VOL. 48 ISSUE 10 OCTOBER 1990

ON SALE SEPTEMBER 27

NOVEMBER ISSUE ON SALE OCTOBER 25

Cover The colour test cards reproduced on our cover this month were provided by Dr. Helmut Vahlbruch of West Germany. Top to bottom: Eutelsat 1 - F2, 7°E on 11.658GHz vertical at 1759UTC on 5 March 1990; Eutelsat 1 - F5, 10°E on 11.070GHz vertical at 1805UTC on 20 March 1990 and Intelsat VA - F15, 60°E on 10.974GHz horizontal at 1635UTC on 11 March 1990

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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

In reply to the letter in SWM (August issue) from Mr Martin Williams. I take offence at him calling CB users idiots. I have been an s.w.l. for 20 years, also a CB enthusiast both legal and illegal. Most of the CBers in my area are now licensed radio amateurs, so if Mr Williams did a little bit of research before putting pen to paper, he will find that quite a percentage of 'hams' were once on the CB bands. So, do they suddenly change overnight from idiots to normal people by passing the RAE?

I hope by the time you publish this letter, Mr Williams will have passed his RAE and give some encouragement himself to CBers who want to 'graduate' themselves.

H. WOOD
MANCHESTER

Dear Sir

The recent most interesting correspondence on the matter of listening to certain frequencies on a scanner raises a very thorny question. As a newcomer to the hobby, could anyone comment on what one should do if one hears a conversation during which arrangements for a crime are being discussed? I have heard a shopping list being given for the stealing of cars, and a discussion of a fraud on the estates department of a major building society, and in each case a telephone number was mentioned.

Supposing the unthinkable happens, such as an IRA conversation being heard? What would be the attitude of the police if one reported it? And supposing a crime ***has*** *been committed and one knows the whereabouts of someone urgently being sought?*

Name and Address supplied

Dear Sir

First, may I thank you for an excellent magazine, the only thing wrong with it is 'Long, Medium & Short' is not long enough. However, the main reason I am writing to you is to do with free radio or pirate radio.

I am 20 years old and have been listening to these station for four years. I would like to know why are these stations not published. In the past you have published clandestine stations, also Radio Monique.

People are missing a facinating part of our hobby. Because these stations do not transmit regularly, it makes listening to them more interesting. If there is a law that stops you from publishing them, then I think it's about time it was changed.

You could publish reception details of Radio Caroline, which is an off-shore station in international waters and does not come under any British law. As far as the excuse that they cause interference to navigation beacons is concerned, that's rubbish as there are none on 558kHz. There are on short waves, but most stations steer clear of them.

I would like to hear other readers' views on my comments, and see if we can get something done about it.

DARREN TAPLIN
BRENCHLEY

Darren's letter is answered by the letter, printed below, from Andy Cadier. ED

Dear Sir

I would like to thank Ian Walsh for the RTTY Data Program, but I disagree with the statement that it is a simple matter to translate for other computers.

As an Atari 800XL 8-bit user, like quite a few readers of SWM, *I am hoping that somebody can translate for Atari BASIC.*

N. ASHBY
MIDDLESEX

Several readers have written pointing out some changes that need making to the program as published. A large s.a.e. will bring you photocopies of the suggested corrections and changes. Mark your envelope Data Program, please. ED.

Dear Sir

I thought I would let you know what a pleasure it was to deal with Lowe Electronics.

I posted a query regarding my AR3000 at 10am on June 28. To my surprise I received the answer by the first delivery on June 30 and the query had been dealt with by J.B. Lowe himself.

I have always had prompt service from Lowes, but this is the best so far.

R.K. YOUNG
LANCASTER

Many readers will know that Lowe Electronics have been taken over by Zycomm, but I'm sure that they will continue serving their customers in the same way. *Ed*

Dear Sir

Further to the letter from Percy Tannac, published in the July issue of SWM, *regarding the illegality of listening to communications stations. This legally grey area is in fact being increased by the introduction of even more legislation relating radio broadcasting. The Wireless Telegraphy Act of 1949 allows licence holders (remember the Radio Licence?) to listen to authorised broadcasting stations. Several countries are somewhat lax when it comes to granting, enforcing or licensing broadcast stations. So how listeners are supposed to know which stations are taboo is unclear.*

The Marine Offences Broadcasting Act of 1967 makes it illegal for anyone to listen, communicate with, advertise with, or assist anyone broadcasting from ships or structures at sea, anywhere in the world. The proposed Goddess of Democracy, or whatever, from the coast of China would clearly be covered by this legislation, which includes penalties for persons giving such stations publicity!

The Broadcasting Act, now passing through Parliament seeks to plug the loop-holes in the exisiting laws with greater powers for the enforcement officers.

Considering that all of these Acts of Parliament are concerned with the regulation of transmitting equipment, and that from the listening angle it is totally uninforceable, the DTI should make our position ***clear****. The July 'Bandscan' article features an Ethiopian clandestine station (publicising an unauthorised station) as reported by the BBC Monitoring Unit! This is clearly illegal, and encourages others to commit an offence.*

Perhaps SWM*'s roving reporter will drop in at the Department of Trade and Industry and ask them for a response?*

Andy Cadier, Folkestone

A WORD IN EDGEWAYS

Dear Sir,

Godfrey Manning's 'Airband' column in the July issue has been brought to my attention. The question is posed, why is the reporting point on airway Romeo 8 called GIBSO? The authoritative answer is that it was chosen by my staff because:

a. They thought it was funny.

b. They are sycophants, or

c. They wished to embarrass me!

Unfortunately, the design of the airspace containing GIBSO has not proved universally popular with the users and I could well have done without being so closely associated with such a controversial point.

Incidentally, they played the same trick on my predecessor. But I'm sure you will find JACKO much easier to find (and much less controversial!).

AIR COMMODORE M.J. GIBSON OBE FRAeS RAF, DIRECTOR OF CONTROL (AIRSPACE POLICY), NATIONAL AIR TRAFFIC SERVICES, LONDON.

Dear Sir

Don't you think you should set a higher bench-mark for your Seen & Heard columns?

Many of the short wave entries are not real DX in my opinion - some of the broadcast stations logged can be pulled in any day, sitting on the loo with a 'tranny'.

I for one don't want SWM to go the way of a small-town newspaper where the Editor lists an entire funeral congregation by name lest he offend a subscriber.

As an s.w.l. I'm a comparative newcomer - so you're quite entitled to tell me to mind my own business. If, if you seem keen to promote discussion - so what do other readers think?

GRAHAM MARSDEN NOTTINGHAM

WHAT'S NEW

Single Sideband Broadcasts

The Quito-based broadcaster, HCJB, has started on-the-air testing of the newly installed single sideband transmitters. The upper sideband is used with the carrier inserted from 5 to 50%. Listening tests in Quito resulted in a decision to use 20% carrier injection for the time being for regular transmissions.

At present the testing is being carried out using an antenna directed towards Europe and the South Pacific, but it is expected that other areas will soon be targeted. The antennas in use are an unterminated rhombic for 11 through 19m and a folded dipole for 11m only so that, for now, when two transmitters are on the air together one of them must be on 11m. The actual frequencies used for the tests are 25.950, 21.470, 17.790 and 15.155MHz.

The transmitters were obtained at very low cost through the courtesy of the Swiss PTT, which operates the Swiss Radio International station in Schwartzenberg, Switzerland. These transmitters have been used there since about 1970 to communicate with aircraft in flight. Since some of that is now done by satellite, four of their seven s.s.b. transmitters were not being used and through a series of providential circumstances became available to HCJB.

These transmitters were built by Oimens in Germany and although built in the 1950s, were to such an advanced design that they are still quite modern, even by today's standards. They are capable of unattended operation, including automatic tuning to any frequency from 3 to 30MHz without an operator being present. The peak output power is 30kW which has the same effectiveness as around 100kW of a.m. - as long as the listener can receive s.s.b. on his short wave radio!

With 20% carrier insertion a listener with only a.m. reception available will notice considerable distortion, although speech will be understandable. With a conventional s.s.b. receiver speech will be undistorted, but the frequency response will be limited. Music will be distorted unless tuning is done very carefully. Receivers with synchronous detection, such as the Sony 2010, will get high-quality reception of both speech and music. The audio bandwidth is 6kHz, so that with the proper receiver, audio quality will rival or exceed the better a.m. transmitters, especially when fading is present.

HCJB would appreciate very much any reception reports of their s.s.b. transmissions. Details of receiver and the audio quality obtained with various types of tuning are needed. HCJB want to co-operate with set manufacturers to develop cheaper s.s.b. compatible s.w. receivers and DXers and DX clubs can help in this by making known which receivers do the best job with s.s.b. broadcasts.

You can monitor current HCJB s.s.b. programming from 1400 UTC until 0500UTC on 21.470MHz and 0700UTC until 1200UTC on 25.950MHz.

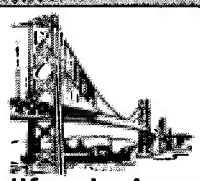
Friends of The Radiophile Get-together

Those of you who have attended previous Radiophile Get-together's will need no reminding that they are highly enjoyable events which give you the opportunity to meet friends as well as swap, sell or buy vintage equipment. A Bring & Buy stall will be in operation for visitors wishing to sell the odd item.

The next event is at Shifnal on 23 September 1990. Admission is still only £1 each and although tickets can be obtained at the door, if you buy them in advance by post you will be given priority of entrance at 10.00am. 'Advance' tickets are available from **Ray Holmes, 10 Paddlebrook, Hollinswood, Telford TF3 2DB. Tel. (0952) 2605**. Please enclose an s.a.e. for the return of tickets to you.

Shifnal lies between Wolverhampton and Shrewsbury in the beautiful Shropshire countryside and is accessible from Junction 4 on the M54 or the A5 or A464. The Village Hall is in the centre of village, near the railway station and is set in a large car park which is free on Sundays. The RAF Aerospace Museum at Cosford, Ironbridge Gorge and one of the largest garden centres in the Midlands are within a short distance. Light refreshments will be available in the Hall and good cooked meals are served in nearby hostelries.

As well as the Get-together there will be a special valve Auction in the afternoon. The complete collection of a well-known enthusiast will be offered for sale comprising about 200 valves mainly from the 1920s and including R-types, DEV(V24) and double-ended screen grids, in some 60 lots. The collection can be viewed during the morning.



California Award

The Northern California DX Club issues the California Award, free of charge, to qualifying foreign amateurs.

NCDXC publish a list of all qualifying NCDX member calls, some of which belong to silent keys, others are previous callsigns of present members and others are no longer members. However, all of the callsigns on the list qualify as present or former members and all their QSL cards are valid if dated after October 1946.

The list is updated once a year and the new lists are available by writing to **NCDXC, PO Box 608, Menio Park, CA USA 94026-0608.**

WHAT'S NEW

Chalk Pits Commemorates the Start of Empire Broadcasting

Gerald Eugene Marcuse, born in 1886, made the very first broadcast to the British Empire in September 1927.

The Chalk Pits Museum, which is privileged to have in its library some fascinating 'Marcuseiana', thanks to the generosity of Mrs Irene (Marcuse) Marwood, staged a commemorative display during the first weekend in September. This was designed to explain to the non-technical visitor what the ether sounded like at the time, just how rudimentary public broadcasting was and why Gerald's achievement was such a vital pioneering step in what is now accepted as the BBC World Service.

The Wireless Section of the Museum celebrates Gerald Marcuse each year about this time with GB2NM, but this year's effort changed the style of the celebration as well as shifting the emphasis from his amateur to Empire Broadcasting activities.

Visitors to the Chalk Pits saw a display of graphics together with contemporary crystal sets and valved receivers, components and microphones including the famous Marconi-Reisz one which transmitted Gerald's voice to all parts of the British Empire. There was also a continuous slide show and Gerald's recorded reminiscences of the early days of his Empire Broadcasts. These often finished as the dawn broke with the birds singing in the garden.

The display was housed in Number One Pit which has just been completely restored by the local Rangers and Guides. The Wireless Building was, of course, open as usual and Ron and Joan Ham, who arranged the Marcuse display, were in attendance with the museum's amateur station GB2CPM being operated by Margaret Brownlow.

JOTA Listeners' Awards

The International listeners' Association are organising awards for listeners in conjunction with this year's Jamboree On The Air. The dates for the event are 20 and 21 October 1990 and the awards are intended to encourage new youngsters to take part in this event and enjoy a simple challenge. However, all listeners irrespective of age, are invited to participate. The aim is to log as many JOTA stations as possible over the weekend.

The entry fee is £1 ($2) which is being donated to MENCAP. All participants will receive the ILA JOTA Certificate and the best entries in the following categories will also receive engraved trophies: Scout s.w.l. using h.f.; Scout s.w.l. using v.h.f./u.h.f.; Non-Scout s.w.l. using h.f.; Non-Scout s.w.l. using v.h.f./u.h.f.

The contest is for s.w.l.s only and Scouts may enter as individuals or as a pack, patrol or troop exercise. The closing date for entries is 15 November 1990 and should be sent to **ILA JOTA Awards, 1 Jersey Street, Hafod, Swansea, SA1 2HF.**

World by 2000 Confirmed Stations Award

There are ten short wave stations scattered around the world that are part of the World by 2000 project. FEBC in Manila. KFBS in Saipan, KGEI in San Fransisco and FEBA Radio in the Seychelles are operated by Far East Broadcast Company. Trans World Radio has TWR Monte Carlo in Monaco, TWR Bonaire in the Netherlands Antilles, KTWR in Guam and TWR in Swaziland. The remaining two are ELWA in Liberia and HCJB in Quito, Ecuador.

HCJB's *DX Partyline* is offering an award to listeners who have verifications from at least one World by 2000 station in each of the five geographical areas of Europe, the Americas, Africa, Asia and the Pacific. These verifications must include at least one from FEBC, TWR and HCJB. A special endorsement is available if you have verifications from all ten stations.

To receive the award send a list of the five (or ten) stations you are entering, together with a photocopy of each of the verifications, ensuring that details of the confirmations are clearly shown, together with one IRC for return postage to ***DX Partyline*, HCJB, Box 691, Quito, Ecuador.**

British Postcodes Award

The Civil Service Amateur Radio Society in Westminster is marking the 150th anniversary of the issue of the Penny Black, the world's first adhesive postage stamp, with the introduction of a new award based on hearing, or working, the various Postcode Areas of the UK.

The Postcode Area is that represented by the initial letter or letters which precede the first numeral in the Postcode of the address from which the station worked, or heard, is operating. In most cases the Postcode is shown in the station's entry in the 1990 RSGB *Amateur Radio Callbook* and a list and map of Postcode Areas will be found on pages 2 and 3 of that edition. (The *Amateur Radio Callbook* can be obtained from the *SWM* Book Service see pages 59 and 60).

There is provision for s.w.l.s to enter on a 'heard' basis. For further details, an application form, list and map of Postcode Areas and a copy of the rules send an s.a.e. to **Civil Service Amateur Radio Society, Civil Service Recreation Centre, Monck Street, London SW1P 2BL.**

Raycom to Expand Amateur Side

Ray Withers G4KZH, Managing Director of Raycom, has announced plans to expand the present amateur radio side of the business to cater for the growing popularity in scanning receivers and new amateur radio products.

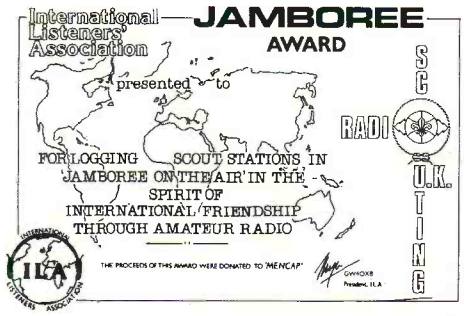
Raycom's ability, engineering skills and unique talents have led to rapid expansion into the professional communications markets and Raycom have several specialist exclusive agencies such as Sony and Motorola and they are extremely active in land mobile radio and entertainment.

Radio enthusiasts may like to know that they are very highly regarded members of a group of customers which includes The Rolling Stones, Paul McCartney and Anneka Rice.

With expansion in the building which has housed Raycom for the last two years, the Amateur Radio Department now has its own entrance, easily accessible from the large car park and only a short drive from Junction 2 on the M5 motorway. The new department is being further developed and is now under the care of Tom Crosbie G6PZZ who joins Raycom from Navico Ltd, where for the last two years he was Product Manager in charge of the highly successful AMR1000/S 144MHz amateur radio transceiver.

Raycom are looking to bring back the one-to-one customer relationship, improve all areas of customer care and introduce exciting new products with full after sales support. Plans include refitting the shop and expansion of the product range whilst improving the service to both trade and retail customers. New products to be launched shortly include h.f. s.s.sb. mobile transceivers, a new range of scanners and heavy-duty power supplies. Ray has also promised some of his valuable time to devise some more of those modifications he is world famous for.

Raycom can be found at **International House, 963 Wolverhampton Road, Oldbury, Warley, West Midlands B69 4RJ. Tel: 021-544 6767.**



Walton Lifeboat

The credits for the cover picture of Walton Lifeboat were omitted from last month's issue. The colour transparency of the Walton & Frinton Lifeboat *RNLB City of Birmingham* was taken by the Walton Lifeboat Mechanic, Jim Berry, RNLI. The pictures used in the article were taken by the author.

TRADING POST

FOR SALE: Plessey PR155G m.f./h.f. receiver, solid-state 1 - 30MHz, 30 bands, 6 bandwidth cal, many features, looks and works like new, very powerful, fine receiver. £265. Tel: 081-571 5759.

WANTED: New s.w.l. looking for 144MHz band converter for Yaesu FRG-7700 receiver. Rowan. 21 Buchanan Street, Kircudbright DG6 4AL. Tel: (0557) 30850.

FOR SALE: Sony ICF SW1E, synthesised world band receiver. £70. Tel: 031-346 0195 evenings after 8pm.

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

FOR SALE: Supra STV-660 (same as JVC CX-60GB) 6in PAL/SECAM v.h.f./u.h.f. TV with 5.5/6.0/6.5 sound switching, £120. AOR-1000 hand-held scanner, 6 weeks old, £200, v.h.f./u.h.f. Citizen 2.5in l.c.d. colour TV £50. Brighton (0272) 503958.

FOR SALE: AOR AR900UK scanner, covers civil and military airbands plus much more, very good condition, still under guarantee, full accessories, box and instructions, £150 o.v.n.o. Genuine reason for sale. R. Irish. Tel: Reading 699004.

WANTED: Ferrite rod antennas as long and thick as possible. Pete. Tel: (0742) 666144. (Sheffield).

WANTED: Icom IC-R7000. I have Realistic PRO-2005 scanner, 7 months old, cost £340 will accept £225. Read about it in September 1989 *SWM*. Joe. Tel: Ipswich (0473) 328575 after 6pm.

FOR SALE: Trio R1000 receiver, £180. 14-element u.h.f. TV wide-band antena, £25. Shilvock. Tel: 021-550 6050.

FOR SALE: Realistic 2003 programmable scanner, v.h.f./u.h.f. 68-174MHz, 410-512MHz, a.m./f.m. broadcast, £120 o.n.o. ARA900 active antenna, receive between 50-1300MHz, £95. Paul. Tel: (09913) 223. (Halesowen).

FOR SALE: FRG8800 all-mode 150kHz - 30MHz, v.h.f. converter fitted 118-174MHz, ARA 30 active antenna, mint condition, £650. Sony AIR 7 150-2194kHz, 76-174MHz, mains adapt/charger, holster, £180 o.n.o. Paul. Tel: (09913) 223. (Dyfed).

FOR SALE: Yaesu FRG-9600 scanner with PA4C mains adapter unused, still boxed complete with discone, £350. Mr Ball. Tel: Merseyside 051-924 5643. (Dyfed).]

FOR SALE AOR800E hand-held scanner, little used, boxed, all accessories. Would exchange for Sony AIR7 or 8 or sell for £150. Hartley. Tel: (0582) 37297. (Luton).

FOR SALE: 10 month old 900UK recently checked at Lowes, requires a discone. Wish to swap for base set, cash adjustment to suit, charger, antennas, spare batteries or offer. J Clark, 7 Honeygate, Luton LU2 7EP. Tel: (0582) 28488.

FOR SALE Yaesu digital receiver, FR-101, f.m. board fitted, nearest to £150 secures. Lloyd. Tel: (0285) 713628. (Fairford).

FOR SALE Sony ICF-PRO-80, £150. Sony AIR-7, £70. P Ogden-Smith. Tel: Bishopton 862444.

WANTED Panasonic RF-B65D compact multi-band radio in good condition. Also service manual for Grundig Satellit transistor radio (Germany) model 5000/205A. Alan, 32 Heldhaw Road, Bury St Edmonds, Suffolk IP32 7ES. Tel: (0284) 760984.

FOR SALE R2000 + VC10 converter + d.c. option + YK88CN c.w. filter, cost £820, first offer £430. Also 9R59 + matching speaker unit, v.g.c., £60. Carriage extra or collect. Tel: (0706) 218290 after 7pm.

WANTED Service manual for Pye Olympic u.h.f. A.R. Batho, 28 Ancaster Court, Scunthorpe, South Humberside DN17 2UF.

FOR SALE AOR 900 hand-held scanner, 3 months old, £150. Also three Pye Westminsters, low band a.m., ex-p.m.r. mobile models suitable for conversion, £10 each. Tel: Halifax 361635.

WANTED Trio 1000 with manual. W. Bell, 33 Back Canning Street, Liverpool L8.

FOR SALE Spectrum 48K plus datacorder, RTTY TX/RX and SSTV TX/RX programs plus c.w., AMTOR, RTTY, SSTV RX, £80 as new, AKD scanner conv. tunes 100-160MHz to RX 0-60MHz, £30 brand new. J. Graham. Tel: (05763) 494 nr Lockerbie.

FOR SALE AOR-2002 scanner receiver, excellent condition with owners manual, £250 o.n.o. Tel: Norwich 721790. Howes. 32 Lonsdale Road, New Rackheath, Norwich.

FOR SALE/SWAP BBC FAX unit, DL Bird, Psion Organiser II 32K model XP, 4.5in reflecting telescope, equitorial mount, tripod, lenses, etc. Cost £300, w.h.y? Bill. Tel: 091-482 1344. 18 Wesley Street, Low Fell, Gateshead, Tyne & Wear NE9 5YN.

FOR SALE Kenwood R-5000, brand new, £800. Yaesu FRG-9600 with European TV module, PP3 battery for memory back-up, change battery with no memory loss!, £275. Both mint, boxed, with manual. George Brown. Tel: (0268) 753508. (Benfleet, Essex).

FOR SALE Matsui MR4240 9-band s.w. and airband, £15. Steepletone SAB9 m.w./l.w./f.m./air, £15. Realistic Jetstream a.m./air, £10. E Stevenson. Tel: 081-842 2215. (Hayes, Middlesex).

FOR SALE Kenwood Trio 600 communications receiver, 150kHz - 30MHz, a.m., s.s.b., c.w., digital frequency display, genuine reason for sale, £250 o.n.o. G. Jones. Tel: (0273) 515500 (Newhaven, Sussex).

FOR SALE Drake SSR-1 communications receiver 500kHz to 30MHz a.m., u.s.b., l.s.b., 12V d.c. and 240V a.c. operation, telescopic antenna, ideal s.w.l. rig, v.g.c., £95. Ian Rock. Tel: 081-948 5483 (Richmond).

FOR SALE Jupiter II MVT-5000 v.h.f./u.h.f. scanner plus p.s.u., £185. Jim M-100 pre-amplifier, £40. All seven months old. Reason for selling - concentrating on h.f. communications. James Trutwein. Tel: Maidenhead 27505.

FOR SALE/Swap Realistic PRO32A hand-held scanner with 2 antennas and manual, for any small base scanner with 68-88MHz a.m., or sell for £100. Reason for sale - purchased HP100E. S. Scott. Tel: (0908) 318202 (daytime). (Milton keynes).

FOR SALE Icom's latest IC-R1 scanner only 3 months old, boxed with full instructions, complete with both LC59 and LC57 cases, BP90 AA battery pack, HP4 headphones, £325. Carriage extra. Mr J Elliott, 27 Surridge Court, Stockwell, London SW9 9AG. Tel: 071-622 2820.

WANTED Grundig Satellit 500 receiver. Len Sangster, 113 Moss Lane, Litherland, Liverpool L21 7PS. Tel: 051-920 9360 after 6pm only.

WANTED Operators handbook wiring circuit, service manual for Akai model No. AC3400S stereo cassette receiver. A. Kynaston, 223 Sundorne Road, Shrewsbury SY1 4RF. Tel: Shrewsbury (0743) 54227.

FOR SALE Philips D2999, as new, 5 months old, little used, £225 o.v.n.o. M. Durnall. Tel: Market Drayton 3131.

FOR SALE/Swap Uniden/Bearcat 50XL hand-held scanner. Absolutely mint condition, excellent marine band and 144MHz reception, original packing and instructions. Offered in exchange for Matsui MR-4099 or similar receiver. Tel: (0253) 811648 (Knott End-on-Sea).

WANTED SRX30D or Century 21D receiver with circuit if possible, reasonable price please. K Rainford. Tel: (0492) 514718. (Colwyn Bay).

FOR SALE: Or **Swap** Les Paul (copy) guitar and practice amplifier, excellent condition. **WANTED**: hand-held scanner, must have a.m. airband. Tel: (0925) 828914. (Warrington).

SWM OCTOBER 90 TP

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

GRASSROOTS

Lorna Mower

Bedford & DARC: Tuesdays, 7.30pm. Allen's Club, Hurst Grove, Bedford. Oct 2 - Etching by Stuart G0GOF, 9th - A Social Evening, 16th - Double Sideband by Eric G3YUQ, 23rd - AGM. Glenn Bedford 266443.

Bromley & DARS: 3rd Tuesdays, 7.30pm. The Victory Social Club, Kechill Gardens, Hayes. Oct 16 - Linear Amplifiers. Geoffrey Milne, 081-462 2689.

Chelmsford ARS: 1st Tuesdays, 7.30pm. Marconi College, Arbour Lane, Chelmsford. Oct 2 - AGM. Roy Martyr, Chelmsford 353221 ext 3815.

Cheshunt & DARC: Wednesdays, 8pm. Church Room, Church Lane, Wormley. Oct 3 - Packet Radio 3 by Mike Dennison G3XDV, 10th & 24th - Natter Night, 17th - The Schneider Trophy by Rex Levi & Michael Bowl, 31st - Junk Sale. Roger Frisby, Hoddesdon 464795.

Coventry ARS: Fridays, 8pm. Baden Powell House, 121 St Nicholas St, Radford, Coventry. Sept 28 - Operation Raleigh II by John Layton, Oct 5 - AGM, 15th - Night on the Air, 19th - Packet Radio talk. Neil, Coventry 523629.

Delyn RC: Alternate Tuesdays, 8pm. Daniel Owen Centre, Mold. Oct 9 - Demo by Major Radio Equipment Manufacturer, 23rd - Cheese & Wine Evening. Steve Studdart, Deeside 819618.

Derby & DARS: Wednesdays, 7.30pm. 119 Green Lane, Derby. Oct 3 - Junk Sale, 10th - Visit by Birketts of Lincoln, 17th - Small-scale Combined Heat & Power - Making Your Own Electricity by Bob Everett G1DWC. Kevin Jones, Derby 669157.

Derwentside ARC: Wednesdays, 7.30pm. The Steel Club, Consett, Co. Durham. Paul, (0207) 580872.

Dunstable Downs RC: Alternate Fridays. Sept 28 - GCSE Electronics Exam Paper by G3WLM, Oct 5 - Constructors' Contest, 19th - Technical Question & Answer Evening. Mike Spacey, QTHR.

East Kent RS: 1st & 3rd Thursdays, 7.30pm. Cabin Youth Centre, Kings Road, Herne Bay. Oct 4 - AGM. Brian Tutt, Herne Bay 366232.

Hastings E&RC: 3rd Wednesdays, 7.30pm. Westhill Community Centre, Croft Road, Hastings. Oct 17 - Junk Auction.

Horndean & DARC: 1st Thursdays, 7.30pm. Horndean Community School, Barton Cross, Horndean. Oct 4 - AGM. F. Charrett, Havant 483676.

Keighley ARS: twice monthly, 8pm. Ingrow Cricket Club. Sept 27 - Intruder Alarms by G8NWK, Oct 4, 18 & 25 - Natter Night, 11th - Questions & Answers. Kathy, Bradford 496222.

Lothian RS: 2nd & 4th Wednesdays, 7.30pm. The Orwell Lodge Hotel, Polwarth Terrace, Edinburgh. Oct 10 - Open Night, 24th - Visit to Torness Power Station. P.J. Dick GM4DTH, QTHR.

Mansfield ARS: Polish Catholic Club, off Windmill Lane. Oct 4 - The History of Computers & Computing by Dennis G0KIU. Mary, (0623) 755288.

Mid-Warwickshire ARS: 2nd & 4th Tuesdays, 8pm. St John Ambulance HQ, 61 Emscote Road, Warwick. Oct 9 - Amateur Radio Computing Bonanza Demo by Les G8TFF, 23rd - I did it Myself - bring your home-brew. Mike Newell, Kenilworth 513073.

Norfolk ARC: Wednesdays, 7.30pm. The Norfolk Dumpling, The Livestock Market, Harford, Norfolk. Oct 3 - A talk with your RSGB Zonal Council Member John Greenwell G3AEZ, 7th - Project YEAR at Hewett School, 10th - Science for All by Arnold Tomalin G3PTB, 17th - Informal, 24th - Towards a Cleaner Oscillator by Dick Bacon G3WRJ, 27th - Outing to the Leicester Show. Mike Cooke, (0362) 850591.

Shefford & DARS: Thursdays, 8pm. Church Hall, Ampthill Rd, Shefford. Sept 28 - Bedfordshire Cub Scouts 'Go for a Million', Oct 11 - What's on 80 by John Allen G4PDP, 18th - Junk Sale. Nigel Leaney, Royston 71149.

South Bristol ARC: Wednesdays. Whitchurch Folkhouse Assoc, Bridge Farm House, East Dundry Rd, Whitchurch. Oct 3 - Computer & Audio Bring & Buy, 10th - ATV Activity Evening, 17th - Home-brew evening, 24th - 144MHz Activity evening. Len Baker, Whitchurch 832222.

Southgate ARC: 2nd & 4th Thursdays, 7.45pm. Holy Trinity Church Hall (upper), Winchmore Hill, N21. Sept 27 - Inter-club Darts Match. Brian Shelton, 081-360 2453.

Stourbridge & DARS: 1st & 3rd Mondays. Robin Wood's Community Centre, Scotts Road, Stourbridge. Oct 1 - Natter Night, 15th - Sound Recording by Andrew G8MKK. Dennis Body G0HTJ, QTHR.

Sutton & Cheam RS: 3rd Thursdays, 7.30. Downs Lawn Tennis Club, Holland Ave, Cheam. 1st Mondays in the Downs Bar. Oct 1 - Natter Night, 8th - Inter-club Quiz, 18th - Junk Sale. John Puttock G0BWV, QTHR.

Trowbridge & DARC: 1st & 3rd Wednesdays, 8pm. Territorial Army Centre, Bythesea Road, Trowbridge. Oct 3 - Local Radio & Radio Data Systems by Ian Anderson, Engineer-in-Charge BBC Wiltshire Radio. G0GRI, (0380) 830383.

Vale of Evesham RAC: 1st Thursdays, 8pm. MEB Club, Old Worcester Rd, Evesham. Oct 4 - Reliability by G4YIG. Ken Sheldon, Evesham 860202.

Verulam ARC: 2nd & 4th Tuesdays, 7.30pm. RAF Association HQ, New Kent Rd, St. Albans. Oct 23 - GB2SM by Mr G Voller G3JUL. Andy Ince G0BZS, QTHR.

Wigan & DARC: 1st & 3rd Thirsdays. The Old Pear Tree Inn, Frog Lane, Wigan. Mrs M.E. Norton (0942) 47416.

Wimbledon & DARS: 2nd 7 last Fridays, 7.30pm. St Andrews Church Hall, Herbert Road, SW19. Sept 28 - Night on the Air, Oct 12 - Surplus Equipment Sale, 26th - AGM. Nick Lawlor, 081-330 2703.

Wirral ARS: 1st & 3rd Wednesdays, 7.45pm. Club Room, Ivy Farm, Arrowe Park Rd, Birkenhead. Oct 3 - AGM. Alec Seed G3FOO, QTHR.

Yeovil ARC: Thursdays, 7.30pm & Fridays, 7.30pm. The Recreation Centre, Chilton Grove, Yeovil. Sept 27 - Natter Night, Oct 4 - Design & Use of an Absorption Wave Meter by G0HDJ 11 - Junk & Bring & Buy, 18th - Simple Radio Controls by G1PZK, 25th - Natter Night. David Bailey G1MNM, QTHR.

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

RALLIES

*Short Wave Magazine and Practical Wireless in attendance.

September 29 & 30: RSGB HF Convention will be held at the Penguin Hotel, Daventry. 29th is a visit to BBC station at Daventry and a DX Dinner. 30th starts 10.30am all the usual attractions, RSGB Bookstand, hands on software demos, packet point and much more. Steve G4JVG, QTHR.

September 30: The 6th North Wakefield RC Rally will be held at Outwood Grange School, Potovens Lane, Outwood, near Wakefield. Admission is 50p at 11am - disabled 10.30am. Fully licensed bar with real ale, good selection of food from cafe, raffle, Bring & Buy, radio, computer and electronic traders and repeater groups. **Richard G4GCX on (0532) 622139**.

***October 7**: The Great Lumley Amateur Radio & Electronics Society will be holding their rally in the Community Centre, near Chester-le-Street, in Great Lumley. Doors open at 11am (10.30am for disabled). Barry G1JDP. Tel: 091-388 5936.

October 14: Computercations will be held again this year at Hillhead campsite on the Dartmouth Road in Brixham, South Devon. **Bill Trezise. Tel: (0803) 522216**.

October 20: The G-QRP Club Mini Convention will be held in St Aiden's Church Hall, Manchester Road, Rochdale from 10am to 5pm. There will be a large social area, full lecture programme, equipment display, refreshments, Bring & Buy, Component/Kit Stands, Test Bench and lots more. Admission £1. **Rev George Dobbs G3RJV, QTHR**.

