SHORT WAVE MAGAZINE

short wave magazine

February 1992 £1.75 ISSN 0037 - 4261

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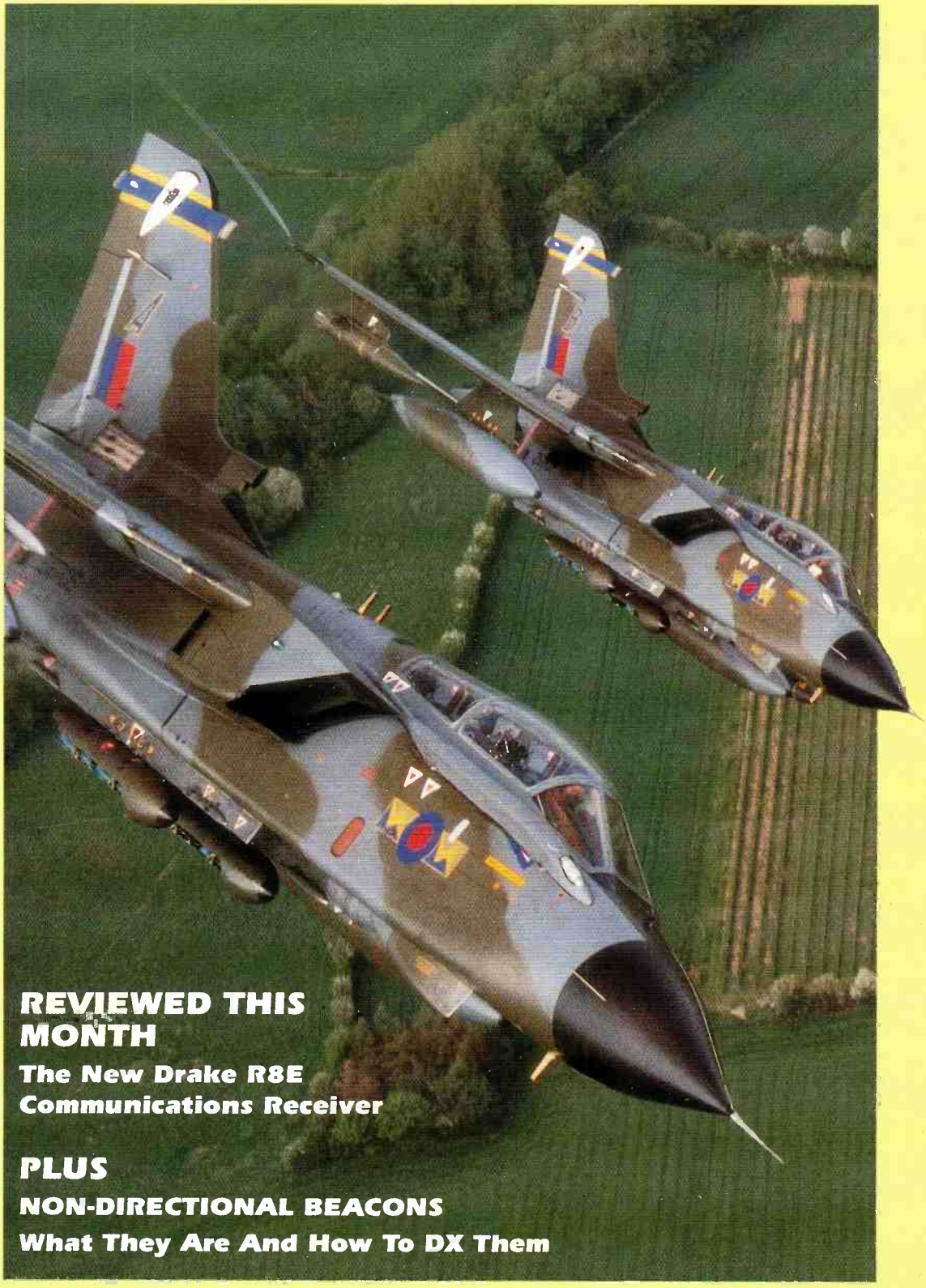

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short wave magazine

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EDITOR: Dick Ganderton, C. Eng., MIEE, G8VFH
ART EDITOR: Steve Hunt
NEWS & FEATURES: Elaine Richards G4LFM
TECHNICAL ARTIST/PHOTOGRAPHER: Rob Mackie

EDITORIAL
Enefco House, The Quay,
Poole, Dorset BH15 1PP
TEL: (0202) 678558
FAX: (0202) 666244
CREDIT CARD ORDERS: (0202) 665524
(Out of hours service by answering machine)

ADVERTISEMENT DEPARTMENT
ADVERTISEMENT MANAGER
Roger Hall G4TNT
TEL: 071-731 6222
FAX: 071-384 1031
ADVERTISEMENT PRODUCTION (Poole)
Marcia Brogan
TEL: (0202) 676033
FAX: (0202) 666244

contents

Cover:
Airband has a large following amongst the readers of SWM. Our dramatic cover picture shows two Tornados, flying in close formation, captured by the camera of Sgt. Rick Brewell ABIPP of the RAF Public Relations department.
(Crown Copyright)

REGULARS

...GOOD LISTENING

ANTENNA SPECIAL OFFER COUPON SWM FEB 1992

editorial

SWM SERVICES

Subscriptions

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

Components for SWM Projects

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

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

Back Numbers and Binders

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

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

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

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

Radioline

Radioline is alive and well! Although our sister magazine reluctantly decided to close Wirelessline, our own Radioline continues. It is now two years ago that we launched the service and it has proved to be popular with readers. In general I try to update it on a weekly basis, either on Friday afternoon or Saturday morning, but some times this is not possible. The recent Christmas holiday period is a good example of that.

You should also note that the number to dial for Radioline has now changed from 0898 654676 to 0891 654676 This is to try to get away from the sleazy connotations that 0898 numbers seem to have acquired. However, you will still be able to dial the old number for another year and get through.

Special Offers

From time to time we bring you radio related equipment at special prices. We select these Special Offers with great care, both to ensure that what is being offered is of good quality and reputable manufacture and will provide you with something of use for your hobby. Occasionally, I get the odd letter of complaint from a reader about some problem or other, but these are usually quickly resolved. However, the recent Special Offer for the Revex RA980 Wide Band Active Antenna brought some quite nasty anonymous 'letters' accusing the magazine of ripping off the readers. As I cannot reply directly to such letters, let me say here that our Special Offer antenna is not the same as the those being sold by Henrys or Argos - a Rolls Royce is not the same as a Ford, other than that they are both motor cars!

letters

Dear Sir

I note that the January 1992 issue of *Short Wave Magazine* was the start of Volume 50.

Passing such a milestone should not go unnoticed especially by a group which has had so much good publicity within the pages of *Short Wave Magazine.*

Here, then, are the congratulations from the Committee of BARTG to all those involved with *Short Wave Magazine*, both now and over the last 50 volumes, for their efforts in producing the magazine. The end result is a magazine which is bulging with articles to interest any keen listener and also, I suspect, many transmitting amateurs as well.

I have read the magazine since I was first licensed in 1975, (though my collection goes way back to before Volume 10), and I can honestly say that the current version of *Short Wave Magazine* is the best I've read. I hope I'm around in fifty years time because the *Short Wave Magazine* of 2041 will be, I'm sure, totally different from, but equally as good as, the *Short Wave Magazine* of to-day.

Congratulations again and our very best wishes for the future of *Short Wave Magazine.*

Ian Brothwell G4EAN / G4ATG
Secretary & Publicity Officer
on behalf of the Committee of BARTG.

Dear Sir

It has just come to my notice that repairs are quite a dear caper. Why don't the big s.w. receiver firms start an insurance policy. Tandy does one, fully comprehensive for 4 years, plus a year at a time after that. This not only covers the receiver going wrong, but also if the dog gets caught in the leads, etc.

Please let me know if other insurances do short wave receivers. Once I asked a Sony dealer for such an insurance. He said, No but I could do so with a TV! why?

David Fay
Flackwell Heath

Dear Sir

The letter of Ken Lancaster, *SWM* November issue, highlights what seems to be a very serious point as regards the repair of expensive radio equipment. Having suffered the same thing myself with a valuable communications receiver with an intermittent fault that was away for twelve months and then paying a £48 solicitors fee to get it back with, I may add, the same fault. Before we pay over hundreds of pounds, why cannot this type of dealer be honest with us and say if it goes faulty do not return it to us, at least we would know where we stood.

B. Scott, Leicester

letters

Dear Sir
Reading David Simon's account of visiting USA with scanner spurs me to relate my experience.

I was likewise torn between 'taking or leaving' equipment, but the only scanner I then had was an SX200N and as I also worked 2-way amateur communications on 144MHz the rather bulky desk-top scanner stayed at home while I took and Icom IC2E walkie-talkie.

The pre-flight planning had to start 2 months before departure and consisted of:

(a) obtaining a reciprocal amateur licence from the FCC

(b) obtaining a copy of the ARRL's *Repeater Directory* and

(c) placing a blob of solder in the innards of the '2E so as to increase its coverage to US band plans.

I was asked by customs to switch the rig on once but no other problems. A 5/8 magmount whip in my luggage caused no frowns at the X-ray gate, much to my surprise.

Once in the USA my scanning interest was aroused by ordinary analogue-tune broadcast receivers marked with TV channels and a 'weather band' I bought one for $10. I found that the rig, of walkie-talkie size and shape, had three bands on it. There was the usual medium wave (the USA don't use l.w. for broadcast) and two v.h.f. f.m. bands, 56-108 and 161-214MHz. The first had Band I TV channels 2-6 leading straight onto the 88-108MHz broadcast slot and the second started at the weather band leading on to Band III TV, channels 7-13.

Around New York and the 'Tri-State Area' the weather broadcast was on 162.55MHz and being continuous might be worth checking from the UK for transatlantic Sporadic-E.

Back home this rig has been a useful quick way to check what's doing on the airwaves.

As for my amateur fun and games...that's another story!

Richard Gosnell, Swindon

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
My most grateful thanks for inserting my request for help in obtaining the instructions for my Mizuho Sky Coupler KX2. I have been most surprised by the response by receiving copies for both the KX2 and KX3! I am therefore much indebted to those who so kindly replied, so maybe you could publish my most sincere thanks.

I have been an s.w.l. for many years and am 80 next week, having started through my father in the crystal set and early valve set days. Then followed a long gap due to College, Occupation, WWII, until I was ill when a local amateur friend suggested I became an s.w.l. I enjoy construction, but my hands are not so agile now. I still have a copy of a small portable receiver using a frame antenna and powered by grid bias 9V and a 1.5V for an AT5 valve - I made it from *SWM* while in the army around 43-45 - it worked. I have been using an a.t.u. from July '77 by R. Squance, which gives me attenuator series, parallel, pi and L and still have the magazine, though I have built many others but still favour it. The KX2 was given by an amateur friend as it was passed on to him as using a TX it was of little use to him.

I now have to wait to give the a.t.u. a fair trial as soon as the building alterations finish and I can replace my antenna and earth, so here's hoping.

H Jones
Dartmouth

Dear Sir
I have a small correction to Part 5 of GW3KJW's article '50 Countries on the 144MHz Band', which states that two-way contacts on 144MHz were made via the moon in 1953.

The first two-way amateur contact via the moon was made on 21 July 1960 on 1296MHz between W1BU and W6HB and is described in the September 1960 issue of *QRT*. However, a 144MHz contact between DL3QA and W1RFU was claimed in the April issue of the German magazine *Das DL-QTC* and the details were reproduced at length in the May 1953 *SWM* by the v.h.f. columnist, A.J. Devon. How many of us remember the callsign hidden by this nom-de-plume?

It turned out that the story was an April Fool hoax with the alleged intention of focusing interest on the possibility of v.h.f. DX via the moon. A.J. Devon was certainly not amused and wrote several paragraphs of scathing comment in his July 1953 column.

Whether the story did anything to promote moon bounce contacts, then many years away, is a matter of conjecture.

Brian Bower G3COJ, High Wycombe

Dear Sir
I read Mr B A Pettit's letter in the November SWM with great interest, my own memories of the Royal Air Force in 1939 may remind older readers of the radio situation then prevailing in what was regarded as the Bomber Force.

In January 1939 I joined No. 83 Squadron at Scampton, the squadron had very recently exchanged its Hawker Hinds for Handley Page Hamptons, I was just out of apprentice training as an aircraft fitter and was pleased to be employed on what to us was 'high-tech' aircraft.

The wireless operators who flew in the Hampdens were lowly airmen, not even of Corporal rank, this situation prevailed until after the war started when over night they were all made Sergeants, we were dead jealous and the long serving members of the Sergeant's Mess were none to happy to welcome them, I expect it was done so that as prisoners of war they could not be forced to work in Germany, whatever the reason, they richly deserved the extra pay it brought.

Now about the radio fitment on our Hampdens, it was known as the TR9, I wonder if any still exist, I presume they were t.r.f. as I clearly recall the wireless operators walking out to their aircraft carrying in one hand their clip-on parachute and in the other a box of plug-in coils, identified by different colours, I suspect one was 'reaction' and the other 'tuning'. The antenna was a long wire with three or four lead balls at the outer end, it was deployed by the wireless operator from his position looking rearwards towards the tail unit, he was also provided with a hand wound winch to reel it in again, and it was a cardinal sin to forget to do so before landing when, of course, it was lost on the final approach, beside giving any unfortunate airmen in the area an awful fright.

I remember that the 'wireless section' was invariably a cosy warm room off the main hangers and when the shout went up for people to help close or open the heavy hangar doors you would indeed be fortunate to get a response from the chaps with a fistful of sparks on their arm, they harboured a belief that such tasks might well ruin their 'touch'.

It saddens me when I realise that few of those wireless operators lived to see the end of the war, maybe those who spent years in some German Prisoner of War camps were the lucky ones?

