifier stages must not become overloaded on strong signals and the input and output signals must be kept separate from each other.

The simplest way to achieve this is to use two thin film hybrid r.f. amplifier modules such as the Philips OM361 in series. These were originally designed for use in TV distribution systems and are broadband devices which give just under 30dB gain per module across the frequency range 40 - 860MHz. One or two additional components and a 12V d.c. power supply are all that is required to turn the modules into a working circuit. With so much gain being provided by the amplifier care must be taken to keep the input and output signals isolated from each other. This can be achieved by careful siting of the transmit and receive antennas, using natural barriers such as the edge of the cliff to screen them from each other and choosing opposite polarisations. Power is another problem but I would think that a small solar panel and car battery would be capable of providing sufficient energy especially if the supply is turned off when it is not required with a time switch. A small brick-built housing for the electronics and a mast for the antennas will also be required but you may be able to talk a local farmer into helping you. In addition you may be able to spread the cost of such an installation if you can find neighbours who would also like to improve their TV and f.m. radio reception.

As I said not a job for the faint hearted, and in this instance it may actually be cheaper to move house!

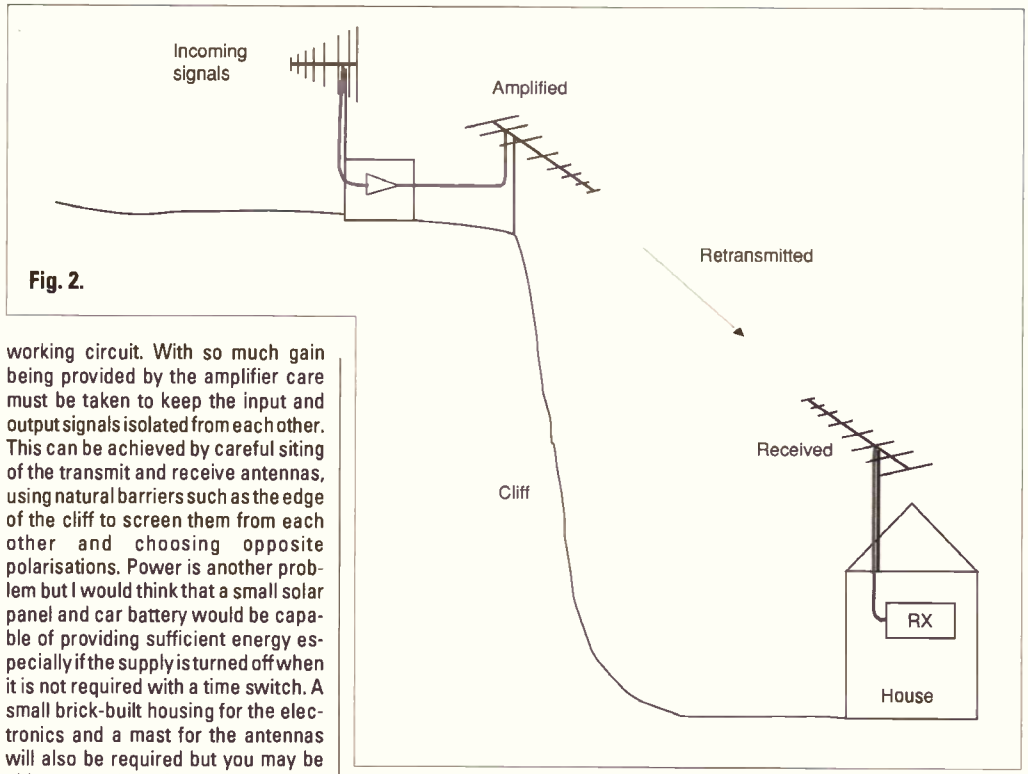


Fig. 2.

Spectrum +3 Interface

Trevor Dare of Jersey wonders if anyone out there has managed to interface a Spectrum +3 computer to an AR3000. I know I have featured similar requests before but no one will admit to having achieved it - can anyone help?

Once again I seem to have reached the bottom of the page, so until next month, good listening.

Airband 44 ➨

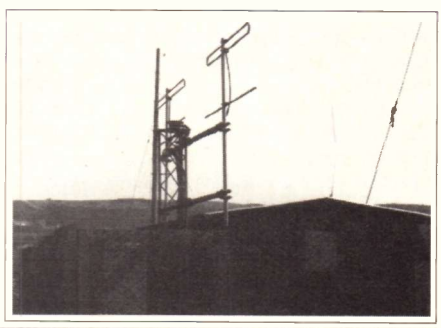
there is hardly any flying. There are also slack times in the middle of the day but this is on the decrease and can be further reduced by seasonal traffic peaks. Ultimately, a runway might be closed for repairs that can't wait. At Heathrow, single-runway operation might be possible. If not, then aircraft are 'stacked' in the holds and, hopefully, none will need to divert to another terminal due to fuel state. In the end, it's a trade-off between the inconvenience of late or diverted flights and the danger of essential ground equipment being out of action.

Brian's question is also an opportunity for me to remind ourselves of the lighting encountered at airports. Runways are brightly lit by a combination of white centre-line and/or edge markers. The threshold end might have a red border and, at the far end of the roll-out, the lights are also often red. Calvert lighting guides the final approach direction before the runway is reached. To show the correct glide path, there is a variety of slope indicators which all show red lights for 'you're too low' and white for 'too high'; correct angle is indicated by a mix of reds and whites.

Avoiding confusion with taxiways is essential. These are more dimly lit by green centre-line and blue edge lights - making an attractive vista to decorate the airport at night. Sometimes the green lights are switched on and off by the Ground Movements Controller in order to guide particular aircraft; in this case the controller will issue a taxi clearance which includes the phrase 'follow the greens'.

The next three deadlines (for topical information) are April 10, May 8 & June 5. All correspondence to 'Airband,' c/o The Godfrey Manning Aircraft Museum, 63 The Drive, Edgware, Middlesex HA8 8PS. All replies are via this column; unfortunately it is not possible to enter in to direct correspondence.

Middle marker on the i.r.s. approach to Runway 09 at Jersey in the Channel Islands.
Godfrey Manning.



Abbreviations

AIC	Aeronautical Information Circular
a.m.	amplitude modulation
DC	Douglas Commercial
f.m.	frequency modulation
h.f.	high frequency
l.w.	long wave
MHz	megahertz
m.u.f.	maximum usable frequency
m.w.	medium wave
PFA	Popular Flying Association
s.s.b.	single sideband
v.h.f.	very high frequency

info in orbit

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

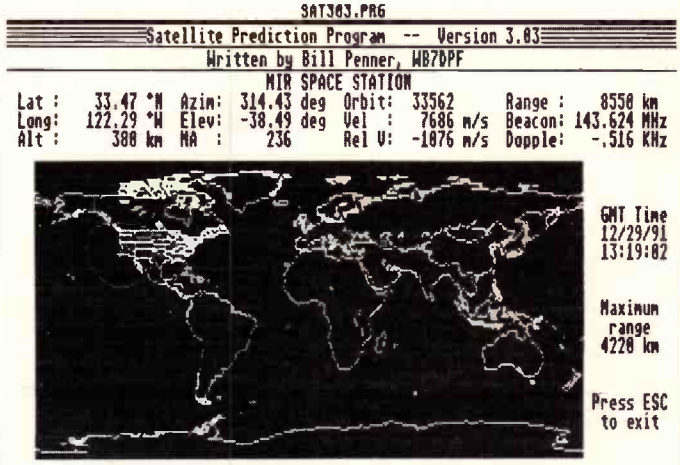


Fig. 1: Screen shot of SAT303 Satellite Predictions program from P.J. Bartlett.

The METEOSAT 5 (officially called MOP-2, the METEOSAT Operational Programme) label appeared after a long wait, on February 11. Although launched in early March last year, number 5 still has problems and was taken out of routine operations within two days of the transfer from METEOSAT 4, which happened last May. Since then, METEOSAT 4 (MOP-1) remains the operational satellite with only occasional problems such as interference from the sun during the equinoxes. Both METEOSAT 4 and 5 are near to longitude 0°.

METEOSAT 5 is occasionally used for image collection but METEOSAT 4 is then used for the re-transmission of those images. A careful note of the time of those pictures showed that they were about an hour old - this is referred to as having a slot offset of -1. Normally, pictures are from the last scan, taken every 30 minutes. The original problem with number 5 is now believed to be a very small movement of the radiometer cold optics lens, and although some program modifications at ESOC are being studied, it is not likely that number 5 will be brought into routine use for some time.

METEOSAT 2

This older satellite will be moved out of geostationary orbit shortly. Final pictures were taken to celebrate the 10th anniversary of the program.

METEOSAT 3

This remains positioned at longitude 50° west in order to provide the Americans with weather pictures of the western Atlantic. It has a failed power amplifier and minor damage to its electronically despun antenna but is otherwise healthy. Only one channel (1691MHz) is used for dissemination.

METEOSAT 6 (MOP-3)

Launch is currently planned for September 1993.

METEOSAT Experimental AVHRR Images

Since 1 August 1991, we have been able to receive WEFAX AVHRR frames from METEOSAT 4 that are transmitted on an experimental basis three times daily; 0726, 1026 and 2226UTC, on channel A2. The images are from the Advanced Very High Resolution Radiometer carried by the NOAA satellites. To include these wide-area pictures a number of satellite passes are combined and the data is re-mapped on a polar stereographic projection. From the original five spectral channels having a resolution of about 1km the data is processed in different ways to provide different products. One product uses an automatic cloud classification scheme for night-time imagery using just the infra-red channels. Another product contains only channel 3 data (3.7 micrometres). Final processing converts the data into the format for METEOSAT transmissions. My thanks to EUMETSAT for kindly providing this information.

Current Polar Satellites

There haven't been any unexpected changes within the NOAA satellite group. For some weeks all four were transmitting a.p.t. and their beacons have also been strong (see Frequency listing). A significant (well I think so!) milestone during the progression from winter to spring, was reached in early February when the afternoon passes of NOAA 11 finally remained in the visible format right to the end of the picture - near the north pole. During the longest hours of winter (between mid November and early February) the northern hemisphere is very dark and NOAA 11 switches over from visible to near infra-red just after passing Scotland! Meanwhile METEOR 3-4 has continued to transmit continuous telemetry although I would expect a change-over to 3-5 when 3-4 reaches the terminator. At that time its solar panels will be poorly illuminated and so there may be power problems. The predictable switch-over from METEOR 2-20 to 2-19 occurred on February 11, still using 137.85MHz. A further METEOR launch has now been officially scheduled so perhaps 3-6 will make an appearance.

Keplerian Elements

A number of correspondents including **J Martin** of North Harrow have asked for an explanation of Keplerian element parameters. Over the next few editions I'll cover each one. In order to get a computer program to predict when a satellite will be above the horizon at your receiving station you have to provide the program with a set of numbers (elements) which describe the details of the satellite's orbit. Several numbers are required to describe the orbit and different computer programs may require slightly different versions! Some require the 'equator crossing time' yet others need different parameters. It is possible to use a set of Kepler elements to calculate other parameters used in different programs.

The First Kepler Elements!

The first artificial satellite, Sputnik 1, was put into a fairly low orbit above the earth and had a revolution (orbital) period of not much more than an hour. This orbital period is related to its average height above the earth - the higher the orbit, the longer that period, and the slower its speed. So the moon, which of course is the earth's largest natural satellite, takes about one month to orbit the earth, at its distance of some quarter of a million miles. It is an interesting project to calculate the various orbital speeds for satellite orbits of different heights.

Object number: Each satellite has a unique object number which gives its position in the NASA catalogue. NOAA 9 is number 15427. Another classification method is to give the launch date and 'part number': NOAA 9 is also 1984-123A.

Epoch: This is the first computed element and it refers to the time at which the satellite's position was measured. Measurements are usually made by radar but can be derived from optical measurements. I once made several joint visual satellite observations with a French colleague to provide Herstmonceux (the old Royal Greenwich Observatory) with data. The Epoch is given in the form: 92 12.2206774 or 01/12/92 05:17:46UTC. You can see that the first form uses the 'Day of the Year' format in which January 1 is Day 1 and February 1 is Day 32. By multiplying the decimal part of the number, firstly by 24 to extract the hours (0.2206 x 24 gives 5 hours), and then by 60 to obtain the minutes, you can convert this decimal to the actual time of day - so 0.2206774 is really 05 hours and 17 minutes UTC. Remember that sometimes the American date format is used where the month and day are reversed (as above)! We now know when the orbital position was measured but we have to know how the orbital plane is tilted with respect to the earth's equatorial plane.

Orbital inclination: This is the angle between the plane of the satellite's orbit and the plane of the earth's equator. A satellite in an orbit with an inclination of 0° is travelling in the earth's equatorial plane - the geostationary satellites have such inclinations. Orbital inclinations of nearly 90° mean that the satellite passes over both poles on every pass, while the earth rotates below. The weather satellites have inclinations near to 90° so that they can pass over the poles

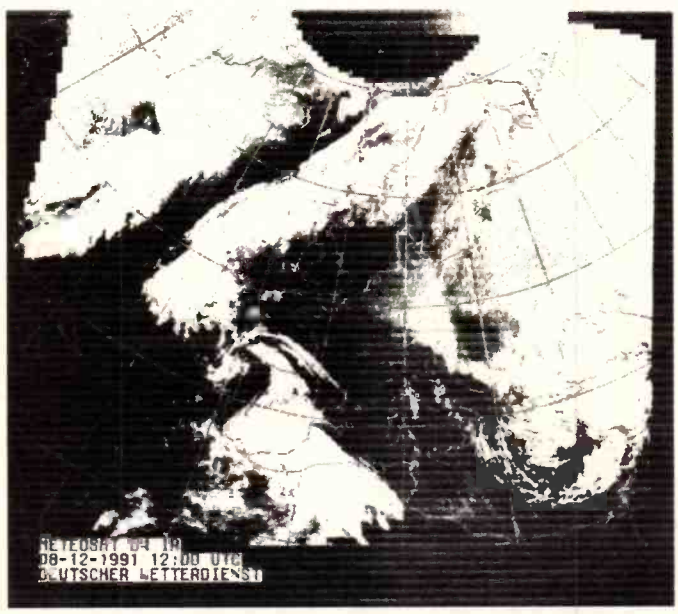


Fig. 2: METEOSAT 4 via Offenbach from Tony Hulme.

and therefore every place on the earth. Inclinations can vary between 0 and 180° - the larger inclinations simply refer to satellites orbiting in the opposite direction. Intermediate inclinations between 10 and 80° are commonly used.