***October 20/21**: The 4th North Wales Radio Rally will be held at the Aberconwy Centre in Llandudno. Rally open as at 11am on both days and the entrance fee is £1 with OAPs 50p and children under 14 free. **Mr B Mee. Tel: (0745) 591704**.

***October 26/27**: The Leicester Amateur Radio Show will again be held in the Granby Halls, Leicester.

November 11: The MARS-Birmigham Mobile Radio Rally will be held at Stockland Green Leisure Centre, Erdington, Birmingham. Doors open from 10am to 5pm. **Peter Haylor G6DRN. Tel: 021-443 1189.**

***November 18**: The Bridgend Annual Amateur Radio Rally will be held in the Leisure Centre, as last year but in 1990 they are taking over the whole of the building! **Don Chennell GW4DUY. Tel: (0656) 863084**.

December 9: The 6th St Albans (Verulam) Rally will be held at Hatfield Polytechnic, Hatfield. Doors are open from 11am to 5pm. Usual attractions, club stands, talk-in on S22, Trade stands, prize draw, Bring & Buy, Catering and bar. Entrance £1.

1991

January 27: The CLARC & ULARS are holding their rally at Lancaster University. **Mike Sherlock G4ZYN. Tel: (0257) 452287**.

May 25: The Maidstone YMCA ARS are holding their biennial rally at the YMCA Sportscentre, Maidstone. As usual the rally will feature Trade and Special Interest Groups stands, refreshments and ample free parking. **Alan Judge G8KCW. Maidstone 750703**.

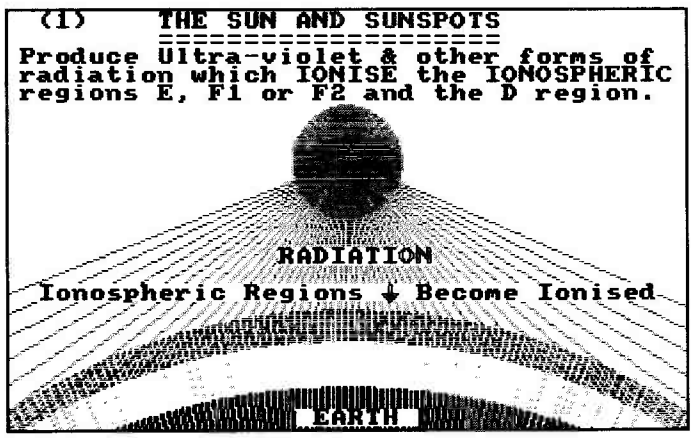
June 30: The 34th Annual Longleat Rally will be held, as usual, at Longleat House, Warminster, Wilts. **Shaun O'Sullivan G8VPQ. Tel: (0225) [illegible]**.

July 28: The Scarborough ARS will be holding their annual rally at The Spa, Scarborough.

WE'RE SORRY!

HF Radio Wave Propagation - 1 Correction

Unfortunately, a gremlin attacked Part 1 of this series and we ended up with the drawing for Figure 5 being used for Figure 1 as well. The correct Figure 1 is reproduced here and it is suggested that you cut it out or photocopy it and paste it over the incorrect Figure 1 in Part 1. The captions were correct.



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

The NRD-525 from JRC

In America, they refer to the NRD-525 as JRC's superset, and it's not a bad description, because there is little doubt that the NRD-525 stands in a class of its own. Whatever you want a receiver to do, it's likely that the NRD-525 will do it; whatever you want to hear, the NRD-525 will allow you to listen to it.

What will the NRD-525 do for you? In a space so limited as this page, I cannot possibly cover all the answers, so I will let a respected reviewer make some comments for you. Here's what Rainer Lichte, author of "Radio Receivers — chance or choice" said about it:-

Accuracy and stability

"The tuning accuracy and the matching display are impressive indeed, Still the more impressive is the receiver's frequency stability. Drift is virtually non-existent, it was measured at less than 5Hz/hour."

And about dynamic range:-

"ICP 3rd order (3rd order intercept point) was measured at +17dBm at 7MHz and +14dBm at 25MHz. These are excellent values, and they are not the result of decreased sensitivity. The NRD-525 is amongst the most sensitive receivers I've measured so far. . . . Dynamic range was computed to 102dB, an equally outstanding value."

All very well you may say, but what does this technical jargon mean in real life? Let me quote Rainer Lichte again:-

"The signal quality under adverse conditions is remarkable, e.g. the 40 metre band here in Europe is fairly cluttered with high-power stations and most receivers just quit when you try to extract some intelligence from a weak radio amateur signal. The NRD-525 is unimpressed and functions in a truly professional manner."

In other words, there is virtually nothing you cannot resolve. If it cannot be received by the NRD-525, it cannot be received by anything. As a final quote from the review, let me give some conclusions:-

"The receiver is a joy to operate and a joy to listen to."

"The new NRD-525 very impressively manifests itself as the No. 1 receiver outside the commercial/military bracket."

"Performance-wise, the NRD-525 is way ahead of the competition because this receiver delivers outstanding results in all modes of operation."

When you try an NRD-525 for yourself, all that Rainer Lichte has said will be clearly true, but that's not the end of the story, because the NRD-525 has a range of options which will extend its use even further; to VHF/UHF with an internally fitted converter; to more demanding applications with a range of high performance IF filters; to almost anything you want it to do.

For more advice on this outstanding receiver, just send for details, or call in here at Matlock, or at any of our branches across the country. You will find us helpful, knowledgeable and competent, and when you buy from us you have the comforting thought that you have the backing of Europe's best service team should you require it. That's why JRC, Kenwood, AOR, Signal, Daiwa, and all the other well known names have chosen us to be their sole UK distributors. Others may sell the radios, but we do so much more. Try us and see.

NRD-525	90kHz to 34MHz.	**£1095**
Options		
CMK-165	VHF/UHF converter.	**£391**
CMH-530	RTTY demodulator.	**£102**
CMH-532	RS232 interface.	**£91.75**

The NRD-525 is fitted with 12kHz, 6kHz and 2.4kHz filters as standard. Option filters are available for 300Hz, 500Hz, 1kHz and 1.8kHz bandwidths.

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26 YEARS IN SHORTWAVE

When it comes to scanners Look to Lowe

The New HF-225 Receiver

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

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

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

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

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

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

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

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

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

The HF-225 is even better.

HF-225 £425 John Wilson

For the past 26 years Lowe Electronics have specialised in seeking out the best in radio and bringing it to our customers. Those customers will also tell you that we have another speciality — looking after them. Whatever is best in radio, we sell. Whatever we sell, we back with really expert advice and service. We are pleased to represent the best companies in the receiver world, and in addition to the AOR range shown here, we also distribute receivers from Signal Communications and WIN, two of the top names in Airband radio. For full information and a copy of our Airband Guide, simply send us four first class stamps and mention that you saw our ad. in Short Wave Magazine". Happy listening.

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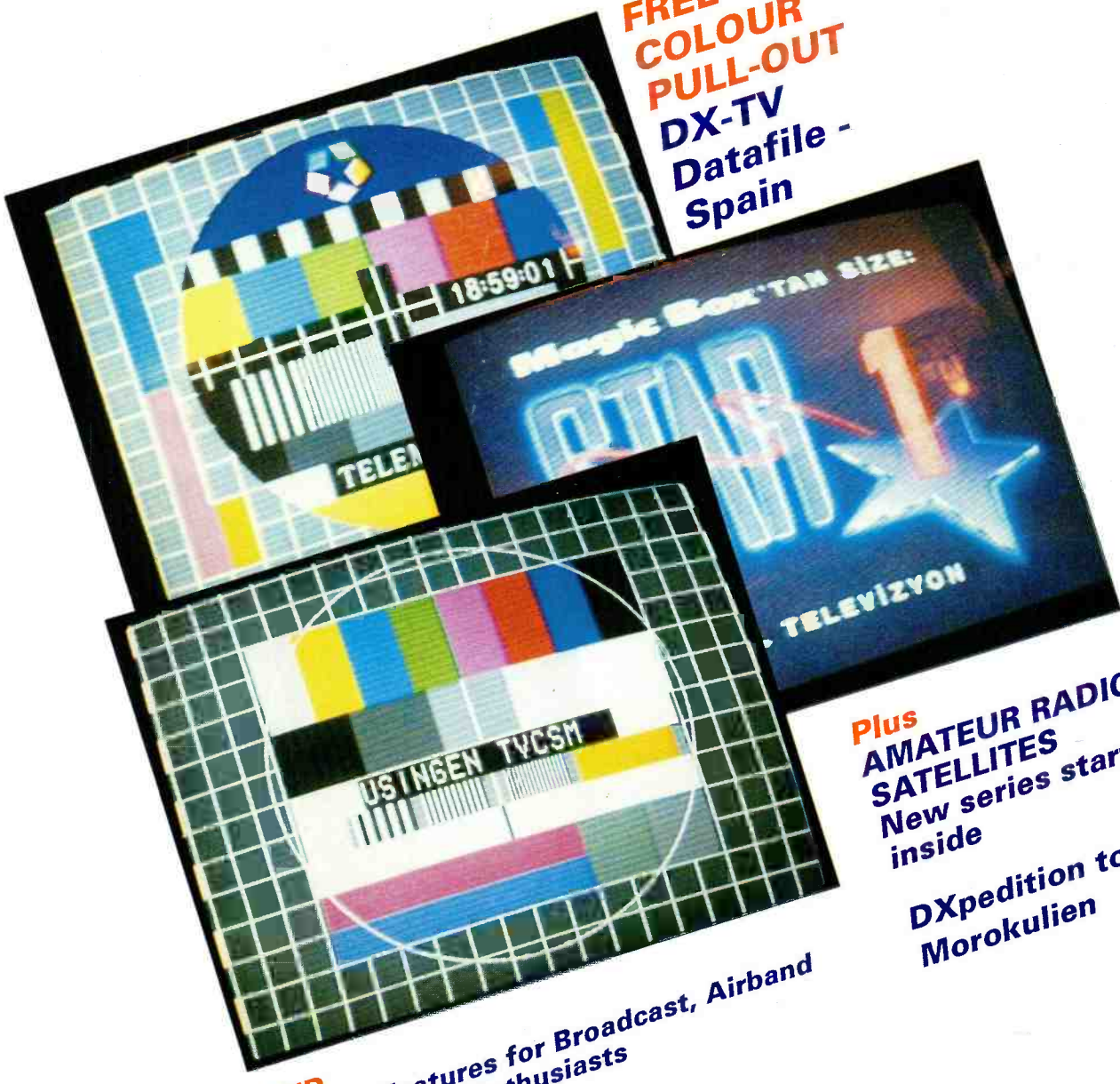

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AIRBAND

Godfrey Manning G4GLM

Be careful! *Aeronautical Information Circular 55/1990* from the CAA warns that military aerodromes are now giving their altimeter settings as QNH instead of QFE. The latter is still available on request.

Frequency & Operational News

This July was the last that the Popular Flying Association will have held their Rally at Cranfield. I always looked forward to this event as there was invariably a bargain to be had for the museum. Next year's venue is not yet decided. Any reader finding out the answer should write in without delay - or you could have a very unhappy columnist come next July!

Frequency changes unearthed by **Tim Christian** and **Chris Coates** (both from North Walsham) are as follows. B1 traffic uses 128.125 with handovers to 134.25MHz. South Atlantic and Caribbean h.f. allocations are changing. New York and Santa Maria control traffic to/from the Caribbean on 6.628, 8.906 and 11.309MHz. East-west intercontinental traffic remains on 6.577, 8.846 and 11396kHz. Propagation predictions suggest that Pacific signals could reach further than intended - such as Europe - in late September, the problem areas being 10.048 (mornings), 11.282 (afternoons) and 8.903MHz (evenings). Air Zimbabwe has 8.949MHz to themselves as a company ops frequency.

Also noted by **Geoff Powell** (Tamworth) is an operational RTTY frequency: 13752kHz, as found in *Aeronautical Communications Handbook h.f. Edition* (reviewed September '89 'Airband'). When a primary and secondary frequency are given, both can be in use simultaneously. **J. McIntosh** (Selkirk) gives as example 8.825, the secondary being 6.628kHz. Sorry that I can't meet the request for SelCal information. Other specialised books such as *High in the Sky* by Ken Barker (The Aviation Society) deal with the subject and there just isn't room in this column.

M'aider!

Not really a 'Mayday' call but someone out there might be able to help me identify two museum pieces. First, a Doppler ground speed and drift setting unit type AA 5665-1 by Elliott (a name from the past!). Two cranked knobs respectively enable G/S Knots (3 digits) and Drift (2 digits each, port and starboard) values to be set in windows. There's also an Auto/Manual switch. What's it from, how was it used? Same questions apply to a Latitude/Longitude Controller LCN 3-3 by Computing Devices Co. Ltd. Made in 1968 it has two windows, each with three digits, for N-S and E-W. Below each is a zero resetting switch. Six round, white, momentary-action pushbuttons complete the panel. Both units have grey transilluminated front panels.

As the summer draws to a close, there's more time to read new books and Godfrey makes some suggestions.

Now I'll try to help **Jim Hawkins GW4NLE** (Cardiff) with his navigational problems. I can't suggest one book that tells everything you need, but keep reading this column and look at some of the recent book reviews (such as *Air Traffic Control*). Colloquially named "air corridors" are technically known as controlled airways. They are bounded top and bottom by prescribed altitude limits; they begin and end at defined points. The easiest point to define is at a radio beacon (a n.d.b. such as Westcott or, more commonly these days, a v.o.r. such as Compton). Along the way, and sometimes at the beginning or end, are points with no beacon. They are just defined by latitude and longitude, but most pilots find them by their distance and bearing from nearby beacons. Examples of these reporting points are KENET and HAZEL (note the 5-letter names). The only way to find out the details is to consult a radio-navigation chart, available to the public cheaply. In August I detailed all the suppliers of these, but a good start is Aerad Customer Services (081-562 0795). Request a copy of their *Legend Booklet*, usually available free and accompanied by sample recently out-of-date products. Let me know if this helps.

Let me also refer **Ian Armstrong G7GVN** (Millom, Cumbria) to the August suppliers list. Both Aerad and RAF 1 AIDU sell good *En Route Supplements* that include UK radio frequencies; the Aerad one covers Europe and Middle East, the RAF covers British Isles and North Atlantic.

Book Reviews

If it's by **Stan Stewart** then it must be worth reading and his latest is no exception: *Emergency - Crisis on the Flight Deck* (Airlife, 264 pages hardback, £13.95, ISBN 1-85310-031-5). Considering the conditions of flight, air travel has a solid safety record. But, the unfortunate incidents that do occur attract disproportionate publicity. No mechanically-based technology can be predicated on the assumption that, properly designed, built and maintained, it can never go wrong. Things do go wrong and a large part of the pilot's skill is in handling these situations in a safe way. This is the side of flying that the media neglects. It is timely that Stan has brought this important aspect of the pilot's training to the public's attention with this book.

Some of the cases described had already received a cursory treatment in the press, others are little known. All of them tell the same story. When things go wrong, the aircraft can still land safely if the crew execute their jobs with the level of professionalism and training that the passenger expects of them. Stan probes the incidents in more detail than any newspaper article. He has had first-hand meetings with many of the people involved. The level of technicality will be taken in the stride of the typical reader of this column. Don't worry, Stan helps you every step of the way with his explanations and, if all else fails, there is a glossary at the back of the book.

Each chapter deals with a particular type of problem, mostly just one incident. This column's readers will delight in the real-life air/ground radio transcripts that appear throughout.

The next book is definitely not to be read in one go. *Mechanics of Flight* by A.C. Kermode (Pitman, 507 pages, ISBN 0-273-31623-0) is a specialist text, yet suitable for the more inquisitive enthusiast as well as engineering students. If you want to know what keeps aeroplanes up there, what happens aerodynamically every time the pilot makes a manoeuvre, this is the book to get you started. Some ability at mathematical formulae will definitely enable much more to be gained from the text but none of it would bother an A-level student and calculus is mercifully avoided. There's even a section on orbiting spacecraft, an invaluable asset to those of you who also listen to satellites. This book will give the more technically-minded a deeper understanding of what really happens each time you observe an aeroplane alter direction, speed, or height, with such apparent ease.

Lastly, another technical book. *SWM* is a radio magazine, and many radio enthusiasts spread their interest more widely into electronics. *Aircraft Electrical Systems* by E.H.J. Pallett (Pitman, 168 pages hardback, ISBN 0-273-08445-3) will show how you can apply the knowledge gained in your hobby to aeronautical systems. Now looking a bit dated, it does explain the basic requirements. Most of the circuit diagrams are simple and don't require a deep knowledge of solid state electronics. The influence of British made equipment is obvious from the pictures, many of which illustrate equipment on display in my own Museum collection.

AIRBAND

Follow-Ups

Still on the subject of books, I reviewed *Air Traffic Control* (Ian Allan) in the July edition. Its author, Graham Duke (Newport) has written to say that the next edition is scheduled for December 1991. My amateur detective work was wrong; he is not an air traffic controller, but became an honorary member of the Guild through having written his book. Graham and I have something in common: learning and writing about aviation whilst working professionally in a different technical discipline.

Also in July, **John Snell** (Newton Abbot) wanted the address of Sandpiper Communications, which is now supplied by Graham and **J. Stevens** (Newmarket) as Pentwyn House, Penyard, Llwydcoed, Aberdare, Mid Glam CF44 0TU. Tel: (0685) 870425.

In July I highlighted the 'Spanish Track'. **Ron King** (Lewes) once worked in flight operations. The tracks start at Santiago and Aviles (Spain). The tracks split to the north, ending at Cork or Lands End respectively.

Ron adds a description of north Atlantic flight planning - enough for an article in its own right! I am forced to summarise here. Eastbound flights operate 0100-0800Z (time of crossing 030°W) and westbound flights 1130-1900Z. For each period, the tracks are worked out to take best advantage of the wind. Flights going against the flow must stay off the tracks.

Ken Marsh (Southport) asked about the 'Stud' terminology in August. **Graham Tanner** (Harlington, near Heathrow) and **K. Blagg** (Blackpool) tell me that some military airborne u.h.f. transceivers have numbered channels rather than indicating the actual frequency to which they are tuned. The controller has merely to say, "Call on Stud N" (where N is an integer) and the pilot can then select the correct channel.

Just what's that building at Little Budworth, Cheshire (August edition)? It defies elucidation! Nearby Whitegate n.d.b. (WHI, 368.5kHz) has been located "in the middle of a forest" by **J.J. Parry** (Northwich) and **Nick Axworthy** (Runcorn). Simply plot the published lat/long on an Ordnance Survey Map, then off you go. Avoid trespassing during your search. Nick located the Wallasey beacon (now withdrawn) in a field. The shotgun-equipped farmer took exception!

You will find that n.d.b.s look like simple masts near a hut and v.o.r.s are larger, having a circular frame at first-storey level with vertical antennas at intervals around the circumference. There is considerable variation from these typical appearances.

Looking back to the Grantham site (also mentioned in August): my vote goes to **Fran Kelk** (Nottingham). **P.J. Salisse** (Highgate) has written that the site he nominated belongs to the gas and electricity boards. Better luck next time.

Abbreviations

CAA	Civil Aviation Authority
E	east
ft	feet
G/S	ground speed
h.f.	high frequency
kHz	kiloherz
lat	latitude
long	longitude
MHz	megaherz
N	north
n.d.b.	non-directional beacon
ops	operations
QFE	altimeter setting, reads zero at aerodrome elevation
QNH	altimeter setting, reads zero at sea level
RTTY	Radio TeleTYpe
S	south
u.h.f.	ultra high frequency
v.h.f.	very high frequency
v.o.r.	v.h.f. omni-directional radio range
W	west
Z	Zulu (Universal Co-ordinated Time)

Historical Section

Geoff Halligey (Bridgend) has flown professionally and was also once a wireless operator at Croydon Aerodrome. At the end of the 1930s three stations - Croydon, Pulham (Norfolk) and Lympne (Kent) were established with transmitters on 336kHz.

To plot an aircraft's position, the stations listened on 333kHz to direction-find the aircraft's signal. The other two stations then transmitted their bearings to Croydon. The plot was on a map that was drilled with a hole for each station. Through each hole passed a string that was pulled out and laid in the direction from which the transmission came. Where the strings crossed (or, more likely, formed a 'cocked hat') was the position of the aircraft.

The next three deadlines (for topical information) are October 5, November 2 and November 23. All correspondence to *SWM* office please. □

SERVICES

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Subscriptions are available at £19 per annum to UK addresses £21 to Europe and £22 overseas. Subscription copies are despatched by Accelerated Surface Post outside Europe. For further details see the announcement elsewhere in this issue. Airmail rates for overseas subscriptions can be quoted on request. Joint subscriptions to both *Short Wave Magazine* and *Practical Wireless* are available at £32 (UK) and £37 (overseas).

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. See page 24 for full details.

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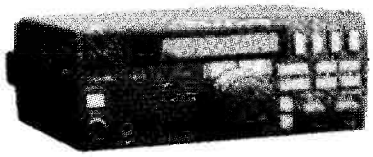

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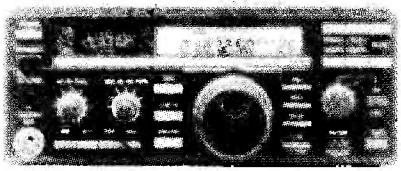

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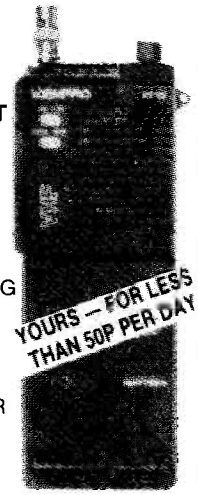

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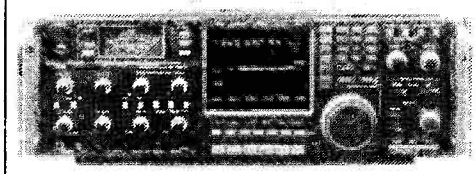

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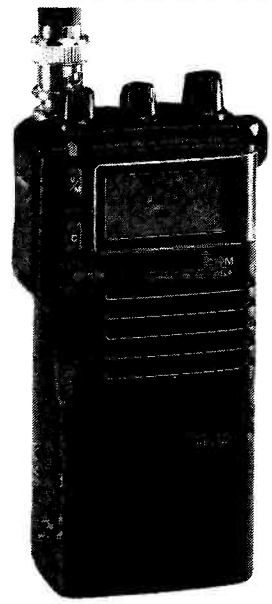

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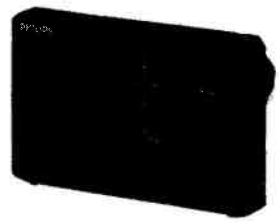

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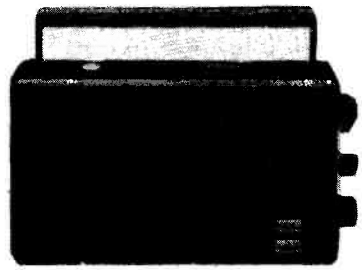

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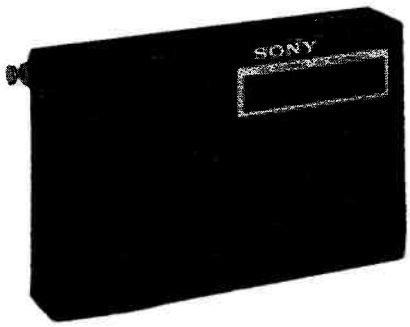

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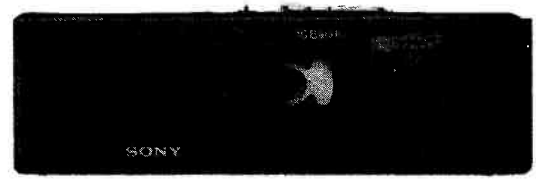

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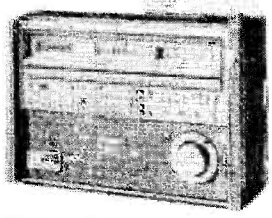

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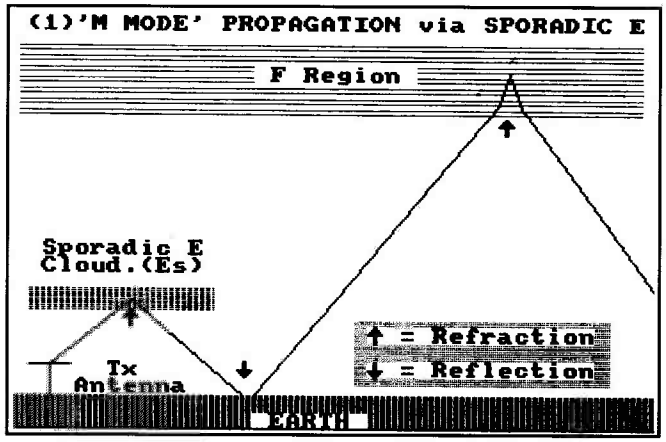
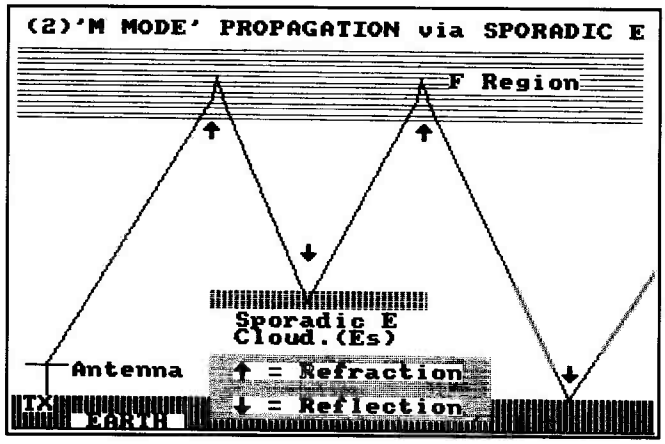
HF RADIO WAVE PROPAGATION

F. C. Judd G2BCX Part 2

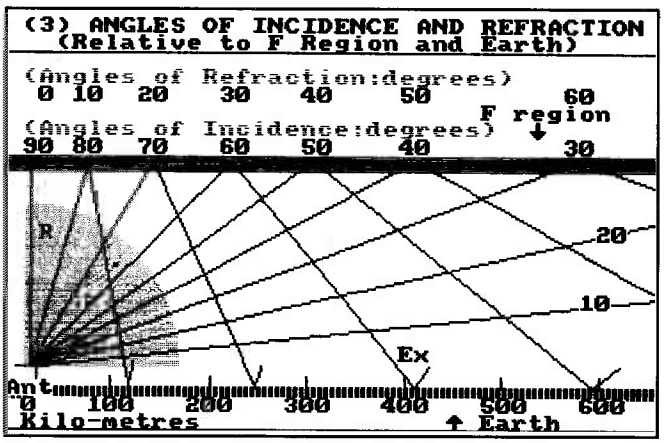
These graphics, like text book diagrams, show 'single lines' to represent the paths of radio waves. It must be made clear, that once they leave the antenna, all radio waves expand during propagation as in (4) and (5) in this section. Weak signals, or none at all, may sometimes be due to 'N' or 'M' modes of propagation caused by the presence of Sporadic-E clouds (1 & 2) or to a D region absorption i.e. when the lowest ionospheric region, the D layer at 50-90km, becomes intensely ionised.



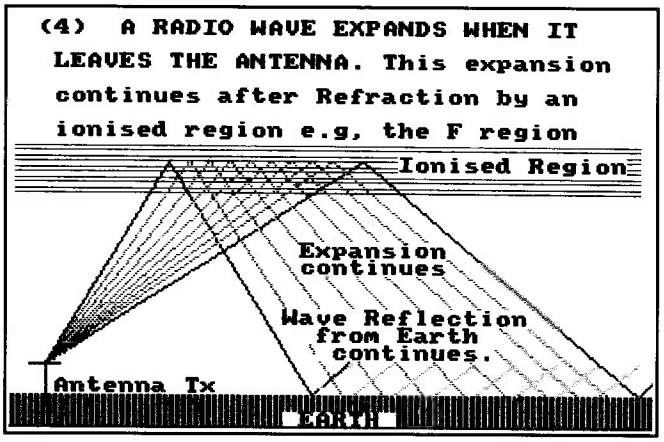
(1) A more or less overhead Sporadic-E cloud can cause waves to be reflected or refracted to earth after which a normal F region/earth propagation path is followed. This is often referred to as 'N' mode propagation. Sporadic-E or Es clouds move very rapidly. An intensely ionised E region can propagate waves at frequencies above 30MHz over very long distances, but at the same time prevent propagation via the F region.



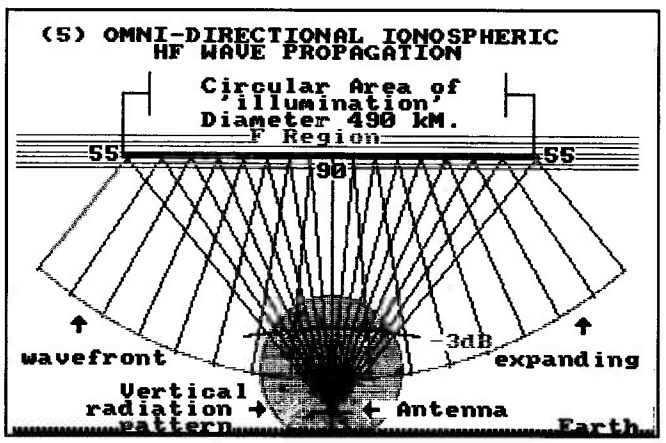
(2) In this case a Sporadic-E cloud is intercepting a wave refracted from the F region and returning it to the F region to continue its original propagation path; F region/earth. This is usually referred to as 'M' mode propagation. Beneath the Sporadic-E cloud reception of that wave would be weak, or even non-existent.



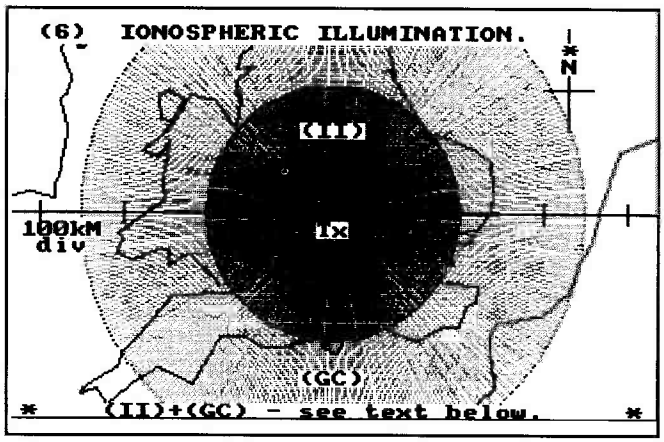
(3) Assume an antenna with maximum vertical radiation (R) equal at all vertical angles, also angles of incidence with the ionospheric region and the earth are equal. *Hop distance in km for any angle of maximum radiation* equal to 2(tan θ x 350) where θ is the angle of refraction and 350 is the average virtual height of the region in km.



(4) As already mentioned, the *single lines* in these illustrations serve only to represent a wave path. Radiation from an antenna expands, and continues to expand, as the propagation distance increases. This includes propagation either via an ionospheric region, or over the ground (ground wave).



(5) With antennas a small fraction of the operational wavelength in height above the ground, radiation is maximum at high vertical angles. The overall radiation pattern is more or less circular so the ionospheric region is *illuminated* over a circular area. The reflected wave provides an *omni-directional* ground coverage as in (6).



(6) It may now be seen how this *omni-directional* coverage is obtained. The dark area (II) is the ionospheric region illumination. Combined with the area (GC) this provides a more or less circular coverage (at ground level) extending to 300km or more in any direction from the transmitter.

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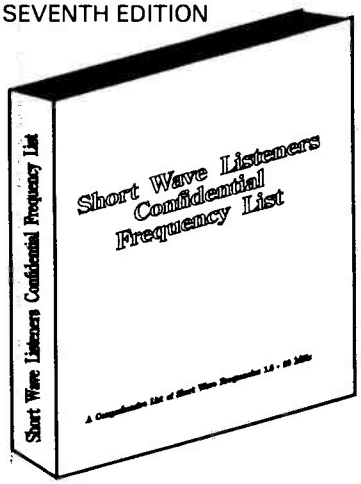

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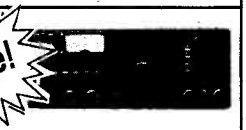

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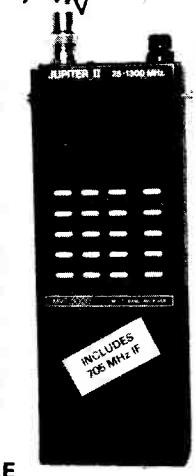

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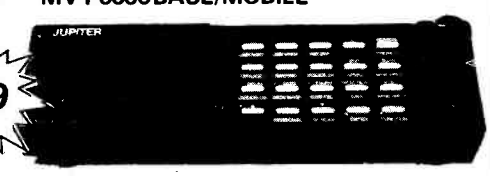

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ALL MAJOR BRANDS STOCKED LARGEST IN SOUTH EAST

BANDSCAN

Peter Laughton

At the end of July, Radio Kuwait's English service was operating normally. It always sounded like the 'Radio Luxembourg' of the Middle East, playing a lot of pop music especially from Britain. The affinity to Britain wasn't surprising. Between 1899 and 1961 the British government controlled Kuwait's foreign affairs until independence. The oil industry had attracted lots of Europeans, and the English language programme we heard on short wave was also broadcast on f.m. as a service for foreigners living in the country.

But in the early hours of Thursday August 2, Iraq launched an invasion on Kuwait. Initially, Iraqi forces managed to capture the studios of Kuwait Radio & Television at the Ministry of Information building. But after a period of silence, people running the short wave transmitter of Radio Kuwait succeeded in getting the station back on the air using all Radio Kuwait's frequencies. The announcement in Arabic was a plea for help to the rest of the Arab world, and the Gulf Co-operation Council. The broadcasts came from the transmitter site located outside Kuwait City at Kabd. For as long as it was in Kuwaiti hands, transmissions were heard on 21.675, 17.895, 15.505, 15.495, 15.245 and 13.610MHz. However, throughout that Thursday and early Friday August 3 most of the lower frequencies suffered from deliberate interference by Iraqi jamming transmitters.