John L Alton, Salisbury

grassroots

rallies

* Short Wave Magazine & Practical Wireless in attendance

January 26: The 2nd Lancastrian Rally will be held at the University of Lancaster. Doors open 10.30am for the disabled and 11am for everyone else. **Sue G1OHH. Tel: (0524) 64239.**

February 16: The Welsh Mobile Radio Rally will be held at the Barry Leisure Centre, off Holton Road, Barry. Doors open 10.30am (10amfor the disabled), with trade stands, Bring & Buy, refreshments and free parking. Swimming pool available. Talk-in on S22 with GW3BRS. **Peter GW0BAH. Tel: (0656) 788502.**

February 16: The Kidderminster & DARS rally will be held at the Harry Cheshire School, Habberley Road, Kidderminster, Worcs. Doors open 10am. **G8JTL. Tel: (0384) 894019.**

February 23: The Bideford Bay ARC will be holding their 5th Taw & Torridge Rally at the BAAC Halls, Bideford. Talk in on S22. **John Denford G0GFK. Tel (0237) 476402.**

February 23: The Northern Cross Radio Rally will be held at Rodilian School, Lofthouse, West Yorkshire. Doors open 11am (10.30am for the disabled). On site parking for 1000+ cars. Dealers, craft stands, Bring & Buy, Morse Tests, Bar and Refreshments. Entry 50p (programme draw prizes). **Dave Gray G0FLX. Tel: (0532) 827883.**

February 23: The East Coast Amateur Radio and Computer Rally will be held at The Leisure Centre, Vista Road, Clacton-on-Sea. Doors open 10.30am. Ample Car parking, easy access for disabled, bring the family as there are sports facilities, a swimming pool, children's adventure playground as well as a bar and cafe. **CLPK, 18 Litchfield Close, Clacton-on-Sea, Essex CO15 3SZ.**

March 7: The TARS annual rally will be held as a new venue this year, the Temple Park Leisure Centre in South Shields. **Jack G0DZG. Tel: 091-265 1718.**

March 29: Bournemouth Radio Society will hold their 5th Annual Radio, Electronics & Computer Sale at Kinson Community Centre, Pelhams, Millhams Road, Kinson, Bournemouth. Doors open 11am, admission 50p including prize draw ticket. Light refreshments available. **Vic G4PTC. Tel: (0202) 516593** after 1800.

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

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

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

Acton, Brentford & Chiswick RC: 3rd Tuesdays, 7.30pm. Feb 18 - Astronomy by G0IIP. Paul Truitt G4WQO. 071-938 2561.

Barnsley & DARC: Mondays, 7.15pm. Darton Hotel, Station Road, Darton, Barnsley. Ernie G4LUE. (0226) 716339.

Bedford & DARC: Tuesdays, 7.30pm. Allen's Club, Hurst Grove, Bedford. Glenn G0GBI. (0234) 266443.

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

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

Cheshunt & DARC: Wednesdays, 8pm. Church Room, Church Lane, Wormley, Nr Cheshunt. Roger Frisby. (0992) 464795.

Conwy Valley RC: **1st** Thursdays, 7.15pm. The Studio, Penrhos Road, Colwyn Bay, Clwyd. Merfyn Jones GW4NNL, 72b Princes Drive, Colwyn Bay, Clwyd. (0492) 530725.

Coventry ARS: Fridays, 8pm. Baden Powell House, 121 St Nicholas St, Radford, Coventry. Neil Blair. (0203) 523629.

Derby & DARS. Wednesdays, 7.30pm. 119 Green Lane, Derby. Jan 29 - Video Show, Feb 5 - Junk Sale, 12th - Visit to Drakelow Power Station, 19th - Building a Motorway by Mr S C Black. Richard Buckby. Ambergate 852475.

Dorking & District RS: 2nd & 4th Tuesdays, 7.45pm. Friends Meeting House, South Street, Dorking. John Greenwell G3AEZ. (0306) 77236.

Edgware & DRS: Watling Community Centre, 145 Orange Hill Road, Burnt Oak. Hank Kay G0FAB. (081-205 1023).

Fareham & DARC: Wednesdays, 7.30pm. Porchester Community Centre, Westlands Grove, Porchester, Fareham, Hants. Rod Smith G0ERS. (0705) 373572.

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

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

Keighley ARS: Thursdays, 8pm. The Cricket Club, Ingrow, Nr Keighley. Kathy Bradford. (0274) 496222.

Maidstone YMCA ARS: Alternate Thursdays. YMCA Sports Centre, Melrose Close, Maidstone, Kent. Jan 31 - Novice Licence, RSGB Video & Lecture by G0LCH, Feb 14 - Open Night on the Air, 28th - Introduction to Computers by G4AXD. C.L. Roberts. (0622) 670936.

Mansfield ARS: 1st Thursdays, 8pm. The Polish Catholic Club, off Windmill Lane, Woodhouse Road, Mansfield. Feb 6 - Chairman's Evening A talk and slide show by G8EHX on his recent visit to China. Mary G0NZA. (0623) 755288.

Midland ARS: 3rd Tuesdays, 7.30pm. Headquarters Unit 22, 60 Regent Place, Birmingham B1 3NJ. John Crane G0LAI. 021-742 8712 (evenings).

Mid-Wales ARC: Llandrindod Wells. Len Rees. (0597) 823823.

Mid-Warwickshire ARS: 2nd & 4th Tuesdays, 8pm. St John Ambulance HQ, 61 Emscote Road, Warwick. Jan 28 - Amiga Graphics. Mike Newell. Kenilworth 513073.

Nelson & DARS: Wednesdays. Llancaiach Junior School, Nelson, Mid Glam. Leighton Smart. (0443) 411736 evenings.

Norfolk ARC: Wednesdays, 7.30pm. The Norfolk Dumpling, The Livestock Market, Harford, Norfolk. Jan 29 - Informal & Committee Meeting, Feb 5 - Construction Techniques by G3TOZ, 12th - Novice Licence by G3OEP, 19th - Science For All by G3PTB, 26th - Informal & Night on the Air. Jack Simpson G3NJQ. (0603) 747992.

North Bristol ARC: 3rd Fridays. SHE 7, Braemar Crescent, Northville, Bristol. J. Chris G0LOJ. (0454) 616267.

North Ferriby United ARS: Sundays, 8pm. North Ferriby United Football Club Social Room, Church Road, North Ferriby. F.W. Lee. (0482) 650410.

ARC of Nottingham: Thursdays, 7.30pm. Sherwood Community Centre, Mansfield Road, Nottingham. Jan 30 - Spring Clean Junk Sale, Feb 6 - Forum, 13th - Series of Mini Talks on Receivers, 20th - WAB Activity and Construction Evening, 27th - Fuses by G0IEG. Rex Beastall. (0602) 733740.

Poole RAS: 2nd & last Fridays, 7.30pm. Lady Russell Coates House, rear of Jelico Theatre, Poole College of Further Education, Constitution Hill Road, Poole, Dorset. V. Cotton. (020) 760231.

Preston ARS: Alternate Thursdays. The Lonsdale Sports & Social Club, Fulwood Hall Lane, Fulwood. Eric Eastwood G1WCQ. (0772) 686708.

Salisbury R&ES: Tuesdays. Grosvenor House, Churchfield Road, Salisbury. Bert Newman G2FIX. QTHR.

Saltash & DARC: 1st & 3rd Fridays, 7.30pm. TOC H Hall, Burraton, Saltash. A.T. Blackmore. 3 Parkesway, St Stephens-by-Saltash, Cornwall. Tel: Saltash 843472, 842537 or 847705.

Sevenoaks & DARS: Sevenoaks DC, Council Offices, Argyle Road, Sevenoaks.

Shefford & DARS: Thursdays, 8pm. The Church Hall, Ampthill Road, Shefford, Beds. Nigel G1JKF. (0908) 274473.

South Bristol ARC: Wednesdays. Whitchurch Folkhouse Assoc, Bridge Farm House, East Dundry Rd, Whitchurch. Jan 29 - Video Evening, Please Bring Your Own with G0AWX, Feb 5 - Computer Evening by G6PJS, 12th - Microwave Evening by G4YTH, 19th - Bring Your QSL Cards - Boast to your Friends with G0FGR, 26th - VHF Activity Evening. Len Baker. Whitchurch 832222.

Southdown ARS: 1st Mondays, 7.30pm Chasely Home for Disabled Ex-Servicemen, Southcliff, Bolsover Road, Eastbourne. Wednesdays & Fridays, 7.30pm. Hailsham Leisure Centre, Vicarage Road, Hailsham.

Southgate ARC: 2nd & 4th Thursdays. Winchmore Hill Cricket Club Pavilion, Firs Lane, Winchmore Hill, London N21. Jan 23 - Final Planning & Preparations for the London AR & C Show, Feb 27 - The Hazards of RF Energy at Kings College, London. Brian Shelton G0MEE. 081-360 2453.

Stevenage & District ARS: Tuesdays, 7.30pm. Ground Floor Rear Suite, Sitec Building, Ridgemond Park, Stevenage. Peter Daly G0GTE. Tel: (0438) 724991.

Stirling & DARS: Thursdays, 7.30pm. Brian Mulleady. (0324) 36235.

Stourbridge & DARS: 1st & 3rd Mondays. Robin Wood's Community Centre, Scotts Road, Stourbridge. Dennis Body G0HTJ. QTHR.

Stratford upon Avon & DARS: 7.30pm. The Home Guard Club, Main Road, Tiddington, Stratford-upon-Avon.

Thornbury & DARC: Wednesdays, 7.30pm. United Reform Church, Chapel Street, Thornbury. Jan 29 - Bonus Natter Night, Feb 5 - Global Positioning Systems by G0KZP, 12th - General Meeting, 19th - Rig Testing Equipment by G1USW, 26th - VHF/HF Activity Night. Tom Cromack. Thornbury 411096.

Three Counties RC: Alternate Wednesdays, 7.30pm. The Railway Hotel, Liphook, Hants. Dec 4 - Quiz Night. Dave G4VKC.

Todmorden & DARS: 1st & 3rd Mondays, 8pm. The Queen Hotel, Todmorden. Mrs E Tyler. (0422) 882038.

Torbay ARS: Fridays, 7.30pm. ECC Social Club, Highweek, Newton Abbot. Jan 24 - Construction Cup Judging. Walt G3HTX. (0803) 526762.

Trowbridge & DARC: 8pm. TA Club, Bythesea Road, Trowbridge. Feb 5 - Surplus Equipment Sale, 19th - Social Evening. G0GRI. (0380) 830383.

West Kent ARS: 3rd Fridays, 8pm. The School Annex, Albion Road, Tunbridge Wells, Kent. Feb 7 - Informal Meeting, 21st - The BBC World Service Sighting of Transmitters and Propagation by Richard Davis. John Taylor G3OHV. (0892) 664960.

West of Scotland ARS: Fridays, 8pm. Scout Shop, 21 Elmbank Street, Glasgow. Jan 31 - The CAA Air Traffic Control Service by GM4SUC. Jack Hood. (0698) 350926.

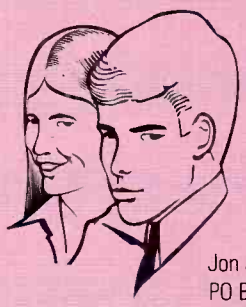
Wimbledon & DARS: 2nd & last Fridays, 7.30pm. St Andrews Church Hall, Herbert Road, SW19. Jan 31 Solomon Isles DXpedition by G3TXF, Feb 14 - General Activity Evening, 28th - Packet Radio for Beginners by G3ZPB. Chris Frost. 081-397 0427.

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

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

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

junior listener



Jon Jones
PO Box 59
Fishponds
Bristol BS16 4LH

Station Photo

Jonathan Tagg of Coleraine has become a regular contributor to the column. In his latest letter he's sent a photo of his station that I thought you might like to see. The most recent addition to his station is the AR-2800 scanner. Once he'd built up some experience with the AR-2800 Jonathan finds it to be a very good receiver. However, hid did hit one snag with noisy s.s.b. reception. The solution was to use the rechargable batteries instead of the supplied mains unit when using s.s.b. This is actually a common problem and is usually caused by the poor supply modulating the b.f.o. This then gives a 100Hz warble to the s.s.b. signal that can be quite irritating.

The other receiver in Jonathan's photo is a Panasonic radio cassette unit that he uses mainly for recording signal from the AR-2800. He finds this particularly useful when conditions are bad as he can play a callsign over several times in an attempt to identify a station.

I'd like to see more readers stations featured in the column, so why not send me a photo and some details.

RTTY?

With an increasing number of junior listeners having access to computers, I thought it was about time I covered some of the more complicated transmission systems. There are many systems ranging from Morse code through to the high speed multi-channel types. However, the most popular with short wave listeners are RadioTeleTYpe (RTTY) signals. These can be found throughout the h.f. bands carrying a wide range of information. Before I go on to describe how the system works, let's see what they sound like. A good frequency to try is 4.489MHz which is used by the Met Office at Bracknell to send weather readings. To receive the signal you should set your receiver for s.s.b. reception and, if you have a choice, use upper sideband. If you're tuned in ok you should hear a rapid warbling sound that varies in frequency as you tune across the signal. Now you've heard what it sounds like, let's find out a little more about this mode.

In the early days of using electricity to communicate, there was great competition to develop systems and codes that could use this new medium. One of the earliest systems to be developed was Morse code. Its effectiveness can be gauged by the fact that it's still widely used today. Although the code is very effective it is not well suited to automatic reception. The main problem with Morse code is the different lengths of each character. For example, the letter E is a single dot or dit, while C is dah-di-dah-dit. This variation in length makes it very difficult to build a machine that will reliably decode and print this system. The result is that a specially trained (and expensive) operator is required at each end of the link.

For the new transmission medium to be a success, it was essential for messages to be printed in plain text. This would make the system available to a much wider range of people and businesses. The breakthrough came in several stages, the first being the development of a code that used five elements to represent each character. This code was developed by Frenchman Jean-Emile Baudot in 1860. This standard character length made it highly suitable for use by an automated system. The code was made-up of individual units, each of which could either be a mark or a space. I've shown an example of how the letter D is constructed in **Fig. 1**. These early systems all used d.c. voltages passed over wires to communicate between remote stations. A typical system would have used voltages of ±80 volts to represent the mark and space respectively. The high voltages were necessary to overcome the resistance of the line and so provide a useful range.