Orbital period (Mean Motion): The time taken by a satellite to complete one revolution of the earth is termed its orbital period and is commonly about 100 minutes for the polar weather satellites. The geostationary satellites obviously have periods of 24 hours (23 hours 56 minutes to be more accurate). From this period, the number of orbits per day (Mean Motion - MM) can be calculated. Many of the weather satellites have MM values of about 13 or 14, that being the number of orbits of the earth that they complete each day. A glance at the Mean Motion values of METEOR classes two and three shows that each is distinct; METEOR 3-5 has a MM of 13.17 (approximately) and METEOR 2-20 has a value of about 13.83. METEOSAT has a MM of 1.00. The term Nodal Period is sometimes used in computer programs and this is defined as the period taken from one perigee passing to the next (see next edition). In practice it is effectively the orbital period expressed in minutes.

Kepler Elements

If you want a print-out of the latest elements just send me an s.a.e. All operating weather satellites are included, together with their transmission frequencies. In early February some correspondents received a print-out which contained an error in the NOAA 10 elements, having a RAAN value of 0.0 - my apologies for this. This data is supplied courtesy of NASA.

UoSAT 5

Professor Martin Sweeting of the University of Surrey sent me a photograph (see **Fig. 3**) taken by the UoSAT 5 satellite in November 1991 showing the large iceberg that detached itself from the Antarctic ice sheet. The University continue to collect routine images which are made available in the Amateur Satellite Service on 435.120MHz at 9600bps f.s.k.

New Products

I have asked a number of suppliers of weather satellite products to keep me up-to-date with their latest hardware. I have not had a startling response from them, which is surprising since the idea is that readers of this column will be interested to know of the latest products.

A new high specification pre-amp for METEOSAT has recently been developed by Timestep Weather Satellite Systems. I believe that it is intended for those wanting to set-up a receiving system for METEOSAT digital (PDUS) data, but I have had a look at both it and Timestep's new METEOSAT a.p.t. receiver. The receiver does not have a conventional appearance, having no external controls, but is built to be operated within their PROSAT 2 and previous software, by which it is controlled. The receiver has to be operated with a pre-amp and directly accepts the 1691MHz signal. The output is then fed to the interface card. The pre-amp is one of the new P-Hemt type containing ultra-low noise components. There were no specification sheets available but I tried it out on both METEOSAT 3 and 4. The sensitivity, gain and effective noise figure of the combination are such that some 20m of cable can be used between the dish (with the pre-amp attached) and the receiver.

The METEOSAT pictures produced by this combination were the best that I have seen on my system, and this is reflected in the item prices. I believe that the pre-amp is approximately £184 and the receiver about £199! Further details from Timestep on (0440) 820040.

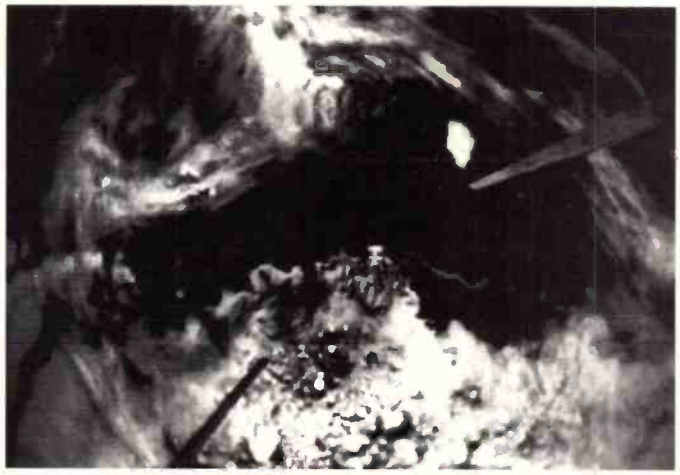


Fig. 3: Iceberg near Antarctica from UoSAT 5 - Martin Sweeting.

Letters

Last month, I mentioned **P J Bartlett** of Pinner who provided information about satellite predictions software for the Atari ST computer. He has sent me a screen-shot (see **Fig. 1**) of the SAT303 program. **L D Curno** of Holsworthy in Devon has been an avid satellite monitor for many years and uses the Griffin and George receiver and colour framestore for monitoring METEOSAT and the polar orbiters. He mentions that he has seen high altitude aircraft trails on METEOR pictures. **Tony Hulme** of Blackpool is a keen monitor of the Shuttle program and is a regular listener to the Russian manned space station MIR on 145.550MHz. The other frequency worth monitoring from MIR is 143.625MHz which can be heard on most days when MIR passes over the UK. Tony has quite a collection of equipment; an Icom IC-R70 receiver with down-converter, the Technical Software RX8 multi-mode system, a PC386 computer running InstantTrack satellite predictions and an AOR2001 scanner. An assortment of antennas feed these various receivers! Tony's only problem is that he has not had a QSL card from NASA, but received several from the MIR cosmonauts. **Fig. 2** shows one of Tony's printouts.

Bandwidth for WXSATS

Peter Burgess of Gloucester describes a problem that he has with his weather satellite equipment. He uses a home-assembled Maplin decoder fed from a Realistic PRO-2022 scanner, itself fed from a crossed dipole. The decoder feeds an Amstrad PC1640 and he has written his own assembler program to produce the pictures, using the reduced EGA mode of 640 by 200 lines with 16 grey levels. Peter explains that the signals sound loud and clear and yet his picture is not synchronising properly. There also appears to be a problem with reception - he experiences deep, cyclical fades.

Finally, Peter asks what the receiver bandwidth requirements are for weather satellites. From the description, the first item to check is the bandwidth of the scanner. It is probably only a narrow-band i.f. unit (often 12kHz). Normal weather satellite transmissions consist of the main carrier (around 137.50MHz) which is frequency modulated by a sub-carrier of 2400Hz. This sub-carrier is amplitude modulated by the image data from the satellite's own scanner. The bandwidth of this unusually complex telemetry is about 30kHz with another 20kHz or so of added Doppler shift! That is why a dedicated weather satellite receiver has this extra bandwidth. With the wider bandwidth the improvement will be considerable and should provide proper synchronising tones. The antenna problem described by Peter does sound like a wrongly-phased crossed dipole. This effect was seen when the Chinese FENGYUN satellite was launched and its telemetry was found to be left-circular instead of right-circular causing deep signal fades.

Pat McMahon E11018 wrote from Eire to say that he has been a s.w.l. for several years but when he recently got a v.h.f. scanner he was able to tune in to the WXSATS. His children have an Amstrad PC1512 and Pat wonders about the availability of cheap software for producing satellite pictures. I don't know of low-cost software for the 1512 but perhaps a reader might be able to help? Several letters held over till next month - thank you all for writing!

Other Satellites

With the number of frequencies that can be monitored using synthesised frequency scanners probably many monitors will try searching for the occasional unexpected satellite in the 137MHz band. There are several that can be heard between 136.0 and 137.95MHz. The Japanese Marine Observation Satellites MOS-1 and MOS1B transmit on 136.11MHz. Sometimes just one operates and sometimes both are transmitting. I hear PROSPERO (the British satellite X3) on 137.56MHz occasionally.

Tony Hall wrote from the Isle of Wight to tell me about the on-board systems of PROSPERO. He has been talking with the engineers in Australia who were involved with the Black Arrow launcher that put PROSPERO into orbit, and he tells me that there are two telemetry transmitters available, both using the same frequency with an output power of only 300mW. The effective bandwidth of the signal is only 8kHz so it is interesting to be able to pick it up with a weather satellite receiver which has a bandwidth of some 50kHz! This is an example in which, for simply monitoring satellite signals, the general purpose scanner which has a narrow i.f. bandwidth, is perhaps better than the dedicated weather satellite receiver.

WXSAT Frequencies

NOAAS 9, 11 a.p.t. on 137.62MHz, beacons on 137.77MHz

NOAAs 10, 12 on 137.50MHz, beacons on 136.77MHz

METEOR 2-19 or 2-20 on 137.85MHz

METEOR 3-4 or 3-5 on 137.30MHz

OKEAN 3 on 137.40MHz (not heard recently)

FENGYUN 1-2 was on 137.80MHz (keep watching)

METEOSAT-4 channel A1 1691MHz, channel A2 on 1694.5MHz

METEOSAT-3 1691MHz

decode

Mike Richards G4WNC
200 Christchurch Road, Ringwood, Hants BH24 3AS.

Philip Mitchell of Newbury has written with a tip for FAX operators who use printer based decoders. One of the problems with printing FAX images is that it eats ribbons! The cost effective solution, proposed by Philip, is to re-ink the ribbons. Whilst not new, I think the idea is worth another mention. Philip has had great success by using a bottle of ink-pad ink, applying it to the ribbon with a sable brush. Although this works fine for Philip, I would personally advise against using ink-pad ink. This is because the ink in a printer ribbon contains a lubricant for the pins in the print head. If you use an ordinary ink, there is a risk that either the head may gum up or wear badly. If you take a look at any of the popular computing magazines you should find an advert for proprietary re-inking compounds. One other tip is not to get the ribbon too wet - you'll lose definition if you do.

Ray Pugh of Southport is having difficulty finding a suitable printer for his ERA Microreader with optional large display. Like many short wave listeners, Ray is not computer trained, so has some difficulty finding his way past all the jargon. The problem is compounded through a lack of mobility. I think Ray's requirements align with many other listeners, so I'm asking for your comments and experiences. What I need to find is a current model printer that's physically small, cheap, quiet and has a parallel interface. As some readers need a serial interface, it would be useful if this was also available. I eagerly await your suggestions!

Roy Berrisford of Bakewell in Derbyshire has recently migrated from the amateur bands to utility listening. The equipment in use is the very capable JRC JST-125 transceiver with a PK-232 intelligent terminal unit. The computer is an IBM PC compatible which links to the PK-232. With his change of interest, Roy is looking to expand his reception modes from those covered by the PK-232. Having seen my mentions of devices like the Wavecom and Pocom units, he's asks where can he get more details. There are two options here. The first is to visit one of the many radio rallies where you can see many of the units being demonstrated. An alternative is to contact Dewsbury Electronics as they carry a very comprehensive range of the more sophisticated decoders. However, as he already owns an IBM compatible PC, the Code-3 from Hoka is likely to be a very strong contender.

Image Processing

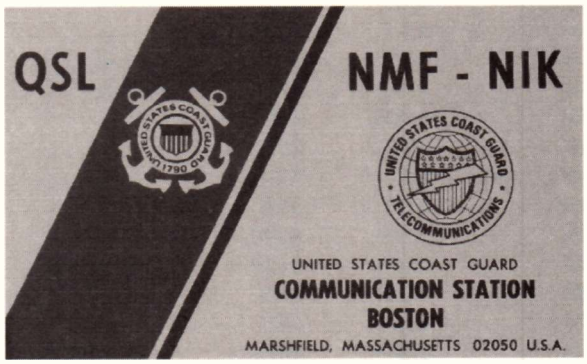
Philip Mitchell also queried a chart that I published in the February 'Decode'. The chart was from William Clark and I commented on the peppery background caused by interference to Offenbach. The only problem was that the image appeared to be very clean when printed in the magazine! This is a spin-off from a good Desk Top Publishing (DTP) and printing system. These systems are designed to give the best possible print quality. Because of this you can run into trouble if you're trying to show a poor image! Probably the classic example of this occurred a few years ago with a sun spot chart. If you're not familiar with sun spot charts, these usually comprise a white disk with a number a small dots representing the sun spots. On this particular occasion the printer, in an attempt to give a good image, erased all the dots from the chart. This left a clear white disk!

However, the story is not all negative, as it gives an indication of what can be done to improve a noisy FAX image. The technique is not new and is used extensively in the scientific world to pull signals out of the noise.

For the utility listener, the most obvious application is to clean-up FAX images. The systems that lend themselves best to this are the IBM PC based FAX decoders. Most of these feature the ability to save the received chart or photo as a .PCX file. A .PCX file is a format for storing graphic data and enables graphic images to be moved between programs. By using this system, you can receive the FAX image and pass it to a paint or other graphics program. Once in this system, the interference patterns can be erased and missing lines inserted. Although this can be time consuming, the results can be really good. Once the image has been cleaned, by far the best type of printer is one of the modern laserwriterss. This is an expensive option for most listeners, but if you have access to a laserwriter at work, why not see if you can take a disk in for printing.

If you've experimented with computer processing of FAX images, I'd very much like to hear from you.

Day Watson received this WOO-Ocean Gate Radio QSL.



QSL card from Coast Guard Communication Station, Boston, USA, Sitor broadcast, 27 - 30 Sept & 1, 5, 7 Oct '90.

TASS Update

The news here seems to be no news! I've been scanning the bands and can find no trace of activity on any of the old TASS frequencies. I've also received letters from many readers telling the same sorry tale. For the utility listener this is a real blow as TASS was certainly the most prolific of the h.f. press agencies. Although there will doubtless be new agencies formed as the new states find their feet, they probably won't return to RTTY. This is because of the effectiveness and availability of satellite links. If the old RTTY links are retained it will probably only be as a back-up system. However, it may turn out that the cost of maintaining the old links means that they become totally abandoned. However, as **Robert Hall** of South Africa quotes in a recent letter, there are still plenty of stations to monitor. From the press point of view there are some twenty stations still active. A selection of the most popular being: TANJUG, XINHUA, KCNA, MENA, PAP, ANSA, PANA, IRNA, TELAM, MAP, KYODO, CNA and JANA.

If anyone catches any transmissions on old TASS frequencies, I'd be grateful if you could write with the details.

Press Photos

This is a subject that seems to reappear regularly. The latest to write is **Mr T. C. Buckle** of Daventry. He currently uses a Spectrum +2 computer running the J & P Electronics RAMS IV decoding package. Although he reports great success with both amateur and weather FAX images, he's not been able to find any press photos. This is not uncommon, as there are very few reliable transmissions left on the h.f. bands. The main reason for this is that the major press agencies use satellite links or land-lines for the bulk of their transmissions. However, all is not lost, those that are left are quite interesting.