Kuwait Vanishes

At 1111UTC Friday August 3, Radio Kuwait's voice vanished from the airwaves. The condition of Radio Kuwait's medium wave transmitter sites at Magwa and Jewan is still unknown. In the first few days of the occupation, checks in the Gulf area revealed a new medium wave station on 990kHz, who's name translated as 'Radio of the Provisional Free Kuwait Government'. Kuwait had never used that frequency, and specialists believe it probably originates in a border area from Iraqi territory. A week later the transmitter switched to a simple relay of Radio Baghdad.

As far as English is concerned, Radio Baghdad appears with the strongest signals in Europe between 2000 and 2200UTC on 13.660MHz. There is a repeat between 0130-0330UTC to North America on 11.830MHz and a beam to the Indian subcontinent on 11.810MHz. Transmissions at 1000 & 1600UTC have also been noted on 11.860MHz.

Other Information Sources

There are other information sources you can try from the region if you don't speak Arabic. UAE Radio Dubai has strong signals in Europe and elsewhere in the world. Try at 1030UTC on 21.605MHz. You might also want to check Radio Jordan, Amman on 13.655MHz at 1100UTC.

Although a magazine such as this cannot follow the day-to-day developments in the Gulf crisis it would be wrong to ignore the dramatic role short wave broadcasting has played for foreigners stranded in Kuwait and Iraq.

Jamming

Iraq is clearly keen to prevent broadcasts from certain international broadcasters from being heard in the region. If you scan the short wave dial right now you'll probably hit several frequencies suffering from deliberate interference. Somewhere south of Baghdad is a site with dozens of transmitters producing what is usually termed as bubble jamming because of the warbling sound.

Iraqi jammers are currently blocking Arabic language programmes from the Voice of America, and BBC, plus selected channels from Turkey and Egypt. Bill Whitacre, chief of the Frequency Management and Monitoring Division at the VoA in Washington DC says the intensity of the jamming is very high, and the Iraqis seem to find new frequencies that VoA brings up within 60 minutes or so. Arabic language broadcasts from the BBC have also been jammed, according to Gordon Harold, General Manager Engineering for BBC World Service. At 0330UTC, the BBC Arabic service has added three extra frequencies: 12.040, 13.745 and 17.695MHz. It is clear from comments made by those foreigners who have managed to escape that short wave radio has been the sole source of information. Individual satellite dishes are banned in most countries in the Middle East.

British Forces Broadcasting

With so many troops heading for Saudi Arabia, another short wave voice has emerged from London, alongside the BBC. On Monday August 6 the British Forces Broadcasting Service started three half-hour broadcasts from transmitters put at their disposal by the BBC, one in Cyprus, the other two in Britain. They are being widely heard around the world. At 0200UTC check 7.125, 9.640 or 13.745MHz. Then at 0930UTC check 15.205, 17.695 or 21.735, although in Europe 21.735MHz is completely blocked by UAE Radio Dubai. And finally at 1330UTC check 15.195, 17.695 and 21.735MHz.

Each Monday only, the 0930UTC broadcast is simulcast on the BBC Radio One.

But what about the American forces in Saudi Arabia? AFRTS stopped hiring short wave airtime from the VoA some time ago, and says it has no plans to start it all up again for the Gulf crisis. Colnel Cook, Deputy Director of AFRTS Washington told *SWM* that signals are getting in by satellite to the forces who need to be entertained and informed.

Clandestine

A few days after the disappearance of Radio Kuwait on August 3, monitors in the Middle East noticed a medium wave pro-Emir station calling on Kuwaiti to resist the Iraqis. It was on 540kHz. UAE Radio Dubai carried an interesting report recently indicating that the operation has now given up because the Iraqis broadcast Radio Baghdad on top of it. In fact Radio Baghdad continues to be heard on 540kHz.

On short wave, a strange clandestine station has been traced on 9.720MHz calling itself Holy Mecca Radio. It's not coming from Mecca though, but originates in Iraq. The question remains as to who is jamming it. Holy Mecca Radio is thought to be 24 hours a day, although propagation into Europe is only possible between around 0400 and 2200UTC.

At this point the excellent research work by those in the Broadcast Reception Service department of BBC Monitoring in Reading deserves credit. Since the start of August they have had the tough job of following all the new stations that have appeared, and keeping track of the ever-changing schedules for international broadcasters.

They also check news agencies, and recently quoted a report from the Middle East News agency in Cairo, stating that the Egyptians are to loan a short wave transmitter for two hours a day to the exiled Kuwaiti authorities to broadcast back to the country.

Canadian Moves

Radio Canada International didn't have sufficient funds to start an Arabic service as scheduled this past April. But the Canadian involvement in the Gulf crisis prompted a reaction from RCI to put short Arabic language newscasts into existing English and French programmes to the Middle East.

This parallels what RCI did at the time of the Chinese massacre last year, several months before their Chinese service was officially started.

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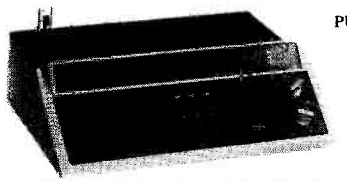

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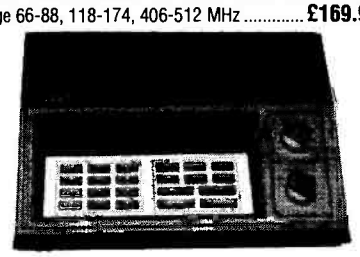

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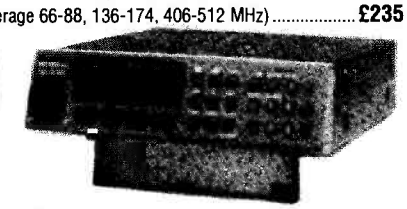

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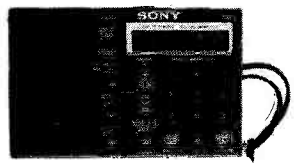

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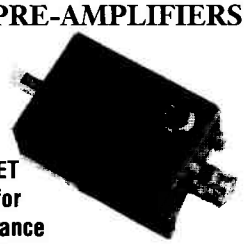

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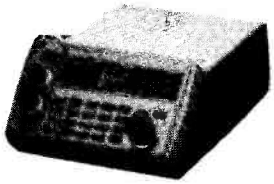

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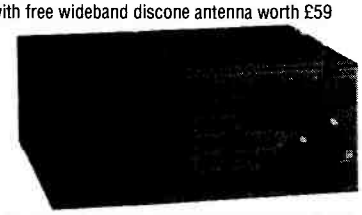

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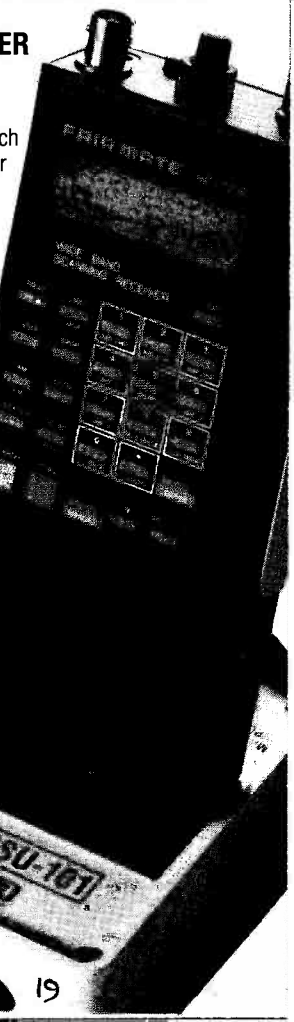

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SEE US AT THE LEICESTER SHOW

BANDSCAN

Atlantic 252

Alan Smart in Leicester in England tipped us off to extended broadcasting from Atlantic 252 into the evening hours as late as 0100UTC. That seems odd because the station is partly owned by Radio Luxembourg. Until now Atlantic has signed off as Luxembourg's English service has signed on. The power used at night is reduced to 100kW, and suffers interference (outside the immediate target area of Ireland and Northern Britain) from Algeria on the same channel.

Liberia

With the situation in Liberia steadily getting worse, have a thought for the 11 000 refugees who have found a haven inside the complex of the Voice of America short wave relay station at Careysburg 30km outside Monrovia. Amazingly the staff at the station have managed to keep the transmitters on the air to relay 20 hours a day of VoA programmes to Africa. Fortunately the local staff are from tribes that are not involved in the civil war. All this is linked to letters I have been getting from people who have spotted a music station on 18.515MHz u.s.b. heard for much of the 24 hour period with good signals here in Europe. That is a 10kW communications transmitter at the VoA relay station, and from time to time you can hear messages being relayed back to the US.

Kashmir

The media situation in the state of Jammu and Kashmir is worsening. This is a disputed territory in the north-western Indian subcontinent, parts of which are claimed by India and Pakistan. The Indian's state winter capital is Jammu and the summer capital is Srinagar. Around 10km outside Srinagar is a small village called Narmal, a good three hour bus ride from Srinagar, despite the short distance because of the mountainous terrain.

The transmitter site of All India Radio Srinagar is built on top of a hill but surrounded by a large fortified complex some 30km across. Pakistani-backed rebels recently lauched a rocket attack on the transmitter building blowing the roof off, but evidently not causing any damage to the transmitters, which remain on the air. Investigations in Kashmir and New Dehli reveal that because of several death threats to news announcers on Radio Kashmir Srinagar, all the news and current affairs for the state is now produced and presented from Broadcasting House in New Delhi. Special short wave transmitters from transmission centres just outside the Indian capital at Kingsway and Khampur beam the programmes to Jammu and Kashmir where they are simply relayed with no further announcement. □

Abbreviations	
f.m.	frequency modulation
kHz	kilohertz
km	kilometre
kW	kilowatt
MHz	megahertz
u.s.b.	upper sideband

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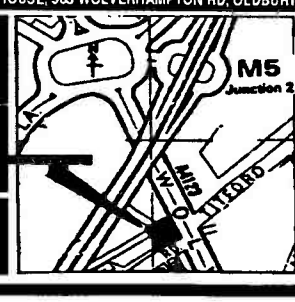

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SCANNING

Alan Gardener

A couple of new products this month and a look at the differences between scanners designed for base, mobile and hand-held use.

If you want to increase the range of signals you can hear on your scanner an externally mounted antenna is a good starting point. However, many readers living in rented accommodation, blocks of flats or even on modern housing estates find that this is not possible because there are local planning restrictions or objections from the landlord/neighbours. In these situations large or obtrusive designs such as discones, Yagis or log-periodic arrays may not be feasible but it could be possible to use a small active antenna.

These offer a wide frequency range and good performance in a very compact size. The term 'active' refers to the built-in amplifier stage that is used to compensate for the small size of antenna. Obviously these cannot compete with very large, high gain, antennas, but they do compare very favourably with designs such as discones. The disadvantage of active designs has traditionally been the component cost of the amplifier stage. This has to combine a low noise figure, in order to prevent the loss of weak signals, with good strong signal handling capabilities. This is required o prevent problems occurring when the antenna is sited near a strong signal source - a local broadcast station or taxi rank for example.

Recent developments in the design of monolithic, microwave integrated circuits, or m.m.i.c.s, have made it possible to produce very high performance r.f. amplifier circuits at relatively low cost. These devices are about the same size as a small transistor and offer a very wide frequency range, low noise figure and good strong signal handling - ideal for use in an active antenna.

C.M. Howes Communications are now using one of these devices in their new AA4 Active Antenna kit. This contains four, good quality, printed circuit boards which interconnect to form the antenna element, amplifier and interface unit plus all the specialised electronic components. The only other parts required are housings for the antenna and interface boards, interconnecting coaxial cable and connectors. The main design features include coverage from 25MHz to beyond 1.3GHz, 15dB average gain, a noise figure of less than 3.2dB with a 3rd order intercept of +15dBm.

Power is fed to the antenna via the coaxial interconnecting cable from the interface unit which requires 12-14V at 20mA. Another nice feature is the inclusion of a 10dB switched attenuator on the interface board. This can help to prevent receiver overload problems, which could occur under certain conditions.

Low Cost Pre-amp

If you own a hand-held scanner and would like to improve its performance then the next product may be of interest to you. This is a new low cost pre-amplifier being stocked by Nevada. The unit is called the JIM M-50 and features a low noise GaAs-f.e.t. device which provides high gain with little additional circuit noise. The gain is fixed at 20dB and the unit does not feature the adjustable gain control, band pass filters and r.f. switching of its big brother the M-75. However its compact size 71 x 35 x 17 and internal battery power supply make it ideal for use with mobile or hand-held scanners. The cost is around £49 and further details of all three JIM pre-amplifiers can be obtained from: Nevada, 189 London Road, North End, Portsmouth, Hampshire PO2 9AE. Tel: (0705) 662145.

The tiny Icom IC-R1 hand-held scanner is continuing to attract a lot of interest and quite a few readers of this column now own one. From the enthusiastic comments I have heard the set offers an amazing range of operating features and high level of performance for its size.

However, there does seem to be a problem with its signal handling performance. This tends to limit its use in areas where there are a lot of strong local signals around, particularly when an external antenna is connected. The problem seems to be associated with the choice of i.f. filters used in the receiver. The small size and packed circuit boards making it difficult to provide the normal selection of filter bandwidths required for both narrow band f.m./a.m. communications and wide band f.m. broadcast stations. Having seen the space available inside the receiver - or rather the lack of it - I don't really think that a simple modification is practical. But rumour has it that quite a lot of effort is going on behind the scenes to solve this problem - so watch out for further details.

Bases, Mobiles & Hand-helds

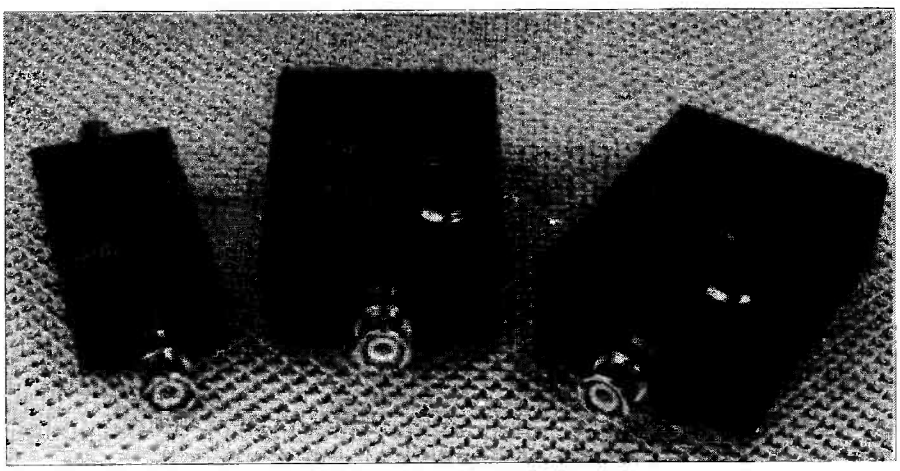
Several readers have asked me if there are any major differences between scanners intended for base station, mobile or hand-held use. In particular, they wonder if there are likely to be any problems associated with using a mobile or hand-held scanner as a base station.

Hand-held: A hand-held scanner is primarily designed just for that purpose. It has to be physically small, lightweight and be capable of operating for several hours from an internal battery pack. In order to achieve this the designer initially has to determine what level of performance is acceptable.

With a hand-held scanner it is assumed that most of the time operation will only be with a small antenna attached to the receiver. Because of this the level of signals present at the antenna socket is likely to be very much lower than that which would be expected from an external base station antenna. In order to maximise performance many hand-held scanners have a large amount of r.f. gain, limited r.f. stage filtering and low level of local oscillator injection.

Whilst this is acceptable for hand-held use problems can arise when a larger antenna is connected. If a number of strong signals are present they can overload the r.f. stages of the scanner. Although no physical damage will result it is unlikely that you will be able to hear any wanted signals amongst all the noise and hash produced as a result of strong signals mixing in the r.f. stages.

Mobile: Mobile scanners are also designed for use with relatively small antennas but because they can be



The range of JIM pre-amplifiers with the new, low-cost M-50 on the left.

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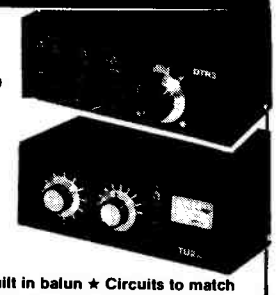

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Access

physically larger than a hand-held and can have a plentiful supply of power from the car battery they can often equal the performance of a dedicated base station scanner. They still have rather high levels of r.f. gain in order to compensate for small antennas and do not have quite as many facilities as you would expect from a base station but they can be used either in or out of the car - providing you have a 12V power supply available.

Base station: Base station scanning receivers are usually much more bulky than their mobile equivalents. This is usually because of the need to provide an internal mains power supply but it also has the advantage of spacing out the front panel controls, making operation much more convenient. The r.f. stages are likely to be designed to cope with much stronger signals than their mobile equivalent and many models have additional features such as computer control ports, tape recorder sockets and, in one or two cases, a large tuning knob!

Choices

When you are choosing a scanner you really need to know how or where you are most likely to use it. Obviously you cannot easily use a base station scanner as a hand-held but you could use a mobile as a base station, or a hand-held as a mobile. You may have to provide additional power leads and an external loudspeaker but with a little ingenuity you can usually achieve good results.

Unless you live in a rural area or are willing to experiment with external filters I would not recommend using a continuous coverage hand-held scanner with an external base station antenna. However you may be able to use one of the hand-held models which offer just a few separate frequency bands without any major problems as they generally have more extensive r.f. stage filtering.

Before you buy any receiver try and find out as much about it as you can - read reviews, ask friends who own one or see if you can borrow one before you part with your cash. I still find it surprising that many people don't bother to find out about scanners before buying them and then discover their shortcomings. All products have their good and bad points - what the consumer has to do is to pick the product best suited to their requirements. Even top of the range models cannot do everything so it usually pays to do a little research before you come to a decision.

Perhaps you can help in this respect. I am hoping to compile a list of the more popular scanners showing their good and bad points. If you would like to contribute why not drop me a line. All I need is a brief note on a postcard stating which scanner you own and what you most like or dislike about it. I will collate the details for a future column.

Cautionary Tale

A couple of readers have sent me letters regarding the use of scanning receivers in other countries. The message in both of them is - **check the legal position before you take a scanner abroad**. In many cases the ownership of wide frequency coverage receivers is forbidden and can lead to confiscation of equipment, in addition to the imposition of fines and further of legal action.

In at least one case a Fairmate HP100 has been confiscated and a £150 fine levied. Germany, Belgium and Denmark seem to be the strictest European countries in this respect but regional variations also seem to apply in others. So if you are going abroad check on the legality of scanners and make sure that you have the relevant customs documents stamped before you cross borders. You may then stand a chance of recovering any confiscated equipment if the worst should occur.

Mail Bag

I am still receiving a lot of letters from readers asking me for information, reviews or photocopies of articles which have appeared in back issues of *SWM*. Whilst I have tried to help it has now reached a point where I cannot continue to do this. If you want to obtain back issues of *SWM*, PW Publishing Ltd run a back-issue service. Alternatively large public libraries hold back issues of most radio and electronic magazines which are available for inspection on request.

If you wish to receive a reply directly when you write to me it is of great assistance if you can include an s.a.e., preferably one with a first class stamp and capable of taking A4 sheets of paper. It would also help if you print your name and address at the top of your letter as I quite often receive requests for help with either no name or an indecipherable signature! - If you don't want your name to appear in print then please tell me.

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

Abbreviations

a.m.	amplitude modulation
dB	decibel
dBm	decibel referenced to 1mW
f.m.	frequency modulation
GHz	gigahertz
i.f.	intermediate frequency
mA	milliamp
MHz	megahertz
mV	millivolt
r.f.	radio frequency
s.a.e.	stamped addressed envelope
V	volt

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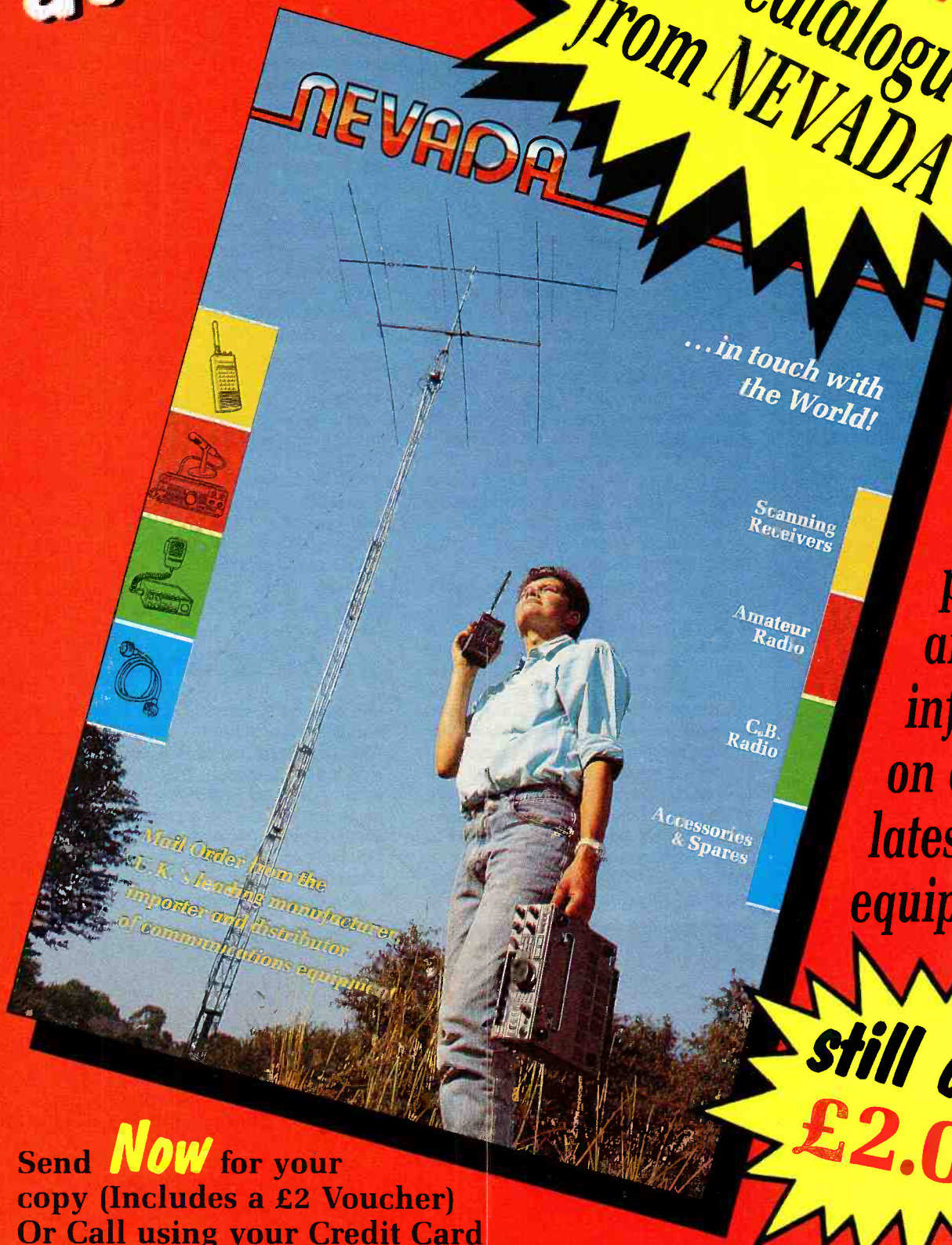

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SONY ICR-SW700 CREDIT CARD RADIO

Peter Shore

In recent years new portable short wave radio receivers have tended to be similar, with digital frequency display and varying memory capacities. But now the Sony Corporation has introduced a revolutionary new receiver.

On first inspection, the ICR-SW700 from Sony looks similar to other portable short wave receivers. This may have been the intention of the designer, for it is unique in broadcast reception today. The front panel of the set has the usual two halves - loudspeaker (left) and touch sensitive keypad and display (right).

Once the receiver is on, the clock changes to the current tuned frequency. This may be altered by pressing the DIRECT EXEC 'key' followed by the frequency in kilohertz and then the DIRECT EXEC 'key' again. Provided the channel is within the set's frequency range, the display will change to the frequency wanted. The set can be manually tuned by the '+' and '-' buttons, and this will change the frequency in 5kHz steps on short wave, or in 9kHz steps on medium wave (a concealed switch allows this to be changed to 10kHz steps for North America). Each time you press the screen, the set emits an electronic 'bleep' type noise to confirm that the set has accepted the command.

There is a telescopic antenna for short wave reception, and an integral ferrite rod for medium wave frequencies. There is no provision for an external antenna to be connected directly, although in this pre-production model, Sony include the Compact Antenna, which is a roll of plastics coated antenna wire in a round case, like a retractable metal tape measure, with a sheath at the end that simply slips over the base of the telescopic antenna. When connected, the antenna wire can be unrolled and draped around the curtains in the room, or out of the window. This small 'antenna' seems to provide a reasonable improvement in signal strength.

There are sockets for the connection of mono headphones or an earpiece, and for a tape recorder.

The ICR-SW700 uses 3 x AA batteries, or an external 4.5V d.c. supply. The receiver is somewhat basic, covering only medium wave and short wave between 3.70 and 17.90MHz. There is no adjustable bandwidth, nor provision of s.s.b. or b.f.o. Whilst there is a clock and alarm facility, there is no tone control. But this set, whilst not boasting many DX type facilities, does break new ground.

Smart Cards

Open the back of the set where the battery compartment is, and you will find four Smart Cards. These are information-packed double- sided cards, the size of credit cards. These cards form the basis of the potentially unlimited memory capacity of the set, containing up to ten pre-programmed short wave frequencies on each side. The cards are slotted in to a mechanical holder on the receiver's right-hand side, slipping underneath a clear protective touch sensitive screen.

This screen and the cards are linked electronically by tiny, computer-like, flat plastics cables to the receiver's circuitry. As the card connects, the set 'bleeps' and the word 'CARD' appears in the digital display alongside the clock with the card's memory number from 1 through to 0 (which means 10).

The cards are programmed in the Japanese factory with frequencies for several different international broadcasters. There is a card for the BBC, which has Voice of America frequencies on the other side, while another card has Radio Japan and Radio Australia on each side, and the final frequency card has an Omnibus with frequencies for Radios Beijing, Korea, Moscow, France International, Deutsche Welle and the Voice of Free China, whilst the reverse has ten blank memories that may be programmed by the owner.

Once a card is in the receiver, the frequency will change to the last memory position used on the card. For example, if the set has been manually tuned to 13.645MHz, and you insert the BBC card, memory 1 or 7.325MHz will be recalled, assuming this was the last channel used on this card. Manual and direct tuning is still possible whilst a card is inserted, as the 'DIRECT EXEC' with the '+' and '-' keys are on each pre-programmed card.

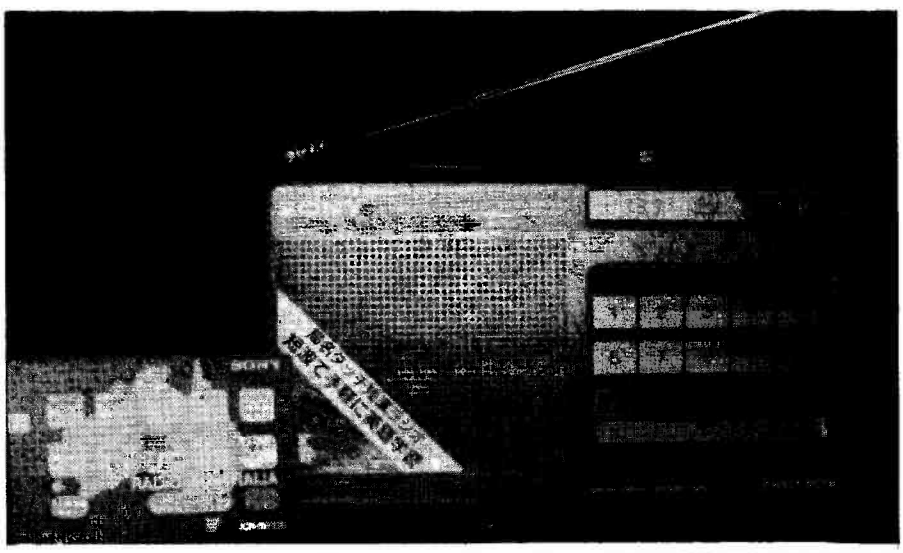
Clearly, the provision of pre-programmed cards could be a drawback should it not be possible to alter the programmed frequencies. This is because stations alter their coverage or frequencies for different seasons and so forth. The designer has allowed for this by enabling each card to be re-written as necessary. Clearly with BBC and Voice of America channels, this should not prove necessary too often as they seem to change rarely, at least for European coverage. Still, it has become necessary to reprogram the card for Radio Australia, whose frequencies changed dramatically earlier this year.

Reprogramming is done by inserting the appropriate Smart Card, calling up the frequency to be stored using the 'DIRECT EXEC' system, depressing a key on the card marked as 'WRITE' and whilst keeping this pressed, touching the appropriate memory number from '1' to '0'.

An additional 'Clock Card' controls the receiver's clock and alarm facility, and provides a handy guide to time differences from Greenwich Mean Time on a world map on the front, and a listing of major cities on the reverse, which unlike the other cards does not have any function.

Credit Card Radio

The idea of a 'credit card radio' has been around for sometime - I think that the BBC originated the idea several years ago, with the thought that programme schedules could be provided not just in paper format, but on a card that could simply slip in to a receiver, thereby making life far easier for people for whom listening to programmes is the main intention, and not searching for different



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SONY ICR-SW700 CREDIT CARD RADIO

frequencies which, experience shows, is often confusing. Cards could be sent out with different frequencies to individual target areas at each frequency change. This will possibly be easier with the reduction, in the United States at least, of seasonal changes from four to only twice a year.

Some stations could clearly not afford to provide listeners with pre-programmed cards, but perhaps a system of exchange could be established, by which dealers could offer new pre-programmed cards for old cards twice a year

As has been mentioned, the facilities on this pre-production model, obtained from Japan through Sony (UK) Ltd., are limited. The frequency range is peculiarly restricted, failing to cover the 21 and 25MHz bands that, in this period of increased sunspot activity, is used by many broadcasters. The fixed, somewhat wide, bandwidth is the major drawback. On the test model, there was splatter from strong signals on to adjacent channels (for example Radio Free Europe on 9.705MHz affected the Radio Australia frequency of 9.710MHz).

Basic Receiver

Still, this is a basic receiver, and not one designed for the specialist listener or DXer. It is to encourage those listeners for whom tuning to international broadcast stations is something of a chore, especially tuning around to find the best of several frequencies on the air at any one time. This 'Smart Card' system also does away with the necessity to carry around lists of frequencies in the head or on pieces of paper.

A further advantage of the card system is that the cards store frequencies indefinitely, and are not affected by power loss. Anyone who has suffered losing all the 32 memories on their Sony ICF-2001D will tell you just how frustrating that can be.

By adding to the supply of cards, an unlimited databank of frequencies could be created and storage of plastic cards does not take up too much room. Visually impaired users may find the set difficult to use, since the keypad is a completely flat touch sensitive surface, and offers no suggestion when touching it which number one is pressing.

Limitless Expansion

The possibilities for the expansion of this technology are almost limitless. There is nothing to stop Sony incorporating this memory card technology in a receiver as sophisticated as the ICF-2001D and if the card system were to be standardised (doubtless with Sony retaining the patent) other manufacturers could create sets using this system, and stations would be encouraged, if sufficient people purchased the sets, to provide schedules in card format.

Publishers of frequency related books could diversify into card production, and short wave clubs might even take a hand. Fantasy? When one considers that home computers were not even dreamt of fifteen or so years ago, perhaps it is simply a question of time before this type of memory facility is a standard feature on many sets and stations provide electronic frequency guides.

Availability

Now, the Sony ICR-SW700 is not available in the United Kingdom, although it is on sale in the Far East. Sony advise that they have no intention of marketing the receiver in this country for the time being. Although, sources outside the company in Europe suggest that it will be sold on the Continent this year. I think that this receiver will cost around £59.00 in the United Kingdom based on the Japanese retail price of 13 000 Yen. The review sample was provided by: **Sony (UK) Limited, Sony House, South Street, Staines, Middx TW14 1PP.** □

Abbreviations	
b.f.o.	beat frequency oscillator
d.c.	direct current
DX	long distance
DXer	listener who 'chases' long distance signals
kHz	kilohertz
MHz	megahertz
s.s.b.	single sideband
V	volts

DX-TV DATAFILE No. 2

SPAIN

Keith Hamer and Garry Smith

In the first Datafile we covered some of the standard test cards used by various television services around the world. We continue the series by looking in detail at each TV service, country by country, commencing with Spain. If any *SWM* readers overseas can supply information about their local TV services, please write to the authors with details: an address is given at the end of this Datafile.

Receiving Spanish TV

Spanish TV in Band I is well received throughout Europe and the UK during the Sporadic-E season which normally starts in May and ends in September. Signals from all transmitters are usually extremely strong and of long duration and are quite often of 'entertainment quality'. Reception from Spain occurs at any time of the day and it is not uncommon to experience continuous openings from early morning until closedown. On fairly rare occasions, both state-owned networks (TVE-1 and TVE-2) are encountered in the United Kingdom via tropospheric propagation in Band III and at u.h.f.

Brief History

The monoscopic Test Card 'G', without identification, was used during the early Sixties. This caused identification problems because several other countries also used it. This was followed by an easily identifiable monochrome test card which was used until 1970 (see **Fig. 1**). This was superseded by another unique monochrome design which is shown in **Fig. 2**. Colour tests were introduced around 1974 and a colour test pattern known as the *GTE* came into being. The test cards have always been shown for approximately fifteen minutes prior to station opening sequences. Initial test transmissions have, in the past, consisted of vertical stripes, the EBU bar, colour bars with various forms of identification plus a host of colourful bar patterns with regional names. Until the early eighties, the station opening sequence showed a transmitter complete with radiating waves, the date and even the number of the day's transmission!