All this was happening at about the same time as the typewriter was being developed and it was this that provided the vital link to make the system user friendly. It wasn't long before these two innovations were combined, using a typewriter keyboard with some associated mechanics to generate Baudot's five unit code. So was born the modern teleprinter that has been in commercial use for so many years.

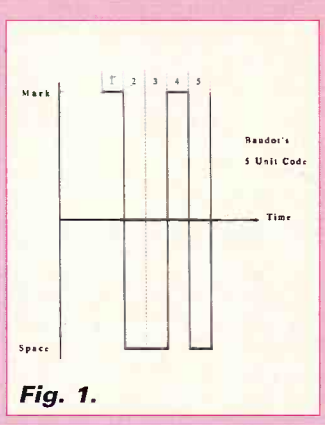


Fig. 1.

The next series of developments came in response to growing demands to communicate over ever greater distances. With the advent of reliable radio systems, it was only a matter of time before someone devised a way of using teleprinters over radio. The solution was to use a technique called frequency shift keying or f.s.k. Despite the complicated name, it's a very simple modulation system. All that happens is the frequency of the transmitter switches between two frequencies according to whether a mark or space is being sent. It's this change in frequency that produces the warbling sound that you heard in the earlier example. In a practical system, the change in frequency is called the shift and is usually quite small in comparison to the carrier frequency. One of the most common shifts in use today is 400Hz.

The next point we need to cover is the term baud rate. This is used to define the speed of the transmission and is simply the number of units per second. The speeds in common use are 45.45, 50, 75 and 100 baud. Incidentally, in case you haven't already twigged, the term baud is derived from the inventors name - Baudot.

With that bit of history out of the way, you're probably wondering what RTTY is used for these days. There are, in fact, many different organisations using RTTY on a regular basis. Probably the most popular amongst short wave listeners are the press agency transmissions. Just about every country, other than the major Western powers, use RTTY to distribute news from their agencies. The great attraction of these broadcasts is that you get the very latest news, often before it gets into the papers. The transmission modes used for most of these stations are 50 baud with a shift of 400Hz. The next major users of RTTY are the Meteorological agencies, for communicating weather reports. The only problem with these transmissions is that most are coded. One other area that remains quite active is amateur RTTY. You'll find this on most of the amateur bands between the s.s.b. and c.w. sections. The busiest band however, is 14MHz between 14.080 and 14.1MHz using a shift of 170Hz and 45.45 baud rate.

If I've whetted your appetite for RTTY signals, you'll be wanting to know how to get started. It's very difficult for me to give you clear guidance on this because there are so many different options. I'd suggest you start with a look through the adverts in *Short Wave Magazine* to find a company that's offering a package to suit you computer. If you want to receive without using a computer, both ERA and Dewsbury Electronics have systems on the market. I would also recommend that you keep a careful eye on the Mike Richards' Decode column, as he covers the subject from beginners upwards.

news

World Service by Satellite

The BBC World Service radio broadcasts for Asia are now available across the continent by satellite for the first time, opening up opportunities to reach millions more listeners.

The development follows the launch of BBC World Service Television in Asia on HutchVision's Star TV. As part of the deal that makes the BBC's TV news and information channel available on AsiaSat, the satellite will also carry radio broadcasts beamed from London in 18 languages.

SWLing in Ghana

George Akpaloo operates a DX Club in Accra called the First Ghana International DX Club that has a membership of about 20. They would like to get in contact with other DX Clubs or individuals who perhaps have discarded equipment that they could pass on. DXing enthusiasm in Ghana is rather low, a direct connection with state control over communications activities as well as low income levels, George says. Members, however, hope to overcome these problems if access to DXing literature and equipment could be obtained.
George Akpaloo, PO Box 10063, Accra - North, Ghana.

Catalogues

I have received two new catalogues this month. The first is from the Vintage Wireless Company and it's their Valve Catalogue 1992. This 45-page catalogue contains details of a huge number of valves this company have available for mail order. Not to mention the help they can give you to track down that elusive 'glass bottle'.
The Vintage Wireless Company Ltd., Tudor House, Cossham Street, Mangotsfield, Bristol BS17 3EN.

The other catalogue is the Winter '91/92 Cirkit catalogue, with its usual discount vouchers and new product lines. This 192 page publication is available from: **Cirkit Distribution Ltd., Park Lane, Broxbourne, Herts EN10 7NQ. Tel: (09920 444111.**

Portable Power

Recently we heard from a reader who had discovered an interesting product, the LV Motors Portable Power Pack. This can be switched between 12 and 6V d.c. and has a capacity of 8Ah, but can be recharged in three to four hours. The charge can be from the mains, a car battery or any other 12V source.

The unit weighs 1.8kg and comes with a case and shoulder strap supplied. The Portable Power Pack costs £72. For more details, contact: **LV Motors Ltd., 1 Royston Road, Baldock, Herts SG7 6NT. Tel: (0462) 896095.**

Navigation Receiver

RCS Microsystems Ltd have sent us details of the world's smallest and most powerful 5-channel Global Positioning System receiver module.

The Rockwell NavCore V, for which RCS will be providing in-depth engineering support, measures just 2.5 x 4 in. It interprets high accuracy navigation/position broadcast by the US Department of Defense through its NAVSTAR GPS satellite system. From this, the NavCore V provides three dimensional position information with velocity and time, world-wide.

The NAVCORE V employs advanced miniaturisation techniques to attain very small dimension with high functionality. Most important from a cost reliability and quality stand point is the low parts count. The vast majority of the circuitry is contained on four custom i.c.s supported by four memory devices. The NAVCORE V is designed with gallium arsenide receiver front-end, a high-speed custom digital signal processor and a high speed, low-power navigation processor. The gallium arsenide receiver comprises more than 1200 components on a 0.125in square semiconductor device, while the DSP has almost 250 000 transistors!

The OEM needs to add just an antenna, conditioned power (±5V d.c.) display, keyboard and software. A single serial port is used to output the data and to receive commands and initialisation information.

RCS Microsystems Ltd. Tel: 081-979 2204.

TV DX News

Another regional radio TV station will open Autumn 1992 in the Aragon region making the 8th region to operate on a regional (non TVE) basis. The reason is claimed to by the Aragon regional government that the mainstream TVE network does not offer sufficent local programming for local consumption.

In Trinidad two independent commercial TV stations have opened, that of 'Channel TV 6' and 'TV 18', both based in the capital town Port of Spain. On-air was mid-September last though initially with a temporary transmitter and studio operation. An f.m radio station is also operating by the same group.

Following on from the expansion and renovation of the GBC Ghana TV network in the Tamale region, the GBC is now considering installing a terrestrial transmitter at Ajangote, near Accra to re-radiate the CNN International programme covering a 20 mile radius - the programmes would be encrypted.

In Japan 1992 should see a start to a.m stereo broadcasting in Medium Wave though uptake by broadcasters is thought to be limited due to cost and also to the well established f.m radio system.

A new TV network will expand throughout Chile known as 'La Red' and owned by Chile Television SA, currently operating on ch.A4 in the capital, Santiago, the broadcast company has requested additional frequencies for expansion throughout the country.

'YLE Teksti-TV' is the Finnish teletext service over YLE-1 which carries 700 pages on a 24 hour basis, and when no programmes are transmitted over the YLE-1 network so the test card is radiated (good news for TVDXers!). Unusually a teletext 'show' is provided during the 0400-0700 weekdays which includes main national/international news and weather forecasts. The teletext morning programme is called 'Uutisruutu'. The service started October last.

For F2 propagation enthusiasts, ch. A0 Australian channel at 46.25MHz nominal - RTQ-0 now operates out of Toowoomba, Queensland, formerly this was DDQ 0, 'Star TV' and 'Vision-TV', RTQ uses the logo 'WIN Queensland' with a square of 9 large dots.

And finally from reader Anthony Mann, Perth, Australia, he notes that the Thailand TV ch.E2 outlet (often seen with a '3' logo via F2) now measures at 48.251MHz vision carrier.

Roger Bunney

Book Reviews

NEWNES GUIDE TO SATELLITE TV
by Derek Stephenson
published by Newnes
Available from SWM Book Service
156 x 234mm, 256pages. Price £16.95 plus £1.00 P&P
ISBN

There are a great many books published on the theory and practice of satellite television ranging from the profusely illustrated American volumes from the house of Baylin Publishing to the basic down to earth guides that John Breeds has produced now in several editions (*Satellite Television Installation Guide*). Whereas the former relates to both the UK, European and North American market in both C and Ku band, the John Breed series is biased to UL and general European practice, it's essentially a practical instruction with some theory but 95% a 'hands-on' guide.

The Newnes *Guide to Satellite TV* 2nd edition is a hard bound volume, printed in high quality paper and weighs in at 680g. The author is a satellite repair and installation engineer and the book covers all information needed by the installation engineer, the hobbyist and the service engineer to understand the theoretical and practical aspects of satellite reception with dish installation and how to trouble-shoot when picture quality is not up to anticipated reception. Mathematics has been kept to a minimum and much of Chapter 5 'The linked Budget Calculation' can be swiftly read unless you like complicated maths (at least I found it complicated, but then, I'm a simple soul).

The book has ten chapters, ranging from intensive detail of the various types of dish antenna, feeds, polarisers, polar mounts, cables, gain and focal point through to LNBs, satellite receivers, site surveys and how to install; how and where to mount the system, vandalism; how to align the system both tracking and fixed; distribution systems and repair of receiving equipment. At the very back is an extensive glossary with satellite footprint maps, a valuable table of azimuth and elevation angles for most towns around the UK - complemented with a similar table to cities across Europe.

There is a great deal of text and numerous line drawings, though the use of photographs is kept to an absolute minimum, a pity I felt. One plus point are the several pages which discuss the use of plastics wall plugs, Rawbolts, how to calculate the 'pull out load' for a range of situations, Hilti anchor bolts, Rawloks, etc. If you are into installation work then it's worth using the book for this information alone.

A good test of a satellite book is to see if it mentions Polyrod Lens, this book did! Planning regulations and dish siting is also covered, though obviously written prior to the latest DOE guide-lines, which recommend the use of dishes no greater in diameter than 700mm in the southern UK. Perhaps the planning aspects could also have been expanded, since this does have an impact with the installation trade, particularly if work within a conservation area occurs from time to time.

The Newnes *Guide to Satellite TV* is a good read, a good reference work and essential for any person involved professionally in the installation trade. The amateur or home enthusiast involved in his own satellite reception experimentation and DXing will also find the volume invaluable for general reference and consultation.

Roger Bunney

SECRET SIGNALS - THE EURONUMBERS MYSTERY
By Simon Mason
published by Tiare Publications, PO Box 493, Lake Geneva, WI 53147, USA.
Price $9.95 plus $3 shipping overseas. Visa/Mastercard welcome.
ISBN 0-936653-28-0

The ending of the Cold War hasn't brought a corresponding end to those mystery stations sending out coded numbers night and day, all over the short wave radio bands!

This book takes a look at the number stations of Europe with an author who has studied them for years, monitoring thousands of transmission in the process.

Learn about 'Bulgarian Betty', 'Papa November', 'The Lincolnshire Poacher', 'Swedish Rhapsody', 'The Russian Man' and many more. The book includes numerous traffic excerpts, identifiers, schedules and clues turned up by hearing mistakes in transmissions. It includes a full, by-frequency log with over 300 entries, complete with notes on formats and schedules.

RADIO LISTENERS GUIDE 1992
published by PDQ Publishing
Available from the SWM Book Service
140 x 204mm, 56 pages. Price £2.95 plus £1.00 P&P
ISBN 1-871611-03-2

This is the fourth and latest edition of this guide. Within the guide you will find easy-to-use maps showing the frequencies for all the radio stations in the UK. These include Radios 1, 2, 3, 4 and 5, BBC local and Independent and Community radio stations. Foreign stations broadcasting in English are also listed.

This year, the guide also includes articles by the BBC, the Radio Authority, The Voice of the Listener, Sony and Blaupunkt and, for the first time, it also lists stations transmitting from the Republic of Ireland.

While retuning, or scanning the airwaves, have you ever stumbled onto an interesting radio station, only to find that the station takes forever to identify itself? With the comprehensive frequency indexes in the guide you will be able to quickly and easily identify radio stations by their frequency.

THE AVIATION ENTHUSIAST'S HANDBOOK
by Kevin M. Fox
published by Argus Books
249 pages, 155 x 232mm. Price £9.95
ISBN 1-85486-054-2

If you read my 'Airband' column, you should buy this book! The title couldn't be more appropriate as Kevin Fox's own enthusiasm permeates the entire book. He writes in a chatty, easily followed style which will enable even the absolute newcomer to the subject to feel immediately at ease with it. More experienced readers will appreciate finding a general summary in a single book - and we can all find something new to learn.

Some of the subject matter is dismissed rather sketchily. I can see the author's problem here: too much detail would have made the material inaccessible to newcomers, but lack of detail will disappoint the more advanced reader or those with particularly enquiring minds. It is pleasing to see a common sense approach to some technical problems. An example is in making it clear that a so-called long wire antenna is only long when compared to the operational wavelength; absolute measurements in metres mean nothing.

In the 'Airband' column, I'm often asked to recommend a receiver or antenna. This is of course impossible! It must be an informed choice made by the purchaser. Kevin Fox's book, though, reviews some of the current possibilities and hence provides far more information on the subject than I can cram into an issue of 'Airband.' If you are making a choice of receiving equipment, you will be far better informed after reading this book.

Other important areas covered are a general run-down of what you'll see going on at a typical airport (and in its surrounding skies); also a directory of spectator facilities at many major airports. Kevin Fox pays special attention to provision for wheelchair visitors - and not before time. From his personal experience, it is obvious that Kevin didn't find all airports to be receptive to such disabilities. I hope that the offenders take note and improve themselves.

As with any such work, a few niggles are bound to creep in. The sub-editor has consistently allowed mHz instead of MHz, an error of only nine orders of magnitude! There's a perpetuation of a myth on page 85 that Heathrow is the world's busiest terminal. British Airports Authority might wish this to be so, but in fact Heathrow is well behind Chicago O'Hare in the United States. Heathrow has the greatest number of international movements - most flights in the USA being domestic.