Before I go on to describe them, I ought to make mention of the equipment you need. Although you can receive press photos with most FAX programs, you really need one that supports a grey scale for best results. Many of the simpler FAX programs are designed primarily for receiving charts and so are set-up to print either black or white. Using this system, each element of the received image is examined and declared to be either black or white. This has great advantages when receiving charts, as it helps to give a clean well defined image. However, when trying to receive photographs, the program continues to attempt to switch between black and white. From this you might think that this type of program can't be used for photos. In practice it can, because the software dithers whilst receiving a mid tone and creates the illusion of a grey scale. However, the quality is greatly reduced when compared to that from a more sophisticated decoder.

By far the most consistent of the press stations is the transmission from DCF39 on 139kHz. This station is based in Germany and relays photos and new items for the DPA agency. To receive this transmission you will need a decoder that can operate with a 150Hz shift, set to an IOC of 288 and a drum speed of 60 r.p.m. Because this station uses the narrow 150Hz shift, the tuning is particularly critical. You'll find that you can adjust the contrast of the recovered image by careful fine tuning. The range and quality of images transmitted from this station are usually very good and certainly copious! One of the disadvantages with this l.f. signal is the level of interference that many listeners suffer. This is often very difficult to locate and cure. From letters I receive on the subject, a good quality audio filter can really pay dividends with this type of interference.

One characteristic of most press FAX stations is the lack of normal start

and stop tones. This means that many images have to be started manually - so demanding a lot of time from the operator.

The next most interesting press photos come from the Associated Press agencies in Buenos Aries. This is one of the last of the long distance FAX links and provides some very interesting images. The frequencies to watch are: 17.672MHz (LQZ67), 18.093MHz (LRO84) and 20.736MHz (LSA600) The format used is similar to DCF39, with an IOC of 288 and drum speed of 60 r.p.m. The main difference is in the shift used which is the standard 400Hz used for most h.f. FAX signals. This has the advantage of simplifying the tuning. The main problem with this station is the infrequency of the transmissions, coupled with the lack of start or stop tones. This means that you have to listen for the start of the transmission and then manually start the decoder. Because the signals disappears for often long periods between images, you need to manually stop the decoder at the end. Although time consuming, the results are usually worth the effort. As with the l.f. transmissions, good audio and r.f. filtering can make a tremendous difference to the quality of the received pictures.

If you have information on any other reliable press FAX transmissions, perhaps you'd drop me a line with the details.

Free Software

I thought that title would catch your eye! Regular readers will no doubt be aware of the RTTY weather decoding programs that Bill Nicoll has so kindly provided. Well, Bill has now gone one stage further and made these, and some new programs, available on disk. Just to whet your appetite, here's a sample of the programs on his disk;

Comms (Main Menu)
Decoder (Baudot - meteo)
FAX/FAXA (WX map display)
LOG1 (Amateur log)
Morse (Morse tutor)
PKDISP/PKLIST (Printing)
RTTY-1/2 (Test for TX)
SAT (Satellite positions)
STAAM (Log book)
COPY/YAPP (File copier)
CALLS (station info)
LOCATE (Maidenhead locator)
PK232 (TNC Driver)
YAGI (Antenna construction)
RADAR (Distances)
OHMS CALCULATIONS
BAROMET (WX conversion)
SORTS (Sort station lists)

If you would like a copy of this disk, you will need to send Bill a FORMATTED disk (3.5 or 5.25in) and an s.a.e. As this is a very generous free service, **please be patient and make sure you include adequate return postage.** Bill's address is: 124 Hilton Avenue, Aberdeen AB2 2LH.

WLO Frequencies

Tim Anderson of St. Leonards has just received a schedule of the latest operating frequencies for this well known maritime station. I've reproduced it here for your information. If you'd like to QSL with the station, the address is: Mobile Marine Radio Inc, 7700 Rinla Avenue, Mobile, Alabama 36619, USA.

The frequencies listed here are for the latest narrow band duplex ARQ transmissions.

WLO also operate a broadcast service that transmits traffic lists, weather info and broadcast schedules. The mode used is FEC and the current frequencies are:

December to May: 4.343, 6.416, 8.514, 12.8865, 17.0225 & 22.487MHz.

All other times: 4.4625, 6.344, 8.534, 12.992, 16.9976 & 22.688MHz.

If you want to catch the latest broadcast schedules, they are sent after the traffic lists at the following times: 0235, 0835 & 2035UTC.

My thanks to Tim for this comprehensive report.

ITU Chan	TX	RX	Remarks
405	4.1745	4.2125	Delete
406	4.175	4.213	
410	4.177	4.215	
415	4.179	4.217	New Freq
417	4.1805	4.218	New Freq
606	6.2655	6.317	
610	6.2675	6.319	
615	6.27	6.321	
619	6.272	6.323	
624	6.2745	6.3255	New Freq
805	8.3785	8.4185	Delete, now 829
806	8.379	8.419	
810	8.381	8.421	
811	8.3815	8.4215	Delete, now 832
815	8.3835	8.4235	
826	8.389	8.429	
829	8.3905	8.4305	New Freq
832	8.392	8.432	New Freq
1205	12.479	12.5815	
1211	12.482	12.5845	
1215	12.484	12.5865	
1225	12.489	12.5915	
1229	12.491	12.5935	
1234	12.4935	12.596	
1240	12.4965	12.599	
1250	12.5815	12.684	Delete, now 1261
1251	12.502	12.6045	
1254	12.5035	12.606	
1261	12.507	12.6095	New Freq
1605	16.6855	16.809	
1611	16.6885	16.812	
1615	16.6905	16.814	
1625	16.6955	16.8185	
1629	16.6975	16.8205	
1640	16.703	16.826	
1644	16.705	16.828	New Freq
1650	16.708	16.831	
1654	16.710	16.833	
1661	16.7135	16.8365	New Freq
1810	18.875	19.6855	
2210	22.287	22.381	
2215	22.2915	22.3835	
2254	22.311	22.403	
2256	22.312	22.404	
2260	22.314	22.406	
2262	22.315	22.407	
2272	22.320	22.412	

Operating frequencies for WLO, the well-known maritime station. This list was supplied via Tim Anderson of St, Leonards, Sussex.

Frequency List

As usual I've included a selection of loggings supplied by readers during the past month. I also have a more complete list that's available to all who supply three first or second class stamps to the address at the head of the column. The format for the list is: frequency, mode, speed, shift, callsign, time and notes.

123.7kHz, FEC-A, 96, 200, DCF42, -, PIAB Bonn

2.822MHz, RTTY, 100, 425, DHN37, 2222, Grengel Meteo

3.3314MHz, AUTOSPEC, 68.5, 85, -, 2123, Oil rig

4.2536MHz, c.w., -, -, EAH, 2125, Istanbul radio

4.583MHz, RTTY, 50, 425, DDK2, 1512, Quickborn Meteo

5.24MHz, RTTY, 50, 400, -, 2300, TANJUG press

6.972MHz, RTTY, 50, 400, YOG59, ROMPRES

7.646MHz, RTTY, 50, 425, DDH7, 1428, Quickborn Meteo

7.85MHz, RTTY, 50, 400, ZAA, 1900, ATA Tirana

7.96MHz, RTTY, 50, 400, -, 1910, IRNA press

7.946MHz, ARQ-E, 96, 400, UNID, 2343, 4 CRC idling

8.02MHz, RTTY, 50, 400, -, 1816, KCNA press

8.4376MHz, RTTY, 50, 400, PBC, 1223, Dutch Navy

9.046MHz, RTTY, 75, 400, DFZG, 0706, MFA Belgrade

10.536MHz, RTTY, 75, 850, CFH, 2142, CF Halifax

10.551MHz, RTTY, 50, 400, GFL23, 1740, Bracknell meteo

10.595MHz, RTTY, 50, 400, -, 1640, MAP Rabat

10.61MHz, RTTY, 75, 400, -, 1621, MENA

11.5654MHz, ARQ-242, 192, 138, -, 1621, 4 chan 4 CRC idling

12.6627MHz, c.w., -, -, 7TF8, 1756, Skikda radio

12.8336MHz, c.w., -, -, SVA, 1411, Athens radio

13.016MHz, c.w., -, -, IAR, 1907, Rome radio

13.38MHz, ARQ-242, 96, 400, CUA67, 1236, PTT Lisbon

14.367MHz, RTTY, 75, 400, -, 1210, XINHUA

17.1057MHz, c.w., -, -, IRM, 1546, CIRM Rome

long medium & short

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

The final transmissions from the historic BBC Daventry station will take place on March 28, when the current winter schedule ends. Most of the broadcasts will be transferred to the Woofferton station, which has spare capacity owing to a reduction in VOA relay requirements.

Apparently there is to be a final closing ceremony around midday on Sunday March 29, to which many former members of staff have been invited. One of the 'Senders' will carry a special transmission on 15.070MHz, followed by an official switching off at 1230.

Long Wave Reports

Note: l.w. & m.w. frequencies in kHz; s.w. in MHz; Time in UTC (=GMT). Unless stated, all logs made during the four weeks ending February 1.

Encouraged by reception of transatlantic signals from Europe last month, **Alan Roberts** (Quebec) has been checking the band more frequently. Conditions often proved to be unfavourable, but at 0555 on January 8 he heard chimes, followed by headlines and a news bulletin in French from Europe 1 via Saarlouis, Germany (2000kW) on 183kHz. Reception was fair. There was no mention of 'Europe 1', but 'Edition 1' was quoted twice. At 0610 he heard a man singing in Arabic and N.African music on 207kHz. Reception was poor, but the nature of the broadcast suggested that it came from Azilal, Morocco (800kW).

Medium Wave Reports

Whilst at Cwm Nantcol, Gwynedd (754m a.s.l, near the coast of NW.Wales), **Sid Morris** searched for transatlantic signals on five nights. Using a Nevada MS 1000 scanner plus telescopic whip antenna, he heard broadcasts from six stations in the USA and seven in Canada. The first came from WINS in New York on 1010kHz at 0130. Best reception occurred was 0145. Conditions then deteriorated and much fading was evident by 0430.

Speech and music were heard on 930kHz by **Tim Bucknall** (Congleton) after midnight on January 25. The signal, which peaked 23422 at 0025, may have come from CJYQ in St.John's, NF but Tim was unable to obtain a definite ident. Since then he has monitored 930 several times without success.

Signals from CJYQ on 930 is used by many DXers as a pointer to conditions. It was SIO233 at 0017 by **Jim Willett** in Grimsby. The Caribbean Beacon, Anguilla 1610 became audible after 0330 and peaked SIO222 at 0520.

Sky wave signals from stations in Spain have been dominating the band after dark. **John Stevens** (Largs) says, "I doubt if there is any legal frequency in use from 520-1602kHz which has not got a Spanish transmission on it after dark. Even local people with portable radios who listen to a.m. broadcasts in the evening are complaining about it".

Many local radio outlets that transmit on both m.w. and v.h.f. are closing their m.w. outlets to make way for additional Community Radio stations. By the time this issue is printed, BBC R.Gloucester 603, R.Oxford 1485, R.Northampton via Trowell 1521 and R.Cleveland via Stockton 1548 may well have closed down.

Listeners:-

A: J.Arunachalam, Thumrait, Oman.
B: Darren Beasley, Bridgwater.
C: Tim Bucknall, Congleton.
D: Steve Cann, Southampton.
E: Paul Gibson, Edinburgh.
F: Alf Gray, S.W.Birmingham.
G: Francis Hearne, N.Bristol.
H: Rhoderick Illman, Oxted.
I: Philip Lee, Huntingdon.
J: Eddie McKeown, Co.Down.
K: George Millmore, Wootton I.O.W.
L: Sid Morris, Rowley Regis.
M: Don Phillips, Bridlington.
N: Hugh Quinn, Co.Kildare
O: Tom Smyth, Co.Fermanagh
P: John Stevens, Largs.
Q: Phil Townsend, E.London.
R: Julian Wood, Elgin.