There are two networks operated by Radiotelevisión Española in the v.h.f. Band I spectrum: TVE-1 and TVE-2. However, in the case of the second network there is only one transmitter (located in the north-west) in this particular band. All other TVE-2 allocations are confined to u.h.f.

The highest-power TVE-2 transmitter is situated in Madrid and uses channel E24 with an effective radiated power (e.r.p.) of 1500kW. There are over 35 TVE-2 transmitters operating throughout the u.h.f. band with e.r.p.s of over 100kW.

First Network

The TVE-1 programme, which carries commercials, is mainly a national network although regional opt-outs occur, normally

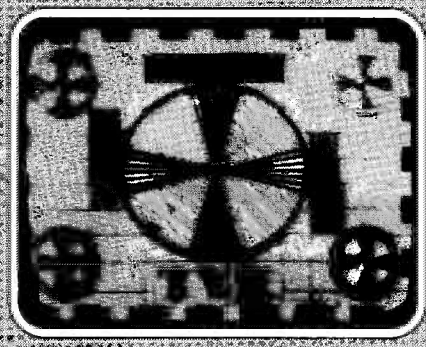


Fig. 1. The distinctive monochrome test card radiated in the sixties by TVE. This particular photo shows the 2nd Network version.

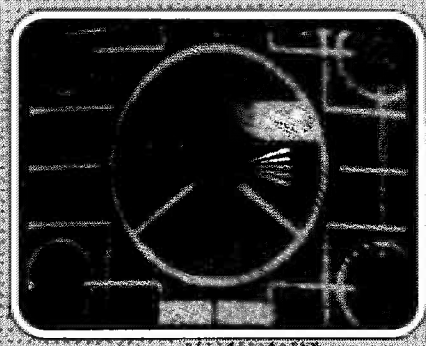


Fig. 2. Another unique monoscopic test card used by TVE. This was first used in 1970.

around midday with local news bulletins and current affairs programmes. During these periods regional identification captions may be shown. Some of the regional programmes include *Hoy Mismo* and *Telesur*. Bands I and III are used extensively in Spain with all channels in operation except E12. The transmitter with the highest e.r.p. in Band I is Madrid (on channel E2) with 250kW while in Band III it is Granada (channel E7) with 200kW. Other Band III transmitters are typically 20-60kW. There are 10 TVE-1 u.h.f. transmitters with e.r.p.s higher than 100kW.

Second Network

The TVE-2 network is shown nationally, although in the Balearics this is not available as such. Instead, TVE-1 programmes in the Catalunyan language are shown but the test card initially displays 'tve 2' identification which changes to 'barcelona' just before the station opens.

The TVE-2 network is most likely to be encountered within the UK on channel E2 via Sporadic-E propagation. A 'vertical stripes' test pattern is normally radiated prior to the electronic test card which includes 'tve 2' identification at the bottom.

Canary Islands

Izaña, a high-power (350kW) transmitter on the island of Tenerife, broadcasts TVE-1 programmes. TVE-2 broadcasts are confined to u.h.f. with the main transmitter operating on channel E27 from Fuencaliente with an e.r.p. of 170kW. Nowadays, most programmes are relayed from the mainland via satellite, so for much of the time the programmes are identical. Consequently it is now extremely difficult to identify the Canary Islands, although past experience has shown that signals tend to be either weak but steady (similar to tropospheric reception), or very ghosty. Years ago, local test cards were transmitted and clock captions indicated that the Canary Islands were on GMT (one hour behind the Spanish mainland). Breakfast TV programmes are relayed complete with the mainland clock superimposed in one corner.

Transmission Systems

Spain and the Canary Islands use B/PAL for channels E2 to E12 (v.h.f.) and G/PAL for channels E21 to E69 (u.h.f.).

Transmission Times

Within the past year or two, programme hours have been considerably extended which means there is very little time for the test card, especially on the TVE-1 network which has continuous programming from 0800 on Fridays right through until the early hours on Monday morning! Programmes on TVE-1 normally end at around 0300 on weekdays. TVE-2 normally close down at around 0200.

Currently the test card is officially shown on both TVE-1 and TVE-2 between 0745 and 0759 (local time) on weekdays although it may occasionally be shown earlier and also after closedown for a short period. The test card is radiated on the TVE-2 networks on Saturdays and Sundays between 0745 and 0759. Throughout the week, the Breakfast TV programme *Buenos Dias* is shown on TVE-1 immediately after the test card and normally without any formal station opening such as identification captions or an announcer. However, computer graphics play tricks with the test card just before *Buenos Dias*: the test card turns on its side, floats around, features a ball rolling beneath it and ends up with a face wearing a top hat!

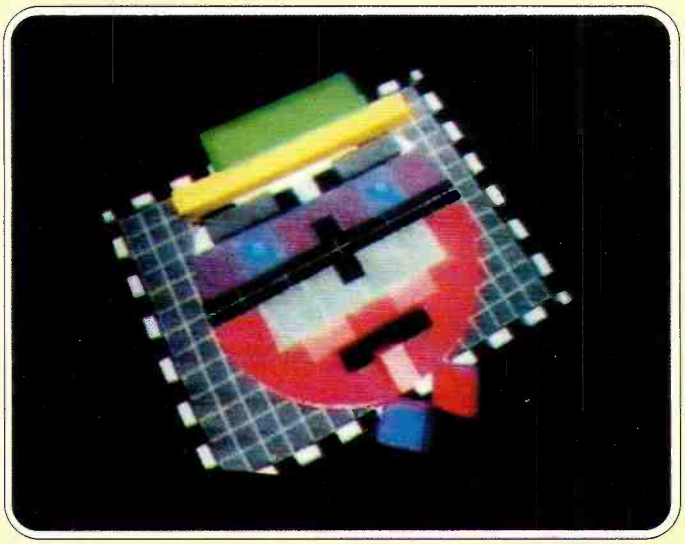
Test card transmission times are normally published in TV programme guides and some newspapers under the heading 'Carta De Ajuste'. Details are also given of the accompanying music on TVE-1, but not normally for TVE-2.

General Identification

Programme captions may include the identification RTVE or, more usually, TVE.

The analogue clock caption currently in use does not, unfortunately, feature any identification. With the exception of regional opt-outs, the only occasion when it seems to be shown nationally is at 2030 on TVE-1 prior to the main news programme *Telediario*. The clock caption is not shown in the Canary

The GTE electronic test card introduced in the mid-seventies when TVE began colour transmissions.



The colour test card often plays tricks at the start of the morning transmissions, as seen here!

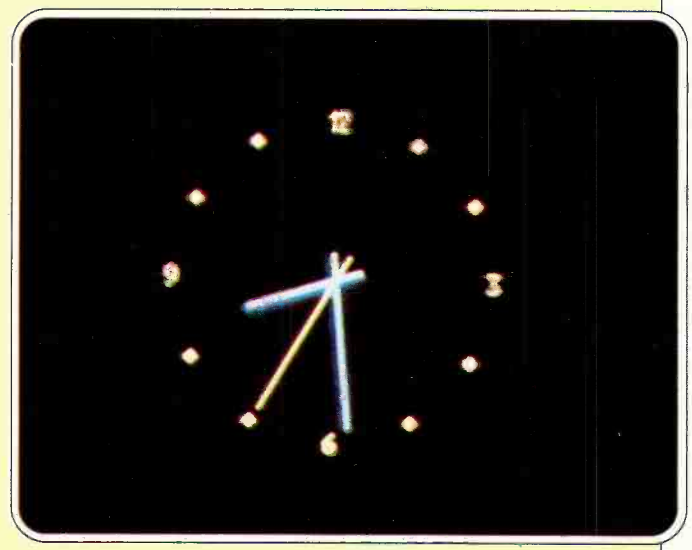
A regional test pattern used during the early eighties which featured transmitter identification.

The main TVE news programme called *Telediario*.

Part of the lengthy animated programme opening sequence used by TV3. This is also shown at closedown.

PM5534 test card (TV3). A moving blue band at the bottom often has programme details just before the start.

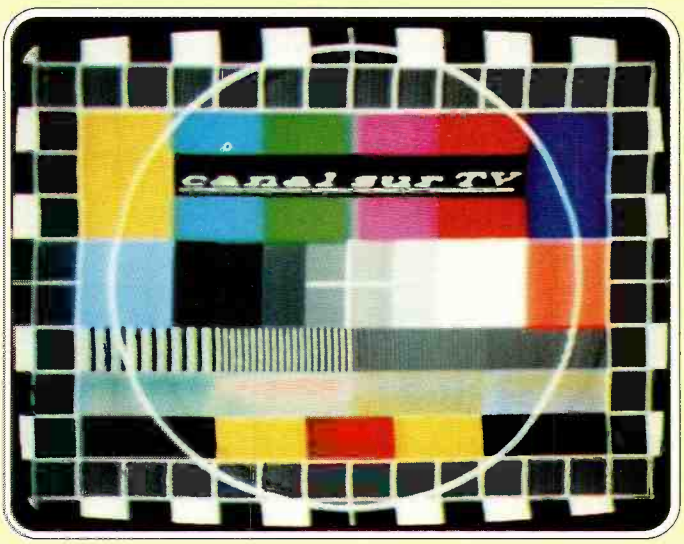
Part of the animated TVE-1 programme opening sequence.



The TVE clock caption which is seldom seen except before the main news at 2030.

Part of the animated TVE 2nd Network identification symbol.

A sample page from the TVE teletext service called Teletexto.



An unusual test card which is radiated by the private station Canal sur TV.

A combined colour-bar test pattern and clock caption used by several TVE-2 regions with suitable local identification.

Photographs supplied by HS Publications (UK) and Bertrand Prince (France).

islands because of the 1-hour time difference between there and the Spanish mainland.

Various captions and key programmes to look out for are as follows:

Telediario	News programme
Buenos Dias	"Good Morning" TV programme.
Breakfast	
Documentos TV	Documentary
Avance Informativo	Programme information
Dibujos Animados	Cartoons
Hoy Mismo	"Today" programme
	(Andalucia region)
Telesur	Andalucian regional programme
Noticias	Announcements
Ultimas Noticias	Final announcements

The following may be found useful when receiving programme schedule captions:

Lunas	Monday
Martes	Tuesday
Miercoles	Wednesday
Jueves	Thursday
Viernes	Friday
Sabado	Saturday
Domingo	Sunday

Teletext

The teletext service is called Teletexto. Due to extended programme hours, sample pages are rarely shown during normal test transmissions.

Main VHF TV Transmitters

TVE-1

Channel	Region	Transmitter	e.r.p.
E2	Madrid	Navacerrada	250kW
E3	Valencia/ Tele Murcia	Aitana	79kW
E3	Asturias	Gamonitairo	90kW
E3	Aragón	La Muela	35kW
E4	Cataluña (Circuit Catala)	Tibidabo	150kW
E4	Andalucia	Guadalcanal	120kW
E4	Pais Vasco	Sollube	60kW*
E4	Galicia	Santiago	120kW

* May now be out of service.

TVE-2

Channel	Transmitter	e.r.p.
E2	Santiago	40kW

Spanish Regional TV

The following list shows TVE-1 regions which have local opt-outs around midday:

Andalucia	Catalunya
Aragón	Galicia
Asturias	Madrid
Baleares	Murcia
Canarias	Navarra
Cantabria	La Rioja
Castilla-Leon	Valencia
Catalunya	Pais Vasco

There are also TVE-2 regional opt-outs in the following regions between approximately 1730 and 1900, local time:

Andalucia
Catalunya
Baleares (the TVE-2 network carries TVE-1 Catalunyan programmes.

Private TV Services

Although banned at one time, the following private networks now operate legally under relatively new Spanish regulations.

Televisió de Catalunya (TV3)

Channel	Transmitter	e.r.p. (kW)
E29	Parramóssa	5
E29	Montcaro	5
E38	Carrasqueta	2.5
E44	Tibidabo	10
E46	Altabia	2.5
E52	Alpicat	10
E52	Rocacorba	10
E60	Bartolo	5
E63	La Mussara	10

The test card is normally radiated between 1030 and 1045 (local time) on weekdays and is listed in programme schedules as 'Carta D'Ajust'. At weekends it is radiated between 0945 and 1000. Programmes normally come to a close by 0100.

Televisión de Galicia (TVG)

This station operates on channel E42. Transmissions normally begin with the test card (known as 'Mira De Axuste') from 1130, with programmes commencing at 1200. Closedown it usually around 0100. News programmes are called *Telexornal*.

TV Euskal Telebista (ETB-1 and ETB-2)

The channel E35 outlet has been received in the UK on a number of occasions during periods of enhanced ionospheric propagation. ETB-1 transmissions begin at around 1250 with *Aurkezpena* and normally end shortly after midnight. ETB-2 normally open up at 1343 with a two-minute programme schedule sequence called *Presentación*. Closedown is at around 0030. The PM6534 test card is used with the identification 'E.T.B.' at the top and '4. KANALA' in the lower black rectangle.

Canal 33

Weekend transmissions begin at 1545 with the test card ('Carta D'Ajust') until 1600 when programmes begin. Closedown is usually at around midnight. On weekdays, the test card is radiated from 1915 until the start of programmes at 1930. Closedown is usually between 2330 and 2400 and consists of a sequence called *Fi D'Emissió*.

The news programme is called *Telenoticias Vespre* and is shown every evening at 2100. As the name of the network suggests, transmissions are on channel E33.

Canal 9 Televisió Valenciana

Transmissions begin at weekends with the test card ('Carta D'Ajust') at 1430 followed by a two-minute programme schedule sequence at 1500 called *Avanç De Programació*. On weekdays, the test card is shown for 15 minutes from 1915. The news programme is called *Noticies 9* and is shown every evening from 2100 until 2130. Closedown (known as *Fi D'Emissió*) is usually around midnight.

Canal Sur

This network is operated by the state-owned service (TVE). Weekend transmissions begin at 1445 with *Carta De Presentación* which lasts for 15 minutes. On weekdays, this is radiated from 1700 until 1715. Closedown is normally around 0030. The news programme is called *Telediario* and is shown at 2200 at weekends and at 2100 during the week.

The main Canal Sur transmitters are as follows:

Transmitter	Channel	e.r.p. (kW)
Cordoba	E27	200
Parapanda	E29	160
Jerez de la Frontera	E29	32
Sierra Almaden	E42	372
Huelva	E42	250
Pechina	E44	100
Valenzuina	E60	79
Mijas	E62	200

Telemadrid

This network is operated by the state-owned television service (TVE). Transmissions begin each day with *Carta De Sintonia* which lasts for 30 minutes. On Saturdays it begins at 1630, Sundays at 1130 and on weekdays it is radiated from 1800. Closedown (known as *Fin De Emisión*) is normally around midnight although programmes may be extended until around 0100 at weekends. The news programme is transmitted on weekdays from 2100 until 2145 (from 2050 until 2100 at weekends) and is known as *Telenoticias*.

Details of the main Telemadrid outlet are as follows:

Transmitter	Channel	e.r.p. (kW)
Madrid	E52	117

Satellite TV

TVE operate a satellite network called 'TVE Internacional'. Programmes are beamed from transponder 3 of Eutelsat 1F5 which is positioned 10°E. Transmissions are in the 11.149GHz band and are horizontally polarised. At present, all programmes are unscrambled and the PAL colour system is employed. When this service originally began, the normal TVE-1 service was relayed but now a mixture of TVE-1 and material from other Spanish-language TV networks is aired. The standard Spanish GTE test card is used but with the identification 'TVE Internacional'.

Galavision transmits on Panamsat 45°W in the 11.510GHz band using the NTSC 3.58 colour system and also on Eutelsat 1F4 13°E in PAL using transponder 5 on 11.566GHz. Galavision is entirely satellite based with no terrestrial outlets and has been included in this Spanish DataFile for the benefit of TV enthusiasts who DX satellite transmissions.

Can You Help?

We mentioned at the beginning of this DataFile that we would be very pleased to receive any information about your country's television service. Following our recent series of articles which covered the art of TV DXing we know that there are *SWM* readers spread throughout the world who may be able to send photographs, colour if possible, or videos of their local test cards and identification captions plus lists of main transmitter locations and e.r.p.s. If you can help, please write to the following address with full details: 7 Epping Close, Derby DE3 4HR, England.

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AMATEUR RADIO SATELLITES

Arthur C. Gee G2UK

Part 1

If you feel like having a change from listening to the h.f. bands for DX or the v.h.f. bands for the local gossip or the broadcast bands for their political propaganda, why not have a go at listening for the amateur radio satellites?

You will find this a completely new field of short wave listening, absolutely fascinating and not nearly so expensive or complicated as you may have been lead to believe.

One of the reasons why short wave listeners do not 'get into satellites' is that the idea has got around that this field of amateur radio is very 'high-tech', very expensive, very complicated and needs very special equipment - especially in relation to antennas. Then, having spent hundreds of pounds on all this gear, there is very little to listen to and not much to be gained from the involvement thought to be necessary.

To start with the question of 'high-tech'. Like most technical projects, the degree of participation can vary from the 'keep-it-simple' approach to a standard involving the very highest levels of professional skills and knowledge.

Amateur satellites are only for those with a transmitting licence. Wrong! This is something new you can try as a listener.

This is very much so with amateur radio satellites. At the lowest level is the use of well tried techniques which will give the user reliable communication over long distances with comparatively simple and not too expensive equipment.

Individual Needs

At the other end, such as is being practiced by the satellite team at the University of Surrey and the technical institutes in Germany, the USA, Australia and Japan to mention some of the best known examples, where their activities are right into research and development of the highest order.

Between these two extremes, one can find a whole series of standards to suit individual needs and abilities.

Simplest Involvement

Let's look for a start at the simplest involvement in the amateur radio satellite scene. What will it give the participant and what equipment will you need?

There are a number of amateur radio satellites functioning consistently at the time of writing, which can be listened to with quite simple equipment.

The UoSATs and the Russian satellites RS10/11 are possibly the best examples to quote, particularly the latter. These can be heard once or twice a day as their orbits pass within receiving distance of these shores. The RS10/11 satellite system sends its signals down to earth in the 28MHz (10m) amateur band and it can be heard with a good amateur bands communications type receiver which has 28MHz band coverage.I

f the short wave receiver in use does not cover the 28MHz band, a 28MHz converter can be bought in ready-to-operate or d.i.y. kit form. A normal short wave receiving antenna can be quite sufficient to receive its signals.

Trapped Dipole Antenna

The author uses a trapped dipole, all-bands, antenna as used with his amateur bands transceiver for receiving the RS10/11 signals without any pre-amplifier or converter. The UoSATs send their earth-bound signals down in the 144MHz band. A 144MHz converter into a normal short wave receiver can be used if you have no 144MHz band receiving equipment. The s.w.l.s who confine themselves to v.h.f. and have receiving gear for 144MHz can quite easily get set-up for listening to the UoSATs.

Different Concept

The UoSAT programme was initiated by the Electronics Department of the University of Surrey. It is a quite different concept from that of the communications satellites we have just been considering, though it did have its beginning through the earlier amateur radio satellite programme.

Head of the Department of Electronics and Electrical Engineering of the University of Surrey, J.D.E. Beynon wrote in the *Radio and Electronic Engineer* of August/September 1982, "It should be stressed however, that UoSAT did not come about by chance. In the same way as inventions favour the prepared mind,

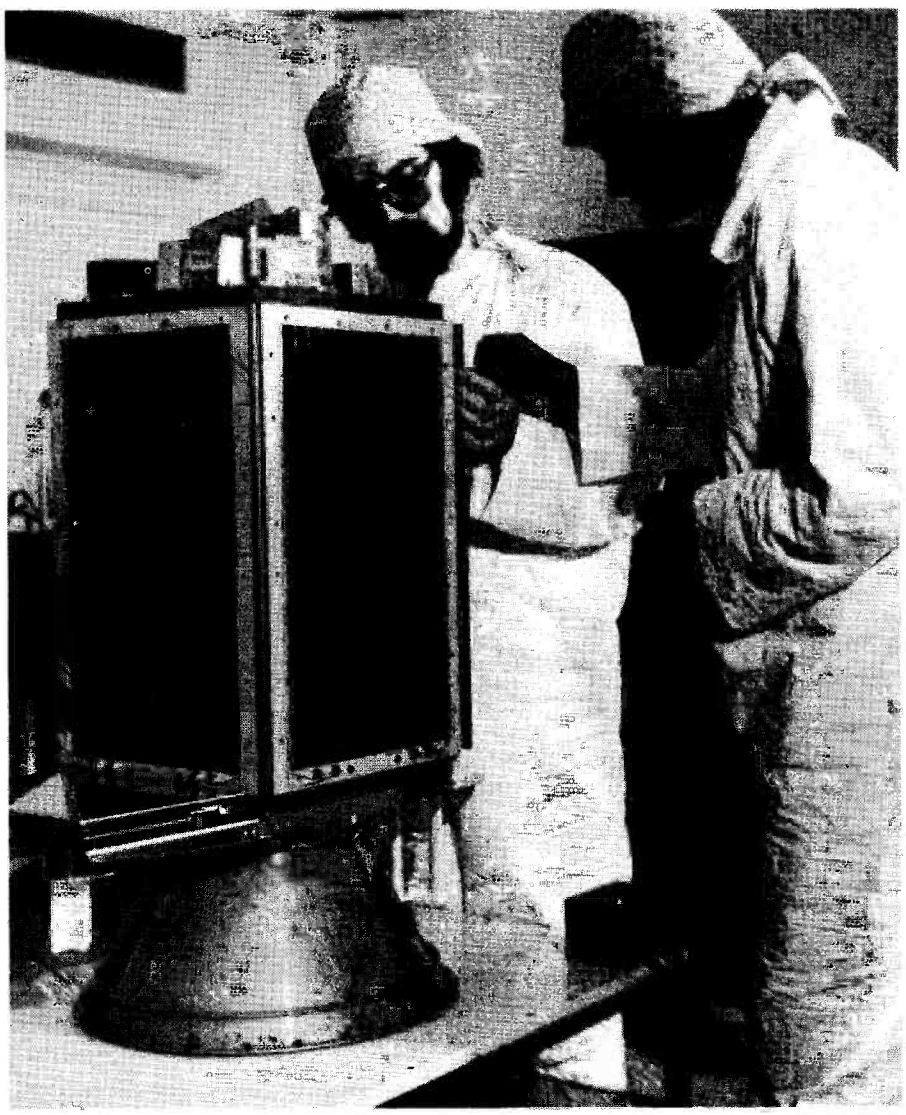


Fig. 1.1: A typical amateur radio satellite, UoSAT-B, in the clean room during construction. Ian Ferebee (left) and Christine Sweeting are members of the University of Surrey Spacecraft team. **Photo: UoS Audio-Visual Aids Unit.**

AMATEUR RADIO SATELLITES

UoSAT came to pass in an environment which was prepared to accept the challenge when the opportunity arose.

Thus the Department of Electronics and Electrical Engineering at Surrey had supported for many years a very active amateur radio society involving staff and students which had already carried out useful work for the amateur satellite community. One of the more notable achievements had been to take responsibility for the control of several early OSCAR satellites, it succeeded in prolonging the operational lifetime of one of these by several years.

Anticipating that a successful space shuttle could well transform the economics of spacecraft construction as a result of launches becoming very much cheaper and more readily available, members of the group were already convinced of the worth-whileness of attempting to build a satellite on an appropriately small budget to investigate the engineering, scientific, reliability and cost trade-offs whilst achieving a technically useful mission."

Tracking Station

The Department of Electronic and Electrical Engineering at the University of Surrey had been involved in establishing a satellite tracking station when the students' Amateur Radio Society set up a simple tracking station to monitor telemetry data from OSCAR 6. This monitoring station was developed over subsequent years to control OSCARs 7 and 8.

By 1978, enthusiasm for the University's space activities reached a stage where it became apparent that it might be feasible to build low-cost spacecraft that could be used for educational and scientific purposes and which would stimulate a greater degree of interest in space science in schools, technical colleges and universities through actual participation in receiving data transmitted from satellites.

Fantastic Story

We do not have space here to recount the quite fantastic story of how the first UoSAT satellite was designed, costed, financed, built and launched in 30 months!

The facilities it included provided data for ionospheric research, a solid-state, charge-coupled, camera, a series of radio beacons transmitting radio signals on differing frequencies for propagation studies, two particle counters to provide information on solar activity and auroral events, a magnetometer similar to that used on the *Voyager* mission to Jupiter and Saturn for measuring the earth's magnetic field, an electronic voice synthesiser which 'speaks' details of the telemetry with a vocabulary of about 150 words in English!

It was successfully launched from the Western Test Range in California on 6 October 1981. NASA provided the launch facilities "in view of the satellite's potential to contribute to space science, education and to the investigation of radio propagation phenomena".

This illustrates the 'high-tech' aspect of the amateur radio satellite scene at the extreme ends of its activities. In the second part, we shall see just how the s.w.l. can take first steps in becoming part of this fascinating activity. In the meantime, if you are interested, start off by getting a copy of the *Guide to OSCAR Operating* from AMSAT-UK HQ, 94 Herongate Road, Wanstead Park, London E12 5EQ. If this stimulates you enough, get a copy of *Amateur Radio Satellites - the First 25 Years* from the *SWM* Book Service. And then if you feel you'd like to 'have a go' read on next month!

Postscript

Since writing this series the first of the UoSAT satellites has fulfilled its lifespan and re-entered the earth's atmosphere where it presumably burned up. It was last heard by ZS6CCD around 1200 on Friday 13 October 1989.

During its life it made over 45000 orbits of the earth. Apart from a bit of a hitch just after launch, which was eventually overcome, it functioned perfectly throughout its eight years in space. During this time a large number of school children, radio amateurs and space enthusiasts heard its digitalker and recorded its telemetry data.

In spite of its loss, there UoSAT-2 and numerous other satellites carrying out similar activities can still be heard by the space-orientated s.w.l. □

Abbreviations

AMSAT-UK	amateur satellite organisation
d.i.y.	do-it-yourself
DX	'long distance'
m	metre
MHz	megahertz
OSCAR	Orbiting Satellite Carrying Amateur Radio
s.w.l.	short wave listener
UoS	University of Surrey
UoSAT	University of Surrey SATellite
v.h.f.	very high frequency

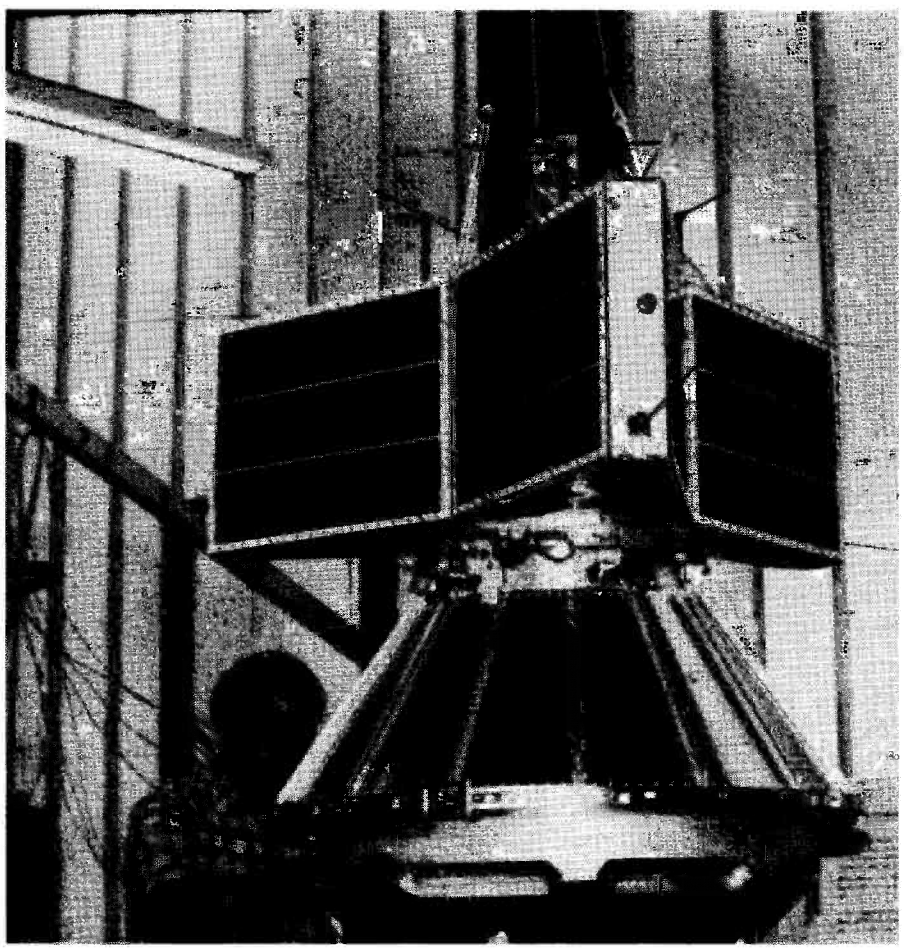


Fig. 1.2: OSCAR 10 seen here being fitted to the launch vehicle which successfully put it into a Molniya-type orbit.

DXPEDITION TO MOROKULIEN 1990

Allen Bartram G7ELS
Chairman ELARC.

The story of East Leeds Amateur Radio Club's trip to the border between Norway and Sweden to work some DX.

The best laid plans can and will go wrong, Murphy's Law decrees it. The first misadventure happened just 20 hours before we left Leeds. Our driver for the trip had the side of the car ripped off, by an overtaking lorry.

After some panic phone calls to his sympathetic firm, a replacement car was provided for us. All was well again, just in time to stop us all going grey(er) or bald(er) with frustration. Our thanks to his firm for the speedy replacement.

We left Leeds just before lunch on Saturday May 5, for our trip to Newcastle, to board the ferry to Kristiansand in Norway, a trip of about 22 hours. We left a blazing sun and a temperature in the eighties in Leeds.

The temperature gradually dropped during the 130km trip to Newcastle, until the sun disappeared altogether leaving us feeling chilly and wondering if we were doing the right thing by going. Within 10 minutes of leaving Newcastle on the ferry, the fog came down, and stayed down for almost all of the trip.

We went looking for cheap goodies in the ferry's duty free shop. There weren't any. It seems that all goods in the duty free shop are set at Norwegian prices before any duty is taken off.

After a lot of soul searching, and blocking the till exits for 20 minutes, we bought half a dozen tins of a well-known lager. That cost nearly four times the price of the same stuff on a local UK supermarket shelf. It certainly reached the parts no other lager has done in the past - the inner depths of one member's wallet that hadn't seen daylight for many a year. I swear that I saw the portrait of the Queen on a ten pound note blinking due to the blinding light penetrating the wallet confines for the first time in years.

Lager was not the only item that was expensive on board. All other 'essentials' like coffee or a snacks were also somewhat expensive, compared to UK prices. One of our team went a funny 'seasick green' colour when asked for the equivalent of a pound for a thimbleful of coffee.

About an hour before docking in Kristiansand, the sun broke through. From then on and for the rest of our trip we had brilliant weather - 80 degrees plus, all week.

The Last Detail

Having bought a current road map of Norway before leaving UK, we had planned our route to the last detail, Off the ferry and straight on to the E18, a matter of a few minutes drive, which was shown as the major road between the port and Oslo. We had reckoned on a steady journey of about 7 hours from getting off the boat to arriving at our destination. This proved to be ambitious, to say the least!

What we hadn't reckoned on was that the 'major' road shown on the map, turned out to be a single carriageway, (i.e. one up and one down), for 95% of its length. There were a few very short lengths of what can loosely be called motorways, each one requiring a toll of about £1.50 for it's use. The distances you can travel on these 'motorways' is hardly likely to make any drastic reduction on the overall travelling time.

Our driver was nearly on his knees at one point. So, we decided in the interests of safety and sanity that we had no choice but to stop for a meal and a coffee, and a short rest. Cost for the meal of chicken and chips with a coffee - a princely £8.40, **each**, and that was in a road-side cafe.

We eventually reached Oslo, but because of traffic congestion, we were behind schedule and it was now dark, (this was definitely **not** in our plans). We missed a turning in the dark in Oslo and this set us back another hour and a half.

Having successfully found our way out of Oslo, we found the road we wanted to complete our journey, Route 2. We then began to realise how good the road system in the UK was. The road was so badly worn by traffic, that the surface had 'tram tracks' in it. Try to wander off these, and the steering wheel was snatched from your grip.

Added to this, when we came to a road junction, the Route 2 road went left and right, but gave no indication of which way to travel to the town we knew was the next one on the list. A recipe for impending doom?

We ultimately reached the Swedish/ Norwegian border, a distance of about 500km from Kristiansand, where we had to pick up the key for the shack in Morokulien. Our anticipated 7-hour journey had taken us a little over 10 hours by now. But at least we were now only 500 metres from the shack.

We duly paid our money to the pretty lady customs officer at the border, and she handed over the keys for the shack. We asked her where the shack was and this brought a shrug of the shoulder and the reply, "I don't know, it's down the road".

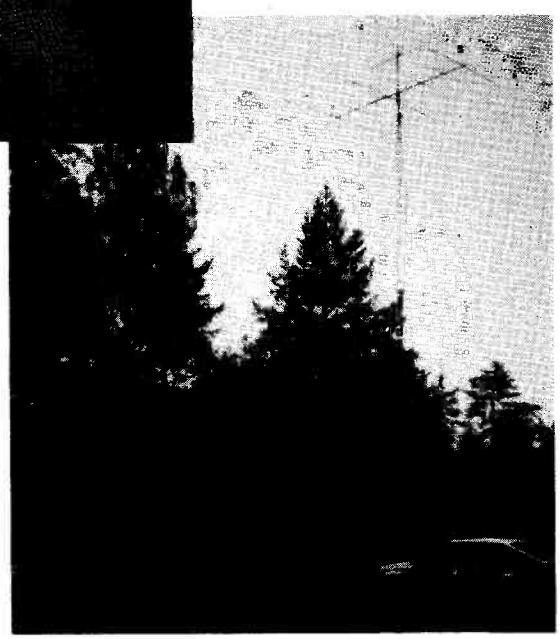
Surely someone must know where the place is I thought, but at 2a, there was no one else to ask.

Luck

We wandered off into the dark night, and found the shack purely by luck after about ten minutes of searching and a shriek of delight from one of our party. I thought it was an owl screeching, and ducked for cover. "Look at the size of that mast," he exclaimed, pointing to a lattice tower poking foutrom the tops of the pine trees. This was it. At least the key fitted the door, and we were inside.