This is a book which is written, by its own admission, for 'plane spotters and not for pilots. I dare say a few pilots would, nonetheless, benefit from reading it! I think the typical follower of 'Airband' stands to gain considerably from the book.

Godfrey Manning

Errata

A Basic RTTY Receive-only Terminal Unit
November & December 1991.
Unfortunately some errors crept into this project.

Part 1. Page 39. Fig. 1.2. The formula at line 5. should read $R1 = Q/(A_V * 2 * Pi * F_O * C)$

Part 2. Page 12. **Fig. 2.1.** R18 is shown positioned one track too high. It should be connected between D22 and D27.
Fig. 2.3. The lower connection to the C64 User Port should read 1,A (not 1,4) and is also connected to chassis (0V). Also note that the supply to IC2 is the 74xx standard; +5V on pin 14, 0V on pin 7.
The connections from the C64 User Port (24-way edge connector) to the 5-pin DIN socket on the terminal unit back panel are:

DIN socket	C64 User Port
1	J
2	1 & A
3	NC
4	2

Computer Listing 2 (page 37)
Line 50 should read:
50 POKE S+3,8: POKE S+1, HI: POKE S, LO: POKE S+4, 65
(The 60 : at the end should not be there).

Computer Listing 4
Line 40 should read:
40 GET K$: IF K$ <> " " THEN GOSUB 200: GOTO 20
Line 320 should read:
320 HA=INT((F/B)/256: POKE 666, HA

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

Feature

Navtex

Part 2

Jeff Harris G3LWM concludes his explaination of how Navtex helps mariners.

To receive Navtex signals a special receiver is required and Lo-Kata Ltd of Falmouth manufacture a wide range of marine electronic equipment, including a range of Navtex receivers. Their Navtex 1 is designed for use as a dedicated Navtex receiver for use in small and medium sized craftand complies with the signals and data format defined in CCIR rec 476-2 and 540.

Circuit Description

The block diagram, **Fig. 2.1**, shows the major functions of the receiver. The r.f. signal on 518kHz is fed into the appropriate antenna terminal. This signal is matched in a transformer to the 50Ω input on the receiver board. The basic receiver is a t.r.f. receiver

Specification of Navtex 1 receiver

Receive Frequency:	518kHz
Modulation Type:	f.s.k. ±85Hz
Sensitivity:	50Ω input <1μV e.m.f. from 50Ω for <4% error rate.
	Hi Z input <5μV e.m.f. from 10Ω/22pF for <4% error rate.
Adjacent Channel:	Measured with an on-chanel signal
Selectivity:	20dBμV for <4% error rate >30dB at ±1kHz off channel
Spurious Response Rejection:	>80dB from 100kHz to 30MHz except in the band 514 to 522kHz. measured with an on-channel signal of 20dBμV for 4% error rate
Audio Output:	3.5mm headphone socket level >100mV from 1kΩ
Antenna Type:	(a) 50Ω input
	(b) Hi Z input for wire antenna
	(c) 50Ω input for Navtex Active Antenna (internally powered)
Environmental:	generally to MPT1204B
Operating:	0-40°C
Printer:	40 column thermal type paper width 112mm 9 x 5 dot matrix.
Power Requirements:	12 or 24V d.c. nominal (10.8 to 31.5V d.c.) chassis isolated from power terminals
Power Consumption:	<100mA quiescent <1A when printing
Size:	300 x 130 x 90mm
Weight:	2kg
Front Panel Controls:	Off/On/Store Print Status Feed Paper
Hidden Control:	Set Up/Test Accept/Reject
Indicators:	Signal l.e.d. Alarm l.e.d.

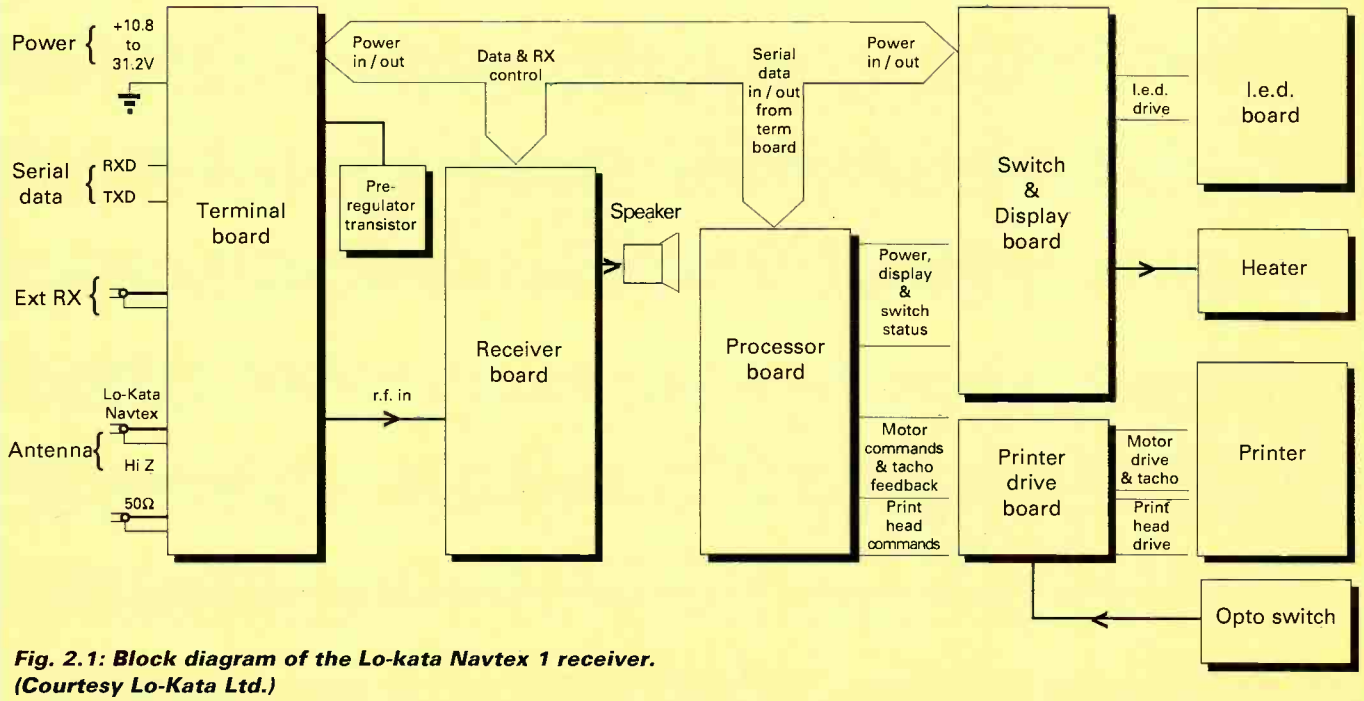

Fig. 2.1: Block diagram of the Lo-kata Navtex 1 receiver. (Courtesy Lo-Kata Ltd.)

Navtex 1 receiver. (Lo-Kata Ltd.)

FAX 2 Weather facsimile and Navtex system. (ICS Ltd)

ICS FAX-1 equipment. (ICS Ltd)

with a product detector and b.f.o. The receiver has a narrow band filter (two sections of a half lattice crystal filter) followed by a mixer that converts the r.f. signal to an audio frequency f.s.k. (frequency shift keyed) signal. This signal is either 1615Hz representing a data bit zero or 1785Hz representing data bit one.

The audio signals are then fed to the demodulator. This process converts the audio frequencies to the logic levels '0' or '1' in the form of a serial data signal suitable for handling by the processor board. This data has a rate of 100 bits per second. The processor converts this data stream into an internal character stream and searches these characters for a 'message header'.

When an acceptable header is found, this information and all subsequent characters are stored in memory and the processor then searches for the end of message code. When this has been received the printer is activated. A combination of control commands are sent to the Print Drive Board that amplifies these command signals to switch on the printer and energise the thermal print head. Feedback signals from the printer are similarly amplifed and these allow the printer controller to keep track of the exact position of the print head as it moves across the paper.

Other receiver functions concern power supply routing, operator controls, alarm and self-test features.

The receiver is very soundly made and provided care is taken in the mounting position in the vessel, away from spray and drips, the unit will withstand the severe condition encountered in a marine environment.

Programming the receiver is easy and the comprehensive operator's handbook supplied with the unit enables these functions to be speedily learnt.

The transmitters that are required to be copied can be programmed as well as the required messages. (Messages Type B and D can not be rejected). A logging function is also available that will print the header code and message numbers of rejected messages. Having programmed the receiver, the Print Status control will indicate the selected transmitters, message types and serial numbers contained in the Message Receive Store.

The Signal Indicator will flash when a transmission is being received but will only Print those that have been selected. The Alarm Indicator will illuminate and flash after reception of a message type B or D. This can be cleared by pressing Feed Paper.

When the ON/OFF/STORE control is placed in the STORE position the receiver will accept signals and store them in the memory and will not be printed at once. When the switch is returned to the ON position the messages will be printed. Search and Rescue messages and gale warnings will be printed immediately they are received. If the store becomes full, then some messages will be printed to allow room for a new message. It is impossible to lose messages by using the Store mode.