Medium Wave Chart

Freq kHz	Station	Country	Power kW	Listener
520	Hof-Saale	Germany	0.2	C,J*
531	Leipzig	Germany	100	C,J*,K
531	Oviedo	Spain	10	C*,J*
531	Beromunster	Switzerland	500	C*,N*
540	BRT-2 Wavre	Belgium	150/50	C,J*,K,L*,N*,Q*
549	DLF Bayreuth	Germany	200	J*,K,L*,N*,Q*
549	Nordkirchen	Germany	100	C
558	Rostock	Germany	20	J*
558	Valencia	Spain	20	C*,J*
567	Berlin	Germany	100	C*,J*
567	RTE-1 Tullamore	Ireland (S)	500	C,E,H,K,L,Q*
576	Muhlacker	Germany	500	J*,Q*
576	Stuttgart	Germany	500	C*,J*,K,L*
585	Orf Wien	Austria	600	J*,Q*
585	FIP Paris	France	8	C*,K
585	RNE-1 Madrid	Spain	200	C*,L*
585	BBC-R.Scot D'fries	UK	2	C,N*
594	Frankfurt	Germany	1000/400	C,J*,K,L*,N*,Q*
594	Muge	Portugal	100	J*
594	Izhevsk	Russia	100	C*
603	Lyon	France	300	C*,J*
603	BBC-R4 Newcastle	UK	2	C
612	RTE-2 Athlone	Ireland (S)	100	C,K,L,Q*
612	Sebaa Aioun	Morocco	300	J*
612	Lerida	Spain	10	J*
621	RTBF-1 Wavre	Belgium	80	C,J*,K,L*,M,N*,Q*
630	Vigra	Norway	100	J*,N*
630	Timisoara	Romania	400	J*
630	Tunis-Djedeida	Tunisia	600	C*
639	Praha	Czech	1500	J*,K
639	La Coruna	Spain	100	C*,J*,L*,N*
648	BBC Orfordness	UK	500	C,D,J*,K,L
657	Burg	Germany	250	J*
657	RCE-2 Madrid	Spain	20	J*,N*
657	BBC-R.Wales	Wrexham UK	2	C,L*
666	Bodenseesender	Germany	300/180	C*,J*,L*,Q*
666	Barcelona	Spain	20	J*
675	Marseille	France	600	J*,L*,N*
675	Hilversum-3 Lopic	Holland	120	C*,J*,K,N*,Q*
684	RNE-1 Sevilla	Spain	250	C*,J*
684	Beograd	Yugoslavia	2000	J*
693	Berlin	Germany	250	J*
702	Aachen/Flensburg	Germany	5	J*
702	Monte Carlo	Monaco	300	C*,J*
702	Zamora	Spain	5	J*
711	Rennes 1	France	300	B,C*,J*,K,L*,N*,Q*
720	Langenberg	Germany	200	K
720	Norte	Portugal	100	J*
720	BBC-R4 Lots Rd	LondonUK	0.5	B,K
729	RTE-1 Cork	Ireland (S)	10	B,C,J*,K
729	Oviedo	Spain	50	J*,L*
738	Paris	France	4	B,K
738	Poznan	Poland	300	J*
738	RNE-1 Barcelona	Spain	250	C,J*,N*
747	Hilversum Flevo	Holland	400	B,C,J*,K,L*,N*,Q*
756	Brunswick	Germany	800/200	B,C,J*,N*
765	Sottens	Switzerland	500	B,C,J*,L*,N*
774	R4 Enniskillen	Ireland (N)	1	J*,N*
774	RNE-1 Caceres	Spain	60	C*
774	S.Sebastian	Spain	60	B,J*
783	Burg	Germany	1000	B,C*,J*,L*,N*,Q*
783	Zagreb-Buje	Yugoslavia	10	C*
792	Limoges	France	300	B,C*,K
792	Sevilla	Spain	20	J*
792	BBC R.Ulster	UK	1	N
792	Al-Hiswah	Yemen	750	A
801	M'chen-Ismaning	Germany	300	C*,J*
801	Burgos	Spain	10	J*
810	SER Madrid	Spain	20	C*,J*
810	Scot. Burghead	UK	100	C*,N*,Q
810	Scot.Westerglen	UK	100	B,C,J*,K,L
819	Bordeaux	France	20	N*
819	Toulouse	France	50	J*
828	Hanover	Germany	100/5	C*,J*
828	Corca Dhuibhne	Ireland (S)	1	N*
837	Nancy	France	200	C*,J*,N*
837	R.Popular, Sevilla	Spain	10	J*
846	Rome	Italy	540	C*,J*,L*,Q*
855	Berlin	Germany	100	C*
855	Murcia	Spain	125	J*,L*,N*
864	Paris	France	300	B,C*,J*,K
873	Frankfurt	Germany	150	C*,J*,L*,Q*
873	Enniskillen UK	1	J*,N
882	COPE Malaga	Spain	5	J*
882	BBC-Penmon	UK	10	C
882	BBC-Tywyn	UK	5	C
882	BBC-Washford	UK	100	B,J,K,L,N,Q*
891	Algiers	Algeria	600/300	C*,J*,K,L*,N*
900	Karlovy Vary	Czech	20	C*
900	Milan	Italy	600	C*,J*,N*
900	Qurayyat	Saudi Arabia	1000	J*
909	Brookmans Pk	UK	140	L
909	Moorside Edge	UK	200	C,K
918	R.Intercont.	Spain	20	C*,J*,L*,N*
927	Wolvertem	Belgium	300	B,C*,J*,K,L*,N*,Q*
936	Bremen	Germany	100	C*,J*,N*,Q*
945	Toulouse	France	300	J*,N*,Q*
945	Rostov-na-Donu	USSR	300	C*
954	Dobrochov	Czech	400	J*
954	RCE Madrid	Spain	20	C*,J*
963	Pori	Finland	600	B,C*,J*,K,L*,N*,Q*,P,Q*
963	Tir Chonaill	Ireland (S)	10	C*
972	Hamburg	Germany	300	B,C*,J*,K,L*,N*
972	Nikolayev	Ukraine	500	C*
981	Alger	Algeria	600/300	C*,J*
981	Ceske Budejovice	Czech	30	J*
990	Berlin	Germany	300	J*,N*
990	SER R.Bilbao	Spain	10	J*,Q*
990	BBC-Tywyn	UK	1	C*,N*
999	Hoyerswerda	Germany	20	J*
999	R.Popular, Madrid	Spain	20	C*,J*,Q*
1008	Hilversum-5 Flevo	Holland	400	B,C*,J*,K,L*,Q*
1017	Rheinsender	Germany	600	C*,J*,N*,Q*
1017	RNE-5 Burgos	Spain	5	J*
1026	Graz-Dobl	Austria	100	J*,Q*
1035	Prog.3 Lisbon	Portugal	120	J*
1035	Tallinn	USSR	500	C*
1044	Dresden	Germany	250	C*,J*
1053	COPE Zaragoza	Spain	10	J*,N*
1062	Kalundborg	Denmark	250	B,C*,J*,N*
1071	Prague	Czechoslovakia	60	J*
1071	Brest	France	20	C*,J*,K
1071	Lille	France	40	C*,J*
1080	Katowice	Poland	1500	J*
1089	Weimar	Germany	20	J*
1098	Bratislava	Czech	750	C,J*,N*
1098	RNE-5	Spain	10	J*,L*
1107	AFN via Munich	Germany	40	J*,L*
1107	RNE-5 Santander	Spain	10	J*
1107	BBC-R1 Wallasey	UK	0.5	C
1116	SER-Pontevedra	Spain	2	J*
1125	La Louviere	Belgium	20	K
1125	RNE 5	Spain	10	J*
1125	Llandrindod Wells	UK	1	C,L
1134	Zadar	Yugoslavia	1200	J*,L*
1143	AFN via Stuttgart	Germany	10	C*,J*,N*
1143	Kaliningrad	Russia	150	C*,J*
1152	RNE-5	Spain	10	J*
1161	Stara Zagora	Bulgaria	500	J*
1161	Strasbourg (F.Int)	France	200	B,J*,L*,N*
1179	Santiago	Spain	10	J*
1179	Solvesborg	Sweden	600	B,C*,J*,J*,K,L*,M*,N*,Q*,R*
1188	Kuurne	Belgium	5	B,J*,K
1188	Szolnok	Hungary	135	C*
1197	VOA via Munich	Germany	300	B,C*,J*,L*
1197	BBC Enniskillen	Ireland (N)	1	J*
1197	BBC Bournemouth	UK	0.5	B,K
1206	Bordeaux	France	100	C*,J*
1206	Wroclaw	Poland	200	N*
1215	Kaliningrad	Russia	500	J*
1215	BBC-R3 Droitwich	UK	30	L
1224	Vidin	Bulgaria	500	J*
1233	Melnik	Czech	400	J*
1242	Marseille	France	150	C*
1251	Huisberg	Netherlands	10	J*,Q*
1260	VOA via Rhodes	Greece	500	J*
1260	Valencia	Spain	20	C*,J*,L*
1269	Neuminster	Germany	600	B,C*,K,L*,N*,Q*
1278	Strasbourg	France	300	C*,J*
1278	Dublin/Cork	Ireland (S)	10	B,J*,L
1287	Litomysl/Liblice	Czech	300/200	L*,Q*
1296	San Sebastian	Spain	5	J*
1296	BBC Orfordness	UK	500	B,C*,J*,L*,N,Q*
1305	Marche	Belgium	10/5	C*
1305	Rzeszow	Poland	100	J*
1305	Orense (RNE5)	Spain	5	J*,L*
1314	Kvitsoy	Norway	1200	B,C*,J*,K,L*,N*,P*,Q*
1323	BBC Zyyi	Cyprus	50	C*
1323	R.Moscow	Germany	150	C*,J*,L*,N*
1332	Rome	Italy	300	C*
1341	Lisnagarvey	Ireland (N)	100	B,C,G*,K,L,N,Q*
1350	Nancy/Nice	France	100	B,C*,J*,K,L*
1359	Berlin	Germany	250/100	C*,J*,L*
1368	Manx R. Foxdale	IOM	20	C,J*,N,O*,P
1377	Lille	France	300	B,C,J*,K
1386	Kaliningrad	Russia	500	B,C*,J*,Q*
1395	R.Tirana	Albania	1000	C*,J*,J*,L,M*,N*
1395	Alicante	Spain	2	J*
1404	Brest	France	20	B,C*,J*,K
1413	BBC/Masirah Is.	Oman	1500	A
1413	Seville	Spain	10	C*
1413	RCE Zaragoza	Spain	20	C*,J*,N*
1422	Heusweiler	Germany	1200/600	B,C*,J*,K,L*,N*,P*,Q*
1431	Dresden	Germany	250	J*
1449	Berlin	Germany	5	J*
1449	BBC-R4 Redmoss	UK	2	C*
1467	TWR Monte Carlo	Monaco	1000/400	B,C*,J*,L*
1476	Wien-Bisamberg	Austria	600	C*,J*,L*,Q*
1476	Bilbao	Spain	20	C*
1485	R1 Bournemouth	UK	2	B
1494	Clermont-Ferrand	France	20	B,C*
1494	St.Petersburg	Russia	1000	C*,J*,M*,Q*
1503	Stargard	Poland	300	C*,J*,M*,Q*
1512	BRT Wolvertem	Belgium	600	C*,E*,J*
1521	Kosice	Czech	600	K,L*,M,Q*
1530	Vatican R. Rome	Italy	150/450	B,J*,Q*
1539	Mainflingen	Germany	700	C*,J*,N*,Q*
1539	Valladolid	Spain	5	B,C*,J*,K,L*,N*
1557	Nice	France	300	N*
1566	Samen	Switzerland	300	B,C*
1575	Burg	Germany	250	C*
1575	Cordoba	Spain	5	B,C*,J*,L*,N*
1584	Cottbus	Germany	1	N*
1584	Pamplona	Spain	2	C
1593	Langenberg	Germany	400/800	B
1602	SER R.Cartagena	Spain	2	B,C,J*,K,L*,N*,Q*
1602	R.Onteniente	Spain	2	N*
1602	Vitoria	Spain	10	B
1611	Vatican R. Rome	Italy	5	C,P
				C,J*

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

long medium & short

Short Wave Reports

Although h.f. propagation has been disturbed by solar flares, good reception from many areas has been noted in the UK. Solar activity is still continuing at a high level and further disturbances are likely.

Daily propagation variations have been noted in the **25MHz (11m)** band, but reports show that most broadcasts have reached their targets well. The majority are beamed to areas outside Europe but they can often be received here via backscatter. However, reception tends to be unreliable and subject to fading and echoes.

Several broadcasters have now left the band, but those still active include the V.of the UAE in Abu Dhabi 25.690 (Ar 0900-1100) SIO254 at 1035 by **Richard Radford-Reynolds** in Guildford; R.Norway Int, Oslo 25.730 (Norw to Australia, NZ 0800-0830, 0900-0930; to S.Am 1100-1130; to S.Asia 1200-1230; to Eu, W.Africa 1300-1330; to M.East 1500-1530) 13221 at 0825 by **Chris Haigh** in Huddersfield; R.Denmark via RNI 25.730 (Da to areas quoted for RNI but 1/2hr later) 44333 at 1130 by **Chris Edwards** in Inverurie; DW via Julich 25.740 (Ger to SE.Asia 1100-1200, to E.Asia 1200-1355) SIO333 at 1136 by **Philip Rambaut** in Macclesfield; RFI via Issoudun 25.820 (Fr to E.Africa 0700-1550) 25233 at 1500 by **Don Philips** in Bridlington; R.Nederlands via Flevo? 25.940 (Du to Asia? 1030-1125 Sun only); also 25.970 (Du to M.East, Africa? 1030-1125, Sun only) both SIO355 at 1100 by **Kenneth Buck** in Edinburgh. In Quebec, Alan Roberts logged RNI 25.730 as 35333 at 1130; DW 25.740 as 45444 at 1305; RFI 25.820 as 45444 at 1310.

Although meant for other areas, some R.Australia **21MHz (13m)** signals have reached the UK. The Carnarvon signals to Asia 21.775 (Eng 0100-1000) was 34333 at 0833 by **Eddie McKeown** in Co.Down; to S.Asia, M.East via Darwin 21.720 (Eng 1100-1430) SIO333 at 1140 in Macclesfield.

Also heard here were the BBC via Limassol 21.470 (Eng to E.Africa 0900-1615) SIO444 at 0930 by **Cyril Kellam** in Sheffield; RNE via Noblejas 21.555 (Sp to C/S.Am 0900-1900) 55555 at 1030 by **Darren Beasley** in Bridgwater; VOA via Kavala 21.455 (Eng to M.East, N.Africa 0800-1100) 32333 at 1036 by **Ron Galliers** in N.London; BSKA Saudi Arabia 21.505 (Ar to N.Africa 1100-1700) SIO444 at 1149 by **John Coulter** in Winchester; RFI via Issoudun 21.770 (Eng to Asia, Oceania 1400-1500) 44344 at 1435 by **J. Arunachalam** in Thumrait, Oman; R.Moscow, Russia 21.625 (Eng to Africa?) SIO434 at 1600 in Rowley Regis; WCSN 21.640 (Eng to Africa 1600-2000) SIO434 at 1650 by **Cliff Stapleton** in Torquay; R.Nederlands via Bonaire 21.685 (Eng to C.Africa 1830-1925) 34232 at 1831 by **Rhoderick Illman** in Oxted; BBC via Ascension Is 21.660 (Eng to Africa 0900-2000?) SIO333 at 1851 by **Julian Wood** in Elgin; VOA via Greenville 21.485 (Eng to Africa 2000-2200) 34333 at 2011 by **Jim Cash** in Swanwick.

Some broadcasts aimed at Europe come from R.Japan via Moyabi 21.575 (Eng, Jap 0700-0830 & M.East) 25333 at 0730 in Bridlington; V.of the UAE in Abu Dhabi 21.735 (Ar 0600-0900) 44444 at 0830 in Huddersfield; R.Pakistan, Islamabad 21.520 (Eng 1100-1120) SIO544 at 1108 in Guildford; UAE R.Dubai 21.605 (Eng 1330-1355) 45555 at 1330 by **David Edwardson** in Wallsend; R.Romania Int, Bucharest 21.665 (Eng 1300-1400) SIO443 at 1337 by **Bill Clark** in Rotherham; RCI via Sackville 21.545 (Eng 1700-1730) SIO544 at 1700 by **Bryan Kimber** in Hereford; WYFR 21.500 (Eng, Ger, Fr 1700-2000) heard at 1830 by **Philip Lee** in Huntingdon; HCJB, Ecuador 21.455 (u.s.b. + p.c. 24hrs) 54344 at 1930 by **Chris Shorten** in Norwich.

The **17MHz (16m)** broadcasts from R.New Zealand Int. via Rangataiki, N.Island have been clearly heard in the UK some days. The 100kW broadcast on 17.770 (Eng to Pacific 2200-0630 was 25211 at 2310 in Bridgwater and 54344 at 0600 in Norwich.