The 'shack' is sited in a beautiful, quiet, camp site, surrounded by a forest of pine trees. The smell of pine drifting through the shack was something to experience and impossible to describe it on paper.

Keith G4VRW, operating c.w. from the Morokulien radio shack, watched by Richard G7EIX.



The radio shack at Morokulien set in the forests on the Swedish - Nowegian border. As the shack is actually on the border the callsign alternates between LG5LG one day and SJ9WL the next.

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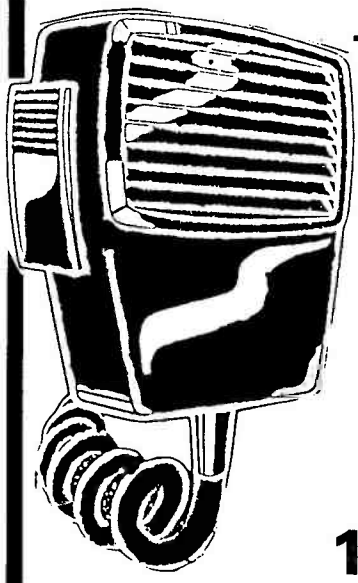

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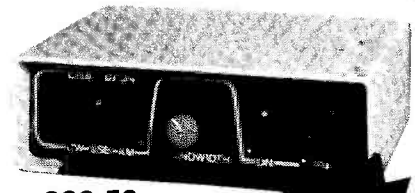

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DXPEDITION TO MOROKULIEN 1990

The 'shack' turned out to be a comfortable chalet, with a wood burning fire, and electric wall-mounted heaters in each room, (not used by us). There was a main room with pine furniture, which doubled as a dining room/lounge and a bedroom. In the room were two settees that opened up into two double beds.

This room also sported a colour TV, a radio cassette, books and a miscellany of board games. The walls were adorned with dozens of certificates and awards of various kinds, from all over the world.

The kitchen had everything you could possibly want for cooking and washing up. It also doubled as the sleeping accommodation, sleeping four in two double bunk beds.

The Radio Shack

Situated between the lounge and the kitchen was the radio shack proper. Again everything you would need for h.f., 144MHz (except a linear), RTTY and packet. To complete the set up there was an antique Siemens teleprinter machine, complete with tape punch. Old it may have been but it worked well.

Within minutes of opening up the shack we were on air using h.f., although only seconds before, we were all exhausted and threatening to sleep for the week. The exhaustion just seemed to disappear when we saw the radios.

From that moment, apart from a quick trip into Sweden, we were on air until the moment we left. We took it in turns to operate, on a 24 hour basis.

For those contemplating the trip, the equipment in the shack consists of an Icom 251E 144MHz radio, Icom 720A h.f. radio, an Icom IC PS15 p.s.u., Kam Kantronics packet terminal, Commodore 64 computer, HAB RTTY terminal, and a TH6 DXX antenna, a 10-element 144MHz beam and a WX2 vertical for 144MHz.

All you need to take with you are your ablutions equipment plus a sleeping bag. One thing we missed above all else, for sleeping, were some pillows or cushions. There are none in the cabin, so unless you are used to sleeping without some form of pillow, take some with you.

The weather couldn't have been better for us during our stay, and conditions for propagation were good with a couple of exceptions. One day there was a thunder storm over Germany, creating a lot of static and noise on the bands.

On another occasion we tried to keep a 'sked' with a colleague in the UK. The skip distance was all wrong and we couldn't hear him, nor could he hear us. However, all was not lost. A station in Maryland, USA, who we had been working just prior to the sked time could hear us both and did a great job of QSP. Thanks to that station in the USA. He knows who he is and maybe he reads *SWM*.

We were in Morokulien for four days. During that time we filled dozens of pages of the log books for the two callsigns available to the station, LG5LG and SJ9WL. For some reason the former callsign seemed to be the most sought after.

You may ask why two callsigns for the same station. The reason for this is that the Swedish/Norwegian border runs through the shack. A Swedish and a Norwegian callsign have been issued to the station because of this. The only stipulation on the use of the callsigns is that they are to be used on alternate days.

We had many hundreds of contacts during our stay. May I at this point say thank you to those who waited patiently for us to return to them during the pile ups. It was a pleasure to meet such courteous people for a change. I can think of many who could learn a lesson from such good manners.

We were truly surprised by the number of people we contacted, who knew we were in Morokulien. Many said they had seen the article about the trip in *PW*, and came looking for us.

Plan Ahead

Plan your route **before** you go and allow yourself plenty of time. Even when you have done this, be prepared for the unexpected. What we consider to be minor road works can cause serious delays on the roads over there.

The speed limit varies between 50 and 90km/h, the lower figure seems to be the norm for most of the journey. There are many 'automatic traffic control' units sited on the road side. Better known as speed traps to you and I.

Fill up with fuel in the UK before boarding the ferry, you will find petrol much more expensive in Norway, but diesel is cheaper.

Take as much with you as you can carry, in particular food, which is very expensive, compared to UK prices. This is confirmed by the many Norwegians who travel to the UK at the weekends to do their shopping in Newcastle.

The fact that so many do it on a regular basis, and taking the cost of the ferry into consideration, must tell you something.

If you want a good night's sleep, don't forget those pillows or cushions. If you're lucky enough to be able to sleep without them, fine, but that's one item all our group wished we had taken.

This article is a reflection on our visit to Morokulien and it is hoped that would-be travellers will find the contents useful. It is not a gripe about prices and road conditions, etc., which are mentioned purely as an aid to anyone intending to visit the area.

We subsequently found out that the Swedish people cross the border to do their shopping in Norway, because it's a lot cheaper there. So costs, I suppose, are relative. The Swede's think that Norway is cheap. Compared to UK prices, it is expensive, but no doubt Norwegian salaries reflect this fact.

We found everyone we spoke to over there most helpful and friendly. The country is beautiful, clean and refreshing, with a distinct absence of litter on the roadside. The only time I saw any litter was in a petrol station rest area and this happened to be an English newspaper. Makes you wonder a bit doesn't it.

Fictitious

What is Morokulien and how did it happen?

Well, it's difficult to describe. In the shack there is a leaflet that sets out how, when and why Morokulien came about. It's opening line is, "Morokulien is an existing, fictitious country". Make what you will from that statement.

From the information left in the shack by the people who organise the visits, plus a bit of information gleaned from the friendly locals, it seems that both Norway and Sweden donated a very small piece of land, many years ago, right on their respective borders. This was then named Morokulien.

The reason for this was partly to promote peace and friendship throughout the world, and the prime medium chosen for this was amateur radio.

There is an enormous monument to world peace on the site of the shack, again the monument is half in Sweden and half in Norway. The name Morokulien derives from the Swedish for fun, (MORO) and the Norwegian for fun, (KUL). (I hope I've got it the right way round). In any event, if fun is the objective, we had more than our fair share.

All proceeds from the rent of the shack and Morokulien awards, etc., are equally divided between Norway and Sweden and go to support their various charities. The rent for the shack, is a mere £15.00 a day inclusive, regardless of how many occupy it. We were told that on one occasion 24 Scouts were there for a week.

In short, Morokulien is a sort of a no mans land, set up to promote world peace and friendship and support charity. Not bad aims in general.

Thank You

Our special thanks to Einar Jansson SM4IM, who arranged our trip for us and came to visit us, to make sure we had arrived safely and settled in OK, and of course to all the people involved with Morokulien. It is by no means a one man show.

Also to *Practical Wireless* and *DX News Sheet*, for publishing details of our trip. A thank you also to the many sysops on packet, who sent details of our proposed trip all round the world.

To the one sysop who objected to doing so, I suggest knitting instead of radio - it would obviously make you a happier person and would make packet easier for us mere mortals to use. □

STARTING OUT

Brian Oddy G3FEX

So what is a suitable antenna? The vital role of any receiving antenna is to intercept the radio waves in its immediate vicinity and to convert them as efficiently as possible into tiny electrical currents, which may then be led to the receiver for processing. Unfortunately many s.w.l.s overlook this important point and attach a short piece of wire to their very expensive receiver and then expect it to perform well!

Whilst it may be possible to receive some of the high power broadcast signals with such an arrangement, the only way to obtain good reception of the weaker signals is to employ an antenna which has been specifically designed for the frequency in use.

A large number of different types of antenna have been designed over the years, each of which has special features. One type of antenna may be more suitable for a particular application than another, so it is advisable to acquire a broad knowledge of the characteristics of the many types. However, before considering them in any detail, it is important that the nature of radio waves and the principles of a basic antenna are understood.

Radio Waves

When the radio frequency energy from a transmitter is applied to a radiator or antenna, it causes a charge to move rapidly to and fro along its length. The electric (E) and magnetic (H) fields associated with the charge are radiated in the form of an electro-magnetic wave, usually referred to as a radio wave. The magnitude and direction of the E and H forces change with each half cycle of the transmitted signal, but the fields always remain at right angles to each other and to the direction of travel as they move away from the antenna - see **Fig. 1**. They leave the antenna at an incredible speed - virtually at the velocity (V) of light, which is about 300 000 000 metres per second (186000 miles per second) in free space.

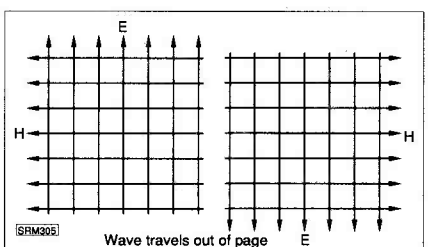

Fig. 1.

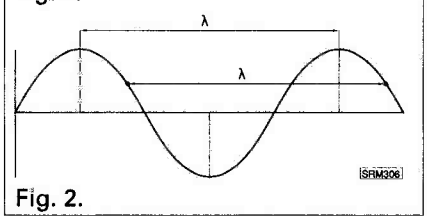

Fig. 2.

No matter how good the performance of a receiver may be, it cannot function correctly without a suitable antenna - they work together as a team and each is wholly dependent on the other!

Consequently they can arrive at a distant location on the far side of the world almost instantaneously! It takes about one seventh of a second for a radio signal to travel around the world.

All radio waves obey the same laws as light, but there is one important difference - the wavelength is much greater. The wavelength (λ) is the distance travelled by the wave during one complete cycle of the transmitted signal and is measured in metres. It may be measured between any two points on the wave provided the field is similar in intensity, magnitude and sign - see **Fig. 2**. The rate at which the cycles occur is called the frequency (f) and is measured in hertz (Hz), where one hertz equals one cycle per second. There is a simple relationship between velocity (V), frequency (f) and wavelength (λ):

Velocity = Frequency x Wavelength

or $V = f \lambda$ (a)

(where V = 300 000 000 m/s, f is in hertz and λ is in metres)

When considering antennas, it is often more convenient to think in terms of wavelength rather than frequency. Either the wavelength or the frequency can be obtained by transposing formula (a):

thus $V/f = \lambda$ (b)

and $V/\lambda = f$ (c)

Basic Antenna

An antenna is basically a special kind of tuned circuit. When the properties of the tuned circuits employed in a receiver were outlined in this series (*SWM* October '89) it was shown that they consist of a series or parallel combination of inductance (L) and capacitance (C) and that resistance (rR) is also present.

Such a circuit is said to have **lumped constants**, because the inductance (L) is provided by a coil of wire and two or more closely spaced metal plates form the capacitor (C). The resistance (R) is usually due to the conductor of the coil and the circuit wiring, but in some circuits an external resistor (Rd) may be added to damp the response.

Because the tuned circuits in a receiver are small and confined they do not radiate appreciably. In contrast, the inductance, capacitance and resistance associated with an antenna is spread out along the length of the wire. Such a circuit is said to have **distributed constants**.

The frequency to which an antenna will be **resonant,** or self-tuned, by the distributed inductance and capacitance, will depend upon the length of the wire. For a given frequency the length of wire must be just sufficient to allow an electric charge to travel from one end to the other and back in the time of one radio frequency cycle.

If the charge travels at the velocity of light (300 000 000m/s), then the total distance covered by the charge can be calculated by dividing the velocity (V) by the frequency (f) in hertz. It will equate to the wavelength (λ) in metres, since $V/f = \lambda$, as in formula (b) above. Note, however, that a wire only λ/2 long will be required to enable the charge to travel a total distance of λ, since it will traverse the wire twice in one cycle. The minimum overall length of wire that can be used as a resonant antenna will therefore be half the wavelength long. Such a radiator is often referred to as a half-wave antenna, or a Hertzian antenna, as he produced the first efficient radiating system in 1887.

The length of any half-wave antenna in free space can be calculated by using the formula $L = 300\ 000\ 000 \times 0.5/f$, where the length (L) is in metres and (f) the frequency in hertz.

Note that if the frequency (f) is in megahertz (MHz), [where 1MHz = 1 000 000Hz] the formula can be simplified to:

$L = 300 \times 0.5/f$ or $L = 150/f$ (d)

In practice, it will be found that an antenna cut to the length indicated by formula (d) will resonate at a slightly lower frequency than expected - in other words it will be a little too long. There are three main reasons why this occurs.

First, the antenna must be well insulated from the masts or other structures which support it, so ceramic or glass insulators have to be attached to each end of the wire and they introduce a capacitive loading on the antenna, called end effect. The capacitance lowers the resonant frequency of the antenna in just the same way as adding capacitance to a conventional tuned circuit lowers the frequency to which is tuned.

Secondly, the velocity of the waves along the wire will be slightly less than in air or free space. Thirdly, the ratio of the length to diameter of the wire used for the antenna will affect the length required for resonance - the larger the diameter of the wire the more the antenna will have to be shortened. This effect will be very pronounced if the antenna is constructed from metal tubing and the ratio is less than 100. Because of these factors it is necessary to reduce the free space length obtained with formula (d) by about 5%. Formula (d) therefore becomes:

$L = 150 \times 0.95/f$ or $L = 142.5/f$ (e)

where L is in metres and f is in MHz.

For those who prefer working in imperial units the formula is:

L = 492 x 0.95/f or L = 468/f, where L is in feet and f is in MHz

Reception

Having established the length of wire required for a resonant half-wave antenna, the manner in which it will respond to a passing radio wave must now be considered. The leading electric (E) and magnetic (H) fields associated with a radio transmission from a distant location are depicted as advancing towards a half-wave vertical antenna in **Fig. 3**. When the fields passes over the antenna they will cause a tiny alternating

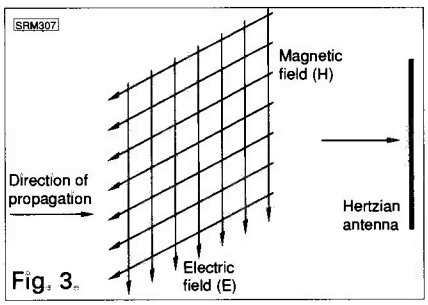

Fig. 3.

e.m.f., with the same frequency as the waves, to develop on the wire. This results in the flow of an alternating current in the wire, which can be led away to a receiver for processing. Any changes in the current flowing in the transmitting antenna will alter the fields and cause similar current changes in the receiving antenna.

Although the E field is depicted as being vertical and the H field horizontal in this example, the reverse is often the case. Unless the antenna is resonant and mounted in the same plane as the E field, the received e.m.f. will not be a maximum. If the antenna is mounted at right angles to the E field the received e.m.f. will be minimal. In order to denote the plane in which the E field lies the waves are said to be **polarised**. When the E field is perpendicular to the surface of the earth the wave is said to be vertically polarised. Horizontal polarisation implies that the E field is parallel to the earth's surface.

It can be shown that at resonance the distribution of voltage and current varies along the length of a half-wave antenna. Such variations are known as **standing waves**. The voltage (V) is highest at the ends and low at the centre, whereas the current (I) is highest at the centre and zero at the ends. The customary method of representing these variations graphically is shown in **Fig. 4**. The distance measured vertically from any point along the line representing the antenna wire to the curve marked (I) indicates the magnitude of the current at that point. Similarly, the curve marked (V) indicates the potential at any point along the wire, but note that there is a change of phase at the centre of the antenna. The impedance (Z), which is the property that determines the antenna current at any point along the wire for the value of voltage at that point, varies from very high at the ends (thousands of Ω) to a low value at the centre.

The amount of energy radiated from or received by an antenna can be related to a factor called the **radiation resistance (Rr)**. This may be defined as the value of resistance which, if substituted for the antenna, would dissipate the same amount of power as that actually radiated. The value of Rr can be determined at any point along the antenna, but it is usual to refer to a point of maximum current. The value of Rr at the centre of a horizontal, half-wave, wire antenna erected λ/2, or a multiple of λ/2 above the ground and well clear of

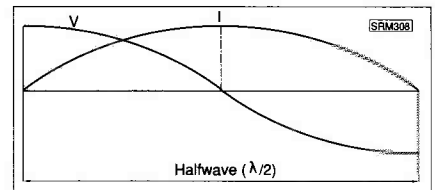

Fig. 4.

surrounding objects will be about 72Ω. Owing to the proximity of the ground, which acts as a reflector, the value of Rr will be modified at other heights, as shown in **Fig. 5**. The importance of the radiation resistance will become apparent when the methods of conveying the energy from the antenna to the receiver are considered in the future.

All practical antennas have directional characteristics. A half-wave antenna responds best to signals which arrive at right angles to the line of the wire and least to those which arrive off the ends. The response in free space is, in three dimensional form, similar in shape to a 'doughnut' - see **Fig. 6a.** When drawn in section it becomes a figure '8', as shown in **Fig. 6b**. The Hertzian antenna forms the basis of many interesting designs, some of which are of special interest to the DXer. Although the basic theory of their operation will be outlined, the emphasis will be on the practical aspects of their construction and erection in this series. □

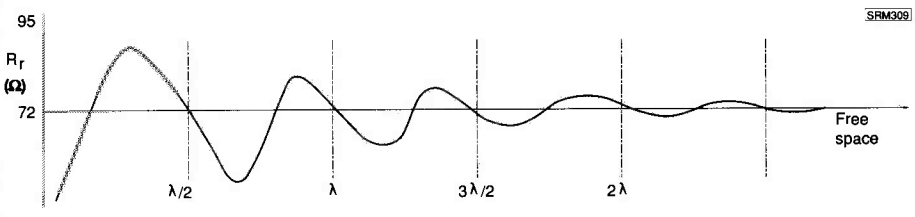

Fig. 5.

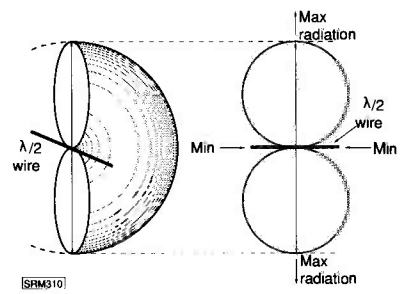

Fig. 6a. Fig. 6b.

AMATEUR BANDS ROUND-UP

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

Despite all our modern technology, a good, savvy s.w.l. using, say, a home-brew direct conversion receiver will probably collect more DX loggings per session than a less able operator using the most modern equipment, given equal antennas. Why is this?

There are various factors that come into play. One is the undoubted fact that the home-brew receiver tends to be more sympathetically used - and hence more efficient - than the commercial equipment. Secondly, in its basic form the commercial receiver is intended to receive broadcast signals, and hence the i.f. strip has a bandwidth to suit, which is almost precisely twice as wide as s.s.b. requires; although of course there may be provision for the installation of s.s.b. and/or c.w. filters in addition. Thirdly there is a natural tendency to assume that since the receiver has been well-advertised and has all the gimmicks, all one needs to do is to crank the tuning control around to hear all there is.

Not so! The more time spent in mastering the controls and using them to the best advantage in QRM, the more skilful the operator will become in himself. Thus within whatever the limitations on the site may be, the s.w.l. who cultivates their personal skills will get more out of it than the one who hopes the receiver will do it all.

And of course that same development of personal skill will tend to cause attention to be paid to the antenna and earth; after all, if you can get an extra S-point on the meter out of a given signal by improvement of the antenna, then you have also brought yourself an extra S-point's worth of signals which were previously below the limit of audibility. In practice this also implies that you hear things that much earlier when the band opens, and that much later when it closes.

If you listen upon the inbuilt loudspeaker, it is surprising what an improvement is obtainable from either a change to a hi-fi speaker or a change to the use of headphones.

In sum, it all depends on the 'nut between the headphones!'

News

Perhaps the most important in the s.w.l. context is the ZA Albania DX-pedition being set up by the Hungarian group. The information at the time of writing is that they have all the documentation in place but have been asked to put the expedition off till autumn, so keep an ear bent to the grapevine if it hasn't happened by the time you read this. If this one comes off, it will be the first operation from ZA for two decades.

However, the momentous events in the Middle East in the past few weeks to the time of writing must alas place a king-sized question-mark over everything. Keep an ear on Wireless Line for the very latest updates on what goes on in the amateur radio context.

Many will know of Geoff Watts; he of the lists and things. Sad to say we recently heard of the passing of Geoff's XYL Marjorie who gave him such support when he ran *DXNS*, stuffing the envelopes and taking them to the post after midnight and in so many ways contributing to his activities. She went down with MS and had been severely disabled since 1982. All our sympathy goes out to Geoff in his sad loss.

It is worth while to have up-to-date copies of Geoff Watts' various lists - they are so cheap that it is worth-while renewing them at least annually. Geoff was the founder editor of the *DX News Sheet*, the IOTA game, and indeed was the only s.w.l. to appear in the American DX Hall of Fame. The address to send to for the Lists is Geoff Watts at 62 Belmore Road, Norwich, NR7 0PU.

Geoff does a *CQ and ITU Zones Guide*, which gives the various prefixes for each zone, plus the other prefixes and specials used by that country; a USSR Oblast Guide, giving the oblasts in numerical order against prefix, and in prefix order against oblast number, plus seven outline maps, USSR Awards, the CQ-M annual contest, Victory-40 stations, CQ and ITU Zones, deleted oblasts, future possible USSR prefixes, and a list of some 250 USSR QSL Bureaux; the *DXCC countries Guide* giving present and past prefixes from 1945 to date, deleted countries etc., and incidentally a list of IOTA references for those who have taken to hunting islands; the *Amateur Prefix-Country-Zone List* giving all the information on each country in one line completely up-to-date. Each publication runs to around 15 pages, and they cost £1.25 each in the version using both sides of each sheet, or £1.50 if you have the single-sided form - handy for sticking on card and mounting on the shack wall. I reckon these have to be the most useful fivers worth you can have in the shack at that price - usual disclaimer of course.

Bands

By the time this reaches you, we will be at the autumnal peak in conditions, so doubtless your receiver will be bursting forth with all sorts of DX - unless a solar flare has wiped out the bands!

Letters

The first comes from **Harold Wood** (Manchester Gorton) who decorated the radio room out, which left him wide open when the XYL advised him she thought the rest of the house ought to look equally nice - ouch! Hence the shortened list: on 14MHz, VP2VM, 4L1NV, LA4CM (Karmoy Is for the IOTA fans), while on 18MHz VE2RP and K2ANR were booked in. A turn on to 21 MHz resulted in VO1SA and 4K5ZI, the latter on Snake Island.

Dennis Sheppard of Earl's Shilton says he prefers his AR88D to the Heathkit RA1 - not surprising since the AR88D was a real top-liner made for Service use until at least the early fifties while the RA1 was a down-to-earth and very basic value-for-money kit receiver; but Dennis is looking around him for an amateur-bands-only receiver. On the antenna side, the inverted-V arrangement has been altered to a half-wave loop arrangement for 3.5MHz as an experiment. On the latter band, SO9KG, PP9HS, VK5HB and ZL4AP were all booked in, while on 18MHz s.s.b. PY7VKL, TA0B, JA1JRK, CU1AC and VK3AHJ were noted. On 24MHz there were CE3GEI, YB0WR, YB8HX and 6W7OG; leaving 28MHz to provide C53GB, CX6DH, K2LGO, KA4IIV, N1ESW, N2HZW and W2RP.

An interesting letter from **G3JON** (Sheffield) mentions that he read the article in April 90 *PW* 'The Windom Revisited' and tried it out. Although cut to precisely the given dimensions, the s.w.r. was very different to the claim; but nonetheless it works well on 18MHz. Now, this is not surprising, because of two factors. The first is the proximity of nearby objects to the antenna, which tend to change the frequency of resonance. The theoretical dimensions only apply in the environment of free space which you can never approach at h.f. Secondly, the Windom relies on single-wire feed, and hence of course the effect of the presence of the earth beneath the antenna. Depending on the quality of the latter, so the s.w.r. noted at resonance will be seen to change, quite apart from the usual variations which occur as the antenna height is altered. In fact, the Windom, while superficially attractive is really obsolete despite attempts to revive its use.

Now **Vincent Cutajar** (Malta); Vince says he hasn't found conditions on 24MHz very good but he did stumble across T77T, A92BE, Z21CS, A22JP, K8LF/4, OA8ABT, ZL3DX, KF3T and WB3JRU. Fingers crossed for an improvement in 24MHz conditions, Vince!

Mike Davis (Thornton Heath) has now got his Trio 9R59D up and running, albeit the scales are some 20kHz out. This is not unreasonable for a general-coverage receiver, since, after all, the tolerance on the signal generators originally used in alignment was probably only ±2%! At 30MHz, for instance, 2% is around 0.5MHz! Obviously, in general the receiver will be better than that, and better as one comes down in frequency. However, with care one may get quite close right across the band, although you may be reduced to touching-up the outer vanes of the oscillator section of the tuning gang which are usually slotted to just that end. However, there's not much wrong as on its very first use after repair it captured VO1FG on 3.5MHz and then KZ4C's DX net on 14MHz. Incidentally Mike is to be congratulated on passing the RAE, and he is now attacking the Morse.

Denis Travis of Guiseley uses the Lowe HF-125 and an inverted-L antenna; since November last year Denis had heard all the USA states; every now and again Denis sets himself the task of starting from scratch and logging all the USA States as an exercise. Outside of this, in July he logged 9V1XQ, YB4GF, WB7CHS (Washington State), YC5NST, YC1YMN, VP2EE in Anguilla, TU2UI, 6X8GL, YC3OSE, ZK1DD, W7MBS (Utah), YC0AT and BY5QA, plus the usual JA, PY/LU/CE, VK and East Coast USA stations.

Nice to receive a report from a c.w. s.w.l. once in a while; **Charles Wells** of Mansfield does just that, and on 18MHz he found VE1GE, RI8BP, RA2FF, SV1TU, UZ9LWG/UJ8S (Oblast 041, QSLs to UW9LA), UF7V, 9H3MX, W4PNK, W3HER, and 4S7WP. On 21MHz there were TK/PA3EBT/P, 8P9FS (QSL to G3DLH), PY4JCP, UA9XFW for Oblast 090 and VP5P; that left time for a couple of LUs on 28MHz, and of course the usual smaller fry scattered across all bands. On a different tack Charles comments on some of the odd calls used in contests. Citing in support of his case the signal heard calling 'CQ TEST de T5ST' on the key (think about it and imagine sending it!) - presumably Costa Rica.

E. H. Trowell noted the notably poor conditions on Top Band in daylight, and so he went instead to the c.w. end of 14MHz where he noted VK2FYM, W7SF, ZS6KT, JA9CAH, 4L1NV, U5WF/UB9P, 4K3/UA3YCA (Kolguyev Is), KH6IJ, VK5GZ, LY2BFO, 4K3MI (Morzhovetz Is), P43SF (Aruba) and, on s.s.b., ZL4OD. Ted also offers some QSL routes, 4L1NV via RA1NA; 4K3/UA3YCA via RA3YG; VU2TTC, Box 54 Villupurum and ZD8LII to Box 2, Ascension Island.

T. Hackworth (Ruddington) gets on the bands usually around 2300; on 14MHz this yielded 4U1ITU, CT1BW, EA6XG, EK4AA, HC6CR, HG2P, JW/DL3LAB, KZ2X, LG5LG, N5PSI, UZ9MWJ, VK2AU, VP8CED, WA4PMF and assorted EU stations; while 21MHz offered 4K3/RA3YG, 4K4BAN, 4M1G, 4U1UN, 4U5ITU, 4X6RL, 4Z4EC, 5B30JE, 5N9FEA, 7X2VXK, 9K2HA, 9Q5PA, AB4JY, BY5RT, BY4RSA, BZ4GBC, C53GB, CE1LGD, CM2ET, CU2DG, CX7ABT, EA8BSG, FM5DN, HH2CI, HL1EG, HL4VP, HR1KAS, HZ1AB, J6L/G3UUV, JA8NF, JF2WXS, JK2WFI, JT1BG, JH0FBH, KA1TRY, KB9N, KI1LT, LU4EZ, N7EXE, PJ2HB, PY2LLF, PZ1AP, TA5C, TG9GI, TI2OY, TU2UI, TR8/FD1OGL, UD70DWZ, UF6VBZ, UZ9YXI, VEs, VP2VM, Ws assorted, YB/YC assorted YI1BGD, YV4CUW, ZF1HJ and ZW7AB, plus the minor stuff I have had to delete.

John Heys (Hastings) notes that GU2FRO on Sark puts a thumping signal on Top Band around 1.950MHz on Sunday mornings, 0830-0930Z for those who have not yet logged Sark on this band.

Antennas

Every winter I read heartbreaking letters about antennas and their supports that have been damaged in the winter gales. To avoid this, you should be looking **now** to a routine overhaul before the October gales start the danger period. It is well to look to masts and guys to be sure there is no sign of chafing, for instance, and to take preventive steps to prevent chafe occurring by, for

For the latest DXpedition news you can always ring Wireless Line (compiled by Practical Wireless) on 0898 654632. Calls charged at 33p per minute cheap rate, 44p per minute all other times.

instance slipping a length of split hose-pipe over the danger areas and taping into place, or using the sailor's baggywrinkle scheme.

Check that the guys and guy anchors are adequate - galvanised stranded wire guys that have rust are obvious danger points.(If a strand has actually broken the ends stick out of the mesh and can 'bite you'!) Once you are sure the mast is capable of standing up to the worst the weather can do to it, you can look to the antenna itself; obviously a length of feeder flailing around in the wind is a candidate for early breakage unless you tape it to something to prevent movement. Don't forget that if one end lets go, the insulator on the free end may well be man enough to break a glass pane, in house or greenhouse. I have a belief in 'preventer' guys and halyards, arranged so they only take the strain if and when the main one breaks - by this means you hope the preventer will keep all under control until the gale abates and you can get out there for repair work.

If you are in a very windy area, consider whether it is worth having a tilt-over mast arrangement, as the windspeed is always lower at ground-level. The one here can quickly be tilted down to ground level single-handed in any weather which makes for peace of mind on the one hand and ease of maintenance on the other!

Mike Drew (Wrexham) tried 21MHz and notes 8J90XPO (The Osaka Exhibition), C56/ON7EH in The Gambia, ZK3EKY (Tokelau), S79MX, JA4OSF, JH4VBK, JA3IMC, JH9UTY, JA1OYY, JA6QZ, VK2SE, KP4LQ, UT4UX/RJ5J and lots of Yanks. On 14MHz he noted XJ4G (Winnipeg, Ontario), UA9CI on SSTV, UA6JD, A61AB, SU1HN, XE2CQ, TG9GI, J39JL, K2POF, WD9HAW, KA3GTC, K8AHU, WD1V, K2GTS, N1AGV, K0BUR, IK1AWV/I90, I1ZQD/I90, WA5RNL, W9JOO, N2ETJ, K6UKZ/4, K1CSB and GM4TNW/CT1.

An interesting point here; the XJ4G is only the second or third VE4 noted in your lists over a period of years: are VE4s all **that** rare? Certainly the map shows the area to be the most sparsely populated part of Canada.

Finale

With the question posed in the last paragraph I will leave you for another month. Deadlines for incoming mail here are: October 8, November 5 and November 30 - please take note of the latter date so I can cope with the Christmas rush! The address is as always, Box 4, Newtown, Powys SY16 1ZZ.

DECODE

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

Tony Leavesley of York wrote to me some months ago asking for help with a difficult, but common, antenna problem. He lives in a listed building where external antennas are forbidden. Having considered the advice received he has just written back to me with his experiences to date. Tony opted to try a Datong AD-270 active antenna, which he configured as an inverted V in the loft space. To provide some sort of comparison he also erected a long wire antenna, again in the loft space. When connected to his Lowe Electronics HF-225 receiver he reports very little audible difference between the two. This is in fact a compliment to the performance of the Datong as it is considerably smaller than the long wire. Size is really the prime justification for buying an active antenna as they can usually be matched or bettered with good sized wire antennas. However, one area where tunable active antennas can score is in minimising the effects of out-of-band interference.

Tony has made several other changes to his station since he last wrote. He changed his Pocom AFR1000 decoder for an AEA PK-232 data controller and added an ERA BP-34 audio filter. The filter is potentially very useful for utility decoding, but he has not yet had time to evaluate its performance. Tony finds the PK-232 to be very good, with the SIAM mode being a particular favourite. SIAM being an acronym for Signal Identification and Aquisition Mode. This is where the PK-232 attempts to identify the type of signal being received automatically. The analysis system is by no means perfect, but it does serve as a useful guide, particularly for the newcomer.

Tony also commented on the number of signals that sound for all the world like RTTY, but cannot be indentified. I'm afraid there is no easy answer to this as, even users of sophisticated decoders still find signals that are unresolvable. Many of these signals are encrypted so that, even if you can receive the mode, the text will make no sense!

Finally from Tony, he reports an addition to the list of NAVTEX message categories I printed recently. The addition is category L that apparently relates to rig moves and has specific relevance in the North Sea.

Robert Evans of Ebbw Vale has been very active of late, judging by the log I have just received. The equipemnt in use comprises a Trio R-600 receiver with an ERA Microreader decoder. On the antenna front he uses five separate systems to cover from l.f. through to 30MHz. The five antennas being matched to the receiver via a home built antenna tuning unit.

Surplus equipment enthusiasts will no doubt be pleased to hear of the success of **Ed Dunlop** of Prestwick. He has been using a R-210 receiver for over two years now very successfully. The biggest problems he has had to face is that of the lack of spares. The weakest link seems to be the film tuning scale. But, with some ingenuity, he has managed to overcome these problems. To give the required tuning accuracy he uses a BC221 frequency meter combined with a digital frequency counter. Besides the R-210, he has a Halicrafters SX-111 receiver that covers just the h.f. amateur bands.