Other Methods of Receiving Navtex Transmisions

Any receiver that can cover 518kHz, has adequate stability, sensitivity, selectivity and is capable of s.s.b. reception will receive Navtex transmissions. It should be remembered that the system is desiged for reception within 200nm of the

```
---------- lokata navtex 1b ----------
ZCZC JA59
102321 UTC FEB
REPETITION OF KIEL RADIO NAVIGATIONAL
WARNING 132
LYNGBY RADIO NAVIGATIONAL WARNING 054
WESTERN BALTIC - FEHMARN BELT:
LANBY FEHMARNBELT IN POSITION 5436N
1109E REPLACED BY REDWHITE
SPARE BUOY NO. K06/T63. RADIO BEACON
OUT OF ACTION.
MARINELEUCHTE RADIO BEACON IN ACTION.

NNNN
--------------------------------------


---------- lokata navtex 1b ----------
ZCZC JA50
051315 UTC FEB
LYNGBY RADIO NAVIGATIONAL WARNING 018

GREAT BELT.TRAFFICSEPARATION SCHEME
KORSOER-SPROGOE. NORTHBOUND
LANE. HALSKOV REV LIGHT IN PSN 55 19.5N
11 02.4E REMOVED.
PSN MARKED BY LIGHT QR AND THREE
LIGHTBUOYS, QR. VESSELS MUST
PASS WEST OF THE LIGHTBUOYS. WORKS IN
PROGRESS 500 METRES EAST-
WARD MARKED BY 4 Y LIGHTBUOYS.

NNNN
--------------------------------------
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Fig. 2.2: Some 'DX' Navtex signals received on the north east coast of the UK.

individual Navtex transmitters, so inland coverage is not a consideration. In my location, on the North Essex coast, a short wire antenna gave the results as shown by the various 'DX' Navtex signals that were received, **Fig. 2.2**. Having received the Navtex r.f. signals it is, of course, necessary to have the equipment to convert these into a printed message (v.d.u. and/or printer). Both computer hardware and software are now available to perform these functions.

ICS Electronics Ltd (Arundel) offer three products that will enable Navtex, amongst other transmitted textual information to be received. The FAX-1 will print Navtex by simply tuning the associated communications receiver to 518kHz. Alternatively the FAX-1/N has its own built in Navtex receiver which permits Navtex messages to be received, even whilst another function is in progress (a weather map being printed, for example). The Navtex message will then appear at the end of the map. A new unit, the FAX-2, is a small unit (252 x 106 x 120mm) and has its own built-in printer. This unit will also decode RTTY and FEC transmissions.

Navtex

Navtex transmissions for UK Coastal waters are made by three of BT International's Coast Radio Stations, Niton on the Isle of Wight, Cullercoats on the Tyne and Portpatrick, near Stranraer.

The messages for transmission originate from the Hydrographer's Office in Taunton, or from the Met Office at Bracknell and are sent by them on telex to the RTT Co-ordinator at Portishead Radio. They arrive on one of his system management v.d.u. screens where they are edited to the correct format suitable for transmission. This will include a time code. At the appropriate broadcast times, the messages are automatically sent by private wire to the transmitters for transmission. A Navtex receiver at Portishead enables the co-ordinator to monitor broadcasts off-air. He also has available a general coverage receiver that can monitor actual transmissions.

The transmitters at the Coast Stations are on standby waiting for the arrival of the data to be transmitted, and are brought up on line at that time. A specification of a typical m.f. transmitter used by the Navtex service is given in **Appendix C**. The antennas used are matched mast radiators. This is a supported lattice mast acting as an effective vertical antenna.

Appendix C

Specification for a typical 2kW transmitter used in the Navtex Service

Type:	W50
Marketed by:	BT International

Drive Unit

Frequency Range:	**405-525kHz. Six pre-set channels crystal controlled.**
Operating Modes:	A1A, H2A, telegraphy modes H3A, J3E, Telephony/f.s.k. modes (upper sideband only).
Output Power:	100mW r.m.s. or p.e.p. into a 50Ω load. Output level adjustable on each channel. A low power condition of -10dB relative to full power is available.
Carrier Levels:	(a) -6dB ±1dB for modes H2A, H3A relative to 100mW p.e.p. output. (b) not worse than -50dB for mode J3E relative to 100mW p.e.p. output.
Unwanted Sideband Suppression:	Not worse than -60dB relative to 100mW p.e.p. output.
Intermodulation Products:	With standard two-tone test applied not worse than -50dB relative to either tone level.
Hum:	Not worse than -70dB relative to 100mW p.e.p. output.
Harmonics:	Not worse than -40dB relative to 100mW p.e.p. output.
Wideband Noise:	Not worse than -110dB relative to 100mW p.e.p. output measured in a 3kHz bandwidth ±10% from centre frequency.
Other Spurious Signals:	Not worse than -60dB relative to 100mW p.e.p. output.
Audio Response:	300kHz to 2700Hz. 3dB down at band edges, maximum ripple 3dB.
Audio Input Level:	-15dBm to +15dBm into 600Ω. Pre-set attenuator and variable control.
A1A/H2A Keying:	20 baud meets CCIR recommendation 328 for hand keying.
Key Up Suppression:	Not worse than -80dB relative to 100mW p.e.p. output.
Muting:	Not Worse than -115dB relative to 100mW p.e.p. output.
Remote Control:	DC Lines maximum line resistance 1000Ω.
Power Supply:	220-240V 50/60Hz single phase.
Operating Temperature Range:	+10 to +40°C
Overall Dimensions:	410 x 145 x 535mm.
Overall Weight:	12.75kg

Power Amplifier

Frequency Range:	405-525kHz. Six pre-set channels.
Operating Modes:	A1A, H2A, H3A, A3A, J3E, F1A, F1B.
Output Power:	2kW r.m.s. or p.e.p. into a 50Ω load.
Input Level:	100mW r.m.s. into 50Ω for 2kW r.m.s. output.
Hum:	Not worse than -55dB relative to 2kW r.m.s. output.
Harmonics:	Not worse than -35dB relative to 2kW r.m.s. output in 50Ω. Note: An associated a.t.u. will improve harmonic radiation by typically 15 to 20dB.
Intermodulation Products:	Not worse than -30dB relative to either tone level.
Wideband Noise:	Not worse than -100dB relative to 2kW r.m.s. output measured in a 3kHz bandwidth ±10% from centre frequency.
Output Load:	2:1 maximum at full output.
Tuning Time:	Not exceeding 5 seconds. Typically 2-3 seconds.
Availablity:	From cold not exceeding 5 seconds.
Cooling:	Forced air cooling by internal blower. Air filter mounted on rear door exhaust through top of cabinet.
Power Supply:	Three-phase 4-wire 50/60Hz inthe range of 380-440V.
Power Consumption:	Standby on 0.7kVA, e.h.t. on key up - 3.3kVA, full output c.w. 4.9kVA.
Operating Temperature Range:	-10 to +40°C.
Overall Dimensions:	900 x 1800 x 750mm.
Overall Weight:	523kg including drive unit.

Antenna Tuning Unit

Frequency Range:	405-525kHz. Six pre-set channels.
Frequency Selection:	Switched adjustable tape for input and output.
Power Rating:	3kW r.m.s. or p.e.p. maximum
Input Impedance:	50Ω
Output Impedance:	Will match antenna impedance of 6-15Ω resistive and 1.5-5nF capacitive.
Output Connector:	Porcelain feed-through 230mm diameter.
Control:	DC Contactors operating voltage 50V
Monitoring:	A d.c. voltage proportional to antenna current is available for extended metering.
Overall Dimensions:	Contained within a glassfibre cabinet 1020 x 850 x 725mm
Overall Weight:	85kg.

South Midlands Communications Ltd.

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LISTEN OUT with SMC

YAESU JRC AOR SONY ICOM KENWOOD DRAKE FAIRMATE BEARCAT LOWE YUPITERU

Yaesu's serious about giving you better ways to tune in to the world around you. And whether it's for local action or world-wide DX, you'll find our HF/VHF/UHF receivers are the superior match for all your listening needs.
When you want more from your receivers, just look to Yaesu. We take your listening seriously.

The **FRG9600,** a premium scanning receiver covering 60-905MHz, SSB, CW, AM & FM modes. 99 memories. 5, 10, 12.5, 25 & 100kHz scanning steps. Keyboard frequency entry. Optional convertors to extend range from 0.15-30MHz and 800-1300MHz

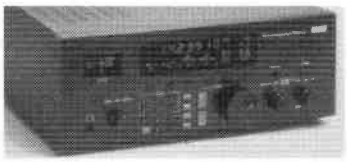
The **FRG8800** HF communications receiver. A better way to listen to the world. Continuous coverage from 0.15-30MHz optional module for VHF coverage from 118 to 174MHz. SSB, CW, AM & FM modes. Direct frequency entry keyboard.

NRD535 from JRC

The new NRD535 epitomises the very best in communications receiver design. This high technology product is based on the abundant technical experience gained by JRC in the professional communications receivers field. This means that the NRD535 is arguably one of the best receivers available to meet the discerning listeners needs. Brief specifications are as follows.
Frequency coverage: 0.1-30MHz; Operating modes: CW, SSB (LSB & USB), AM, FM, FSK & RTTY; Supply voltage: 240V A.C. or 13.8V D.C. ECSS, BWC & RTTY units available as options.

JRC NRD535

DRAKE R8E

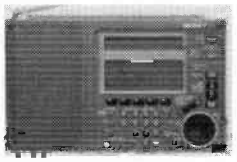


DRAKE R8E

Now available from SMC the new DRAKE R8E communications receiver. These receivers utilise the very latest in technology to meet the demanding requirements of today's listeners. Conveniently located front panel controls allow for rapid operator programming and ease of use. The R8E receiver covers 0.15-30MHz and with the optional VHF converter will also cover 35-55MHz and 108-174MHz. The large clear LCD display gives the operator full information about the current receiver status.

A COMPREHENSIVE RANGE OF RECEIVERS AVAILABLE AT MOST BRANCHES

SONY at SMC



SMC are pleased to be able to offer the SONY range of Multiband Receivers. They feature all the latest technology allowing unequelled coverage of both broadcast and shortwave bands, yet remaining both compact and easy to use. All the models illustrated cover VHF broadcast, SW broadcast, and some models cover other bands as well.

The very latest model available from SONY is the ICF-SW77. This receiver covers LW, MW, SW and FM stereo broadcast bands and has SSB reception on the SW bands. A comprehensive keypad and LCD display give easy control over the massive array of features available.
Other SONY products available include the minuscule ICF-SW1, the versatile ICF-SW7600, the popular ICF-2001D and for airband enthusiasts the AIR7 and ICF-PRO80.

AOR AOR AOR

SMC are pleased to be able to offer a large number of models from the very comprehensive AOR range which includes both hand portables and mobiles/base stations.

All the receivers are built to the highest possible specification yet remain very competitively priced. Often the leaders in the field, the AOR range is proving very popular amongst both professional and non professional users.

The top of the range model must be the AR3000 which covers 100kHz–2036MHz without any gaps. The mid range model is the AR2800 which is a convenient unit for mobile or base operation and covers 500kHz–600MHz and 800–1300mHz. Last but not least is the AR2000 which is an extremely flexible handheld scanner covering 500kHz–1300MHz.
Why not contact us today for more details of the AOR range.

OTHER MAKES AND MODELS

The Bearcat 200XLT is the cream of the Bearcat handheld scanner range. With 200 memory channels and simple operation these are proving very popular. Frequency coverage 66-88, 118-174, 406-512 and 806-956MHz.

The compact HX850E is a basic scanner with a few memories. Ideally, suitable for a novice in the scanner market. AM/FM modes and a frequency coverage of 60-89, 118-136, 140-174 and 406-495MHz.

- *Free Finance on selected items, subject to status. Details available on request.*
- *Up to £1000 instant credit, a quotation in writing is available on request, subject to status.*
- *Yaesu Distributor Warranty, 12 months parts and labour.*
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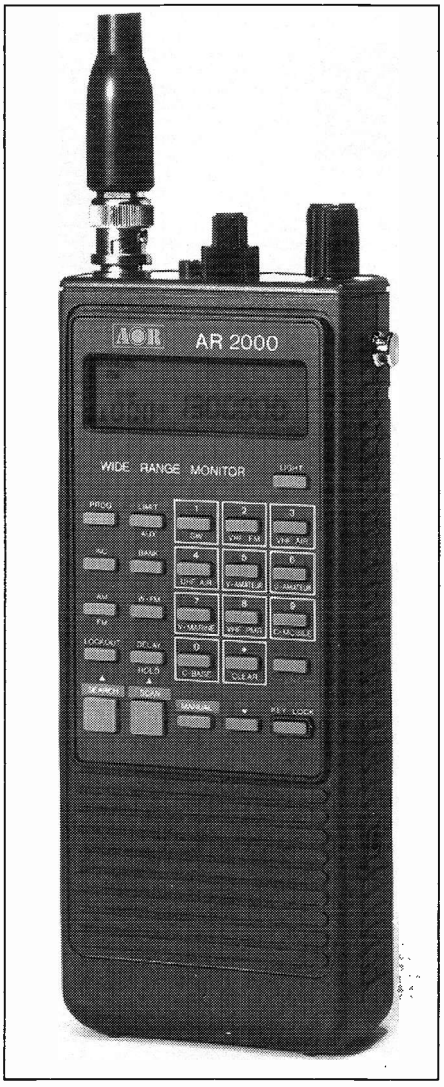
Listen to AOR

The **AR3000** now extends your listening horizons. Frequency coverage is from 100 kHz to 2036 MHz without any gaps in the range. All mode: USB, LSB, CW, AM, FM (narrow) FM (wide). 400 memory channels are arranged in 4 banks x 100 channels. 15 band pass filters before the GaAsFet RF amplifiers ensure high sensitivity throughout the entire range with outstanding dynamic range and freedom from intermodulation effects. An **RS232** port is provided to enable remote operation by plugging directly into most personal computers.