In the morning Africa No.1, Gabon 17.630 (Fr, Eng to W.Africa 0700-1600) was SIO444 at 0840 in Hereford; BBC via Kranji 17.830 (Eng to Australia, NZ 0600-1000) 22322 at 0915 by **Robin Harvey** in Bourne; AIR via Delhi 17.387 (Eng to Australia, NZ 1000-1100) SIO343 in Sheffield; R.Pakistan, Islamabad 17.902 (Eng to Eu 1100-1120) **44444** at 1100 in Bridlington; KHBI N.Mariana Islands 17.555 (Eng to NE.Asia, Russia 0800-1200) SIO222 at 1126 in Guildford.

Later, R.Moscow, Russia 17.610 (Eng to ?) was SIO545 at 1425 in Rowley Regis; DW via Wertachtal 17.765 (Eng to M.East, Africa 1500-1550) 44333 at 1532 in Swanwick; R.Pakistan, Islamabad 17.555 (Eng to M.East 1600-1630) 43443 at 1600 in Oman; DW via Kigali 17.860 (Ger to Africa 1800-0000) 32232 at 1806 in N.London; R.Nederlands via Bonaire 17.605 (Eng to W.Africa 1830-1925) 54333 at 1831 in Oxted; RCI via Sackville 17.820 (Eng to Africa 1900-1930) heard at 1900 by **A.**

Local Radio Chart

Listeners:
A: Darren Beasley, Bridgwater.
B: Tim Bucknall, Congleton.
C: Steve Cann, Southampton.
D: Sean Cooper, Wells-Next-The-Sea.
E: Paul Gibson, Edinburgh.
F: Francis Hearne, Bristol.
G: Rhoderick Illman, Oxted.
H: Eddie McKeown, Co.Down.
I: George Millmore, Wootton, IOW.
J: Sid Morris, Rowley Regis.
K: Hugh Quinn, Co.Kildare.
L: John Stevens, Largs.
M: Phil Townsend, E.London.
N: John Wells, East Grinstead.

Freq kHz	Station	ILR BBC	e.m.r.p (kW)	Listener
558	Spectrum R.	I	7.50	A,B,D,I,J,N
585	R.Solway	B	2.00	B,H
603	Invicta Snd(Coast)	I	0.10	B,D,G,I,M*,N
630	R.Bedfordshire	B	0.20	A,B,D,G,I,J,M*,N
630	R.Cornwall	B	2.00	A,I
657	R.Clwyd	B	2.00	A,B,D,I,J,K,N
657	R.Cornwall	B	0.50	A,I
666	DevonAir R.	I	0.34	A,B,I,N
666	R.York	B	0.80	B,H*,K
729	BBC Essex	B	0.20	A,B,D,G,I,M*,N
738	Hereford/Worcester	B	0.037	A,B,I,J,N
756	R.Cumbria	B	1.00	B,H,K
756	R.Shropshire	B	0.63	A,B,I,J,N
765	BBC Essex	B	0.50	A,B,D,I,J*,M*,N
774	R.Kent	B	0.70	A,D,I,M*,N
774	R.Leeds	B	0.50	B
774	Severn Sound (3CR)	I	0.14	A,B,I,J
792	Chiltern R.	I	0.27	B,D,I,J*,M*,N
792	R.Foyle	B	1.00	K
801	R.Devon	B	2.00	A,B,I,K,N
819	Hereford/Worcester	B	0.037	A,B,I,J
828	Chiltern Radio	I	0.20	D,M*
828	R.Aire(Magic B2B)	I	0.12	B
828	R.WM	B	0.20	B,J
828	2CR	I	0.27	A,I,N
837	R.Cumbria	B	1.50	B
837	R.Furness	B	1.00	B
837	R.Leicester	B	0.45	A,B,D,I,J,M*,N
855	R.Devon	B	1.00	A,I
855	R.Lancashire	B	1.50	B,H,K*
855	R.Norfolk	B	1.50	D,I,N
873	R.Norfolk	B	0.30	B,D,I,N
936	GWR (Brunel R.)	I	0.18	A,B,I,J*,N
945	R.Trent (GEM-AM)	I	0.20	A,B,D,I,J,K,N
954	DevonAir R.	I	0.32	A,I,N
954	R.Wyvern	I	0.16	A,B,J,N
990	Hallam R.(C.Gold)	I	0.25	D
990	WABC (Nice & Easy)	I	0.09	A,B,J,N
990	R.Devon	B	1.00	A,I,N
999	R.Solent	B	1.00	A,C,I,N
999	R.Trent (GEM-AM)	I	0.25	B,N
999	Red Rose R.	I	0.80	B,H*,K
1017	WABC Shrewsbury	I	0.70	A,B,D,I,J,N
1026	Downtown R.	I	1.70	K*
1026	R.Cambridgeshire	B	0.50	A,B,D,M*,N
1026	R.Jersey	B	1.00	A,C,I,N
1035	Northsound Radio	I	0.78	B*,H*
1035	R.Kent	B	0.50	A,I,M*,N
1035	R.Sheffield	B	1.00	B
1035	West Sound	I	0.32	H*
1107	Moray Firth R.	I	1.50	K*
1116	R.Derby	B	1.20	B,J,N
1116	R.Guernsey	B	0.50	A,I,N
1152	BRMB (Xtra-AM)	I	3.00	A,B,J
1152	LBC (L.Talkback R)	I	23.50	C,I,N
1152	Metro R. (GNR)	I	1.80	K*
1152	Piccadilly R.	I	1.50	B
1152	R.Broadland	I	0.83	D,N
1152	R.Clyde (Clyde 2)	I	3.60	E
1161	GWR (Brunel R.)	I	0.16	A,B
1161	R.Bedfordshire	B	0.10	N
1161	R.Sussex	B	1.00	B,I,N
1161	R.Tay	I	1.40	E,K*
1161	Viking R.(C.Gold)	I	0.35	B,D
1170	Ocean Sd.(SCR)	I	0.12	C,I,N
1170	R.Orwell	I	0.28	N
1170	Signal R.	I	0.20	B,J
1170	Swansea Sound	I	0.58	A,H*
1242	Invicta Snd(Coast)	I	0.32	M*,N
1242	Isle of Wight R.	I	0.50	A,B*,C,I,N
1251	Saxon R.	I	0.76	B*,H*,N
1260	GWR (Brunel R.)	I	1.60	A,H*,K*,N
1260	Leicester (GEM-AM)	I	0.29	B,J,N
1260	Marcher Sound	I	0.64	B
1278	Pennine R.(C.Gold)	I	0.43	B
1305	R.Hallam (C.Gold)	I	0.15	B
1305	Red Dragon (Touch)	I	0.20	A,I,N
1323	R.Bristol (Som.Snd)	B	0.63	A,B,H*
1323	S'thern Sound(SCR)	I	0.50	B,H*,I,N
1332	Hereward R.P'boro	I	0.60	B,H*,J*,N
1332	Wiltshire Sound	B	0.30	A,C,I
1359	Essex R.(Breeze)	I	0.28	M*,N
1359	Mercia Snd(Xtra-AM)	I	0.27	B,J
1359	R.Solent	B	0.85	C,I,N
1368	R.Lincolnshire	B	2.00	B*,D,N
1368	R.Sussex	B	0.50	I,N
1368	Wiltshire Sound	B	0.10	H*,I
1413	Sunrise R.	I	0.125	I,N
1431	Essex R.(Breeze)	I	0.35	A,N
1431	Radio 210	I	0.14	A,B*,I,N
1449	R.Peterboro/Cambs	B	0.15	B,I,J*,N
1458	GLR	B	50.00	A,D,F*,I,K*,N
1458	GMR	B	5.00	B
1458	R.Cumbria	B	0.50	H
1458	R.Devon	B	2.00	A,N
1458	R.Newcastle	B	2.00	H*
1458	Radio WM	B	5.00	A,B,J
1476	City Snd(1st Gold)	I	0.50	A,B,I,N
1485	R.Humberside	B	1.00	D
1485	R.Merseyside	B	1.20	B,H*,J,K
1485	R.Sussex	B	1.00	I,N
1503	R.Stoke-on-Trent	B	1.00	B,H*,I,J,N
1521	R.Mercury	I	0.64	A,I,N
1530	Pennine R.(C.Gold)	I	0.74	B,H*
1530	R.Essex	B	0.15	I,M*,N
1530	R.Wyvern	I	0.52	A,B,I,J
1548	Capital R. (Gold)	I	97.50	I,K*,N
1548	R.Bristol	B	5.00	B*,H*,I
1548	R.City (City Talk)	I	4.40	B
1548	R.Forth (Max AM)	I	2.20	B*,H*,J*,L
1548	R.Hallam (C.Gold)	I	0.74	B*
1557	Chiltern R.(Gold)	I	0.76	B,J,K
1557	Ocean Sound (SCR)	I	0.50	A,B*,C,I,N
1557	R.Lancashire	B	0.25	B,H*
1557	Tendring R.(Mellow)	I	?	N
1584	Gatwick	I	0.10	I,N
1584	Heathrow	I	0.10	B*,N
1584	R.Nottingham	B	1.00	B,H*,K*
1584	R.Shropshire	B	0.50	A,B,J
1584	R.Tay	I	0.21	B*,L
1602	R.Kent	B	0.25	A,B*,H*,I,J*,K*,L,N

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

Long Wave Chart

Freq kHz	Station	Country	Power (KW)	Listener
153	Bechar	Algeria	1000	I*,N*
153	Donebech	Germany	500	A,B,F,F*,G,H*,I,J*,M*,N
153	Brasov	Romania	1200	A,B*,F*,J*
162	Allouis	France	2000	A,B,E*,F*,G,H*,I,J*,M*,N
171	Kaliningrad	Russia	1000	A,B,E*,F*,G,I,J,M*
171	Moscow	Russia	500	B*,H*
177	Oranienburg	Germany	750	A,B,F*,G,H*,J*,N
183	Saarlouis	Germany	2000	A,B,E*,F*,G,H,I,J,K*,M*,N
198	BBC Droitwich	UK	500	B,E,F,G,H,J,M*,N
198	BBC Westerglen	UK	50	A,B
207	Munich	Germany	500	A,B,F*,G,H*,I
207	Azilal	Morocco	800	K*
216	RMC Roumoules	S.France	1400	A,B,F*,G,H*,I,J*,M*,N
216	Oslo	Norway	200	A,B*,D,F*,M*
225	Konstantinow	Poland	2000	A,B*,E,F*,H*,I*,L*,M*,N*
234	Junglinster	Luxembourg	2000	A,B,F*,G,H,I,J*,M*,N
234	St.Petersburg	Russia	1000	A*,B*,F*
243	Kalundborg	Denmark	300	A,B,E*,G,H*,I,M*,N
252	Tipaza	Algeria	1500	B,E*,J*,N*
252	Atlantic 252	S.Ireland	500	A,B,C,D,E*,F,G,H,I,M*,N
261	Burg	Germany	200	B*,G
261	Moscow	Russia	2000	A,B,F*,H*,I,J*,M*,N
270	Topolna	Czechoslovakia	1500	A,B,E*,F*,G,H*,I,M*,N
270	Orenburg	USSR	15	B*
279	Minsk	Byelorussia	500	A,B*,E*,F*,G,H*,I*,J*,M*,N

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

Listeners:-
A: Kenneth Buck, Edinburgh.
B: Tim Bucknall, Congleton.
C: Steve Cann, Southampton.
D: Paul Gibson, Edinburgh.
E: Sheila Hughes, Morden.
F: Eddie McKeown, Co.Down.
G: George Millmore, Wootton, I.D.W.
H: Sid Morris, Rowley Regis.
I: Fred Pallant, Storrington.
J: Hugh Quinn, Co.Kildare.
K: Alan Roberts, Quebec, Canada.
L: John Stevens, Largs.
M: Phil Townsend, E.London.
N: John Wells, East Grinstead.

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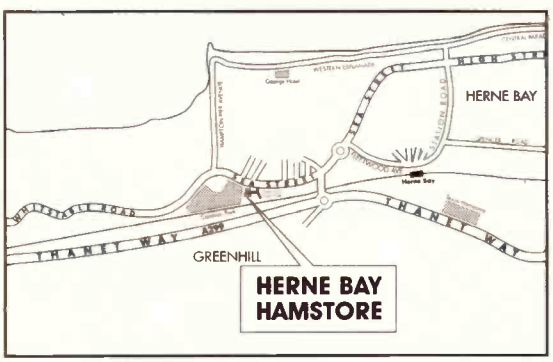

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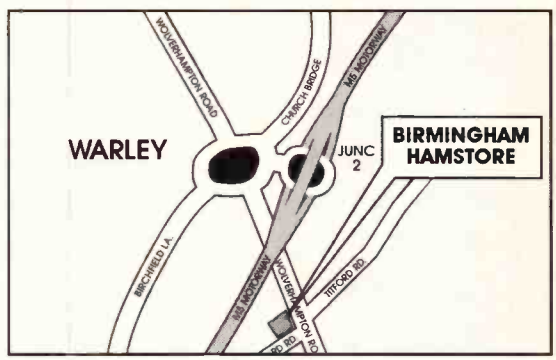

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long medium & short

Henry in Eastbourne; WWCR 17.525 (Eng to Eu, USA 1600-2200) SIO434 at 1915 in Torquay; HCJB, Ecuador 17.790 (Eng to Eu 1900-2000) SIO333 at 1921 in Rotherham; RHC, Cuba 17.705 (Eng to Middle East, Africa 2000-?) heard at 2000 in Huntingdon; also 17.770 (Port, Eng to Eu 2000-?) SIO455 at 2015 in Edinburgh; WYFR 17.750 (Eng to Eu, Africa 2000-2300) 33333 at 2050 in Huddersfield.

Good DX **15MHz (19m)** reception has been noted in the UK. Unfortunately R.New Zealand's signals to Pacific areas on 15.120 (Eng 1800-2205, Sun to Fri) is often marred by co-channel interference until 1830 or later and again from 2000, but in the intervening period reception has been good. The signal was 44444 at 1930 by **Simon Hamer** in New Radnor. During the morning two of R.Australia's broadcasts have been received here: 15.160 from Shepparton (Eng to Pacific areas 2130-1100) SIO433 at 0930 in Hereford; 15.170 from Darwin (Chin, Eng to C.Asia 0900-1400, 2200-?), 44333 at 1157 in Swanwick.