For utility decoding he uses a Spectrum computer with programs for RTTY and FAX. Antennas in use at his station comprise two 10m wires, one running north to south, while the other runs east to west. Just to make sure no signals escape him he also has a 4m vertical! All three antennas are switch selectable from the shack, making a very versatile and comprehensive system.

M. Turvey of Worcester has written with a plea for help. He has a Tatung Einstein computer and would like to use it for the reception of RTTY and c.w. The problem is a source of suitable software - can anyone help?

Ian Campbell of Bracknell is a newcomer and determined to start with a fine station. The current equipment is a Lowe HF-125 receiver fed by a long wire antenna. For data decoding he is eagerly awaiting delivery of a Pocom AFR-2000 fitted with all five expansion options. Good luck Ian and I eagerly await to hear of your results!

FAX-1 and RTTY

Dr. Wood of Ledbury has written asking a few common questions about using the ICS Electronics FAX-1 for RTTY reception. In its original form the FAX-1 was only able to receive FAX images. However, RTTY was added later in the form of a software update. As the FAX-1 was primarily targeted at the maritime market it was a logical progression to continue with the addition of NAVTEX reception.

One of the problems associated with the later developments was that the operating procedure became more complicated than the original concept. Because of this, some people have experienced problems. One of the first problems areas concerns the mention of a 2.2kHz offset when tuning in stations. This has been misinterpreted as causing a tuning problem so that only very strong signals can be received. This is not true.

The instruction to use the 2.2kHz offset is actually to compensate for the way in which frequencies are commonly displayed on s.s.b. receivers. When you operate a standard communications receiver in s.s.b. mode, the displayed frequency is the theoretical frequency of the signal carrier. The actual speech information is spread between 300Hz and 3kHz above or below that frequency, depending on whether upper or lower sideband is in use. When correctly tuned, this range of frequencies lies within the passband of the receiver. Now if we return to our problem, you can see that if we set the receiver so that it indicates a frequency 2.2kHz above or below the quoted station frequency our desired signal, be it FAX or RTTY, will lie neatly within the passband of the receiver. So rather than requiring you to tune away from the signal, the procedure ensures best possible results.

The other point that causes some confusion is shift selection. You will no doubt have noticed that when I give RTTY frequencies, I usually include the shift frequency. Although this information is vital to some types of decoding system, it is not required with the FAX-1. The decoding system used in the FAX-1 necessitates tuning the receiver so that the RTTY or FAX signal evenly spans the centre point of the bargraph display. One way to imagine the operation is to treat the centre of the display as a toggle. Any signal that lights an l.e.d. to the left produces one logic state whilst an l.e.d. on the right produces the opposite. The only difference between the various shifts for the FAX-1 operator is that the band of illuminated l.e.d.s becomes narrower and so tuning becomes more critical on the narrower shifts.

I hope that has helped to clear up some of the points readers have raised on the FAX-1. If you have any other queries on equipment or modes, please drop me a line and I will do my best to include a reply in the column.

Interference Components

I recently had occasion to mention TMP Electronics and their range of split ferrite beads and other magnetic products. Following that mention, Howeth Jones GW3TMP has written to let me know that he has now started up a new company. This company will continue to import and distribute a comprehensive range of ferrite and powdered iron core products. For more details the address is: Ferromagnetics, P.O. Box 577, Mold, Clwyd, North Wales CH7 1AH.

Spectrum - High Resolution FAX

Technical Software have just announced a brand new FAX and weather satellite decoding system for the Spectrum 48K and 128K computer. Most of the existing systems use the screen for the display which limits the available resolution. This new system uses a standard Epson compatible dot matrix printer as the display device to give a much higher resolution. Incidentally, this basic principle is used by many commercial FAX decoders.

This additional resolution capability has been fully exploited to allow the use of grey scales. The result is claimed to be near photographic results.

For h.f. FAX reception the package supports all the standard speeds of 60, 90, 120 and 240 r.p.m. In addition, IOCs of 288, 352 and 576 are included. The grey scales have been very carefully thought out as there are separate scales for each of the common shifts. This should ensure good quality results on both l.f. and h.f. signals. There are several other features included that should simplify life for the FAX operator.

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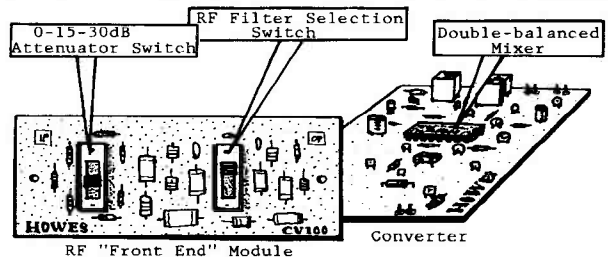

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There are no modifications to the receiver, the CV100 simply connects between its antenna socket and a suitable antenna (HOWES AA2 etc). All the receiver's normal functions are retained. A switched RF attenuator and RF filter selection are the only operational controls on the CV100.

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- ★ RF input filters and switched attenuator.
- ★ Requires 12 to 14V DC supply.
- ★ Easy to build kit, or ready built modules.

If you would like to upgrade the frequency coverage of your scanner, then the HOWES CV100 could be the ideal way of adding extra bands without the cost of buying an additional receiver. Performance is excellent.
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- ★ Easy to build kit, or ready built modules.

If your scanner reception could benefit from the addition of a remotely located broad-band antenna with built in pre-amplifier or you would like a much neater, more compact alternativie to the large, ugly discone types, then the HOWES AA4 could be just the job! Excellent performance in a small space!
AA4 kit: £18.80 **Assembled PCB modules: £24.90**

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The HOWES AA2 is the active antenna to use with a general coverage HF receiver. Broad-band performance that does not tail off at the higher frequencies. The neat compact answer for those with limited space, holiday use, mobile operation etc. Two selectable gain settings, local or coax powering (12 to 14V), easy to build, and much liked by customers!
AA2 kit: £7.50 **Assembled PCB module: £11.50**

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73 from Dave G4KQH, Technical Manager

SEEN & HEARD

Meteosat and polar orbiting NOAA satellite signals can also be resolved by this system. This is unusual for a package of this type and makes it a strong market contender. Of course you still need a suitable satellite receiver. As with h.f. FAX full grey scales are supported and signal derived synchronisation is used for image stability. This synchronisation system also allows signals to be recorded on tape for display later.

As with most advanced packages, it is not possible to provide these facilities in software alone. The Technical Software system uses a combination of hardware and software. The hardware comprises a basic interface board that connects directly to the Spectrum and handles all the external communications, including the printer port. Audio signal processing and synchronisation is supplied by two other boards that connect to the interface board. One of these audio boards provides the FAX interface while the other deals with satellite signals.

As for prices, the basic interface board and tape software costs £40.00 whilst a Spectrum +3 disk version is available at £42.00. The Spectrum FAX board is £40.00 and the APT-1 satellite unit is priced at £59.00. For more information contact: Technical Software, Fron, Upper Llandwrog, Caernarfon, Gwynedd LL54 7RF.

AEA Software Releases

The latest Press releases from ICS Electronics shows that they have a few updates available for the PK-232 and PK-88 data controllers. The PK-232 updates require that the motherboard hardware update, announced last year, should be fitted for correct operation. The new features available centre around better packet mailbox facilities. But there are two features that should prove interesting to the utility listener. The first is an improvement to the Autobaud routine that eases the setting-up between computer and decoder. Second comes the ability to decode five and six bit RTTY codes. The scope of this is a little unclear at the time of going to press, but it looks as if it might include t.d.m.

The updates to the PK-88 are all centred around the mailbox facilities and so will only really appeal to the active amateur. For more details contact ICS Electronics Ltd. Unit V, Rudford Industrial Estate, Ford, Arundel, West Sussex BN18 0BD.

Frequency List

I sincerley hope that by the time you read this the Gulf crisis will have been resolved. However it is well worth keeping an eye on the Middle East Press Agencies to gain an additional perspective on their problems.

As usual I have a few selected frequencies for you that have been sent in by readers. The format used is the normal; frequency, mode, speed, shift, callsign, time and notes:

3.159MHz, RTTY, 50, 425R, -, 2017UTC, Prague Meteo

4.175MHz, RTTY, 50, 170R, -, 1944UTC, Tholen USSR

9.227MHz, RTTY, 50, 425R, 9KT27, 1900UTC, KUNA Kuwait

9.353MHz, RTTY, 50, 425, OLX5, 1930UTC, CETEKA, Prague

9.430MHz, RTTY, 50, 425, ZAT, 1751UTC, ATA Tirana, Albania

10.694MHz, CW, -, -, -, 2133UTC, PAP Press

10.98MHz, FAX, 90, 576, RDD79, 1645UTC, Moscow Meteo

11.048MHz, CW, -, -, -, 1838UTC, Russian Navy

12.860MHz, CW, -, -, -,0113UTC, SVD Athens

14.373MHz, RTTY, 50, 425, YIL73, 1128UTC, INA Baghdad

14.49MHz, RTTY, 50, 425, RNK36, 1322UTC, TASS Moscow

14.760MHz, RTTY, 50, 425, CNM61, 1309UTC, MAP Rabat

16.41MHz, FAX, 120, 576, NAM, 1145UTC, USN Norfolk

18.214MHz, RTTY, 75, 425, -, 2128UTC, VoA Greenville

18.236MHz, FAX, 120, 576, BAF33, 1931UTC, Beijing Meteo

19.75MHz, FAX, 120, 576, 6VU79, 2045UTC, Dakar Meteo

20.736MHz, FAX, 60, 576, LSA600, 2015UTC, AP Buenos Aires

22.325MHz, RTTY, 50, -, UJY, 1900UTC, Kalingrad Radio

That's all for this month but please keep sending in the logs and any additional station details. Good DX.

INFO IN ORBIT

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

Once again we saw changes to the Russian satellite scene just after press time for *SWM* but being a monthly publication we are never far behind!

METEOR 3/2 was switched on and off several times in late July and was then replaced by METEOR 3/3 on the frequency 137.85MHz. The new METEOR 2/19 was switched off and so for a few days the Russians had only one weather satellite operating. On August 4th METEOR 2/17 was switched back on on the changed frequency of 137.30MHz. I had to re-run my predictions for that weekend!

METEOR 3/3 has changed frequencies again during August so I am listing the likely frequencies on which you may hear it. It has been transmitting both visible and infra-red pictures. OKEAN 2 has been transmitting regularly more than once per day, usually visible format pictures. There is likely to be a launch of METEOR 3/4 soon and so we will see further changes in the operation of the Russian wxsats. The predictions list that I gave for September included satellites that were then switched off!

Frequencies

We now have the following operating satellites:

NOAA 9 and 11 on 137.62MHz

NOAA 10 on 137.50MHz

METEOR 2/17 on 137.30MHz

METEOR 3/3 on 137.85, 137.40 or 137.30MHz

METEOSAT-4 on 1.691 and 1.6945GHz

OKEAN 2 on 137.40MHz

I would be surprised if further changes don't happen during the next few weeks!

METEOSAT

There are three METEOSATS available for the ground controllers' use at present and METEOSAT-4 is the one being used for current transmissions and is positioned at about longitude 0° above the equator. Late last year an image fault was found which got worse and so transmissions were changed to METEOSAT-3. METEOSAT-4 moved to 10° west for tests in January but meanwhile a power amplifier failed on METEOSAT-3 in April and so a special one channel mode was used for about 10 days. From April 19th operations were returned to METEOSAT-4.

METEOSAT-2 can be used if necessary and is at 9° west longitude. METEOSAT-3 is now at 3° west and can be used in an emergency. METEOSATs 5 and 6 are planned for the future with an expected launch date of early 1991 for Met-5.

Dishes

Many amateurs, myself included, receive METEOSAT pictures using a dish and mine is about 1.1m diameter. It is worth remembering that the recommended size for proper reception is actually 1.8m for a Secondary Data User Station (SDUS), that is, one using wefax data, and a dish size of 2.4m for a Primary Data (PDUS) Station, that is one using the digital data.

Many equipment manufacturers have produced METEOSAT systems using small dishes which are adequate when the satellite is running at full strength but may not be so effective during problem periods when the power is reduced. Do remember this if you start experiencing problems. I will try to keep *SWM* readers up-to-date with METEOSAT activities.

Digital Header

Listeners to the METEOSAT transmissions will have heard the slight change in the sound just after the start of the frame. This is due to two lines of digital data containing details of the picture content similar to the normal header.

New Schedule

A new dissemination schedule was started on August 1st following new processing methods at the ground station. There are many changes to the previous transmission sequence but space doesn't permit me to reproduce the entire schedule so here is a summary.

1. The DTOT frames are now transmitted every three hours at 14 minutes past the hour from 0014UT. These frames are always followed by ETOT until 0900UT, 1200UT and 1500UT when CTOTs are transmitted.

2. The D2 frames are now broadcast at 30 minutes and 58 minutes past the hour and are followed as before by the C02 and C03 frames.

3. The administration messages and test frames have moved to 18 minutes past the hour every three hours from 0218UT and are on alternating channels as before.

Permission

A recent bulletin from EUMETSAT contains a requirement that all users of METEOSAT data should apply for permission to receive its signals from, in the case of UK users, the National Meteorological Service. The address that users should write to is:

Dr J Houghton, Director, Meteorological Office, London Road, Bracknell, Berkshire RG12 2SZ.

I have written to the Met Office to try to obtain clarification for *SWM* readers since a previous document apparently contradicts this requirement. I will let readers know of the outcome.

Letters

Several letters arrived just too late for inclusion last month. **Matthew Green** must be one of the youngest *SWM* readers at 13 years old and he is already taking an interest in weather satellites. He has a Spectrum computer with an SSTV (slow scan TV) program and also an Acorn Electron computer with Maplin satellite software but as yet no decoding equipment. He sent me a tape to record some METEOSAT frames. METEOSAT is running at lower power than normal so I'm afraid the recorded signals were a little noisy.

Ken White has been operating a BBC computer with the Spacetech decoder for about four years and has recently bought an Atari 1040 computer for which he is now looking for suitable programs.

Several readers have responded to requests for help from other readers. **Ian Wraith** recently asked whether anyone knew of software for the Commodore 64 computer to help with satellite work. More questions about the Commodore 64 came in the latest letter from foreign shores written by **Adam Moscicki** of Poland who is a student who listens to the h.f. bands. He has been using a Commodore 64 to decode RTTY and CW and now wants to know of sources of satellite software for this machine. He proposes to build a receiving station and asks about circuit

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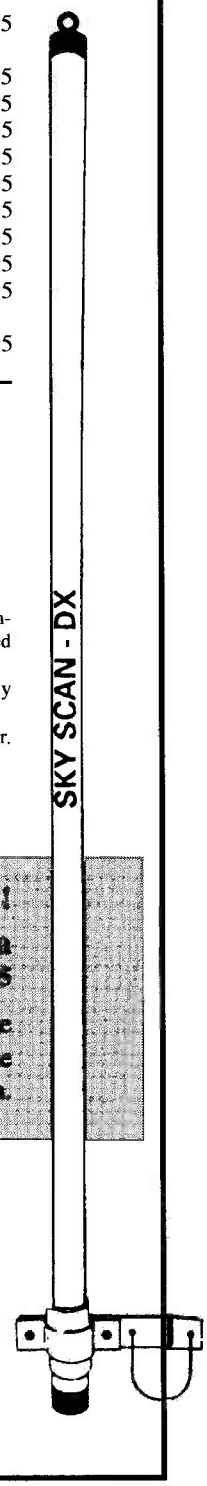

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SEEN & HEARD

diagrams. Several manufacturers sell kits for these projects and so a look through the *SWM* advertisers will provide the information - try companies such as Cirkit and Maplin who have been making kits for some years.

Help Offered

Colin Grellis G1YIL has written to offer to supply a suitable program for orbital predictions and demonstration frames of NOAA and METEOSAT pictures using the Commodore 64 computer. Colin points out that a suitable satellite decoder is needed and adds that FAX can be decoded if a suitable interface is used. Colin can be contacted at 96 Crock Lane, Bridport, Dorset, DT6 4DQ, but please enclose an s.a.e. for details.

More Letters

I have had many requests for a.p.t. tapes including one from **Tony Hulme** who has the Technical Software APT-1 module which runs with the RX-8 receiving system. Tony uses a 137MHz Microwave Modules converter attached to an Icom IC-R70 receiver and a home-made, crossed dipole antenna, and a BBC Model B computer. Tony is very pleased with the RX-8 system and feels that he can recommend it as being easy to use. Tony uses an AOR AR2001 receiver to listen to v.h.f. and has had two QSL cards from the Soviet Space Centre.

Lester Jones of West Kirby also uses the Technical Software RX-8 system and asked for sample wxsat signals to test his software. All tapes were despatched within a few days.

Another listener to the v.h.f. bands is **Geoff Hamilton** of Chigwell who has been listening to the weather satellites using his Realistic PRO-34 scanner fed from a home-made, crossed dipole. Geoff has an IBM PC XT computer and he has just completed building the Maplin satellite decoder which he is now going to interface to the computer. Geoff has kindly agreed to pass on the details of his system when he has got it all working. Remembering how popular the IBM clone computers are this will be of interest to many *SWM* readers. My main satellite data processing system is now of this type, using a 286 chip to provide extremely fast processing speed.

A number of manufacturers are producing boards to slot in the PC computers to decode a.p.t. data and I will give details as soon as space permits.

J G Thompson of Woking wrote to request Kepler elements and some recorded a.p.t. data which was duly despatched. Other routine requests for Kepler element sets have also been sent off, usually within a few days.

Even More Letters

Pat Gowen G3IOR sent me a copy of a bulletin on METEOSAT schedules that he received on his packet radio facility. Pat is very active in the amateur radio field as many of you know, and as well as writing for our sister magazine *PW* he is also involved with environmental organisations.

Patrick O'Callaghan of Charleville is a regular reader of this column and uses a Maplin receiver and decoder with his Atari 520STFM computer. He has a METEOSAT program and so requested some recordings from me to try out his equipment.

Alan Thomson is the Head of Physics at Bellshill Academy where they have a Cirkit receiver and decoder but had problems in receiving signals so Alan asked me for a sample recording. I trust that it helped. Remember that Kepler elements need to be updated at least every few weeks or predictions will gradually become inaccurate.

Pictures

I was pleased to receive a selection of pictures from **Dave Allen** who is a teacher at Chantry High School in Martley. They use Maplin hardware but feel that the software could be improved. Dave comments that a complete NOAA 11 pass takes about six hours to print and asks whether any *SWM* readers might have an improved printing program. They are using the BBC B program supplied by Maplin with the decoder. The pictures shown include a strip from NOAA 11 taken in May, a print of Italy and one of Britain and were produced by **Richard Palmer** and **Nick Woodburn** who are second year pupils at Chantry. Unfortunately the pictures would not reproduce.

The Russian Meteors-Part 2

Last month I covered the earliest METEOR 1 series of experimental weather satellites and touched on the METEOR 2 series. Because of the great interest in identifying the nature of METEOR picture transmissions I am including a list here to show the characteristics of the equipment. The METEOR 2 series weather satellites carry the following units:

1. A scanning system in the 0.5 to 0.7 micrometre band which relays direct images of cloud and background. At the average satellite height of 900km the picture width (swathwidth) is about 2100km with a resolution of about 2km.

2. A scanning system to provide data which can be recorded with an onboard recorder to allow global coverage. This unit has a slightly wider picture width of some 2400km together with a resolution of 1km. This is often used to obtain combined pictures of the polar seas.

3. A global coverage scanning infra-red radiometer operating in the 8 to 12 micrometre band and having a picture width of about 2600km and a resolution of 8km. This unit provides global and individual pictures of areas including the tropics, cloud heights and hurricane co-ordinates.

4. A scanning eight channel infra-red radiometer to sound the atmosphere in the 11.1 to 18.7 micrometre band. The picture width is 1000km with a resolution of about 2° square.

5. Finally there is a radiation monitoring system operating in the 0.15 to 90MeV range to provide data on radiation in space.

All data from METEOR 2 series satellites is processed at the Main Computer Centre and elsewhere and is then transmitted to the Hydrometeorological Centre and other local forecast centres. The next article will cover the development of the METEOR-3 series of wx satellites.

Sorry for not including Predictions this month - I have no more space!

BAND II DX

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

As I concluded this month's column on August 14, I looked back in my weather log and found that the last rain I recorded was a mere 0.01in on July 7 and that on the 11th the real hot spell began. In fact, apart from about 20 hours on July 27, Fig. 1, when the noon pressure fell to 29.9in (1012mb), my barograph remained high, averaging 30.2in (1022mb) for the 40-day period between July 6 and August 14 inclusive.

Our garden temperature hit the jackpot of 100°F at midday on August 3 and by 1600 the humidity reading was down to 46%. I believe that the combination of varying high pressure, humidity and temperature played a major role in creating a variety of short-lived tropospheric-openings which produced some interesting DX that readers found in Band II.

France to Scandinavia

In recent years, **Ian Kelly** (Reading) has edited the section No Static At All for the World DX Club's magazine *Contact* and his personal contribution for July includes hearing stations from various transmitters in Belgium (BRT3, RTBF1&3 and RFM), Denmark (DR2), East Germany (Berliner RF and Radio DDR2), West-Germany (BFBS, HR3&4, Radio RPR and WDR4), Holland (NOS R2), Norway (NRK2) and the UK (BBC Radios Leicester, Newcastle and York and ILRs BRMB (Sutton Coldfield), Buzz FM (Birmingham), LBC (London), Mercia FM (Coventry), Metro FM (Birmingham) and Viking FM (Hull). Ian operates either from home using a Philips D8188 with its own telescopic rod or, when on location, he operates an Audioline car radio coupled to the car-antenna.

From 2132 on July 11 to 0210 on the 12th, **Marc Henry** (Evesham), using a Roberts R25 portable, heard, in his log order, LBC, 2CR, Radio Solent, Power FM BBC Radio 1 from Rowridge, Wrotham and Tacolneston, Radio Kent, Invicta FM, Radio Bedfordshire, Melody Radio, Jazz FM, Northants Radio, Signal FM, 210 FM, Southern Sound, Radio Guernsey, Key 103, GLR London Greek/WNK, Capital FM, Mercury FM, Premier Radio, NOS-3 (Holland), GWR FM and Classics 98.

In Arbroath, **David Glenday** received NRK-2 from Norway on six spots between 95.1 and 99.9MHz and an unidentified Scandinavian programme (102.1MHz) on the 14th. As the atmospheric pressure began to fall from one of the highs of 30.5in (1032mb), I heard several French broadcast stations, above 100MHz, on my Plustron TVR5D, with its own rod antenna, while parked in Littlehampton during the afternoon of the 18th. The band was then quiet until another brief change in pressure occurred during the morning of the 19th and although, at 1115, my car was shielded by trees, near Ardingly, Sussex, I heard several very strong French stations between 100 and 102MHz, one referred to Canal Plus and another was running what sounded like a 'phone-in' programme.

On July 20, **Andrew Jackson** (Wirral) received a strong signal from Century Radio (Ireland) on 100.3MHz. While **George Garden** (Edinburgh) was on holiday in Sutherland, from the 22nd to the 25th, he kept watch on Band II with an "old Sony receiver" with its antenna in the horizontal plane. His efforts were rewarded when he heard pop music, fading at times, near 100MHz and his detective work revealed that it was Radio 1 FM coming from the Black Hill transmitter near Glasgow.

Simon Hamer (New Radnor) received stations from Denmark, (DR1,2&3), East Germany (Deutschlandsender) and West Germany (AFN, BFBS, DLF, NDR2, Radio Hamburg and WDR4) scattered throughout the band on the 12th and during a similar opening on August 4, he heard BBC Radios Guernsey, Hereford and Worcester, and Jersey, ILRs Melody Radio (London), South East Radio (wexford) and Radio Harmony (Coventry) and Ireland's RTE FM1,2 and 3 and their independants Capitol Radio (Dublin), Century Radio, Classics 98 FM and Horizon Radio (Bray).

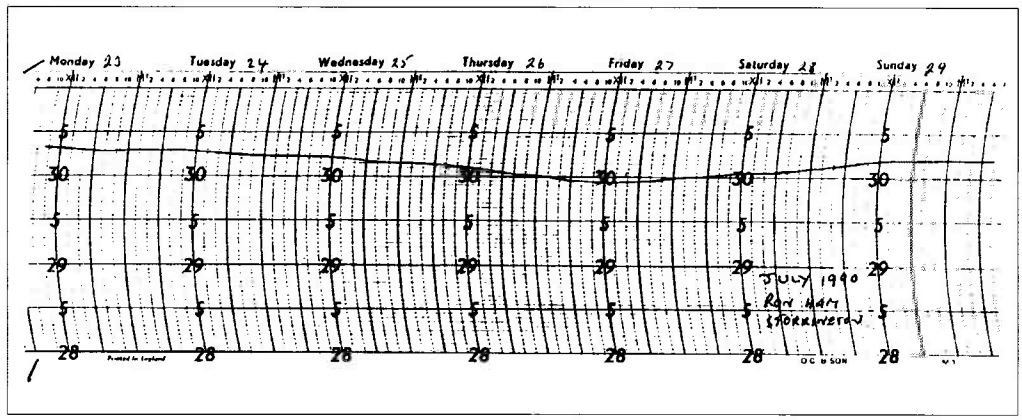
While the pressure was falling from 30.1in (1019mb) to 30.0in (1015mb) at 0830 on August 12, I heard about ten, Dutch I think, very strong broadcast signals between 87.7 and 102.2MHz and a good number of French stations during the evening.

Sporadic-E

My readers also had some Sporadic-E to contend with and although **Barry Bowman** (Prestwich) concentrated his main efforts on DXTV his following checks on Band II produced stations from Italy, 'Mount Cavo transmitter', in mono, on 87.6MHz, from 1920 to

SEEN & HEARD

Fig. 1.



1925 on July 13, Portugal on 101MHz at 1920 on the 25th and Spain, on 87.6 and 87.8MHz between 1800 and 1810 on the 31st. Ian Kelly received signals from Spain on July 5 and 14 and identified Antena 3 and Radio Minuto and possibly Radios Manathano and Quino.

I heard several Italian and/or Spanish stations between 87.5 and 100MHz during Sporadic-E openings from about 1900 to 2100 on July 25 and for much of the day on August 2. I also counted 60 very strong Eastern-European f.m. broadcast stations between 66 and 73MHz and heard the television sync-pulses for Chs. R3 (77.25MHz), R4 (85.25MHz) and R5 (93.25MHz), plus the sound for R3 and R4 on 83.75 and 91.75MHz respectively. The opening for most of the 2nd was toward the Mediterranean and Scandinavia but the range extended during the evening and around 1900 I counted 40 Eastern-Europeans between 66 and 73MHz and the sound and picture signals on Ch. R3. David Glenday also reports hearing Spanish f.m. at 1800 on August 1 and Italian and Spanish during the evening of the 2nd.

Simon Hamer heard many of the East-Europeans on July 14 and I counted nine of them during a mild Sporadic-E opening early on August 12.

Francis Hearne (Bristol) tells me that, as from July 15, Red Dragon Radio will be broadcasting on 97.4 and 103.2MHz. **Roy Patrick** (Mackworth) tells me that Century Radio, Ireland's commercial radio network have transmitters at Clermont Cairn (87.8MHz), Kippure (100.9MHz), Maghera (100.6MHz), Mount Leinster (100.4MHz), Mullaghanis (101.8MHz), Three Rock (100.3MHz) and Truskmore (100MHz). Our thanks to Roy for passing on the gen and to **Tony Nolan**, head of engineering at Century Radio, for sending him the list. In our August issue I published a picture of **Andy Mepham G4CBZ** in Spain on May 29th listening to BBC Radio 4 on 94MHz. This prompted a letter from Marc Henry who told me that on that day he received six Spanish stations between 98 and 103MHz. Thanks lads you have proved that Sporadic-E can work both ways at the same time. During June and the first week in July, **Dave Taskis** (Romford), using a Technics ST-G70L stereo tuner and an Omni FM2 horizontally stacked loop antenna in his loft, monitored the test transmissions from the new IBA station Melody Radio on 104.9MHz and sent his reports to the IBA Director of Radio, 70 Brompton Road, London SW3. In reply he received a 60-odd page glossy booklet called *Factfile* and a few days later came a QSL card and another booklet entitled *Transmitting Stations* from IBA Engineering at Crawley Court, Winchester, Hants SO21 2QA.

TELEVISION

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

Band I

"Sadly there's not much Sporadic-E activity to report - a bad year compared with last year," remarked **David Glenday** (Arbroath) on July 31. I agree, however, during those events that did occur in July David received captions, programmes, logos and test-cards from stations in Austria (ORF1), Czechoslovakia (CST, Denik), Hungary (MTV1), Italy (Raiuno), Spain (TVE1&2), Sweden (SVT1 Kanal1 Sverige), Switzerland and Yugoslavia (JRT TV Slovenija) and an unidentified caption Dokumentarni Program. At 1645 on August 1 he saw the *Home to Roost* programme with German titles at the end and *Falscher Verdacht* title on Ch. E2 and later added Austria, Italy and Spain. David logged RAI and TVE again at 2225 on the 4th.

Ern Warwick (Plymouth) received pictures from France during the evening of July 18 and between 1900 and 2045 on July 25, I received pictures, often in colour and sometimes with sound, plus typical Sporadic-E type fading, from Spain on Chs. E2 (v48.25/s53.75MHz), E3 (v55.25/s60.75MHz) and E4 (v57.25/s63.75MHz). I also saw the captions Sectas, Telediario and TVE. This particular opening was all in one direction because there was no sign of signals from the eastern stations who usually crowd the 'R' channels throughout such an event.

Bob Brooks (Great Sutton), using a rotatable antenna for Bands I and III, Fig. 1, observed Sporadic-E openings on July 18, 19, 21, 22, 24, 25, 26, 27 and 28 and on each of the first 6 days of August. Among the goodies he saw were cartoons from Iceland (RUV), ballet and films from Italy, a film about the Queen Mother from Norway (NRK) plus their regional test-cards Bagn and Kongsberg and a Good Night caption from Poland (TVP), Fig. 2. He also received a test-card from Portugal (RTP), adverts, Breakfast TV, cartoons, various films, such programmes as show jumping, *The Muppets* and *Under the Sea*, news and weather and the captions TVE2 Andalusia, Madrid and Telediario from Spain, test-card and teletext from Switzerland (PTT-SRG1) and news and weather from the USSR.

John Woodcock (Basingstoke) reported "very disturbed conditions" on July 26 when he received pictures from Spain in the morning and heard strong Arabic sound in the afternoon. He logged Spain again on the 31st, Italy and Spain on August 1, test-cards from Italy, Norway, Portugal, Spain and the USSR on August 2 and Norway on the 4th.

There was an intense Sporadic-E opening from about 1800 on August 1 to mid-evening on the 2nd, during which time I periodically received strong pictures on all channels in Band I, plus picture and sound on Ch. R3 (77.25MHz) and, using my ex-military R216, heard sync-pulses on Chs. R4 (85.25MHz) and R5 (93,25MHz), plus R4 sound on 91.75MHz. At one time the Norwegian regional test-cards for Bagn, Hemenes and Mulhus were fighting equally strong programmes of show jumping (often in colour), cartoons and a pianist from Italy or Spain.

Barry Bowman (Prestwich), using a D100 De-Luxe converter fed by his CB27 antenna, watched sport from Spain on July 18, an American police film, cycling and tennis from Spain on the 21st, a Julio Iglesias concert from Italy and adverts and cartoons from Spain with interference from Yugoslavia (JRT) on the 22nd and an American drama, adverts, the captions Telediario and Vierness 21.38h, an episode of *Miami Vice*, pop music, news and weather from Spain among the openings on days 22, 25, 26 and 31.

As usual **Simon Hamer** (New Radnor) did very well for DX during the openings between July 14 and August 4 and in addition to the countries already mentioned he Logged Albania (RTSH), Greece (EPT), Jordan (JTV), Morocco (RTM), Romania (TVRL), Switzerland (+PTT/SSR) and a rolling frame 525-line picture on Ch. A2 (55.25MHz) from an unidentified source. He also saw the news captions Televise Revista and Tagesschau and a programme from Denmark about Scandinavian Airlines. Finally for this month's report, I received a strong test card from Norway (Melhus) at 0840 on August 12 on Ch. E2 and a weak picture on Ch. E4.

Picture Archives

Looking back is always fun especially when there is a long period without a disturbance and in particular after telling a newcomer how interesting DXTV can be. At 1030, last November 15, Bob Brooks was tuning through Band I and received one of those smeary pictures, possibly Malaysia, Fig. 3, via the 'F2' region of the ionosphere and in December he logged captions from Estonia and the USSR, Figs. 4 and 5 respectively and a picture from Scandinavia, Fig. 6, during short lived Sporadic-E openings. Programmes from Malaysia were also received last November 2, Fig. 7 and January 3, Fig. 8, by **Lt. Col. Rana Roy** (Meerut, India) via 'F2' disturbances. David Glenday's tropo-archives for the period May 20 to July 20, 1989, produced u.h.f. band pictures from Germany of an 'RTL' mini-logo top left in Fig. 9, the ARD-1 clock, Fig. 10, a NDR-3 test-card, Fig. 11 and Lothar Erdmann, Fig. 12, a DFF-2 announcer.

Tropospheric

C. Palmer (Hayes) has been TVDXing for a couple of years on the u.h.f. bands and currently uses a a couple of Antiference XG21 wide-band antennas, a mast-head amplifier and a rotator. To date he has received pictures from Belgium, France and Holland and, with this set up, he can normally watch programmes from Crystal Palace, Hannington, Midhurst, Oxford with interference and Sandy Heath. Under DX conditions he has logged Belmont, Caradon Hill, Mendip, Pontop Pike, Sudbury, Wenvoe and Winter Hill.