ACEPAC3 is an exclusively developed multi-function IBM-PC based program to further increase the versatility of the AR3000. A sweep facility provides a spectrum analysis graph. The very latest version displays frequencies in X axis and squelch opening percentage on each frequency in the programmed frequency search range. This indicates 'how active' the frequencies are in the programmed search range. In addition to the graphic display, ACEPAC3 can produce a detailed numerical list from the graphic information. One memory file has 400 channels divided into 4 banks of 100 channels. More than one memory file can be created to increase the memory storage capability. If you make just one extra memory file you can store 800 memory channels!
DA3000 Wide band 16 element discone aerial for external mounting. Frequency range 25 MHz to 2000 MHz (2 GHz). The aerial is supplied with approx 15m of coax terminated in a BNC connector ready to plug in and use with any AOR receiver. 'V' bolts and clamps are provided, however an additional supporting pole will be required for installation.

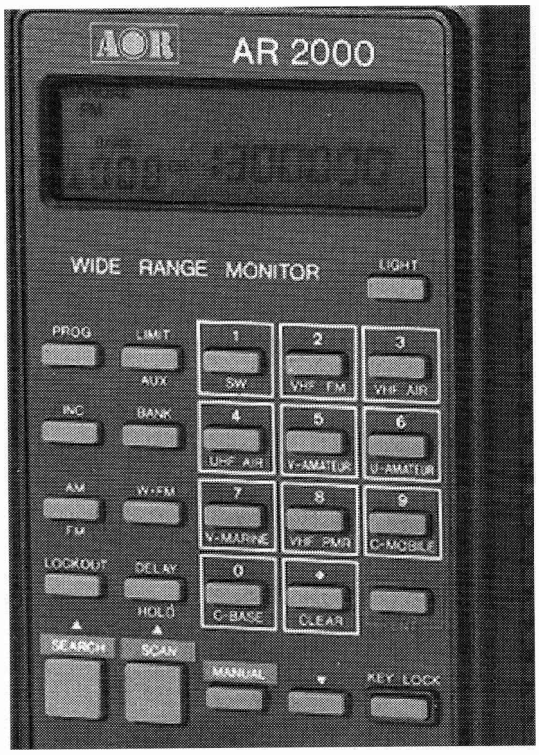


AR2000 ***ultimate portable monitor receiver...***
AOR have followed on from the successful AR1000 and have made the specification of the AR2000 even better. (One major change is the replacement of the 154.825 MHz crystal with a highly-stable 12.8 MHz reference and multiplyer chain). Whether out in a field running hand-portable, in the car or at home the AR2000 enables you to listen to both VHF and UHF airbands. Of course if you get tired of listening to airband, you can push a button or two and the world is yours! 'If it moves you can monitor it' - *well almost.* The choice of listening is endless, marine, Amateur band, airbands even BBC radio 2 on VHF FM. There are 1000 memory channels and 10 search banks, even a rotary tuning control is fitted to further enhance operation.

Search banks:

Bank 1	Shortwave	2 - 30 MHz	5 kHz step	AM
Bank 2	VHF FM	88 - 108 MHz	50 kHz step	WFM
Bank 3	VHF Air	108 - 138 MHz	25 khz step	AM
Bank 4	UHF Air	225 - 400 MHz	50 kHz step	AM
Bank 5	VHF Amateur	144 - 146 MHz	12.5 kHz step	NFM
Bank 6	UHF Amateur	433 - 435 MHz	25 kHz step	NFM
Bank 7	VHF Marine	156 - 163 MHz	25 kHz step	NFM
Bank 8	VHF PMR	165 - 174 MHz	12.5 kHz step	NFM
Bank 9	C-Mobile	890 - 905 MHz	12.5 kHz step	NFM
Bank 0	C-Base	935 - 950 MHz	12.5 kHz step	NFM

UK Specific:
For ease of operation in the UK, the search banks have been pre-programmed at the factory. They may be easily re-programmed by the user.
Each of the ten numeric keys is labelled with the corresponding search band, simply press one button and the receiver starts looking for interesting frequencies.



Frequency coverage:
The receiver has an exceptionally wide frequency coverage from 500 kHz to1300 MHz (1.3 GHz) with no gaps. The modes available are AM, FM (narrow) and FM (wide). Any available mode may be selected at any frequency within the receiver's coverage. There is no frustration in mode selection encountered here, you are *not forced* to listen to a specific mode at a specific frequency or band.

Accessories supplied:
DA900 single wide band whip aerial for VHF and UHF
AC charger
4 x AA High capacity rechargeable NiCad batteries
12V DC lead fitted with a cigar lighter plug for mobile operation
Soft case with carry strap
Belt hook
Earphone

Everything you need is included to just switch on and start listening - today.

Access
VISA

New models on the way for 1992:
AR1500 Hand-held with SSB.
AR3000A latest version of the best selling base monitor **& more...** For further details of all AOR receiver products please send a S.S.A.E. (34p)

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AIRBAND SPECIAL

Air Traffic Control in the UK

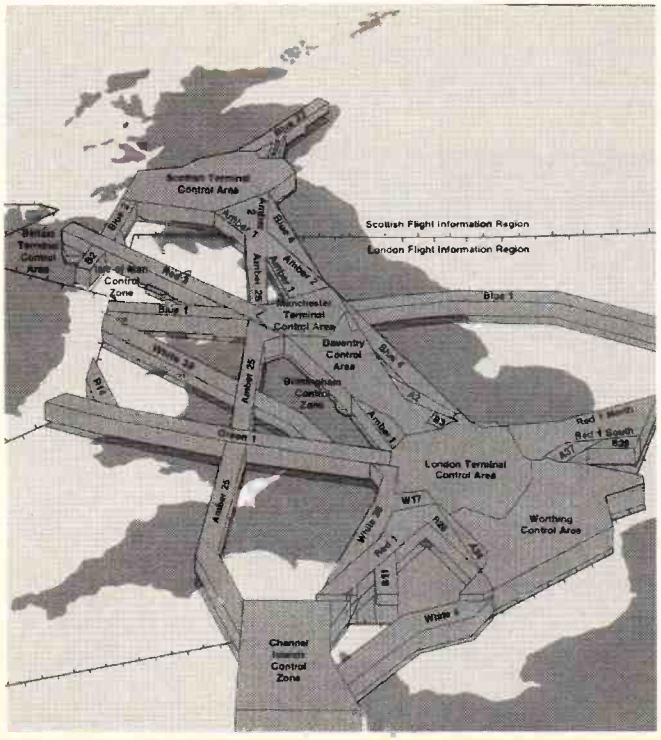
Ever since the advent of air transport some 76 years ago, the need for the effective control of aircraft has been essential for the safety of air passengers. In this article private pilots licence holder Ben Nock G4BXD tells us how it works.

Radio communication between ground and aircraft has evolved over the years to the highly complex and effective air traffic control, as illustrated by the impressive ground operation rooms and control suites in use today. The main London Air Traffic Control Centre (LATCC) at West Drayton has a total staff of 600 (nearly half this total engaged on telecommunications) and controls 3000 flights on average every 24 hours. So the need for an orderly and reliable system is of paramount importance in air safety and efficient handling of flights in UK airspace.

Division of Airspace

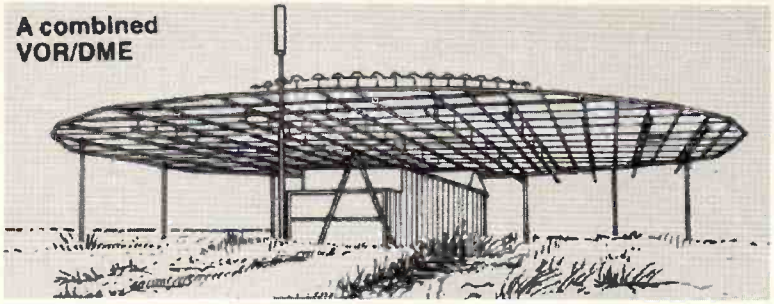
The UK is divided up into two distinct Flight Information Regions (FIR), the LATCC responsible for the southern area and the Scottish ATCC controlling areas north of a boundary at 55°N, located at Prestwick (this location also houses the Oceanic Control Centre for transatlantic flights). Within these defined FIRs a number of fixed airways, 10 miles wide by 5 miles high, form controlled airspaces. At the junction of these airways coinciding with airspace in the vicinity of airports are the Terminal Control Areas (TMA), of which London TMA is the largest. Within these areas functions such as airport approach, departure and ground movements are managed by controllers in the relevant airport control tower. On the ground, under the airways, are located navigation beacons, v.h.f. omni range (VOR and the newer Doppler VOR), Distance Measuring Equipment (DME) and Non-Directional Beacon (n.d.b.) all of which assist the pilot in his accurate navigation along airways under Air Traffic Control. Airways are divided into sectors and each sector is allotted controllers at ATC.

The initial advice of an intended flight is given to ATC in a flight plan by the aircraft's operator, listing its intended route, height, speed, departure and arrival times plus other information relating to passenger numbers, cargo, etc. The flight plan is computer processed at ATC and flight progress strips are printed for the assigned air traffic controllers. Thus ATC



Principal airways in UK airspace. **(Courtesy CAA)**

AIRBAND SPECIAL



Primary and secondary radar/ aircraft transponder **(Courtesy CAA)**

(Swissair)

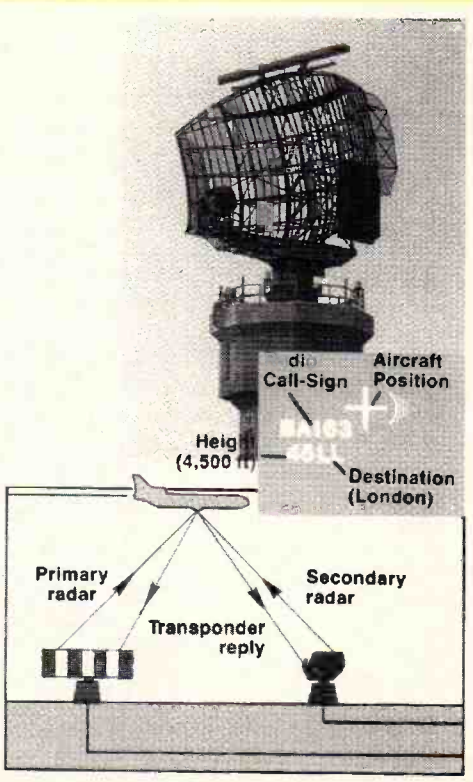
The London Air Traffic Control Centre at West Drayton. **(Courtesy CAA)**

will always remain in control, by radio communication and radar, of that aircraft during its flight in controlled airspace and the pilot has a mandatory obligation to obey instructions once under that control. Both v.h.f. and u.h.f. communications are used within the range of those systems in the UK and English language is used in common throughout the world. The internationally agreed current frequency range is between 118MHz and 137MHz for voice transmission and a total of approximately 380 channels are allocated for air traffic control in the UK. As a general rule frequencies are allocated to a particular airway, but several less busy airways will in some cases share the same frequency. Alternative frequencies are used as directed by the controller during busy periods and other frequencies are allocated to approach, ground, weather and other functions. A further 200 channels are allocated for use by transmissions from radio navigation beacons between the range of 108MHz and 117.97MHz. Details of all frequencies can be found in the many books on Air Traffic Control. A good in-depth example is *Air Traffic Control* by Graham Duke (£3.95), also *Air Traffic Radio* by Ken Davies (£3.95) and *Air Band Radio Handbook* by David J Smith (£7.50). The *En Route Supplement* published by 1 AIDU, RAF Northolt, includes details of all UK Air Navigation Beacons plus u.h.f. military allocations. The many v.h.f./u.h.f. frequency lists available will include a full listing of ATC allocations although sometimes not as detailed as a dedicated ATC guide book.

Central Control Function

Over the past decade, the large increase in UK air traffic has meant that the division of airspace into defined sectors in the south-east has not been found to be the optimum system for controlling the current or projected number of flights in this region. It is planned therefore, beginning in 1992 and fully operational by 1995, to introduce Central Control Function (CCF) to

Air navigation aids - a combined VOR/DME station **(Courtesy CAA)**



provide more effective control over air traffic within the London Terminal Control Area (TMA). Simplified, the system will mean that control of aircraft within this area hitherto managed from individual airports will pass to a separate operations room at LATCC at West Drayton. Where two-way air traffic was previously in operation within the TMA a number of one-way discreet 'tunnels' will handle all traffic within the vicinity of major London Airports. This will, it is claimed, mean at least 30% more air traffic capacity being available without compromising air safety. Both v.h.f. and u.h.f. communications will be upgraded, increasing available channels and improvements made in quality of R/T. Increased outgoing traffic flow will enable existing aircraft to reach their optimum cruising altitudes much sooner than at present. It is planned that the CCF concept will in future be extended in the future to other TMA in the UK when finances permit.

Abbreviations

ATC	air traffic control
CAA	Civil Aviation Authority
CCF	Central Control Function
DME	Distance Measuring Equipment
FIR	Flight Information Regions
LATCC	London Air Traffic Control Centre
MHz	megahertz
n.d.b.	non-directional beacon
R/T	radio telegraphy
TMA	Terminal Control Area
u.h.f.	ultra high frequency
v.h.f.	very high frequency
VOR	v.h.f. omni range
°N	degrees north (latitude)

Lufthansa Boeing 737-300 'City Jet'.

RECEIVERS ARE 'IN' AT WATERS & STANTON

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VHF/UHF Airband Frequency Guide

This latest edition of our famous VHF/UHF Airband Frequency Guide has been completely updated. It's our biggest edition yet and is brimming with information of interest to all airband enthusiasts. Fully illustrated it covers a wide range of topics including aircraft radio services, emergency procedures, navigation, air traffic control, airband monitor receivers, suitable aerials and much more. The number of airfields listed has now been increased considerably to take in the many small private fields not included in our competitors' publications. Of course all the civil and military aerodromes have had their frequency lists updated and we now give approximate distance from the nearest towns for most entries. Many other frequencies are also listed including companies, air to air, display, VOLMET etc. If you want everything in one smart comprehensive bookshelf guide, then order your copy today.

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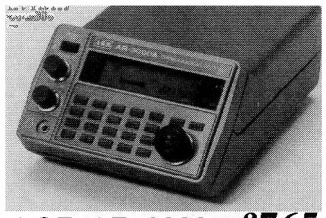
R5000 Kenwood top range super sensitive receiver	£895
FRG8800 Yaesu short wave receiver	£649
ICR71E Icom super top performer	£875
ICR72E Icom's budget short wave receiver.	£659
HF225 LOWE Budget price - superb performance	£425
ICF2001D SONY No other portable can touch it!	£289
SW7600D SONY The smallest truly portable SSB/AM	£149
SW72 SONY portable SSB	£349

NEW MODEL OLD PRICE



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These new Pre-Amplifiers are a must for the scanner enthusiast and will allow reception of signals that were inaudible without them.

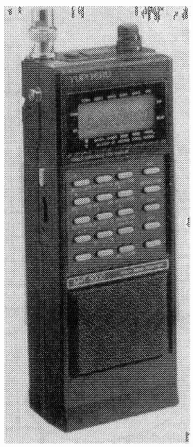
MODEL M75

For base and handheld scanners

- 25-2100 MHz
- Low noise GaAs FET.
- Selectable filters for improved performance.
- Variable Gain Control.

£69.95

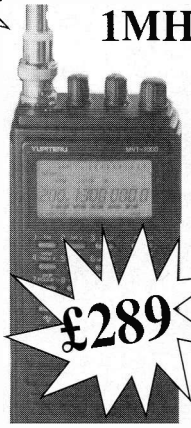
YUPITERU SCANNERS



New Low Price MVT-5000 £229

The MVT-5000 is still available and covers 26-550/800-1300MHz. If you don't mind missing the TV band, this model has to be one of the best ever scanners built. Its sensitivity is still unbeaten and its construction and reliability is legendary.

The NEW MVT-7000 1MHz-1300MHz



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- 12V Lead

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D505 £69 ACTIVE AERIALS 1.5MHz – 1300MHz

ONE AERIAL DOES IT ALL!

Just think one aerial for all your receivers. Both have built in matching circuits at the base of the antenna to provide high gain performance!