Amongst the reported broadcasts to Europe were R.Japan via Yamata 15.250 (Eng, Jap 0700-0900 & M.East, Africa) 44344 at 0750 in Bridgwater; UAE R.Dubai 15.435 (Ar, Eng 0615-2050) SIO444 at 1702 in Winchester; WWCR 15.690 (Eng 1200-0000) 33233 at 1710 in N.London; RNB, Brazil 15.265 (Eng, Ger 1800-2100) 44433 at 1810 by **Ron Damp** in Worthing; RAE, Argentina 15.345 (Eng, It, Fr, Ger 1900-2300) 54443 at 2125 by **Charles Beanland** in Gibraltar; SLBC, Sri Lanka 15.120 (Eng 2000-2130) SIO333 at 2000 in Sheffield; WYFR, FL 15.566 (Eng 2000-?) 44433 at 2004 in Oxted; RCI via Sackville 15.325 (Eng 2000-2100) SIO555 at 2030 in Edinburgh.

Also noted were R.Romania Int, Bucharest 15.335 (Eng to Pacific areas 0645-0715) 54344 at 0645 in Norwich; R.Austria Int, Moosbrunn 15.450 (Ger, Eng to Australia 0800-1100) SIO444 at 0830 by **Francis Hearne** in N.Bristol; VOA via Kavala 15.160 (Eng to M.East. N.Africa 0800-1100) 33433 at 0902 in Bourne; V.of Greece, Athens 15.650 (Gr, Eng to USA 1200-1250) 55555 at 1235 in Bridlington; UAE R.Dubai 15.320 (Eng to N.Africa 1600-1640) 33333 at 1330 in Oman and SIO434 in Torquay; VOA via Selebi-Pickwe 15.445 (Eng to Africa 1600-2200) heard at 1725 in Eastbourne, also via Greenville?, 15.495 (Eng to Africa) 54534 at 1745 by **Darran Taplin** in Brenchley; RSA, S.Africa 15.160 (Eng to Africa 1600-1800) SIO433 at 1740 in Guildford; also 15.365 (Fr to W.Africa 1800-2000) SIO433 at 1800 by **Alf Gray** in SW.Birmingham; BBC via Ascension Is 15.400 (Eng to Africa 1745-2315) SIO443 at 1810 in Rowley Regis; R.Damascus, Syria 15.095 (Eng to USA 2110-2210) 23322 at 2145 in Huntingdon; R.Mexico Int, Mexico 15.430 (Sp 2000-0500) SIO323 at 2140 by **Antonio de Abru-Teixeira** in Evesham; R.Nacional de Chile, Santiago 15.140 (Sp 1700-0415) SIO433 at 2235 in Rotherham.

Tropical Bands

Freq MHz	Station	Country	UTC	DXer
2.310	ABC Alice Springs	Australia	2000	J,T,V
2.325	ABC Tennant Creek	Australia	1955	J,T,V
2.485	ABC Katherine	Australia	1955	J,W
2.560	Xinjiang	China	0000	T
3.200	TWR	Swaziland	1930	T
3.215	R.Orange	S.Africa	1930	Z
3.220	R.Togo, Lome	Togo	0430	Z
3.223	AIR Simla	India	1737	V
3.240	TWR	Swaziland	1815	S,T
3.255	BBC via Maseru	Lesotho	1930	J,S,T,Z
3.270	SWABC 1, Namibia	SW.Africa	2000	T
3.295	Reykjavik	Iceland	1949	I,J,O,Q,S,T,U
3.315	AIR Bhopal	India	2357	J,U
3.315	SLBS Freetown	Sierra Leone	0700	S
3.320	Pyongyang	N.Korea	1530	T
3.325	FRCN Lagos	Nigeria	1810	S
3.355	AIR Kurseong	India	1545	W
3.365	R.Rebelde, La Julia	Cuba	0409	O
3.365	AIR New Delhi	India	1727	V
3.365	GBC Radio 2	Ghana	1812	N,O,P,S,Z
3.380	R.Malawi	Malawi	0012	U
3.385	RFO Cayenne	Guiana	0544	O
3.905	AIR Delhi	India	1707	S,V
3.915	BBC Kranji	Singapore	1700	C,O,S,Y,Z
3.930	KBS Seoul	Korea	1722	O
3.950	PBS Qinghai Xining	China	2306	S
3.955	Daventry/Skelton	England	1815	C,D,E,I,K,L,O,P,S,T,U
3.960	RFE/RL Munich	W.Germany	2000	C
3.965	RFI Paris	France	1900	C,D,G,I,L,O,P,S,U
3.970	RFE Munich	W.Germany	1915	C,D,G,L,O
3.975	BBC Skelton	England	0532	O
3.980	VOA Munich	W.Germany	1900	C,D,K,L,O,P,X
3.985	R.Beijing, China	via SRI Berne	2000	B,D,L,T,X
3.985	SRI Berne	Switzerland	1726	C,D,I,L,M,N,O,P,S
3.995	Cologne (Julich)	W.Germany	1905	B,C,D,I,L,O,P,U
4.005	RRI Padang	Indonesia	1530	G
4.055	R.Moskva1 (Kalinin)	Russia	1817	D,I,O,S
4.220	PBS Xinjiang	China	2310	H,O,S
4.330	PBS Xinjiang	China	0050	H
4.485	R.Moskva (Ufa)	Russia	2115	L,U,V
4.500	Xinjiang	China	2310	E,H,L,O,S
4.545	Alma Ata	USSR	0000	O
4.600	R.Baghdad	Iraq	1945	G,L,O,P,T,W
4.610	R.Khabarovsk	Primorye	1750	V,W
4.635	R.Dushanbe	Tadzhikistan	1610	S,V
4.735	Xinjiang	China	352	H,O,S,U,W
4.740	Moscow	Russia	1630	O,S
4.740	R.Afghanistan	via Russia	2219	U,W
4.750	R.Bertoura	Cameroon	2013	O,Q,U
4.750	PBS Xizang, Lhasa	China	0050	W
4.760	Yunnan Kumming	China	0000	T
4.765	Brazzaville	PR Congo	1910	I,L,O,P,Q,S,T,U,W,Y,Z
4.770	FRCN Kaduna	Nigeria	1920	A,G,H,I,L,N,O,P,Q,S,U,Y
4.775	Kabul City Service	Afghanistan	2017	Q
4.775	RRI Jakarta	Indonesia	1500	S,T,W
4.785	RTM Bamako	Mali	0530	Z
4.785	R.Baku	Azerbaijan	1719	S
4.790	Azad Kashmir R.	Pakistan	0130	O,U,W
4.790	TWR Manzini	Swaziland	1800	T
4.795	R.Douala	Cameroon	2320	G,O,Y
4.795	R.M'cow (Kharkov)	Ukraine	1958	C,G,I,L,O,Q,V,W
4.795	R.Ulan Ude	Russia	2032	D
4.800	PBS Xinjiang	China	2304	E,O,S
4.800	AIR Hyderabad	India	0017	U
4.805	R.Nac.Amazonas	Brazil	2350	F,S,T,Z
4.810	R.Yerevan	Armenia	1925	I,P
4.810	R.Orion, Jo'burg	S.Africa	0050	G
4.815	R.diff TV Burkina	O'gadougou	0600	L,S
4.820	R.Moskva 4	USSR	1755	I,P
4.825	R.Cancao Nova	Brazil	0112	U
4.825	V of Selva	Peru	0400	Z
4.825	R.Moscow	Siberia	2008	G,O,Q,U,Y
4.825	R.Kiev	Ukraine	2040	G,L,T
4.830	R.Tachira	Venezuela	0003	S
4.832	R.Reloj	Costa Rica	0745	H,I
4.835	RTM Bamako	Mali	1930	B,E,F,G,H,I,L,O,P,Q,S T,U,W
4.845	ORTM Nouakchott	Mauritania	1910	G,H,I,O,P,Q,S
4.850	R.Yaounde	Cameroon	2024	H,N,O,P,Q,S,T,W,Z
4.850	AIR Kohima	India	1930	D,Q
4.850	R.Tashkent 2	Uzbekistan	1939	D,L,O,S,W
4.855	R.Sana Yemem	Yemen	1635	S
4.860	AIR New Delhi	India	1730	P,S
4.860	Kalinin	Russia	1730	S
4.860	R.Moskva 2 (Chita)	Russia	1940	B,D,I
4.860	R.Moscow	Russia	1800	C,G,L,O,Q,V,W
4.865	PBS Lanzhou	China	2200	H,L,O,P,S,T
4.865	V of Cinaruco	Colombia	0110	Z
4.870	R.Cotonou	Benin	2010	G,O,P,Q,S,W
4.875	R.La Cruz del Sur	Bolivia	2315	F
4.880	R.Bangladesh	Dacca	0050	S
4.885	R.Clube do Para	Brazil	0810	H,Z
4.885	R.Beijing	China	2338	L,O,S,T
4.885	Voice of Kenya	Kenya	1947	L,Q
4.890	RFI Paris	via Gabon	2013	H
4.890	ORTS Dakar	Senegal	2310	G
4.895	R.Moscow (Kalinin)	Russia	2010	Q,S
4.895	R.Moskva (Tyumen)	Siberia	2115	L
4.900	V. of the Strait 2	China	2230	F,T
4.900	SLBC Colombo	Sri Lanka	0114	A,S
4.905	R.Nat.N'djamena	Chad	2014	H,L,O,P,Q,S,W
4.910	R.Zambia, Lusaka	Zambia	1820	Q,S,Z
4.915	R.Ghana, Accra	Ghana	1800	I,L,N,O,P,Q,S,T,Y
4.915	Voice of Kenya	Kenya	1952	Q
4.920	ABC Brisbane	Australia	1930	J,Q,Z
4.930	R.Moscow	Russia	1955	G,I,L,O,P,Q,U
4.935	Voice of Kenya	Kenya	1800	A,G,N,P,Q,V,W
4.940	R.Kiev 2	Ukraine	1820	G,I,O,P,Q,S,U,V,W,Y
4.940	R.Moskva 2	USSR	2120	L
4.950	R.Nac.Luanda	Angola	1941	Q
4.955	R.Marajoara, Belem	Brazil	0816	H
4.958	R.Baku	Azerbaydzhan	0423	S
4.960	AIR New Delhi	India	0013	O,U,W
4.960	R.Baku 2	Russia	1956	Q
4.970	PBS Xinjiang	China	0020	S
4.970	R.Rumbos, Caracas	Venezuela	0430	Z
4.975	R.Uganda, Kampala	Uganda	1907	O,Q,U,W
4.975	R.Dushanbe	Tadzhikistan	0019	O
4.980	PBS Xinjiang	China	2325	L,Y
4.980	Ecos del Torbes	Venezuela	2213	G,H,I,O,R,S,T,W,Z
4.985	R.Brazil Central	Brazil	0020	G
4.990	AIR via Madras	India	0010	O,R,S
4.990	FRCN Lagos	Nigeria	1800	H,L,N,O,P,Q,S
5.005	R.Nacional, Bata	Eq.Guinea	2000	T,W
5.005	R.Nepal	Nepal	1714	S
5.010	R.Garoua	Cameroon	1730	I,N,O,Q,S,T,W
5.010	SBC Singapore	Singapore	2300	T
5.015	R.Moskva 2Arkhangelsk	USSR	1740	O,V
5.020	Tamil Home Sce.	Sri-Lanka	1500	A
5.023	BBS Thimpu	Bhutan	1425	A
5.025	R.Parakou	Benin	2000	O,Q,T
5.025	R.Rebelde, Habana	Cuba	2230	I,T,Z
5.025	R.Uganda, Kampala	Uganda	0516	O
5.035	R.Bangui	C.Africa	2005	Q,U
5.035	R.Alma Ata	Kazakshtan	2030	H,I,P,T,U
5.040	R.Tbilisi 1	Georgia	1735	F,P,Q,S,U,V,Y
5.045	R.Cultura do Para	Brazil	2330	F,G,T
5.047	R.Togo, Lome	Togo	2042	G,O,Q,S,T
5.050	Voz de Yopal	Colombia	0105	W
5.050	SBC Singapore	Singapore	1600	S,T,W
5.055	Faro del Caribe	Costa Rica	0530	S,Z
5.060	PBS Xinjiang	China	2335	H,L,S,W
5.065	R.Candip, Bunia	Zaire	2345	Y
5.075	R.Beijing	China	1741	O
5.260	R.Alma Ata 2	Kazakhstan	2024	L,O,T,V
5.275	WYFR Oakland, CA	via Taiwan	1500	T,Z
5.290	R.Moskva 1	USSR	1809	L,V
5.800	PBS Xinjiang	China	2340	L,T

Potent **13MHz (22m)** signals from R.Australia have also reached the UK. During their Carnarvon broadcasts to Pacific areas on 13.755 (Eng 1500-2100?) the signal has often peaked SIO444, as noted in Macclesfield at 1721. Also received here were their Carnarvon signals to Asia 13.705 (Eng, Th 2100-0000) SIO332 at 2245 in Rotherham, and to C.Asia from Darwin 13.605 (Chin, Eng 2200-0100) SIO434 at 2310 in Torquay.

Also using this band are R.Korea, Seoul 13.670 (Eng to Eu 0800-0900) 33343 at 0820 in Norwich; SRI via Sottens 13.635 (Ger to Asia, Pacific 1200-1230) SIO444 at 1203 in Winchester; R.Moscow, Russia 13.705 (Eng to Eu 1200?-1600?) SIO444 at 1415 in Rowley Regis; R.Nederlands via Flevo 13.770 (Eng to S.Asia 1430-1525) 44333 at 1438 in Co.Down; DW via Julich? 13.610 (Eng to Africa, M.East 1500-1550) heard in Bridlington; R.Austria Int, via Moosbrunn 13.730 (Ger, Eng, Fr, Sp to Eu 0400-1700) 55544 at 1555 in Bridgwater; RCI via Sackville 13.650 (Fr, Eng to Eu 1700-1730) heard in Huntingdon and rated 44444 at 1700 in Oman; UAE R.Dubai 13.675 (Ar, Eng to Eu 0615-2100) 44444 at 1723 in N.London; WHRI 13.760 (Eng to Eu, USA 1600-0000) SIO533 at 1913 in Guildford and 55534 at 2320 in Worthing; WCSN, Maine 13.770 (Eng to Eu, M.East, Africa 2000-0000) SIO355 at 2040 in Edinburgh; SRI via Sottens 13.635 (Eng to Africa 2100-2130) SIO444 at 2115 in SW.Birmingham.