"Its been a month of two distinct halves for tropospheric. First half there was almost zilch. Second half there's been scarcely a day without something foreign on the screen!", wrote David Glenday on July 31. On the 14th, Dave had a visit from George Garden and a couple of first-class DXers revelled in u.h.f. signals from Belgium (BRT1&2, RTBF and 'TELE21'), Holland (NED1,2&3) and Germany (ARD1, DFF2, HR3,NDR3, SAT1 and ZDF). Dave added Denmark (TV2) on the 15th, 18th, 19th, 24th and 31st, Crystal Palace and Tacolneston on the 14th, France on the 15th, Germany, a slide showing Schleswig-Holstein on the 20th, Germany's 'WEST-3' and WDR-3 on the 24th and their 'DBP' and '3SAT' logos on the 31st. On several days he also logged pictures from Europe and Scandinavia in Band III and, during the first 3 days of August, he logged u.h.f. transmissions from Belgium (BRT1&2 and Canal Plus Belgique), Denmark (DR and TV2), a super haul from Germany (ARD1, BFBS-SSVC, EINS PLUS, NDR3, RB3, RTL+, SAT1, SFB3, SWF3, TELE5, ZDF and 3SAT) and Holland (NED1,2 &3). "Also

SEEN & HEARD

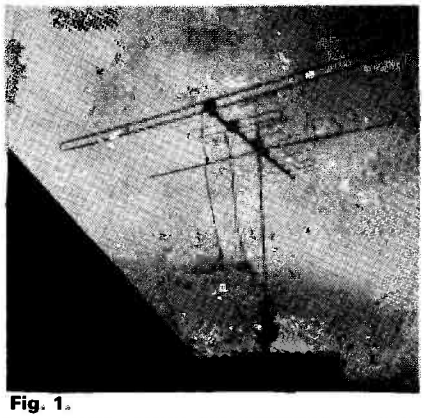


Fig. 1.

Fig. 2: Poland.

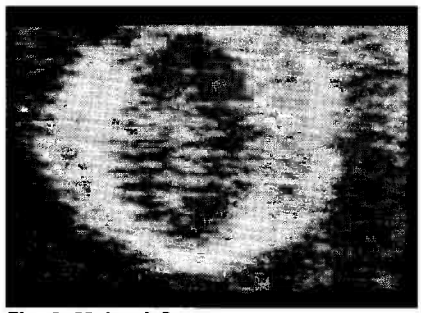


Fig. 3: Malaysia?

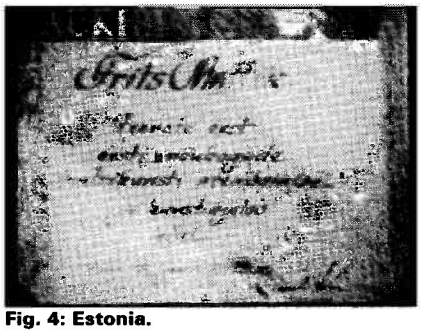


Fig. 4: Estonia.

Fig. 5: USSR.

Fig. 6: Scandanavia.

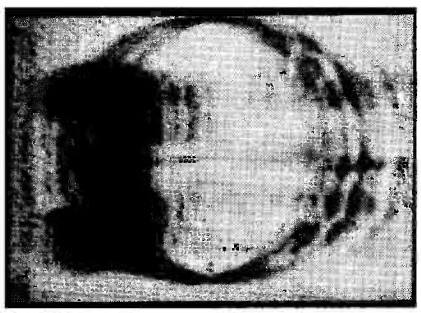


Fig. 7: Malaysia.

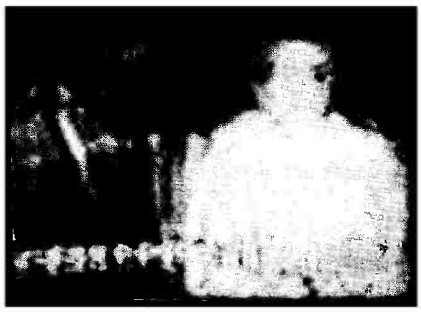


Fig. 8: Malaysia.

Fig. 9: Germany.

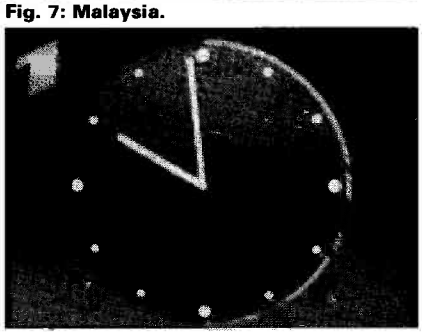


Fig. 10: ARD-1.

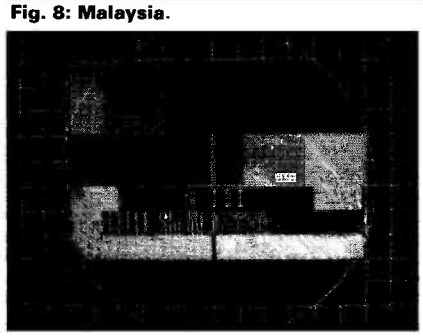


Fig. 11: NDR-3 Test Card.

Fig. 12: DFF-2.

during the evenings of 2nd & 3rd August, the American Forces Network from Soesterberg, on Ch. A80 [867.25MHz] was received at phenomenal strength," said David. This opening ended suddenly at 1100 on the 3rd as a cold front, bringing rain, passed over David's area.

Simon Hamer received Ireland's RTE on most of their channels in Bands I and III on July 20 and Spain's RTVE-1, with aircraft flutter, on Ch. E7 on the 26th.

"Many of the semi-local stations which are usually watchable have been overpowered by co-channel interference," reports **Andrew Jackson** (Wirral) for the period July 14 to August 9. At 2230 on the 14th, he noticed the pressure had dropped and immediately tuned through the u.h.f. band and found reasonable pictures on several channels from France (Antenne 2 and TF1) and Holland (NED-3). Andrew also checked Band III and received strong pictures from Canal+ on Ch. L5 (Lille) and weaker signals from DiJon and Lyon on Chs. L9 and 10 respectively. He logged Belgium (BRT TV1) on the 18th and Ireland (RTE1 and Network 2) on days 19, 20 and 21 and August 1.

I received negative pictures from France on Ch. L9 and Chs. 21 and 27 in the u.h.f. band, using my Plustron TVR5D, with its own rod antenna, in Littlehampton, at 1333 on July 18. All was quiet until a slight 'blip' in the very high pressure accompanied the scorching weather on the 19th and, true to form, at 1115, even though my antenna was screened because my car was parked under trees I received strong pictures from Canal+ in Band III. As the hot weather and high pressure continued, there were several short tropo-openings and the BBC weather programme at 2020 on the 22nd, warned of more interference to television pictures.

As he spoke and for the following few hours the patterning and sometimes extensive ghosting appeared to 'jump' between the u.h.f. channels.

"On Friday 27 July after a long week of hot sunshine, the high pressure of 1025mb [30.25in] was starting to move eastwards towards Europe and decline," wrote **George Garden** (Edinburgh), at the time on holiday in Brora, Sutherland. He drove to Tarbat Ness lighthouse, for a spot of DXing, located at the easternmost tip of the peninsula with an unobstructed view to the sea all around on Dornoch Firth. George used a log periodic antenna, horizontally polarised, on the roof of his car and in addition to 'local' u.h.f. television signals he saw a documentry film, made in Germany, on Denmark's TV2 and weak black and white pictures from Durris on Ch. 25. By turning the antenna vertical he received IBA Grampian from Rosehearty, near Peterhead, on Ch. 41.

John Woodcock received negative, pictures from France (Canal+) on August 2, 3 & 4, Bob Brooks watched a film and *allo allo* from Canal+ on the 2nd and 5th and I saw negative pictures in the v.h.f. and u.h.f. bands on my Plustron, while parked at Bosham, Sussex, on August 9.

I logged a test card from Belgium (BRT) on Ch. E10 and a few weak pictures from Canal+ on Chs. L5 and 9 at 0850 on August 12.

SEEN & HEARD

LONG MEDIUM & SHORT

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

It is worth remembering that good reception of the news bulletins broadcast direct from many areas of the world can often be obtained with a small and inexpensive portable short wave receiver.

Because the propagation conditions vary throughout the day and seasonally, it is necessary to choose a suitable band and time for the best reception from a particular area. The information in LM&S is based on recent reception, so it may be used as a guide.

Long Wave DX

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

Experiments are being conducted by RTE/RTL to determine the level of co-channel interference which would arise after dark on 252kHz if the transmission times of Atlantic 252 (500KW) were greatly extended. The frequency is allocated to Radiodiffusion-Television Algerienne, who radiate their Channel 3 programme in French between 0458 and 0005UTC via a 1500/750kW* transmitter in Tipiza (*750kW 1800-0600); also to Oy Ylesiradio AB in Finland, who radiate their domestic Networks 1 & 2 via a 200kW transmitter in Lahti. The signal levels noted in the latest reports suggest that the power of Atlantic 252 is being reduced during the tests, which take place between 1900 and 0100UTC. No doubt RTE/RTL will welcome reception reports from listeners in Europe, North Africa and Scandinavia, that goes for LM&S too!

MW Transatlantic DX

In addition to the stations noted in the chart, **Tim Shirley** (Bristol) heard for the first time three low power stations in Brazil, S.America: R.Educ Rural Campo Grande MS (ZYK595) on 570 at 0200; R.Regional Irece, BA (ZYH481) on 540 at 0230; also R.Nova Sumare, SP (ZYK734) on 540 at 0330. All are subject to confirmation by QSL.

The extensive report compiled by **Derek Taylor** in Preston makes interesting reading. During a period of exceptional conditions in June, Derek logged 46 stations in S.America, many of which he had not heard before. Most run low power, some only 250W! So far he has received QSLs from R.Melodia, Peru (OAX6X), which radiates 10kW on 1220 and R.Sertao Central, Brazil (ZYH621), which runs just 0.25kW on 1570. In addition he logged 7 stations in C.America and now awaits their QSL. He also heard for the first time two stations in the USA on 1470, namely WSRO in Marlboro, MA and WKMF in Flint, MI, which has just been verified by QSL.

Other MW DX

A caravan holiday on the coast near Aberystwyth enabled **Mike Evans** to search the band at all hours of the night. Using a home-built Sooper Loop ahead of his receiver, he picked up the broadcasts from Istanbul, Turkey on 1107 (1200kW) at 0453, a distance of about 2072km. Several broadcasts from stations in N.Africa and many from stations in Europe were also heard, see chart. At his home in Buckhurst Hill, Mike spends much of his spare time building 'Sooper Loops' for other DXers, if you would like to know more, please send your request with an s.a.e. to me initially.

The broadcasts from Torshaven, Faroe Islands on 531 are seldom mentioned, but two DXers logged them this time. **Tim Shirley** heard them at 0100 and Simon Hamer rated them as SIO232 at 0615.

MW Local Radio DX

Whilst checking the band in Largs, Scotland around 0200, **John Stevens** picked up the sky wave signals from Spectrum Radio, London on both 558 and 990kHz. He also received Airport Information Radio from Heathrow or Gatwick on 1584 via sky wave paths, but found it difficult to obtain a definite ident due to interference from foreign stations. In Derby, **Roy Patrick** was able to hear the broadcasts from BBC Radio Guernsey on 1116 for the first time, as the 1.2kW transmitter in Burnaston, which radiates BBC Radio Derby on 1116, was off the air.

During daylight, the broadcasts from IOW Radio on 1242 have been received in some distant places, see chart. After dark, their sky wave signals reach many areas of the UK. **Simon Holland** has been listening to their broadcasts in Douglas, IOM and **Eddie McKeown** rated their signal as 24122 at 2200 in Co.Down, N.Ireland! Writing from Wootton, IOW, **George Millmore** says, "I see that IOW Radio is spreading itself about a bit, however I am sorry to say that it is not my favourite station. Except for local news, it is just another 'pop' station. I much prefer BBC Radio Solent."

Sunrise Radio in W.London 1413 was also mentioned in the reports this time. In E. London, Phil Townsend found their signal to be buried in the noise during daylight, but good reception of their broadcasts was noted in Morden by **Sheila Hughes**, who quoted 44444 at 1030.

Short Wave DX

As expected, the ionosphere has been frequently disturbed by the effects of solar events. Very high levels of solar noise have been evident in the h.f. bands during some days, which has rendered the reception of broadcasts from some areas difficult or even impossible. At other times the broadcasts have been clearly received and many potent signals have reached our shores.

In the **25MHz (11m)** band the experimental upper sideband (u.s.b.) transmissions from Radio HCJB Quito, Ecuador on 25.950 (Cz, Ger, Fr, Sw, Da, Norw, Eng to Europe 1800-2200) have been attracting the attention of many listeners in the UK.

Long Wave DX Chart

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

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

DXers:-
(A) Ted Agombar, Norwich.
(B) Kenneth Buck, Edinburgh.
(C) Scott Caldwell, Warrington.
(D) Matthew Clarke, Birmingham.
(E) Simon Hamer, New Radnor.
(F) Marc Henry, Evesham.
(G) Simon Holland, Douglas, I.O.M.
(H) Sheila Hughes, Morden.
(I) Mark Mahabir, Leicester.
(J) Eddie McKeown, County Down, N.Ireland.
(K) George Millmore, Wootton, I.O.W.
(L) Ike Odoom, while in Aberdeen.
(M) Fred Pallant, Storrington.
(N) Roy Patrick, Derby.
(O) Tim Shirley, Bristol.
(P) John Stevens, Largs.
(Q) Paul Strickland, Wokingham.
(R) Darran Taplin, Brenchley.
(S) Phil Townsend, London.
(T) Neil Wheatley, Lytham St. Annes.

Good reception of speech was reported by those with a receiver capable of u.s.b. reception, but most experienced difficulty when demodulating musical items. To obtain the best results it is necessary to phase-lock the carrier insertion oscillator (c.i.o.) in the receiver to the transmitted pilot carrier. At present very few receivers meet that requirement, but the mass production of suitable receivers at low cost should commence in the near future.

It seems that listeners who own a Lowe HF-125 or HF-225 receiver can use the synchronous detector option to good effect with the HCJB signal. Writing from Edinburgh, **Kenneth Buck** says, "The synchronous detector of the HF-225 locked onto the signal and sound quality was every bit as good as a normal a.m. signal. I compared the synchronous detector with the u.s.b. mode and whilst the latter was fine for speech, music sounded very unpleasant". Good reception of the HCJB signal was also noted in Canada by **Alan Roberts** while using his new Lowe HF-225 receiver in Quebec. Whilst checking the band he found that Radio Norway Int, Oslo are also using u.s.b. on 25.730, but the level of their pilot carrier is much greater, it may even be a full carrier.

Some of the broadcasts from Radio Australia have been reaching our shores in the **21MHz (13m)** band. Their transmission to C.Pacific areas via Shepparton 21.740 (Eng 2200-0730) was rated as 35533 at 2200 by **David Edwardson** in Wallsend; to C.Asia via Darwin 21.525 (Eng 0100-0900) as 35444 at 0511 by **Jim Cash** in Swanwick; to S.Asia via Carnarvon 21.775 (Eng 0100-1100) as SIO455 at 0930 by Tim Shirley; to E.Asia via Darwin 21.825 (Eng 1100-1230) as 34333 at 1104 by **Leo Barr** in Sunderland.

During some mornings potent signals have reached the UK direct from Radio Japan, Yamata on 21.500 (Sw, It, Fr, Eng, Jap to Europe 0530-0830). While in Borth, **Kenneth Reece** rated them as 44444 during their news bulletin in English at 0700. Later, their broadcasts are relayed to Europe via Moyabi, Gabon on 21.700 (Eng, Jap 1500-1700). **Alan Smith** (Northampton) rated them as 43333 at 1527. Some of the many other broadcasts intended for listeners in Europe stem from UAE Radio Dubai 21.605 (Ar, Eng 0600-1645), rated as 45444 at 1030 by **Tom Parrotte** in Weston-Super-Mare; Voice of the UAE in Abu Dhabi 21.515 (Ar 0600-1600), SIO444 at 1507 by **Ted Walden-Vincent** in Gt.Yarmouth; RCI via Sackville, E.Canada 21.545 (Russ, Uk, Fr, Eng, Pol, Ger 1330-1700), 44454 at 1620 by **Ted Gould** in London; WHRI South Bend, USA 21.840 (Eng, Sp, Yu 1500-1700), 23222 at 1655 by Eddie McKeown; RCI via Sackville, E.Canada 21.675 (Hung, Cz, Uk, Russ, Pol, Eng, Fr 1700-2100), 34553 at 1945 by **John Parry** in Northwich; WYFR via Okeechobee, Florida 21.615 (Eng, Ger, It 1600-2145), 33322 at 2050 by **Dave Taskis** in Romford; Radio HCJB Quito, Ecuador 21.470 (Cz, Ger, Sw, Eng, Norw, Da,

SEEN & HEARD

Fr 1800-2200), SIO455 at 2150 by **Neil Wheatley** in Lytham St.Annes.

Some of the many broadcasts to other areas were noted in the logs: Radio Moscow, USSR 21.725 (Eng to S.Asia 0600-1100), rated 55555 at 0600 by **Ted Agombar** in Norwich; Vatican Radio, Rome 21.650 (Eng, Port, Fr to Africa 0500-0655), SIO555 at 0630 by **Alf Gray** in Birmingham; Radio Finland via Pori 21.550 (Fin, Sw, Eng to SE Asia 0700-0825), 45544 at 0805 by **Ron Damp** in Worthing; AIR via Aligarh, India 21.735 (Eng to E.Asia 1000-1100), 34443 at 1011 by **Rhoderick Illman** in Thumrait, Oman; Radio Austria Int. Vienna 21.490 (Ger, Sp, Eng, Fr to W.Africa 1300-1700), 44545 at 1345 by George Millmore; RFI via Montsinery, French Guiana 21.645 (Sp, Fr to C.America 1300-1700), SIO444 at 1455 by **Thomas Barnett** in Slough; Radio DW via Wertachtal, W.Germany 21.600 (Eng, Swa, Fr to E/C.Africa 1500-1750), 54554 at 1508 by **Andy Cadier** in Folkestone; Radio Norway via Sveio 21.705 (Norw, Eng to USA, C.America 1600-1630), 44344 at 1625 by **Chris Shorten** in Norwich; WSHB Cypress Creek, USA 21.780 (Eng, Fr to E.USA 1800-1955), SIO555 at 1802 by Kenneth Buck; WCSN Scotts Corner, Maine 21.640 (Eng to E/N.Africa 1600-1955), 45434 at 1947 by **Darran Taplin** in Brenchley.

The **17MHz (16m)** broadcasts from Radio New Zealand Int., Wellington have been attracting the attention of many UK Dxers. Their transmission to Pacific areas on 17.675 (Eng 2205-0710 Mon-Fri, 0000-0645 Sat, 0200-0800 Sun) was rated 43433 at 0715 by Ron Damp. Potent signals from Radio Australia also reached the UK during some days. Their transmission to SE Asia via Shepparton 17.715 (Eng 2200-0000) was rated a remarkable 55544 at 2200 by Jim Cash; to E/C.Asia via Carnarvon 17.630 (Eng, Chin 0000-1100) as SIO444 at 0020 by Neil Wheatley; to C.Pacific areas, W.USA via Shepparton 17.795 (Eng, Fr 2100-0830) as 24333 at 0550 by Kenneth Reece.

Quite a number of the broadcasts to areas outside Europe were noted in the logs from UK Dxers: BBC via Limassol, Cyprus 17.740 (Eng to N.Africa 0500-0730), 34553 at 0615 by John Parry; Radio Japan, Yamata 17.765 (Chin, Jap, Eng to E.Asia 0300-0900), 55444 at 0710 by Ted Agombar; Radio Beijing, China 17.710 (Eng to Australia 0830-1035), SIO323 at 0859 by **Philip Rambaut** in Macclesfield; AIR via Delhi, India 17.387 (Eng to E.Asia 1000-1100), 44344 at 1050 by Chris Shorten; Radio Tashkent, USSR 17.745 (Eng, Ur, Hi to SE Asia 1200-1500), 43433 at 1330 by Sheila Hughes; Africa No.1, Gabon 17.630 (Fr, Eng to W.Africa 0700-1600), 43333 at 1508 by Tom Parrotte; Radio RSA Johannesburg, S.Africa 17.735 (Eng to Africa 1400-1600), SIO455 at 1545 by Kenneth Buck; Vatican Radio, Rome 17.710 (Am, Fr, Eng to E.Africa 1630-1755), 54343 at 1735 by **John Sadler** in Bishops Stortford; Voice of Israel, Jerusalem 17.630 (Eng, Fr, Yid to S.America, Africa 2100-2225), SIO333 at 2145 by **Francis Hearne** in Bristol; VOA via Greenville, USA 17.785 (Eng to W.Africa 1600-2200), 55544 at 2000 by Andy Cadier; WSHB Cypress Creek, USA 17.555 (Eng, Sp to C/S.America 2000-2355), 34333 at 2036 by Dave Taskis; Voice of Turkey, Ankara 17.880 (Eng, Tur to SE Asia 2200-0355), 32442 at 2205 by **Darren Beasley** in Bridgwater.

Surprisingly few of the many broadcasts to Europe were mentioned: Radio Pakistan, Islamabad 17.555 (Ur, Eng 0715-1120), 43343 at 1114 by Alan Smith; RCI via Sackville, Canada 17.820 (Eng 1415-1430), 54554 at 1415 by **Robin Clark** in Plymouth; Radio Moscow, USSR 17.695 (Eng 1600-2100), 55555 at 1955 by **Roy Spencer** in Coventry; RNE via Noblejas, Spain 17.730 (Sp 0930-2145), SIO333 at 2034 by Ted Walden-Vincent; Radio HCJB Quito, Ecuador 17.790 (Cz, Ger, Eng, Sw, Norw, Da, Fr, Sp 1700-2230), 54444 at 2000 by **John Nash** in Brighton; RCI via Sackville, Canada 17.875 (Fr, Eng 2030-2200), 54555 at 2229 by Ted Gould.

The **15MHz (19m)** broadcasts to Pacific areas from Radio New Zealand on 15.485 (Eng 1745-2205 Mon-Fri, 1845-2205 Sun) have been reaching the UK quite well. Listening at 1900, Simon Hamer rated their transmission as SIO333. Some of Radio Australia's broadcasts have also been received here. Their transmission to S.Pacific areas via Shepparton 15.240 (Eng 2200-0830) was rated 45554 at 0618 by John Parry; to C.Asia via Carnarvon 15.465 (Eng 1100-1330) as 22322 at 1200 by Darren Beasley; to SE Asia via Shepparton 15.465 (Eng 2100-0730) as 45444 at 2100 by John Nash; to C/W.Pacific areas via Shepparton 15.560 (Eng 0040-0600) as SIO333 at 0400 by Neil Wheatley.

Throughout the day there are many 19m broadcasts to Europe. Those noted stemmed from Radio HCJB Quito, Ecuador 15.270 (Cz, Sw, Norw, Da, Ger, Eng 0500-0830), rated

Local DX Chart

Freq kHz	Station	ILR BBC	Power (kW)	Dxer	Freq kHz	Station	ILR BBC	Power (kW)	Dxer
558	Spectrum R	I	7.50	C,D,F,J,N,Q,T,V,W*,X,Y,2	1161	Viking R.(C.Gold)	I	0.35	I*,2
585	R.Solway	B	2.00	F,I*,S,U	1170	Ocean Sd.(C.Gold)	I	0.12	Q
603	Invicta Snd(Coast)	I	0.10	N,Q,X,Y,2	1170	R.Orwell	I	0.282	
603	R.Gloucester	B	0.10	H,D,Q,V*,2	1170	Signal	R	10.20	M
630	R.Bedfordshire	B	0.20	A,I*,O,Q,U,X,Y,Z,2	1170	Swansea Sound	I	0.58	I*
630	R.Cornwall	B	2.00	I*,Q,U	1170	TFM Radio (GNR)	I	0.32	S
657	R.Clwyd	B	2.00	E*,I*,Q,X,2	1242	Invicta Snd(Coast)	I	0.32	I*,N,Y,2
666	DevonAir	R	10.34	I*,O,Q,X,2	1242	Isle of Wight	R	10.50	F,G,I*,M*,O*,P*,Q, R,S*,U,V*,2
666	R.York	B	0.80	M,S,2					
729	BBC Essex	B	0.20	A,F,O,Q,X,Y,2	1251	Saxon	R	10.76	I,Y,2
738	Hereford/Worcester	B	0.037	H,I,K,O,X,2	1260	GWR (Brunel R.)	I	1.60	O,Q,2
756	R.Cumbria	B	1.00	S	1260	Leicester (GEM-AM)	I	0.29	Y,Z,2
756	R.Shropshire	B	0.63	H,I,O,Q,2	1260	Marcher Sound	I	0.64	I
765	BBC Essex	B	0.50	A,F,H,I,O,X,Y,2	1260	R.York	B	0.50	S
774	R.Kent	B	0.70	A,N,Q,X,Y,2	1305	R.Hallam (C.Gold)	I	0.152	
774	R.Leeds	B	0.50	E	1305	Red Dragon	R	10.20	I,Q,2
774	Severn Sound	I	0.14	I,Q	1323	R.Bristol	B	0.63	F,I,2
792	Chiltern R	I	0.27	F,O,Q,X,Y,Z,2	1323	Southern Sound	I	0.50	I,N,Q,Y,2
792	R.Foyle	B	1.00	I,M	1332	Hereward R	I	0.60	F,Y,Z,2
801	R.Devon	B	2.00	F,I,O,P,2	1332	Wiltshire Sound	B	0.30	I,Q
819	Hereford/Worcester	B	0.037	I,O,Q,2	1359	Essex R.(Breeze)	I	0.28	Y,2
828	Chiltern Radio	I	0.20	O,X,Y,Z,2	1359	Mercia Snd(Xtra-AM)	I	0.27	I*,Q,2
828	R.Aire	I	0.12	M	1359	R.Solent	B	0.85	K*,Q
828	R.WM	B	0.20	Q,2	1368	R.Lincolnshire	B	2.00	Q,1,2
8282	CR	I	0.27	L,Q	1368	R.Sussex	B	0.50	N*,Q,Y,2
837	R.Furness	B	1.00	I	1413	Sunrise	R	I	?N,Y
837	R.Leicester	B	0.45	D,F*,L,O,Q,X,Y,Z,2	1431	Essex R.(Breeze)	I	0.35	I,Y,2
855	R.Devon	B	1.00	O,Q	1431	Radio 2	1010.14	I,Q	
855	R.Lancashire	B	1.50	E*,I,2	1449	R.Cambridgeshire	B	0.15	F,2
855	R.Norfolk	B	1.50	N,O,Q,S,X,1,2	1458	GLR	B	50.00	L*,Q,Z,2
873	R.Norfolk	B	0.30	N,Q,X,Y,2	1458	GMR	B	5.00	I
936	GWR (Brunel R.)	I	0.18	O,Q	1458	R.Cumbria	B	0.50	I,P
945	R.Trent (GEM-AM)	I	0.20	O,Q,S,X,Z,2	1458	R.Devon	B	2.00	K,O,Q
954	DevonAir	R	10.32	Q,Q,X	1458	R.Newcastle	B	2.	
954	R.Wyvern	I	0.16	I*,2	1458	Radio WM	B	5.00	L*,Q,2
990	Beacon(Nice & Easy)	I	0.09	O	1475	City Sound (1st Gold)	I	0.50	L*,I,N*,Q,2
990	R.Aberdeen	B	1.00	I,S	1485	R. Humberside	B	1.00	F,1,2
990	R.Devon	B	1.00	G,O,Q,V*	1485	R. Merseyside	B	1.20	I,M,W
990	Spectrum	I		?,D,J,R,W*,X,Y,2	1485	R.Oxford	B	0.50	O,Q,V,2
999	R.Solent	B	1.00	I,N,Q	1485	R.Sussex	B	1.00	N,Q
999	R.Trent (GEM-AM)	I	0.25	O,Z,2	1503	R.Stoke-on-Trent	B	1.00	E*,I*,M,O,Q,S,2
999	Red Rose	RI	0.80	E*,U	1521	R. Mercury	I	0.64	K,N*,Q,Y,2
1026	Downtown	RI	1.70	I*	1521	R. Nottingham	B	0.50	O,2
1026	R.Cambridgeshire	B	0.50	A,N,O,Y,2	1530	KCBC Kettering	I	?	O,V,Z,2
1026	R.Jersey	B	1.00	N,Q,U	1530	Pennine R (C. Gold)	I	0.74	M,S*
1035	Northsound Radio	I	0.78	S,1	1530	R.Essex	B	0.15	O,Y,2
1035	R.Kent	B	0.50	N,Q,Y,2	1530	R. Wyvern	I	0.52	I,Q
1035	West Sound	I	0.32	A	1548	Capital R.(Gold)	I	97.50	M*,N*,Q,2
1107	Moray Firth	RI	1.50	S	1548	R.Bristol	B	5.00	I,K,Q
1107	R.Northampton	B	0.50	A,N,O,Q,Z,2	1548	R. City (City Talk)	I	4.40	I,M
1116	R.Derby	B	1.20	I*,L,M,Q,2	1548	R. Cleveland	B	1.00	S
1116	R.Guernsey	B	0.50	L,Q,T,2	1548	R.Forth (Max AM)	I	2.20	S,W
1152	BRMB (Xtra-AM)	I	3.00	O	1548	R.Hallam (C. Gold)	I	0.74	2
1152	LBC (L.Talkback R)	I	23.50	N,Q,U	1557	Chiltern R.	I	0.76	B*,Q,Z,2
1152	Metro R. (GNR)	I	1.80	S,U*	1557	Ocean Sound (C. Gold)	I	0.50	M*,Q
1152	Piccadilly	RI	1.50	E*	1557	R. Lancashire	B	0.25	I,M
1152	R.Broadland	I	0.83	S*,1,2	1584	Gatwick	I	?	D,N,V,W*,X
1152	R.Clyde (Clyde 2)	I	3.60	S*	1584	Heathrow	I	?	K,W*,X,Y,2
1161	GWR (Brunel R.)	I	0.16	O	1584	R. Nottingham	B	1.00	I,N,O,S,2
1161	R.Bedfordshire	B	0.10	Z,2	1584	R.Shropshire	B	0.50	K,M,o
1161	R.Sussex	B	1.00	N,Q	1584	R. Tay	I	0.21	M,S,W
1161	R.Tay	I	1.40	S	1602	R. Kent	B	0.25	F,K,M*,N,Q,Y,2

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

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SEEN & HEARD

44444 at 0800 by Sheila Hughes; RFI via Issoudun, France 15.195 (Fr, Eng, Russ 1000-1400), 55454 at 1230 by **Ike Odoom** in Glasgow; RCI Montreal via Daventry, UK 15.325 (Russ, Uk, Fr, Eng, Pol 1330-1630), SIO444 at 1415 by Alf Gray; Radio Korea, Seoul 15.575 (Ar, It, Eng, Sp, Port, Ger 1645-2300), 53433 at 1820 by **Jim Cash** in Swanwick; VOA via Tanger, Morocco 15.205 (Eng 1700-2200), heard at 1830 by Tim Shirley; Voice of Vietnam, Hanoi 15.010 (Eng, Russ, Viet, Sp 1600-2130), 32323 at 2120 by Ted Gould; RNE via Noblejas, Spain 15.375 (Eng, Fr to Africa 1900-2057), 43333 at 1921 by Ted Agombar; Radio Sophia, Bulgaria 15.330 (Eng, It, Ger, Fr 1830-0025), SIO444 at 1950 by Ted Walden-Vincent; WWCR Nashville, USA 15.690 (Eng 1200-0100), 23343 at 1950 by Andy Cadier; Radio Yugoslavia, Belgrade 15.105 (Eng 2100-2145), 43444 at 2135 by Leo Barr; RAE Buenos Aires, Argentina 15.345 (Ar, Eng, Ger, Fr, It 1800-2300), 22222 at 2200 by Tom Parrotte.

A variety of languages are used during broadcasts to other areas, but they often include segments in English. Those noted stemmed from UAE Radio Dubai 15.435 (Ar, Eng to USA 0230-0400), noted as 25532 at 0335 by David Edwardson; BBC via Mahe, Seychelles 15.420 (Eng, Swa to E.Africa 0300-1215), 34333 at 0634 by Kenneth Reece; WYFR via Okeechobee, Florida 15.566 (Eng to W.Africa 0500-0800), 34233 at 0745 by Eddie McKeown; Radio Romania Int., Bucharest 15.250 (Eng, Fa to S.Asia, Middle East 1500-1600), 32423 at 1505 by Darran Taplin; Radio Beijing, China 15.165 (Eng to S.Asia 1400-1555), 43343 at 1520 by Alan Smith; Radio Romania Int., Bucharest 15.340 (Eng, Port to Africa 1700-1826), SIO444 at 1700 by John Sadler; BBC via Kranji, Singapore 15.310 (Eng to S.Asia 1615-1830), SIO422 at 1705 by Philip Rambaut; Radio RSA Johannesburg, S.Africa 15.270 (Eng to E.Africa, Middle East 1800-1900), 54344 at 1800 by Chris Shorten; SLBC Colombo, Sri Lanka 15.120 (Eng to ?), SIO343 at 1830 by Simon Hamer; Radio Nederlands via Talata Volon, Madagascar 15.560 (Eng to S/C.Africa 1830-1925), 32333 at 1833 by Rhoderick Illman (Oman); VOA via Monrovia, Liberia 15.600 (Eng to C/S.Africa 1600-2200), SIO343 at 1900 by Kenneth Buck; Africa No.1, Gabon 15.475 (Fr, Eng to W.Africa 1600-2110), 33344 at 1917 by Robin Clark; Radio Damascus, Syria 15.095 (Eng to USA 2110-2210), SIO444 at 2130 by **Ron Pearce** in Bungay; Radio Moscow, USSR 15.355 (Eng to USA 2200-0000), SIO333 at 2200 by Francis Hearne; Radio Vilnius, Lithuania 15.485 (Eng, Lith to USA 2200-0030), SIO555 at 2200 by **Matthew Clarke** in Birmingham; BBC via Ascension Island 15.400 (Eng to W.Africa 1500-2300), 33333 at 2254 by **Robin Harvey** in Bourne.