Mobile Aerial D505

This aerial covers everything from long-wave to VHF. It is no larger than a conventional mobile aerial measuring just 29.5" long, fits any standard mobile mount and comes complete with cigar lighter lead and matching box with RF gain control.

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Beautifully made from fibre glass, this rugged aerial will fulfil all your needs whether it be HF, VHF, or UHF. It comes complete with all the mounting hardware for mounting externally.

PL259

D707 £99

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Modes:	AM/Narrow FM/Wide FM
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Antenna:	50Ω BNC
Supply:	6-15V DC (Internal 9V AA)
	24mA (Battery save.)
Dimensions:	110 x 53 x 37mm
Weight:	370g
Configuration:	AM/FM Triple conversion
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Specifications:
Frequencies:
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- LW/MW/SW 150kHz-30MHz

Antennas:
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- Ferrite Bar LW/MW

Size:
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DXing Non-Directional Beacons

AIRBAND SPECIAL

Nestling just above Radio 4 on the long waves and just below the medium wave bustle are the aeronautical locator beacons known as Non-Directional Beacons. Ben Nock G4BXD tells us how to DX these permanently transmitting stations.

The trouble with chasing DX is that in the first place it's not always there for one to attempt to receive. Not only do you need a decent receiver, a good antenna and lots of patience, but the DX has to be transmitting at the same time as you are listening. A rare country must be transmitting some r.f. before there is a hope of your cat's whisker detecting it! With Non-Directional Beacons there is no such problem as they are always available to try for.

These relatively low power n.d.b. transmitters are usually located on airfields and, by the use of a display in the cockpit of the aircraft, give bearing information that assists navigation. Although meant for local use, 15 to 30km, around the airfield, by tuning to two known beacons and getting a bearing on both, this will give, by triangulation, one's position in the sky, roughly.

What is an n.d.b.

The actual is a low power a.m. transmitter supplying a carrier onto which is amplitude modulated a callsign sent in Morse code. The code group is repeated on a continuous basis. As most pilots are not too proficient at receiving 40 words a minute the Morse sent by the beacons is very slow and should be quite easily decoded, even by those with only a printed list out of a book. The callsign consists of either a single character, two characters or three characters, e.g. the callsign HG for Halfpenny Green airfield or CDF for Cardiff airport.

The beacons can be found between around 250 and 450kHz. There is usually more than one beacon on each channel, but the beacons will be separated by distance, i.e. a beacon in Scotland could be on the same frequency as one on the south coast. Even when the channel is quite crowded with several carriers the code can be received by careful tuning to one of the sidebands, in fact the use of an s.s.b. receiver greatly improves reception. At this QTH a TS-430S is used and switched between upper and lower sideband depending upon the QRM from other carriers. If used on a.m. the resulting din makes it impossible to copy anything.

Antenna Requirements

The antenna will, of course, make a world of difference, but most of the bits of wire available to DXers will be rather inefficient. This is because a halfwave dipole at these frequencies, say 300kHz, would need to be around 475m long and at a height of 240m to do the best job. If any reader has such an antenna, then they must be the owner of a world-wide radio station

Table 1.

Callsign	Location	Frequency (kHz)
ADR	Belfast	346.0
BHD	Berry Head	318.0
BMH	Bournemouth	339.0
BLK	Blackbushe	328.0
BZ	Brize Norton	386.0
CAR	Carnane	366.5
CDF	Cardiff	363.5
CHT	Chiltern	277.0
CT	Coventry	363.5
EME	East Midlands	353.5
EMW	East Midlands	393.0
EPM	Epsom	316.0
FNL	Fenland	401.0
FY	Finningly	408.5
GE	Gatwick	338.0
GG	Cardiff	329.5
HAW	Hawarden	340.0
HRN	Bournemouth	401.5
JEY	Jersey	367.0
LA	Lyneham	282.0
LPL	Liverpool	349.5
LIC	Lichfield	545.0
MCR	Manchester	388.0
MW	Middle Wallop	376.0
MVC	Colonne !!	298.0
OB	Heathrow	389.5
OF	Filton	325.0
OX	Oxford	403.5
RNR	Radnor	374.0
SND	Southend	362.5
SPY	Spijkerboor !!	381.0
SB	Sonderberg !!!	330.0
STU	Strumble	400.0
WCO	Westcott	335.0
WJ	Wittering	406.0
WOD	Woodley	352.0

AIRBAND SPECIAL

and can I come and use it please? The same requirement also goes for the transmitting antenna. At most locations the power output of the final stage is in the order of 50W feeding through an a.t.u. to a measly 15m or so of end fed wire at something like 10m up - very poor radiator at these frequencies.

A quick listen round the band here in north Worcestershire, using a tatty piece of wire 15m long resulted in many stations, including those in **Table 1**.

The actual output power of the n.d.b.s vary from site to site. There is a monitoring station in Rugby that measures the field strength of the radiated signal which has to be within certain limits. Typical examples are Belfast's ADR which has a capacity of some 300 watts output but reduces this to run about one and a half amps of antenna current into a 100m wire. Then there is Fenland's FNL, north Cambridgeshire, that runs three 807 valves in parallel to a 17m vertical. Jersey's JEY runs some 60W to a T antenna and JW runs 10W to an inverted L. All these were readable at my QTH on 15m of wire.

There are various suppliers and sources of full callsign and location details around although some of the longer distance stations might not be so well detailed. A good source for the UK beacons is *Pooley's Flight Guide*.

Antenna Options

A wire antenna, as long as possible and as high as is allowed(!) is very good at reception but suffers from the drawback that it will always be pointing the same way and giving the same pile of signals. One method of sorting the pile into readable signals is to use a frame antenna that can be rotated and so null out one station to make another on the same frequency readable. An alternative to the frame antenna could be the ferrite rod antennna. This would probably be the easiest to start with as it is commonly available, ready wound, in any junked portable radio covering the long wave band.

The Ferrite Rod

The rod, complete with windings is removed from the old set and some sort of mount arranged so that it can be rotated without the hand being too near it. The old portable usually employs some form of clips inside that already hold the rod and these could be removed at the same time and pressed into service. If the rod also has a m.w. coil it can be removed as it is not needed. A tuning capacitor is also needed and again the existing one can be used. If the attempt is undertaken with some thought the whole rod, capacitor and wiring can be removed in one go, saving considerable head scratching later.

There should be a coupling coil on the rod with the wires going off to the waveband switch, if fitted. This is the coil you will need to get the signals into your receiver. These are located, carefully unsoldered and a short cable fitted with a plug on the end to fit your receiver. As the l.w. coil was centred on 200kHz a slight retuning will be needed. Tune the receiver to around 350kHz and with the capacitor at half mesh, adjust the position of the coil and the rod to get maximum noise. Tune to an n.d.b. station - with the b.f.o. switched on is best - and rotate the rod for the best reception. Should you find two or more stations on the same frequency, the best action is to rotate the rod for a null in the strongest station, which should then make it easier to copy the weaker ones.

The Frame Antenna

The frame antenna, an old time invention but still a worthwhile idea, is relatively easy to construct. It consists of a loop of wire with a variable capacitor connected in parallel to provide the necessary tuning. A further loop placed close to the main loop acts as the pick-up feed to the receiver. A cross of wood is constructed on a base that can be rotated, so that a wire connecting the tips of the cross will give a square of wire with sides about 610mm long. The outer most edge of each wooden tip has a 'V' grove cut into it to hold the wire.The wire, anything around 30s.w.g., is fastened to the base and a loop wound around the tips of the cross, thus forming a square of wire. A good start would be to wind 262 turns with a 350pF variable capacitor. This is the normal value used in old valved receivers, etc. The pick-up loop, around 10 turns, is wound over the main coil and taken by a short cable to the receiver. Again the procedure is to rotate the coils so as to give a null on the strongest signal and enabling you to detect the weaker ones underneath. Some experimentation can be tried with the coil diameter, number of turns and wire size to optimise reception properties.

Conclusion

The provision of these beacons, whilst being a welcome assistance while flying, can provide a real challenge for the serious DXer and a new source of interest inthe field of communication. Perhaps some organisation might be interested in setting up a *Heard All Beacons* Award! Good Listening.

Abbreviations

a.m.	amplitude modulation
a.t.u.	antenna tuning unit
b.f.o.	beat frequency oscillator
DX	weak or far distant stations
kHz	kilohertz
km	kilometres
l.w.	long wave
m	metres
mm	millimetres
n.d.b.	non-directional beacons
pF	picofarads
QRM	man-made noise
QTH	station location
s.w.g.	standard wire gauge
W	watts

Acknowledgements

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Frankfurt airport, the home base of the Lufthansa fleet.

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HF Airband Communications

AIRBAND SPECIAL

The North Atlantic is one of the busiest air routes anywhere in the world. Although the actual traffic density is not as high as over the UK it still needs to be controlled. Philip C. Mitchell explains how this is achieved.

The number of aircraft using North Atlantic air routes currently exceeds 500 flights during peak daily periods. Not all this traffic originates from the UK but from Europe and the Middle East as well and this figure may give the impression of crowded airspace. But bearing in mind that the total oceanic area covered by North Atlantic Air Traffic control is in excess of 18 million km^2, traffic density is considerably less than over land where for example UK ATC only covers approximately 896 000km^2. However, aircraft will still require to be controlled accurately from the ground in a safe and orderly fashion. This is especially so when there is a concentration of transocean traffic at certain times due to differences of time zones plus the restriction on night landings and take-offs.

Other factors discussed later on in this article and the fact that most Atlantic air routes are from east to west or west to east combine to make for a less complex control system compared with overland flights. There is, nevertheless, a lot to be heard of interest to the s.w. listener provided he has a reasonably sensitive h.f. receiver equipped with s.s.b. mode and an efficient antenna system, preferably orientated north to south for optimum Atlantic reception.

HF Communications

In view of the distances involved, neither u.h.f. or v.h.f. communication is possible except within the limited range of land-based transmitters that the 'line of sight' rule imposes. This factor combined with the curvature of the earth likewise restricts effective ground radar range to about 320km hence the inability to locate and accurately position aircraft beyond this range. In the absence if this radar cover to fix position of the aircraft, on-board inertial navigation equipment is used, hence the primary need for h.f. communication with its unlimited range and economy of power and minimum interference on s.s.b. operation, to continually update track details and other information to the respective oceanic control centres. This therefore is a feature that is different from air traffic control over land areas, where radar coverage is of paramount assistance to aircrew to relay exact position of aircraft.