Some **11MHz (25m)** signals to Europe come from HCJB, Ecuador 11.730 (Eng 0700-0830) heard at 0815 in East-

DXers:-
(A) J.Arunachalam, Thumrait, Oman.
(B) Charles Beanland, Gibraltar.
(C) Kenneth Buck, Edinburgh.
(D) Tim Bucknall, Congleton.
(E) Bill Clark, Rotherham.
(F) Antonio De Abreu-Teixeira, Evesham.
(G) Chris Edwards, Inverurie.
(H) David Edwardson, Wallsend.
(I) Ron Galliers, N.London.
(J) Simon Hamer, New Radnor.
(K) Robin Harvey, Bourne.
(L) Sheila Hughes, Morden.
(M) Rhoderick Illman, Oxted.
(N) Philip Lee, Huntingdon.
(O) Eddie McKeown, Co.Down.
(P) Sid Morris, Rowley Regis.
(Q) Fred Pallant, Storrington.
(R) Roy Patrick, Derby.
(S) Peter Perkins, Hemel Hempstead.
(T) Don Phillips, Bridlinmgton.
(U) Hugh Quinn, Co.Kildare.
(V) Philip Rambaut, Macclesfield.
(W) John Sargeant, Bolton.
(X) Chris Shorten, Norwich.
(Y) Cliff Stapleton, Torquay.
(Z) Jim Willett, Grimsby.

bourne; BRT via Wavre 11.695 (Fr, Du, Ger 0700-0900) 45444 at 0900 in Bourne; R.Portugal, S.Gabriel 11.740 (Eng 2000-2030) SIO322 at 2000 in SW.Birmingham; R.Beijing, China 11.500 (Eng 2000-2200) SIO444 at 2015 in Hereford; V.of Vietnam, Hanoi 12.020 (Eng 2030-2100) 44344 at 2030 in Co.Down; R.Damascus, Syria 12.085 (Eng 2005-2105) 54444 at 2044 in Gibraltar; AIR via Aligarh, 11.620 (Hi, Eng 1845-2230) 54344 at 2049 in Swanwick; R.Japan via Moyabi 11.735 (Jap, Eng 2200-0000) SIO343 at 2200 in Torquay; VOFC via Okeechobee 11.580 (Eng 2200-2300) 55444 at 2215 in Bridgwater; V.of Israel, Jerusalem 11.605 (Eng 2230-2300 & USA) SIO444 at 2245 in N.Bristol.

Those to other areas include R.Beijing, China 11.815 (Eng to S.Asia 1400-1600) 33343 at 1400 in Oman; SBC Singapore 11.940 (Eng to SE.Asia 2200-1605) 24221 at 1430 in Bridlington; KTWR, Guam 11.650 (Eng to S.Asia 1500-1636) 35333 at 1500 by **Roy Patrick** in Derby; KHBI, N.Mariana Is 11.580 (Eng to SE.Asia, India, NE.Asia, Russia 1600-1800) 33332 at 1618 in Oxted; VOA via Woofferton 11.710 (Eng to M.East, N.Africa 1630-1700) SIO433 at 1650 in Rowley Regis; RSA, S.Africa 11.880 (Eng to Africa 1500-1800) 53343 at 1700 in Norwich; R.Australia via Carnarvon 12.000 (Eng to S.Asia 1430-2100) SIO433 at 1821 in Macclesfield; R.Nacional da Amazonia, Brazil 11.780 (Port 0800-2200) 35543 at 2032 in Wallsend; AIR via Aligarh 11.715 (Eng to Australia, NZ 2045-2230) SIO333 at 2045 in Guildford; King of Hope, Lebanon 11.530 (Eng to M.East 2000-2200) 32233 at 2100 in N.London; R.Gaucha, Brazil 11.915 (Port 0800-0300) SIO333 at 2255 in Evesham; R.Diff.Nacional, Bogata 11.821 (Sp 0930-0530) SIO222 at 2300 in Grimsby; V.of the UAE in Abu Dhabi 11.965 (Eng, Ar to USA 2200-0200) SIO444 at 2300 in Edinburgh; RHC, Cuba 11.950 (Sp to the Americas 2300-0600) 44444 at 0005 in Brenchley; R.Japan via Ekala 11.840 (Eng to S.Asia 0100-0200) 43434 at 0100 in Huntingdon; TWR, Ned.Antilles 11.930 (Eng to Caribbean, USA 0255-0400) SIO322 at 0320 in Rotherham.

UK listeners are likely to find the **9MHz (31m)** band the best choice for R.New Zealand. Although intended for Pacific areas the signal on 9.700 (Eng 0730-1210) has often reached here at good strength. Typically SIO433 as noted in Rotherham at 1126. Two of R.Australia's broadcasts were heard here: 9.710 from Shepparton (Eng, Toc to S.Asia 0800-1300) 31232 at 0851 in N.London; 9.860 from Carnarvon (Eng to Asia 1430-2100) 31321 at 1700 in Worthing. The ABC 24hr domestic s.w. service from Brisbane (VLQ9) was heard in New Radnor as 33333 at 1905.

Programmes for Europe are broadcast by WCSN 9.840 (Eng 0600-0800 & to USA) SIO444 at 0715 in N.Bristol; R.Nederlands via Flevo 9.895 (Du 0730-0825) 55555 at 0805 in Bourne; Croatian R, Zagreb 9.830 (Eng, Cr 0900-?) SIO434 at 0900 in Sheffield; R.Pyongyang, N.Korea 9.977 (Eng 1500-1600 & M.East, Africa) SIO333 at 1544 in Congleton; VOA via Kavala 9.700 (Eng 1500-2100 & M.East, Africa) SIO444 at 1640 in Rowley Regis; R.Moscow, Russia 9.550 (Du 1800-1900) SIO444 at 1810 in Winchester; REE Spain 9.620 (Sp 1600-2145?) 43433 at 1833 in Oxted; AIR via Delhi 9.950 (Eng 1900-1905) SIO434 by **Tom Smyth** in Co.Fermanagh; VOIRI, Iran 9.022 (Eng 1930-2030) 34332 at 1930 in Derby; V.of Israel, Jerusalem 9.435 (Eng 2000-2030 & USA) 54344 at 2027 in Swanwick; V.of Vietnam, Hanoi 9.840 (Eng 2030-2100) SIO444 at 2030 in Hereford; V.of Turkey, Ankara 9.445 (Eng 2100-2200) 33433 at 2100 in Huntingdon; RCI via Sackville 9.760 (Eng 2200-2300) 55455 at 2233 in Co.Down.

A variety of languages are used in those to other areas: R.Japan via Ekala 9.535 (Jap, Eng to S.Asia 1300-1500) 43443 at 1405 in Oman; R.Bangladesh, Dacca 9.570 (Eng to ? 1830-?) 33433 at 1830 in Brenchley; SRI via Schwarzenburg 9.810 (Port, It, Ger, Fr, Sp to C/S.Am 2215-0100) 55555 at 2215 in Gibraltar; R.Manumby, Brazil 9.665 (Port 0930-0000) SIO323 at 2230 in Evesham; V.of the UAE in Abu Dhabi 9.600 (Eng, Ar to USA 2200-0200) SIO444 at 2300 in Edinburgh; R.Thailand, Bangkok 9.655 (Eng to SE.Asia 2300-0430) SIO333 at 2300 in Grimsby; Ecos del Torbes, Venezuela 9.640 (Sp 0900-0400) 24422 at 2310 in Bridgwater; AWR Alajuela, Costa Rica 9.725 (Eng, Sp to C/N.Am 2300-0500) SIO343 at 2357 in Guildford; R.Sofia, Bulgaria 9.700 (Eng to USA 2245-0100) SIO433 at 0020 in SW.Birmingham; R.Caiman, Guatemala 9.965 (Sp ?-0500) 54444 at 0200 in Norwich.

In the **7MHz (41m)** band the V.of Nigeria, Ikorodu 7.255 (Eng, Fr, Ha to W.Africa 0500-2200) was 43343 at 0515 in Co.Down; KTBN, USA 7.510 (Eng to USA 0200-1600) 23222 at 0840 in N.London; R.For Peace Int, Costa Rica 7.375 (Eng to ?) SIO333 at 1016 in Macclesfield; WHRI 7.315 (Eng to USA 0000-1100) SIO555 at 1100 in Co.Fermanagh; R.Korea, Seoul 7.550 (Kor, Ar, Eng to M.East, Africa 1700-2130) 54444 at 2050 in Norwich; AIR via Aligarh 7.412 (Eng to Eu 1945-2230) 54444 at 2113 in Gibraltar and SIO434 at 2200 in Sheffield; R.Kiev, Ukraine 7.400 (Eng to Eu 2230-?) 54444 at 2230 in Bridlington; WWCR 7.435 (Eng to USA, Eu 0000-1200) SIO444 at 0028 in Guildford.

Some of the **6MHz (49m)** signals to Europe come from R.Nederlands via Flevo 5.955 (Eng 1130-1225) 55555 at 1215 in Bridgwater; R.Austria Int via Moosbrunn 6.155 (Eng 1830-1900) SIO322 at 1832 in SW.Birmingham; VOIRI, Iran 6.030 (Eng 1930-2030) 23222 at 1930 in Derby; R.Finland via Pori 6.120 (Eng 1930-2000) SIO444 at 1945 in N.Bristol; Polish R, Warsaw 6.135 (Ger, Pol, Fr, Eng 1900-2355) SIO545 at 2200 in Co.Fermanagh; R.Prague, Czech 6.055 (Eng 2200-2230) SIO222 at 2203 in Elgin.

Equipment Used

Charles Beanland, Gibraltar: Sangean ATS-803 + a.t.u. + r.w or Howes AA2.
Darren Beasley, Bridgwater: Philips D2935 + Hexagon loop or a.t.u. + 10m wire.
Kenneth Buck, Edinburgh: Lowe HF-225 + r.w. in loft or screened loop.
Tim Bucknall, Congleton: Sony ICF-2001D + AN-1.
Steve Cann, Southampton: Lowe HF-225 + a.t.u. + 30m wire.
Jim Cash, Swanwick: Kenwood R5000 + trap dipole or Sony AN-1.
Bill Clark, Rotherham: Sony ICF-SW7600 + built-in whip.
John Coulter, Winchester: Yaesu FRG-7 + r.w.
Ron Damp, Worthing: Racal RA17 + 30m inverted V dipole.
Antonio De Abreu-Teixeira, Evesham: Sony ICF-2001D + 9.5m wire.
Chris Edwards, Inverurie: Yaesu FRG-7700 + FRT-7700 + 40m wire.
David Edwardson, Wallsend: Trio R600 + inverted V trap dipole.
Ron Galliers, London: Philips D2935 + a.t.u. + 30m wire.
Paul Gibson, Edinburgh: Sangean ATS-803A + r.w.
Alf Gray, Birmingham: Codar CR70 + PR30 + a.t.u. + Ex-Army whip.
Chris Haigh, Huddersfield: Lowe HF-225 + Lowe W-225 or 20m wire.
Simon Hamer, New Radnor: Lafayette HE30 + a.t.u. + 9m or 22m wire or Grundig S1400 or Sony ICF-2001D + loop.
Robin Harvey, Bourne: Matsui MR-4099 + s.w. loop.
Francis Hearne, N.Bristol: Sharp WOT370 + r.w.
A. Henry, Eastbourne: Sangean ATS-803A + built-in whip.
Sheila Hughes, Morden: Sony ICF-7600DS or Panasonic DR48 + 15m wire.
Rhoderick Illman, Oxted: Kenwood R5000 + 17m wire.
Cyril Kellam, Sheffield: Sony ICF-7600DS + AN-1 or 25m wire.
Bryan Kimber, Hereford: Zenith R7000 or Realistic SX190 + 25m wire.
Philip Lee, Huntingdon: Sony ICF-SW77 + AN-1.
Eddie McKeown, Co.Down: Tatung TMR-7602.
George Millmore, Wootton, IOW: Racal RA17L + v.l.f. converter + loop.
Sid Morris, Rowley Regis: Kenwood R5000 + 31m wire or Nevada MS 1000 + whip.
Fred Pallant, Storrington: Trio R2000 + r.w. in loft.
Roy Patrick, Derby: Lowe HF-125 + 44m wire.
Peter Perkins, Hemel Hempstead: Icom R72E + a.t.u. + 17m wire.
Don Phillips, Bridlington: Yaesu FRG-8800 + a.t.u. + 15m wire.
Hugh Quinn, Co.Kildare: Lowe HF-225 + FRT-7700 + 15m wire in loft.
Richard Radford-Reynolds, Guildford: Sangean ATS 803A + 6m wire.
Philip Rambaut, Macclesfield: Int.Marine Radio R.700M + r.w.
Alan Roberts, Quebec, Canada: Lowe HF-225 + 31m, 19m or 11m dipole.
John Sargeant, Bolton: Lowe HF-225 + 20m wire.
Chris Shorten, Norwich: Matsui MR- 4099 + 10m wire.
Tom Smyth, Co.Fermanagh: Morphy Richards R191 + built-in whip.
Cliff Stapleton, Torquay: Trio R1000 + 25m wire.
John Stevens, Largs: Hammarlund HQ 180 or Icom R-70 + loop or r.w.
Darran Taplin, Brenchley: Yaesu FRG-7700 + FRA-7700 or FRT-7700 + 30m wire.
Phil Townsend, London: Panasonic RF1680L portable.
John Wells, E.Grinstead: RCA AR88D + Loop, also LW converter.
Jim Willett, Grimsby: RCA AR77 + 4m loop or Trio 9R-59DS + a.t.u. + X dipole.
Julian Wood, Elgin: Kenwood R2000 + Yaesu FRT-7700 a.t.u. + 6m wire.