More extensive used is being made of the **13MHz (22m)** band by some broadcasters. They include Radio Australia via Shepparton 13.705 (Eng to C.Pacific areas 0600-0830), rated as 32333 at 0711 by Leo Barr; WYFR via Okeechobee, Florida 13.760 (Eng to Europe 0600-0745), SIO433 at 0625 by Philip Rambaut; WSHB Cypress Creek, USA 13.760 (Eng to Australia 0800-0955), 44434 at 0810 by Ron Damp; SRI via Sottens, Switzerland 13.635 (Eng, Fr, Ger, It to E.Asia 1045-1300), SIO344 at 1045 by Matthew Clarke; Radio Austria Int, Vienna 13.730 (Ger, Fr, Eng, Sp, Ar to Europe 0400-1700), SIO444 at 1055 by **John Coulter** in Winchester; Radio Jordan, Al Karanah 13.655 (Eng to Europe 0430-1315), 33343 at 1145 by Tom Parrotte; Radio Australia via Carnarvon 13.745 (Eng to S.Asia 1430-1700), SIO333 at 1620 by John Stevens; Radio Pakistan, Karachi 13.665 (Tur to Middle East 1645-1745), 34433 at 1645 by Darran Taplin; ISBS Reykjavik, Iceland 13.855 (Ic to Europe 1855-1930), SIO455 at 1855 by Kenneth Buck; Radio Kuwait, Sulaibiyah 13.610 (Eng, Ar to Europe, USA 1800-2100), 54545 at 1915 by **Harold Wood** in Manchester; WHRI Noblesville, USA 13.760 (Eng, Sp, Port, Yu to E.USA, Europe 1700-0000), 43434 at 1936 by Robin Clark; Radio Baghdad, Iraq 13.660 (Eng to Europe 2000-2200), 44444 at 2000 by **Mike Smith** in Cambridge; RBI via Leipzig, GDR 13.610 (Ger, Fr, Eng 1830-2100), 54544 at 2029 by Darren Beasley; WSHB Cypress Creek, USA 13.770 (Eng to E.USA, Europe 2000-2155), 32333 at 2103 by Dave Taskis; Radio Nederlands via Flevo 13.700 (Fr, Ar, Eng to N/W.Africa 1830-2125), 33433 at 2106 by Andy Cadier; WYFR via Okeechobee, Florida 13.695 (Eng to E.USA 1100-2245), 32132 at 2130 by Eddie McKeown; Voice of the UAE in Abu Dhabi 13.605 (Eng to N.Africa 2200-0000), 34433 at 2300 by Robin Harvey; Radio Pyongyang, N.Korea 13.650 (Kor, Eng, Sp to N/S.America 2200-0050), 32222 at 2310 by Chris Shorten; AWR Agat, Guam 13.720 (Eng, Ca, Sh to, E/C.Asia 0200-0400), 32333 at 0230 by Rhoderick Illman (Oman).

The broadcasters using the **11MHz (25m)** to reach listeners in Europe include WYFR via Okeechobee, Florida 11.770 (Fr, Eng 0600-0745), rated as SIO222 at 0621 by Philip Rambaut; Radio HCJB Quito, Ecuador 11.835 (Eng 0700-0830), 44544 at 0710 by Kenneth Reece; Radio Portugal via Gloria 11.800 (Port 0800-1655), 44444 at 0845 by Sheila Hughes; SRI via Beromunster, Switzerland 12.030 (Fr, Ger, It, Eng 1000-1230), SIO333 at 1106 by Matthew Clarke; RFI via Issoudun, France 11.670 (Fr, Eng, Russ, Yu, Rom, Pol 0600-2100), 54444 at 1230 by Ike Odoom; Vatican Radio, Rome 11.740 (It, Sp, Port, Fr, Eng, Ger, Pol 1230-1528), 53233 at 1515 by John Sadler; Radio Pyongyang, N.Korea 11.760 (Eng, Russ, Kor 1500-2150), 43233 at 1720 by Chris Shorten; Radio Cairo, Egypt 12.050 (Ar 1400-2250, also to USA), SIO555 at 1820 by Kenneth Buck; Radio Sophia, Bulgaria 11.660 (Ger, It, Fr, Eng 1830-2100), 44344 at 1831 by Leo Barr; RNE via Aganda, Spain 11.920 (Sp 0700-2145), SIO333 at 1915 by Ted Walden-Vincent; AIR via Aligarh, India 11.620 (Eng, Hi 1845-2045), 54545 at 1941 by Robin Clark; Radio Beijing, China 11.500 (Russ, Ger, Eng 1700-2155), 45534 at 2000 by Darran Taplin; Radio Romania Int., Bucharest 11.940 (Ger, Eng, Fr 1900-2126), 53423 at 2003 by Dave Taskis; Radio Damascus, Syria 12.085 (Ger, Fr, Eng 1805-2105), heard at 2005 by Mike Smith; Radio Sweden via Horby 11.705 (Eng, Sp, Sw 2100-2230), 43343 at 2106 by Robin Harvey; Radio Peace and Progress, USSR 11.830 (Eng 2100-2200), SIO333 at 2125 by Francis Hearne; RHC Havana, Cuba via USSR 11.705 (Fr, Eng 2100-2300), 54444 at 2240 by Tom Parrotte.

Some of the broadcasts to other areas stem from RHC Havana, Cuba 11.760 (Sp, Fr, Eng to C.America 2300-0600), logged as 43243 at 0535 by Alan Smith; VOA via Wertachtal, W.Germany 11.780 (Eng to Middle East 0400-0700), 54434 at 0558 by Jim Cash; Radio DW via Julich, W.Germany 11.765 (Eng, Fr to W.Africa 0600-0750), 13333 at 0652 by Andy Cadier; KLNS Anchor Point, Alaska 11.715 (Eng to E.Asia 0800-0900), 43333 at 0800 by Ted Agombar; Voice of Greece, Athens 11.645 (Gr, Eng, Sw to USA 1500-1550), 45344 at 1540 by Darren Beasley; AWR Agat, Guam 11.980 (Eng to S.Asia 1600-1700), 33332 at 1634 by Rhoderick Illman (Oman); Radio Polonia, Warsaw 11.840 (Eng, Fr, Ar to W/N.Africa 1830-2025), SIO222 at 2013 by **Julian Wood** in Elgin; RAI Rome 11.800 (Eng to Middle East 2025-2045), 53444 at 2033 by Roy Spencer; Radio Finland via Pori 11.755 (Eng, Fr, Sw, Fin to USA 2300-0030), 34333 at 2300 by Ted Gould.

Good long distance reception has been noted in the **9MHz (31m)** band during some days. The broadcast to Pacific areas from Radio New Zealand Int, Wellington 9.855 (Eng 0710-0830 Mon-Fri, 0645-1100 Sat) was rated SIO444 at 0800 by Simon Hamer. Radio Australia's transmission to S.Asia via Carnarvon 9.710 (Eng 1430-1700) was noted as 33433 at 1658 by Darran Taplin; to SE Asia via Shepparton 9.770 (Viet, Eng 1330-1900) as 33233 at 1435 by Chris Shorten.

Freq kHz	Station	Country	UTC	DXer
3.270	SWABC 1, Namibia	S.W.Africa	2058	I
3.290	SWABC 2, Namibia	S.W.Africa	1639	G
3.365	GBC Radio 2	Ghana	2115	B,E,G,I,J
3.915	BBC Kranji	Singapore	1850	F,G
3.930	R.Capital	Transkei	2130	K
3.955	BBC Daventry	England	2120	A,H,L,M
3.965	RFI	ParisFrance	2057	H,M
3.975	BBC Skelton	England	0455	H
3.980	VOA Munich	W.Germany	0445	F,H,L
3.985	R.Beijing, Chinavia SRI	Berne	2039	C,E
3.995	DW Cologne (Julich)	W.Germany	0435	H
4.500	Xinjiang	China	2251	E
4.735	Xinjiang	China	2224	D,E
4.760	ELWA Monrovia	Liberia	2005	F
4.765	BrazzavillePep.Rep.	Congo	1930	G,I
4.765	R.Moscowvia	Cuba	0255	M
4.770F	RCN Kaduna	Nigeria	2121	I,L,M
4.775	R.Gabon, Libreville	Gabon	2112	M
4.785	RTM Bamako	Mali	2045	I
4.785	R.Baku	USSR	1940	F,M
4.790	R.Atlantida	Peru	0315	E
4.795	R.Douala	Cameroon	2121	F,G,I
4.800	AIR Hyderabad	India	1730	G
4.800	LNBS Lesotho	Maseru	2040	I
4.815	R.diff TV Burkina	Ouagadougou	2121	F,I
4.830	Gaborone	Botswana	2040	F,I
4.830	R.Tachira	Venezuela	0124	M
4.835	RTM Bamako	Mali	1950	F
4.845	ORTM Nouakchott	Mauritania	2044	I,M
4.850	R.Yaounde	Cameroon	2115	C,D,E,F,G,I
4.865	PBS Lanzhou	China	2050	B,I,M
4.865	V of Cinaruco	Colombia	0502	E
4.870	R.Cotonou	Benin	2125	F,I
4.885	Voice of Kenya	Kenya	1827	I
4.900	V de la Rev.Conakry	Guinea	2125	I
4.905	R.Relogio, Rio	Brazil	2345	E
4.905	R.Nat.N'djamena	Chad	2046	D,F,I,L,M
4.910	R.Zambia, Lusaka	Zambia	2046	I
4.915	R.Anhanguera	Brazil	0130	D,M
4.915	R.Ghana, Accra	Ghana	2125	B,I
4.915	Voice of Kenya	Kenya	1928	I
4.930	R.Moscow	USSR	0045	L,M
4.935	Voice of Kenya	Kenya	2046	D,F,I,L
4.940	R.Kiev 2	USSR	2020	F,M
4.960	R.Baku 2	USSR	2047	I
4.975	R.Uganda, Kampala	Uganda	2047	B,I
4.985	R.Brazil Central	Brazil	2250	D,E,M
4.990	FRCN Lagos	Nigeria	1930	G,I,M
5.005	R.Nacional, BataEq.	Guinea	2048	D,F,I
5.010	SBC Singapore	Singapore	1410	G
5.015	R.Brazil Tropical	Brazil	0300	M
5.035	R.Bangui	C.Africa	2120	I,M
5.035	R.Alma Ata	USSR	2321	D,M
5.047	R.Togo, Lome	Togo	2120	I
5.050	SBC Singapore	Singapore	1410	G
5.060	PBS Xinjiang	China	2251	M
5.065	R.Candip, Bunia	Zaire	1930	I
5.075	Caracol Bogata	Colombia	0501	D,M
5.260	R.Alma Ata 2	USSR	0005	M

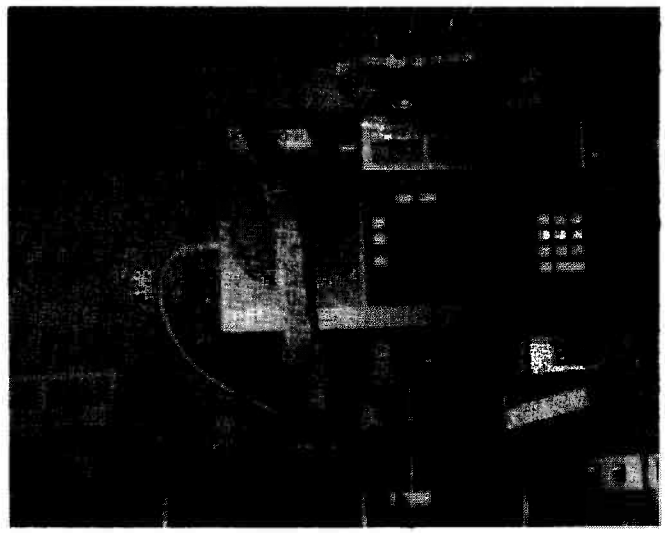
Tropical Band Chart

DXers:-

(A) Ted Agombar, Norwich.
(B) Darren Beasley, Bridgwater.
(C) Andy Cadier, Folkestone
(D) Jim Cash, Swanwick
(E) David Edwardson, Wallsend
(F) Sheila Hughes, Morden
(G) Rhoderick Illman, Thumbrait, Oman
(H) Ike Odoom, Aberdeen
(I) Fred Pallant, Storrington
(J) Ron Pearce, Bungay
(K) Tim Shirley, Bristol
(L) Darran Taplin, Brenchley
(M) Neil Wheatley, Lytham St Annes

SEEN & HEARD

The many broadcasts to Europe include the Voice of the Mediterranean, Malta 9.765 (Eng, Ar 0600-0800, also to N.Africa), rated 45544 at 0600 by David Edwardson; HCJB Quito, Ecuador 9.610 (Cz, Ger, Fr, Eng, Sw, Norw, Da 0500-0830), 44543 at 0715 by Ron Damp; AWR via Sines, Portugal 9.670 (Pol, Ger, Eng 0600-0900 Sun only), 44444 at 0800 by Eddie McKeown; WCSN Scotts Corner, Maine 9.840 (Eng 0600-1000), SIO444 at 0800 by Alf Gray; RFI via Allouis, France 9.805 (Fr, Eng 0500-1400), 44333 at 1230 by Ike Odoom; Radio Tirana via Lushnje, Albania 9.480 (Fr, Eng 1700-1830), 43333 at 1730 by Sheila Hughes; VOIRI Tehran, Iran 9.022 (Russ, Fa, Tur, Ger, Fr, Eng, Sp, Ar 1530-2230), SIO444 at 1800 by John Coulter; Voice of Ethiopia, Ababa 9.660 (Eng 1800-1900), 32332 at 1823 by Rhoderick Illman (Oman); RBI via Wusterhausen GDR 9.730 (Fr, Eng, Ger 1700-2145), 54444 at 1824 by Ted Agombar; R. Finland via Pori 9.550 (Fin, Ger, Eng, Fr, Sw 1600-2055), 45444 at 1835 by Jim Cash; Radio Romania Int., Bucharest 9.690 (Ger, Fr, Eng, Port 1800-2156), 33343 at 1933 by Robin Clark; Vatican Radio, Rome 9.645 (Hung, Cz, Pol, Ger It, Fr, Eng, Sp, Port, Ar 1715-2100), SIO455 at 1950 by Neil Wheatley; Radio Jordon, Al Karanah 9.560 (Eng 1315-2100), heard at 2008 by **Scott Caldwell** in Warrington; Radio Peace and Progress, USSR 9.820 (Eng 2100-2200), SIO222 at 2149 by Julian Wood; AIR via Delhi 9.910 (Eng 2045-2230), 55444 at 2047 by Roy Spencer; Radio Beijing, China 9.925 (Ger, Eng 1800-2155), 55555 at 2050 by Andy Cadier; Radio Cairo, Egypt 9.900 (It, Ger, Fr, Eng 1800-2245), 33222 at 2221 by Robin Harvey; Voice of Turkey, Ankara 9.445 (Eng, Tur 2200-0355), 43333 at 2230 by Tom Parrotte.



Derek Taylor's listening post in Preston.

Equipment Used

Ted Agombar: Grundig Satellit 400 + random wire.
Thomas Barnett: Kenwood R2000 + random wire.
Lee Bate: Matsui MR4099 + Hawk active antenna with 2m vertical wire.
Derek Beasley: Philips D2935 + Hexagon loop or a.t.u. + 18m random wire.
Donald Bluehill: Philips D2935 portable + built-in whip.
Kenneth Buck: Lowe HF225 + random wire or loop.
Andy Cadier: Sangean SW600 + 40m random wire or Datong active antenna.
Scott Caldwell: Sangean 2000 + random wire or Tandberg RT-SX1 + loop.
Jim Cash: Kenwood R5000 + trap dipole.
Robin Clark: Sangean SW5000 + 18m random wire.
Matthew Clarke: Realistic DX-302 or Philips D8478 + random wire.
John Coulter: Yaesu FRG-7 + random wire.
Ron Damp: Racal RA17 + chimney mounted whip.
David Edwardson: Trio R600 + trap dipole 22m long.
Ted Gould: Sony ICF7601 portable + built-in whip.
Alf Gray: Codar CR70 + Codar a.t.u. + Ex-Army rod antenna.
Steve Hanson: Grundig S1400 + 18m wire.
Geoff Harris: Panasonic RF1480 portable + hexagon loop.
Robin Harvey: Matsui MR 4099 + s.w. loop.
Francis Hazrati: Sharp GFA5 cassette radio + random wire.
Mike Henry: Roberts R25 portable.
Simon Holland: Sangean ATS 803A portable + built-in whip.
Sheila Hughes: Panasonic DR48 + 15m inverted L or Sony ICF7600G portable.
Rhoderick Illman: Sony ICF 7600DS + 22m random wire.
Mark Ingram: Ferguson PR39 portable.
Eddie McKeown: Tatung TMR 7604 portable.
George Milmore: Tatung TMR 7602 portable or Racal RA17L + random wire.
John Nash: Kenwood R5000 + Datong AD370 active antenna.
Ike Odoom: Philips D2935 portable.
Fred Pallent: Trio R2000 + random wire in loft.
Tom Parrotte: Sony ICF2001 + a.t.u. + 22m random wire.
John Perry: Realistic DX-400 + 33m random wire.
Roy Pavitt: Lowe HF-125 + 20m wire.
Roy Pearce: Restored GEC export receiver (Circa 1947).
Philip Rembaut: Im Marine Radio R.700M + random wire.
Kenneth Rouse: JVC NRD 525 + random wire.
Alan Roberts: Lowe HF225 + 31m dipole.
John Sadler: DX-400 or Omega 4020 + a.t.u. + s.w. loop.
Tim Shirley: Trio R600 + random wire.
Chris Shorten: Matsui MR 4099 portable.
Alan Smith: Matsui MR4099 + Mizuho KX-3 a.t.u. + vertical dipole.
Mike Smith: Lowe HF-225.
Roy Spencer: Realistic DX-400 + a.t.u. + 30m random wire.
John Stovold: Hammarlund HQ 180 or Yaesu FRG + random wire.
Paul Strickland: Matsui MR4099 portable.
Darran Taplin: Lowe HF225 + Global 1000 a.t.u. + 30m random wire.
Dave Tasker: Sony ICF 2001D + built-in whip.
Derek Taylor: Sony ICF 2001D + 175m Box loop or large S/W outdoor loop.
Phil Townsend: Lowe SRX-88 + a.t.u. + random wire.
Ted Walden-Vincent: Grundig Satellit 1400.
Neil Wheatley: Sangean ATS 803 portable.
Julian Wood: Philips D2935 portable + built-in whip.
David Wratten: Philips D2999 + m.w. loop.

Transatlantic DX Chart

Freq (kHz)	Station	Location	Time (UTC)	DXer
		USA		
540	WGTO	Cypress G'dens, FL	0300	B
660	WFAN	New York, NY	?	C
670	WMAQ	Chicago, IL	?	B
680	KKYX	San Antonio	TX0400	B
680	WRKO	Boston, MA	?	C
710	WOR	New York, NY	?	C
880	WCBS	New York, NY	0100	B
1010	WINS	New York, NY	0100	B,C
1030	WBZ	Boston, MA	?	C
1060	WAMT	Titusville, FL	0215	B
1110	WBT	Charlotte, NC	0300	B
1130	WNEW	New York, NY	?	C
1180	WHAM	Rochester, NY	?	C
1190	WOWO	Ft.Waine, IN	?	C
1210	WCAU	Philadelphia, PA	?	C
1410	WPOP	Hartford, CON	?	C
1440	WFTQ	Worcester, MA	?	C
1440	WRRO	Warren, OH	?	C
1500	WTOP	Washington, D.C	0300	B,C
1510	WKKU	Boston, MA	?	C
1560	WQXR	New York, NY	?	C
		CANADA		
560	CHCM	Marystown, NF	?	C
570	CFCB	Corner Brook, NF	?	C
590	VOCM	St.John's, NF	?	C
600	CBNA	St.Anthony, NF	?	C
600	CFCF	Montreal, PQ	?	C
620	CKCM	Grand Falls, NF	?	C
640	CBN	St.John's, NF	?	C
650	CKGA	Gander,NF	?	C
700	CHSJ	St.John, NB	?	C
710	CKVO	Clarenceville, NF	?	C
720	CHTN	Charlottetown, PEI	?	C
730	CKAC	Montreal, PQ	?	C
740	CHCM	Marystown, NF	?	C
750	CBGY	Bonavista Bay, NF	?	C
920	CBO	Ottawa, ON	?	C
920	CJCH	Halifax, NS	?	C
930	CJYQ	St.John's, NF	?	C
940	CBM	Montreal, PQ	?	C
950	CHER	Sydney, NS	?	C
960	CHNS	Halifax, NS	?	C
970	CKCH	Hull, PQ	?	C
1010	CFRB	Toronto, ON	?	C
1050	CFYN	Sault St. Marie,ON	0030	B
1050	CHUM	Toronto, ON	?	C
1060	CJRP	Quebec, PQ	?	C
1070	CBA	Moncton, NB	?	C
1200	CFGO	Ottawa, ON	?	C
1220	CKCW	Moncton, NB	?	C
1230	CFGN	Port/ Basques, NF	?	C
1290	CHRM	Matane, PQ	?	C
1320	CKEC	New Glasgow, NS	?	C
1380	CFDA	Victoriaville, PQ	?	C
1570	CKLM	Lavel, PQ	0430	B,C
		CENTRAL AMERICA & CARIBBEAN		
1210	R.Caraibes	Roseau, Dominica	0345	B
1220	XEB	Mexico City, Mexico	?	C
1390	CMCM	Jaruco, Cuba	?	C
1610	Caribbean Beacon	The Valley, Anguilla	0400	A

DXers
(A) Mike Evans, while at Aberystwyth.
(B) Tim Shirley, Bristol.
(C) Derek Taylor, Preston.

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SEEN & HEARD

While checking the **7MHz (41m)** band, John Nash picked up AWR via Forli, Italy 7.230 at 0930 (35443); Matthew Clarke heard BBC via Daventry, UK at 1054 (SIO343); Darren Beasley noted Radio Australia via Carnarvon 7.240 as 43453 at 1830; Darran Taplin logged Voice of Nigeria, Lagos 7.255 as 34443 at 1958; Roy Spencer listened to Radio Prague, Czechoslovakia 7.345 at 2008 (54544).

In the **6MHz (49m)** band **Donald Blashill** (Cheltenham) listened to VOA via Woofferton, UK 6.040 at 1915 (54334); Ron Pearce heard King of Hope, Lebanon 6.280 at 2000 (SIO444); Philip Rambaut logged BBC via Antigua, W.Indies 5.975 as SIO333 at 0540; Robin Harvey picked up WYFR via Okeechobee, Florida 5.985 at 2324 (33333); David Edwardson heard Radio Nederlands via Bonaire, Ned.Antilles 6.165 at 0405 (45544); Ike Odoom noted VOFC Taipei, Taiwan via Okeechobee, USA 5.950 as 33333 at 0440.

Station Addresses

BBC Radio Shropshire,
P.O.Box 397,
2/4 Boscobel Drive,
Shrewsbury SY1 3TT.

ILR West Sound, Radio House,
54 Holmston Road,
Ayr KT7 3BD.

Radio Cairo, External Services,
P.O.Box 566,
Cairo,
Egypt.

Radio Pyongyang,
Central Broadcasting Station,
Pyongyang,
DPR Korea.

Radio Sweden,
S-105 10 Stockholm, Sweden.
Swiss Radio International,
CH-3000 Berne 15,
Switzerland.

DXers:

(A) Ted Agombar, Norwich.
(B) Leo Barr, Sunderland.
(C) Darren Beasley, Bridgewater.
(E) Scott Caldwell, Warrington.
(E) Jim Cash, Swanwick.
(F) Mathew Clarke, Birmingham.
(G) Mike Evans, While at Aberystwyth.
(H) Simon Hamer, New Radnor.
(I) Geoff Harris, Sturminster Newton.
(J) Marc Henry, Evesham.
(K) Simon Holland, Douglas, IoM.
(L) Sheila Hughes, Morden.
(M) Rhoderick Illman, Thumrait, Oman.
(N) Mark Mahabir, Leicester.
(O) Eddie McKeown, Co.Down.
(P) George Millmore, Wootton IoW.
(Q) Ike Odoom, while in Aberdeen.
(R) Roy Patrick, Derby.
(S) Tim Shirley, Bristol.
(T) Alan Smith, Northampton.
(U) John Stevens, Largs.
(V) Phil Townsend, London.
(W) Paul Weston, Kettering.
(X) Paul Weston, while in Norfolk.

Freq	Station	Country	Power (kW)	DXer
520	Hof-Saale	Germany (W)	0.2	K*,U*
531	Ain Beida	Algeria	600	O*
531	Torshavn	Faroe Is	5	H,S*
531	Leipzig	Germany (E)	100	D*,G*
531	Oviedo	Spain	10	C
531	Beromunster	Switzerland	500	K*,P,Q,U
540	BRT-2 Wavre	Belgium	150/50	E,G*,O*,P,Q
540	Solt	Hungary	2000	G*
540	Conamara	Ireland (S)	2	G*
540	Sidi Bennour	Morocco	600	G*
549	Les Trembles	Algeria	600	G*
549	DLF Bayreuth	Germany (W)	200	E,G*,O*,P,Q
558	Espoo	Finland	100	O*
558	Valencia	Spain	20	E*,G*,J*
567	West Berlin	Germany (W)	100	J*
567	RTE-1 Tullamore	Ireland (S)	500	D,E,F,G,K,O,P,T,U,V
576	Stuttgart	Germany (W)	500	E*,G*,J*,K*,O*,P,Q*
585	FIP Paris	France	8	D,P
585	RNE-1 Madrid	Spain	200	E*,G*,J*,L
585	R.Scot Dumfries.	UK	2	C,G*,O,Q,U
594	HRF Frankfurt	Germany (W)	400	E*,G*,J*,O*
594	Oujda-1	Morocco	100	G*
594	Muge	Portugal	100	G*,S*
603	Lyon	France	300	G*
603	Sevilla	Spain	20	D*,G*
603	BBC-R4 Newcastle	UK	2	G*,K,O*,Q
612	RTE-2 Athlone	Ireland (S)	100	D,E,F,G*,J*,O*,P,U
612	Sarajevo	Yugoslavia	600	Q
621	RTBF-1 Wavre	Belgium	80	E,G*,L,P,Q,V
621	RNE-1 Santa Cruz	Tenerife	100	G*
630	Vigra	Norway	100	O*,Q
639	Liblice	Czechoslovakia	1500	E*,G*,J*,P
639	La Coruna	Spain	100	E*,G*,L*,O*
648	Palma de Mallorca	Spain	10	N*
648	BBC Orfordness	UK	500	G*,I,K*,L,N,O*,V
657	RCE-2 Madrid	Spain	20	G*
657	R.Wales Wrexham	UK	2	D,L,N,O*,P,S
666	Bodenseesender	Germany (W)	300/180	E*,G*,J*,Q*
666	Lisboa	Portugal	135	G*
675	Marseille	France	600	G,J*,O*
675	Hilversum-3 Lopic	Holland	120	E,L,P,Q,V
684	RNE-1 Sevilla	Spain	250	E*,G*,O*
684	Beograd	Yugoslavia	2000	G*
693	BBC-R2 Droitwich	UK	150	K*,O*
702	Aachen/Flensburg	Germany (W)	5	Q*
702	Monte Carlo	Monaco	300	O*
702	Zamora	Spain	5	G*
711	Rennes 1	France	300	E,G*,V
711	Heidelberg	Germany (W)	5	E*,O*
711	Laayoune	Morocco	600	G*
720	BBC-R4 L'nd'nd'rry	Ireland (N)	0.25	G*
720	R4 Lots Rd London	UK	0.5	P,Q
729	RTE-1 Cork	Ireland (S)	10	B*,G*
729	RNE-1 Alicante	Spain	1	G,O*
783	Burg	Germany (E)	1000	D*,E*,G*,J*, K*,O*,Q*
783	R.Porto, Miramar	Portugal	100	G*
792	Sevilla	Spain	20	E*,G*
801	BRF via Munich	Germany (W)	420	E*,J*,O*,Q*
801	Castellon	Spain	5	E*,G*
810	SER Madrid	Spain	20	E*,G*
810	R.Scot.Westerglen	UK	100	D,E,G*,O*,P,W
819	Rabat	Morocco	25	G*
828	NDR Hannover	Germany (W)	100/5	Q*
828	Karachi	Pakistan	100	M*
828	Barcelona	Spain	20	G*
837	Nancy	France	200	P
846	Nasiriya	Iraq	300	M*
846	Rome	Italy	540	E*,G*,J*,P
855	RAIS Berlin	Germany (W)	100	J*
855	Murcia	Spain	125	E*,G*,O*
864	Paris	France	300	G*,P,W*
873	AFN Frankfurt	Germany (W)	150	D*,E*,G*,J*,O*,Q*
873	R.Ulster,Enniskillen	UK	1	G*
882	BBC-Wales W'shf'd	UK	70	L,O*,P,V,W

Medium Wave DX Chart

Freq	Station	Country	Power (kW)	DXer
891	Algiers	Algeria	600/300	E*,G*,J*,K*,P*
900	Milan	Italy	600	E*,G*,J*,O*,Q*
909	R2 Moorside Edge	UK	200	G*,K
918	R.Intercont. Madrid	Spain	50	M*
1206	Bordeaux	France	100	E*,G*
1206	Haifa	Isreal	50	M*
1206	Wroclaw	Poland	200	B*,G*,L*
1215	Lushnje	Albania	500	G*
1215	Albacete	Spain	2	E*,G*
1215	Arusha	Tanzania	50	M*
1215	R3 Moorside Edge	UK	100	E*,T
1224	Vidin	Bulgaria	500	W*
1224	COPE Madrid	Spain	20	E*,G*
1233	Melnik	Czechoslovakia	400	E*,G*,O*
1233	Al Khatisah	Qatar	100	M*
1242	Marseille	France	50	K*,T
1251	Marcali	Hungary	500	E*
1251	Huisberg	Netherlands	10	J*,O*,Q*,W*
1260	VOA via Rhodos	Greece	500	M*
1260	Valencia	Spain	20	E*,G*,O*
1269	Neuminster	Germany (W)	600	D,E*,J*,O*,Q,W*
1278	Strasbourg	France	300	E*
1278	RTE-2 Dublin/Cork	Ireland (S)	10	D*,E,G*,J*,O,Q*
1287	Litomysl/Liblice	Czechoslovakia	300/200	E*,I,K*,R*
1287	Lisboa	Portugal	2.5	Q*
1296	San Sebastian	Spain	5	E*,G*,J*
1296	BBC	OrfordnessUK	500	E*,G*,K*,V,W*
1296	Baku	USSR	150	S*
1305	Rzeszow	Poland	100	K*
1314	Kvitsoy	Norway	1200	E*,G*,K*,V,W*
1323	R. Moscow, Leipz	Germany (E)	150	D,E*,W*
1332	Rome	Italy	300	E*,O*
1341	BBC-Ulst. Lsngrvy	Ireland (N)	100	D,E,G*,J*,P,Q*,W*
1341	Magwa	Kuwait	200	M*
1350	Nancy/Nice	France	q100	E*,G*,O*,P,Q*,W*
1359	RBI Berlin	Germany (E)	250/100	D*,E*,Q*
1368	Manx R. Foxdale	IoM	20	G*,O,Q*
1377	Lille	France	300	E*,G*,O*,P,V
1377	Porto	Portugal	10	G*
1377	Ukraine	USSR	50	G*
1386	Kaunus	USSR	1000	E*,K*,W*
1395	R.Tirana, Lushnje	Albania	1000	E*,O*,W*
1395	Alicante	Spain	2	E*
1404	Brest	France	20	P,Q
1413	RCE Zaragoza	Spain	20	E*,G*,L*,Q*,T*
1413	Pristina	Yugoslavia	1000	P
1422	Heusweiler	Germany (W)	1200/600	E*,G*,J*,N*,O*, P*,Q*,W*
1431	Dresden	Germany (E)	250	E*,G*,J*,Q*
1440	Marnach	Luxembourg	1200	E*,G*,J*,O*,P,Q*,W*
1449	Berlin	Germany (W)	5	E*,Q*
1449	BBC-R$ Redmoss	UK	2	G*
1458	R.Tirana Lushnje	Albania	500	D*
1467	TWR Monte Carlo	Monaco	1000/400	O*,E*,G*,N*,O*, Q*,W*
1476	Wien-Bisamberg	Austria	600	E*,J*
1476	Bilbao	Spain	2	G*
1485	BBC-R4 Carlisle	UK	1	K*,W
1494	Clermont-Ferrand	France	20	E*,G*,N*
1494	Leningrad	USSR	1000	E*
1503	Stargard	Poland	300	E*,L*
1503	Pamploma	Spain	5	G*
1512	BRT Wolvertem	Belgium	600	A*,E*,G*,O*,P,W*
1521	Oviedo	Spain	5	G*
1530	Vatican R. Rome	Italy	150/450	B*,D*,E*,L*
1539	DLF Mainflingen	Germany (W)	700	E*,G*,J*,O*,Q*
1539	Valladolid	Spain	5	G*
1557	Nice	France	300	E*
166	Sarnen	Switzerland	300	G*
1575	RBI via Burg	Germany (E)	250	D*,E*,J*
1575	Genoa	Italy	50	G*,K*
1575	Villanueva y Geltru	Spain	2	G*
1584	Pamplona	Spain	2	G*
1593	Langenberg	Germany (W)	400/800	E*,G*,J*,Q*,W*
1602	Bolzano	Italy	2	G*
1602	R.Onteniente	Spain	2	E*,G*

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

abbreviations							
Am	Amharic	Fa	Farsi	Kor	Korean	Sw	Swedish
Ar	Arabic	Fin	Finnish	Lith	Lithuanian	Swa	Swahili
Ca	Cantonese	Fr	French	Norw	Norwegian	Tur	Turkish
Chin	Chinese	Ger	German	Pol	Polish	Uk	Ukrainian
Cz	Czechoslovakian	Hi	Hindi	Port	Portuguese	Ur	Urdu
Da	Danish	Hung	Hungarian	Rom	Romanian	Viet	Vietnamese
Eng	English	Ic	Icelandic	Russ	Russian	Yid	Yiddish
		It	Italian	Sh	Shanghainese	Yu	Yugoslavian
		Jap	Japanese	Sp	Spanish		

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