Transatlantic DX Chart

Freq kHz	Station	Location	Time (UTC)	DXer
		USA		
770	WABC	New York, NY	0200	B
950	WPEN	Philadelphia	0220	B
1010	WINS	New York, NY	0130	B
1090	WBAL	Baltimore, MD	0240	B
1130	WNEW	New York, NY	0140	B
1500	WTOP	Washington	0140	C
1560	WQXR	New York, NY	0115	B
		Canada		
580	CFRA	Ottawa, ON	0340	B
590	VOCM	St.John's, NF	0120	C
820	CHAM	Hamilton, ON	0130	B
930	CJYQ	St.John's, NF	0015	A,B,C
1050	CHUM	Toronto, ON	0155	B
1200	CFGO	Ottawa, ON	0300	B
1400	CBG	Gander,NF	0212	C
1410	CIGO	Pt.Hawkesbury, NS	0310	C
1470	CHOW	Welland, ON	0210	B
1570	CKLM	Montreal, PQ	0230	B
		C. America & Caribbean		
1610	Caribbean Beacon	Anguilla	0520	C

DXers:
A: Tim Bucknall, Congleton.
B: Sid Morris, Cwm Nantcol, Gwynedd.
C: Jim Willett, Grimsby.

Station Addresses

Radio Furness, Hartington Street, Barrow-In-Furness, Cumbria LA14 5FH.
Great North Radio, Radio House, Long Rigg, Swalwell, Newcastle-Upon-Tyne NE99 1BB.
Namibian Broadcasting Corpn, PO Box 321, Windhoek 9000, Namibia, South West Africa.
Radio Dif. Nacional, Ave. El Dorado, Bogata DE, Colombia, South America.
Radio CFGO, 1575 Carling Avenue, Ottawa, ON K1Z 7M3, Canada.
Radio WABC, 1330 Avenue Of The Americas, New York, NY 10019, USA.

OFF THE RECORD PIRATES

Andy Cadier, 28 Romney Avenue, Folkstone, Kent CT20 3QJ.

Radiofax have continued to make representations to the Home Office, the DTI and the Radio Communications Agency in effort to obtain a licence to broadcast from the U.K. The present service on 3.910, 6.205 and 12.255MHz is provided from Southern Ireland. Programmes include reports on electronic and scientific subjects, with an emphisis on communications and media news. The production called *Sparks* is obviously aimed at radio amateurs and persons in the communications field, who naturally possess the h.f. receiving equipment with which to hear the broadcasts.

Recently, imported religious material, and a relay of the Radio Caroline satellite service has been added to the varied format. It is suggested that if all those who wrote to the station also contacted their MP, politicians would become aware of the educational aspects and business potential of Radiofax. There is a distinct possibility of former USSR states selling air-time on high power h.f. transmitters to earn badly needed revenue, to help subsidise their own broadcasting activities. The UK tends to licence stations many years after the bubble of enthusiasm and commercial endeavour has burst.

Readers Write

Cyril Kellam from Sheffield says what happened to Radio Harmony? He wrote to Venus, Texas, with two IRCs but no reply. Alas, Harmony lost it's American backing and the intended American Religious programmes went to Radiofax and are broadcast under the name *Reflections*

Mr Steel sends a fax he received from Radio Caroline's Station Manager Peter Moore. He mentions the Caroline relays on WWCR, Radiofax and the Intelsat satellite. There is also a station Newsline Tel: (0839) 669990 This is a premium rate line 34p per minute offpeak 45p a minute peak rate. **Paul Wilson** writing from Hoddesdon, Herts, says he is a Technical College student studying BTEC HND Media Production with Business Studies. He requested, and hopefully received, information for his radio production assignment on offshore pirate radio of the 60s. The completed programme should make interesting listening

Raymond Kelly at Nuneaton, asks about QSLing pirate stations? Most acknowledge reports fairly quickly, while others have a somewhat lax attitude towards listeners reception details. Last year, Britain Radio International were responding very promptly with a card featuring a naked lady (in the best possible taste!). Do remember to send return postage in the manner requested on air. A word of caution, under certain circumstances persons in the UK could be involved in a minor legal infringement by communicating with, and sending revenue to an unlicensed station. The law exists primarily to deter business contacts and advertisers. I have a station address list showing the most frequently heard s.w. stations. Further QSL information is contained in the British DX Club members journal called *Communication*

Adrian Cooke sent me a complimentary copy of the first issue of *FRQ Magazine*. It consists of 20 pages of pirate radio information, this includes a Free Radio Directory showing s.w. stations in alphabetical order. The nearest thing to a pirate radio handbook! A stamped addressed envelope to FRQ P.O. Box 112, Crew, Cheshire CW2 7DS. will get you full details

Gary de Quincey from Bedford complains he was unable to get his January copy of *SWM*. A subscription is the answer, it's delivered to your door and usually arrives several days before it's in the shops.

Coming Soon

An information and QSL service for Dutch m.w. stations provided by the Dutch Pirate Radio Service.(UK) Keep the letters and logs coming, and I'll see you on this page in July.

FM Reception Chart

Freq MHz	Station	UTC	Monitors
Manchester Area			
86.7	Rebel FM		A
100.8	Frontline Radio		A
101.4	Stomp FM		A
105.3	Energy 105		A
105.5	Power FM		A
Yorkshire Area			
99.9	Curfew FM		F
100.0	Asian Link		F
100.4	Radio Britannia		F
100.6	Lazer FM		F
100.7	Power Station		F
East Anglia			
89.8	Pulse FM		B
92.0	Imagine FM		B
100.5	Rock City FM		B
101.2	Starsound Radio		B

Short Wave Reception Chart

3.910	Radiofax	1724	C,E,F,G,J,K
6.200	Radio Orang Utan	1000	C,D,E,F
6.205	Radiofax	0919	C,D,E,F,J,K
6.216	Radio Brigitte	1333	F
6.219	Radio Helgoland	1107	F
6.219	Radio Pluto	1408	F
6.220	Midlands Radio	0920	F
6.220	Radio Reflex	1030	D,E,F
6.225	Radio Nordlicht	0927	F
6.225	Radio Delta	1228	F
6.226	Star Club Radio	1210	F
6.232	Jolly Roger Radio	0920	D,E,F,G
6.232	Radio Europe	1128	D
6.232	Britain Radio	1009	C,D,E,F,H,J,K
6.232	Kranker Radio	1050	D,F
6.240	Radio Geronimo	1130	D
6.240	W.M.R.	1130	D,F
6.240	Free Radio Service	1059	D
6.255	Radio Mutiny	1119	D,F
6.255	Radio Mirage	1058	D
6.260	Radio Anorak	0954	F
6.261	Radio Astra	1123	D
6.262	N.I.R.S.	1000	C,D,E,F,G,K
6.262	Radio Marabu	1318	F
6.262	R. Actve	1215	C,D,E,I,J
6.275	Control Radio	1200	D,F
6.275	Radio Anorak	0922	D,E,F
6.280	Ozone Radio	1025	D,E,F,I
6.280	Radio Dublin	1028	C,E,F
6.280	Radio Mirage	1048	D
6.290	Radio London	0900	C
6.290	Radio Orion	1051	C,D,E,F,G,H,I,J,K
6.295	Europe (FM)	1641	D
6.297	W.M.R./Stella	1110	D,E,J
6.300	Freesound Radio	1154	D,F
6.300	Radio London	1606	F
6.300	Radio Anorak	1030	F,I
6.300	Reflex Radio	1106	C,D
6.300	Radio Confusion	1201	D
6.400	W.N.K.R.	1000	C,D,E,F,G,I,J,K
6.524	Radio Pamala	1301	F,K
6.527	Clandestine Radio	1000	F
6.540	Sierra-Sierra	1327	F
6.555	Radio Nordlicht	1411	F
6.555	Radio Delta	1442	F
6.911	Radio Dublin	1557	D,E,F,J,K
7.325	Britain Radio	1242	F
7.446	Radio Stella	1055	F,K
7.473	Waves	1007	D,F
7.484	Radio Marabu	0926	F
7.497	Radio Brigitte	1013	D,F
9.980	Radio Stella	0925	D,F,K
11.400	Radio Waves	1003	D,F,G,I,K
11.415	Radio Stella	1116	D,E,F,K
12.255	Radiofax	1014	D,F,K

Your columnist Andy Cadier compiling this edition of 'Off The Record Pirates'.

Top, a German station relayed to the UK. Bottom, information card from Radiofax.

Monitors
A Michael Cliffe, Bury, Lancs.
B Sean Cooper, Wells, Norfolk.
C Mark Jones, Peterborough, Cambs.
D Bob Marsh, Bexleyheath, Kent.
E David Matthews, Llandrindod Wells, Powys.
F Free Radio Monitoring, Halesowen, W.Midlands.
G Sid Morris, Rowley Regis, W.Midlands.
H John Parry, Northwich, Cheshire.
I John Robertson, Alnwick, Northumberland.
J David Williams, Southampton, Hampshire.
K Tim Bucknall, Congleton, Cheshire.

SRP 'SPECIALS'

Bearcat UBC 200XLT scanner
Bearcat UBC 760XLT scanner
Sony SW800 shortwave radio
Nevada MS1000 desktop scanner
AOR AR1500 hand-held scanner
AOR AR2002 base scanning receiver
AOR AR2500 base scanning receiver
AOR AR2800 base scanner with SSB
AOR AR3000 scanning receiver
Yupiteru VT125 UK airband receiver
Yupiteru VT150 VHF hand-held scanner
Yupiteru MVT6000 mobile
Yupiteru MVT7000 hand-held
Fairmate HP2000 wideband scanning receiver
Alinco DJ-X1 hand-held scanning receiver
Alinco BCA5A UK charger
Icom IC-R1 hand-held RX
BJ200 MKIII Black Jaguar
Yupiteru MVT8000 mobile/base receiver
Yupiteru MVT7000 case
Grundig Sattelit 500
Sangean ATS803 receiver
The new Drake R8E communications receiver
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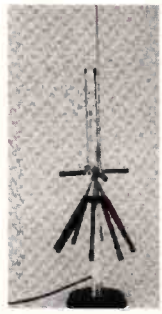

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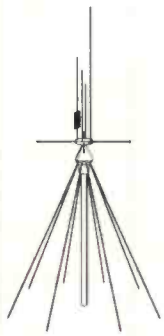

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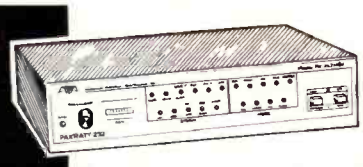

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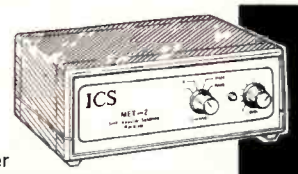

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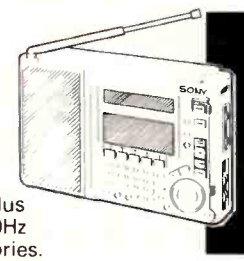

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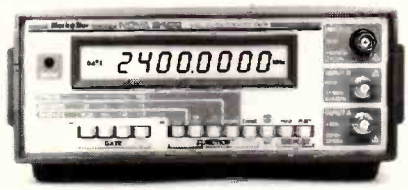

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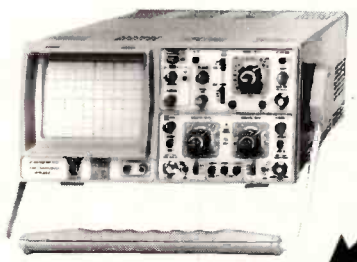

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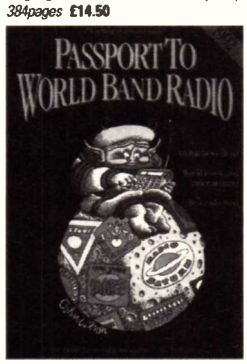

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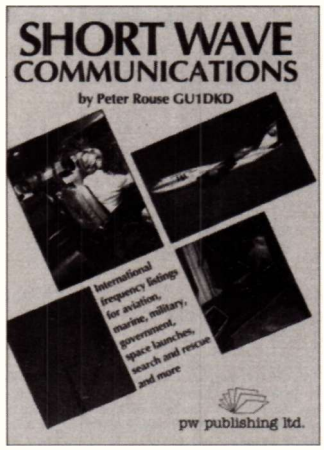

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FOR SALE Trio TS-120S transceiver, 100W s.s.b./c.w., h.f. mint and boxed, £365. Garex 200N scanner, base/mobile, mint and home use only, £160. Tel: (0679) 64393, Greatstone.

FOR SALE AR1000 hand-held scanner, excellent condition, 1000 memories, boxed, complete with soft protective case, mains and car charger, NiCad batteries, earpiece, flexible antenna, a.m., n.f.m., w.f.m., £150 o.n.o. Tel: (0737) 352582 evenings, Banstead, Surrey.

FOR SALE Sony Air-7 airband, p.s.b., f.m., plus 150-2194kHz s.w./m.w./l.w., mint, boxed, instructions, £145. Sony 7600D 150kHz-30MHz a.m./s.s.b. plus f.m. broadcast, £95, boxed, mint, includes p.s.u. Tel: (0277) 201423.

FOR SALE Realistic PRO-32A scanner, 200 channels 68-88, 108-135, 138-174MHz v.h.f. and 380-512MHz u.h.f., includes rubber antenna, manual, test report and NiCad batteries, £55. Brian. Tel: 031-346 0195.

FOR SALE Yaesu FRG-9600, Raycom Mk 5 conversion plus video board, 100kHz-950MHz receiver. Also Royal discone antenna, mint condition, £450 o.n.o. Tel: (0922) 692641 West Midlands.

FOR SALE One Kenwood R500 receiver with YK-88A-1 and YK-88C crystal filters, as new, £650. One Jupiter MVT-5000 scanner as new, £175. One Fairmate HP-100E scanner, £175. All o.n.o. Tel: 021-378 1791.

FOR SALE Icom IC-R1 communications receiver, one year old, good condition with BP90 battery pack box, inst charger, etc., £300 o.v.n.o. Tel: (04565) 365 Inverness area.

WANTED Yaesu FT-101 s.s.b. transceiver. Tel: (0908) 511095 evenings, Milton Keynes.

FOR SALE Sony ICF-2001D h.f. receiver, mint, £180. AOR-2001 scanner, £165. Steve. Tel: (0283) 67193, Burton-on-Trent.

FOR SALE FRG-7 as new, boxed, complete with manual, £135. Tel: (0798) 875442 West Sussex.

FOR SALE Lowe HF-225, 12 months old, mint condition, boxed with manual, p.s.u., plugs, etc., a brilliant performer, £310 or best offer inc insurance and delivery. Mr Steve Holland. 41 Airedale Road, Airedale, Castleford, West Yorkshire WF10 3ED.

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