Oceanic Control Areas (OCA)

The present OCA that are incorporated into the North Atlantic Radiotelephony Network (NARTEL) is shown in **Fig. 1**. The UK based Oceanic Air Control Centre is located at Prestwick in Scotland and is known as Shanwick OACC. The R/T transmission facility for this centre is located at Ballygirreen near Shannon, Southern Ireland hence the coined word 'Shanwick'.

North Atlantic Track Broadcast

Unlike the permanent airways controlled within UK airspace, routes of transocean aircraft follow one of a number of parallel tracks that are determined on a day to day basis. The construction and positioning of these tracks is the joint responsibility of Gander and Prestwick Air Control Centres with the final arrangement being influenced by available information on weather conditions and location and strength of jet streams, factors that will significantly affect the aircraft's performance. An example of organised Atlantic

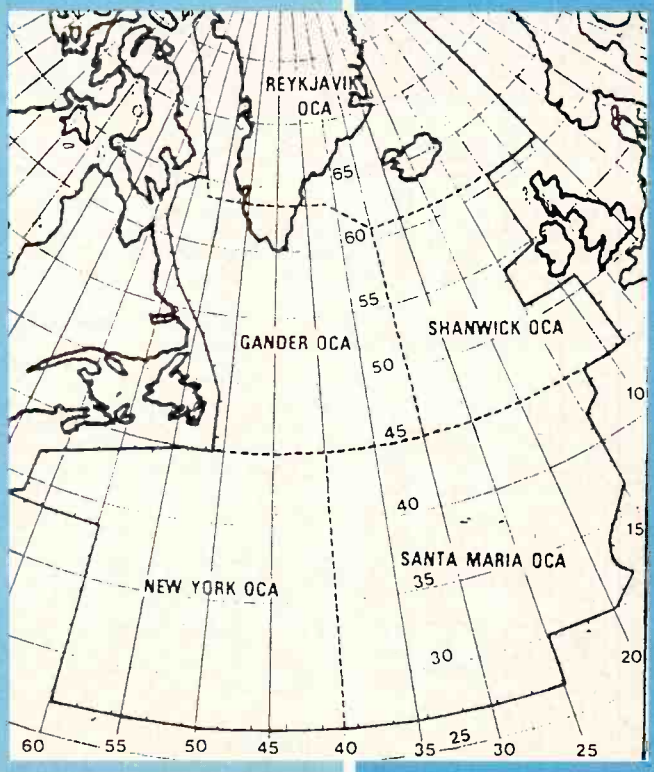


Fig. 1: North Atlantic Oceanic Control Areas.

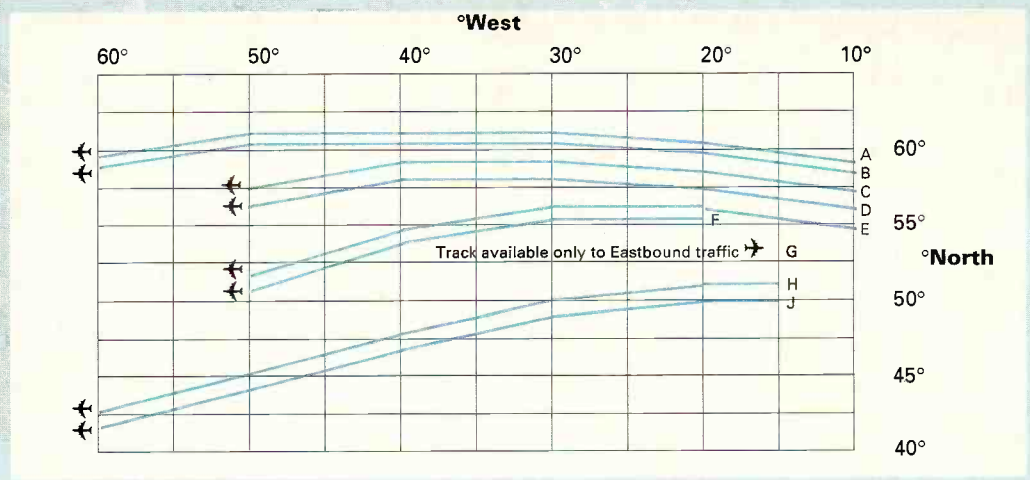


Fig. 2: North Atlantic Organised Tracks as broadcast daily by Shanwick.

tracks for one day, details of which can be heard on a continuous broadcast from Shanwick OACC on v.h.f. 133.8MHz is shown in **Fig. 2**. There is one exclusion however to using these organised tracks and that is for Concorde flights, by nature of this aircraft's enhanced performance over subsonic aircraft, which is dealt with later in this article.

Oceanic Clearance

Before commencing transatlantic flights, aircraft must obtain authorisation for oceanic clearance and verification to use an optimum track relative to its particular flight path. Oceanic clearances can be heard from Shanwick OACC on v.h.f. 123.95MHz for aircraft registered in States west of 30°W and on 127.65MHz for aircraft registered east of 30°W (including Australia). This clearance should normally be obtained before reaching a point east of 2°W for westbound flights.

North Atlantic (NAT) HF Communications System

Having now obtained oceanic clearance for a particular track, westbound aircraft will proceed to it via fixed entry points as indicated in **Fig. 3** and hence under the control of Shanwick OACC. The change over from v.h.f./u.h.f. to the h.f. communication area will occur sometime prior to the aircraft entering its fixed entry point and will be passed to the aircraft by the appropriate Air Traffic controller in the London, Shannon or Scottish flight information region (FIR) to 'continue with Shanwick on h.f.'. As with oceanic clearance, specific h.f.s are allocated to aircraft according to whether registered west of 30°W or east of 30°W and the route flown. The frequencies are grouped into 'families' A B C and D and are shown in **Fig. 4** and the distribution of those frequencies by the aircraft's route taken, are shown in **Table 1** on page 28, several alternatives of which are given for the same ground station, although it would appear that those in the 8MHz family are the most frequently encountered. A typical air to ground conversation from say 8.825MHz would be thus:

'Speedbird 256, 50°N 2°W (current position) 0800hrs. Flight level 370 (37000ft). Outside air temp -50°F. Wind speed 120kts. Estimate 50°N 30°W 0900hrs. Next 50°N 40°W (next reporting point)'. By retaining contact on this frequency it is possible to accurately track progress of this aircraft on most of its oceanic flight.

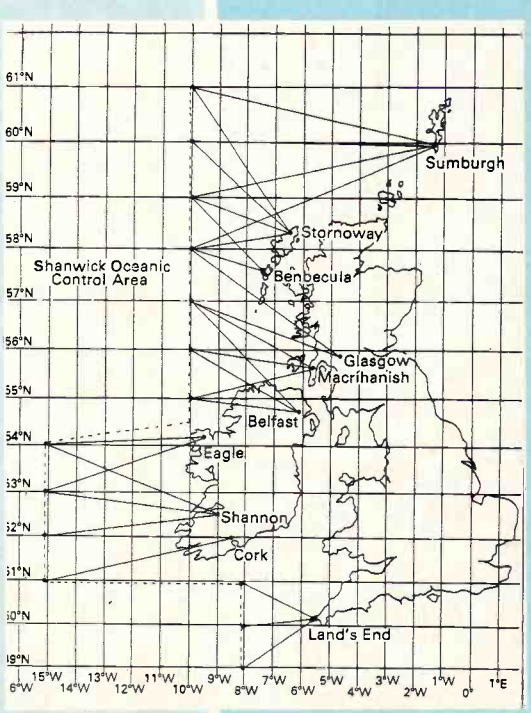
Concorde Flights

Within UK airspace and whilst under land air traffic control, Concorde flights follow normal procedures. However, in view of this aircraft's eventual cruising altitude of around 60 000ft and supersonic speed during most of its ocean flight, three permanently fixed tracks (track SM east to west, SN west to east and SO as reserve track) are allotted across the North Atlantic. This desirable feature is possible since ocean weather conditions, greatly reduced jet stream effects at the enhanced flight levels and the much greater speed of this aircraft will, unlike subsonic aircraft have little influence over Concorde's performance. It should also be noted that because these tracks do not vary on a day to day basis, oceanic clearance is normally given as a routine at commencement of flight. HF Communication procedures however remain the same as with subsonic aircraft.

Selcal

Constant monitoring of all transmissions from the ground on the aircraft's radio, with only messages for that particular aircraft being received is a sensible feature, considering the duration of a transocean flight maybe in excess of five hours. The Selcal system (SELective CALling) enables a special code to be allocated to each aircraft under control from a Oceanic Control Centre. The code, in the form of a two tone signal, is transmitted when the ground station needs to communicate with a particular aircraft and will activate only that specified aircraft's receiver. The Selcal signal is

Fig. 3: North Atlantic Organised Track system entry points for westbound tracks. (information provided by CAA).



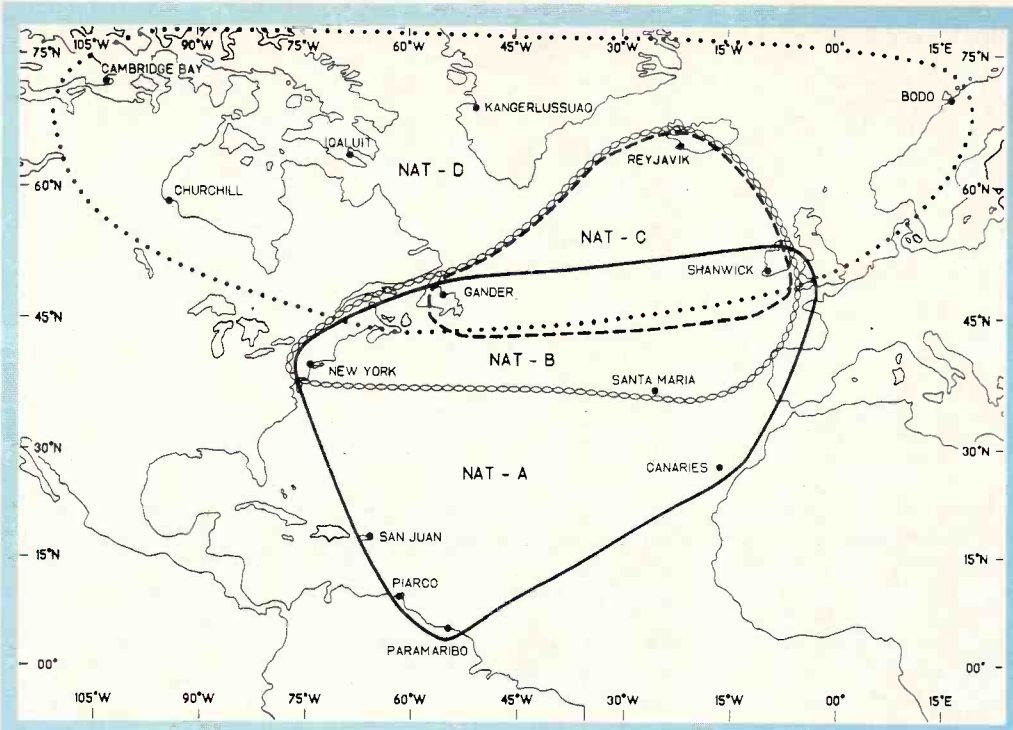


Fig. 4: North Atlantic Communications Areas. frequencies are given in Table 1. (Source: RAF).

Table 1: Frequencies used in the North Atlantic h.f. Communications Area.

NAT A	Southern Routes all Aircraft			
Gander New York San Juan Santa Maria Shanwick Paramaribo Canaries	3.016	5.598	8.825	13.306MHz
NAT B	Central & Northern Routes for Aircraft Registered W of 30°W			
Gander Reykjavik New York Santa Maria Shanwick	2.899	5.616	8.864	13.291MHz
NAT C	Central & Northern Routes for Aircraft Registered E of 30°W			
Gander Reykjavik	2.962	5.649	8.879	13.306MHz
NAT D	Northern Routes Outside NAT Organised Track System			
Cambridge Bay Gander Reykjavik Shanwick	2.971	4.675	8.891	11.279MHz

confirmed on h.f. at the commencement of transocean flight. Either a visual indication or an audible warning will be given to the crew to inform them that the controller has traffic for them. The Selcal two tone signal can clearly be heard on the relevant h.f. communication frequencies listed in **Table 1**.

Peak Traffic Periods

Most eastbound arrivals from North America to the UK reach their peak in the early morning between 0900 and 1000 thus permitting the aircraft to turn round, refuel and service in time to departure in the afternoon and evening. Two main traffic flows are thus established and will therefore to related to two periods of active radio traffic. For the airband enthusiasts amongst you, it should now be possible to accurately log the progress of any one particular North Atlantic flight from UK departure airport to way out over the Atlantic. It would be interesting to learn just how far good DXing will maintain contact with the flight.

Abbreviations

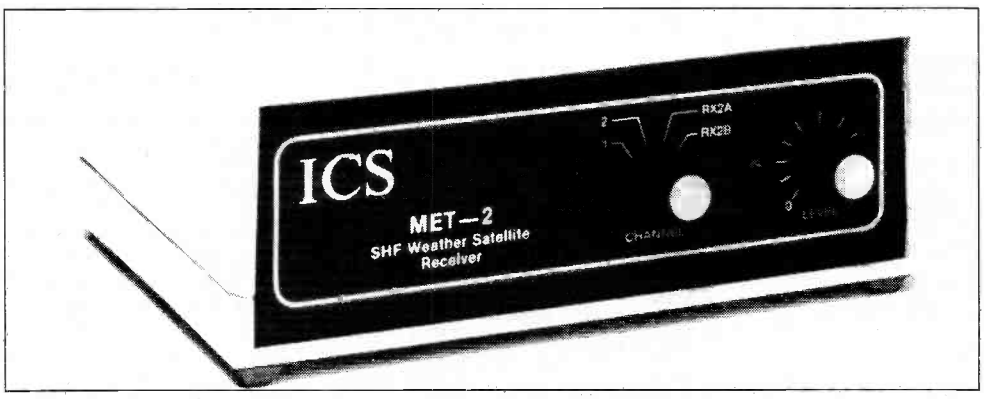
ATC	Air Traffic Control	km^2	square km
CAA	Civil Aviation Authority	MHz	megahertz
DXing	'long distance' listening	NARTEL	North Atlantic Radiotelephony Network
E	east (longitude)	OACC	Oceanic Air Control Centre
FIR	flight information region	R/T	radio telephony
ft	feet	s.s.b.	single sideband
h.f.	high frequency	u.h.f.	ultra high frequency
hrs	hours	v.h.f.	very high frequency
km	kilometres	°N	degrees north (latitude)
		°W	degrees west (longitude)

ICS Shortwave and Satellite

The **FAX-1** is an economical means of obtaining high quality weather maps from an HF SSB receiver and a computer printer. Simply plugs into the loudspeaker output socket of the receiver and feeds any Epson compatible 9 or 24 pin printer. Automatic operation with built in timer and manual override. Prints press pictures, weather maps and radio amateur transmissions from around the world. Also receives RTTY and Navtex text transmissions. Superb image quality from a proven product that is widely used by professional weather forecasters.

FAX-1: £299.95 Post and packing: £6.00

FAX-1 with computer printer, leads and power supply (FaxPack): £449.95. Post and packing: £10.00



The **MET-2** gives superb live cloud cover pictures on any IBM-PC compatible computer direct from the geostationary Meteosat satellite. Covers all of Europe, Middle East, Africa, as well as North and South America. Automatic animation of sequential pictures. Zoom. False colours. Stores and displays the full resolution of the satellite. Everything provided from the antenna to the software. All you need is a PC - preferably with a VGA monitor and a 286 processor or better. Can be extended to receive pictures from the low earth orbiting NOAA satellites with our optional antenna and receiver package. Send for free colour brochure.

MET-2: £822.44. Post and packing: £10.00

NOAA receiver, antenna and software: £340.69. Post and packing: £10.00

Prices include VAT at 17.5%. Send for free Catalogue.

Office hours, 09.00 to 12.30, 13.30 to 17.30. Callers by appointment. Available direct or from our dealers.

ICS Electronics Ltd. Unit V, Rudford Industrial Estate, Ford, Arundel, West Sussex BN18 0BD.
Telephone: 0903 731101 Facsimile: 0903 731105

Aero Radiobeacons

Since completing a 533mm loop antenna Percy Tannac has found a whole new area of exploration. Aero Radiobeacons are to be found between 300-400kHz and Colin Frowen contributed the list published here.

There are a whole host of Aero Radiobeacons surrounding our country and the near Continent. Strangely enough, I showed four or five of the frequencies, with their associated callsigns, to various people at the Mercury show, but none could identify them.

Thumbing through an old *Nautical Almanac* I found some mention of these Aero Radiobeacons and, drawn to the name of Colin Frowen in the 'Airband' section of *SWM*, I wrote to him on the subject. Colin very kindly sent me a list of some 88 callsigns and frequencies, written by hand as his printer was out of action - which I thought was most commendable and has certainly solved a problem for me.

I wonder if there are any other readers, who like myself, having discovered these transmissions, have found an interest in them and yet have not been able to discover much about them?

Beacon	Code	Frequency (kHz)	Beacon	Code	Frequency (kHz)
Aberdeen	AQ	336.0	Heidelberg	HDL	417.0
Aberporth	AP	370.5	Henton	HEN	269.0
Alderney	ALD	383.0	Hericourt	HR	289.0
Amboise	AMB	341.5	Hyeres	HYE	322.0
Amsterdam	SPY	381.0	Ronaldsway	CAR	366.5
Anderstorp	AN	268.0	Jersey	JEY	367.0
Antwerp	ONW	355.0	Kleine Brogel	ONT	448.5
Augsburg	AGB	318.0	Lanveoc	BST	316.0
Barra	BRR	316.0	Lee-on-Solent	LS	323.0
Basle	BN	306.5	Le Harve	LHO	346.0
Beccles	BE	357.0	Le Luc	LU	326.0
Belfast	ADR	346.0	Le Mans	LM	326.0
Blackbushe	BLK	328.0	Lichfield	LIC	545.0
Brawdy	BY	414.5	Gatwick	GY	365.0
Brussels	BUN	341.5	Gatwick	GE	353.5
Carrickfin	CFN	361.0	London City	LCY	322.0
Charleroi	ONC	323.0	Heathrow	W	334.0
Clacton	CLN	669.5	Heathrow	OE	334.0
Clonmel	CML	387.0	Heathrow	NE	389.5
Cognac	CGC	354.0	Lorient	LOR	294.2
Cumbernauld	CBN	374.0	Luxemborg	ELU	368.5
Dortmund	DWI	357.0	Luxeil	LXI	363.5
Dounreay	DO	364.5	Middle Wallop	MW	376.0
Dresden	GBZ	342.0	M'gladbach	MGB	377.0
Dublin	RSH	326.0	Nancy	NAY	295.0
Dublin	GAR	407.0	Nantes	GL	369.0
Dusseldorf	DUE	269.0	Nicky	NIK	336.5
Edinburgh	EDN	341.0	Northampton	NN	378.5
Eindhoven	EHN	397.0	Norwich	NH	371.5
Epinal	MI	419.0	Orleans	OAN	385.0
Epsom	EPM	316.0	Ostend	ONO	399.5
Evreux	EUX	324.0	Penzance	PH	333.0
Fairoaks	FOS	348.0	Poitiers	PI	378.0
Fawley	FAW	370.0	Radnor	RNR	374.0
Fife	GO	402.0	Rochester	RCH	369.0
Filton	OF	325.0	St. Dizier	SDI	373.0
Frankfurt	FFM	320.0	Shoreham	SHM	332.0
Fredrichshafen	FHA	473.0	Sleap	SLP	382.0
Fulda	FDA	441.0	Sligo	SLG	384.0
Galway	CRN	321.0	Southend	SND	362.5
Glasgow	GLG	350.0	Strumble	STU	400.0
Great Yarmouth	ND	397.0	Swansea	SWN	320.5
Guernsey	GUR	361.0	Tours	TUR	331.0
Halfpenny Green	HG	356.0	Waterford	WTD	368.0
Hannover	HAE	332.0			

May 1991

Table 1: Aero Radiobeacons in the UK and Europe

SALE

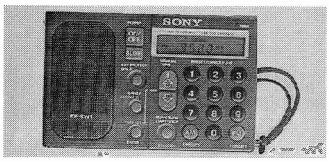
ASK ELECTRONICS LTD

SALE

MULTI-BAND RADIOS

SONY

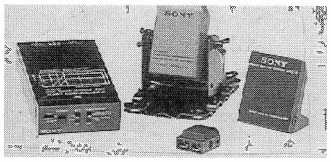
ICF-SW1E £134.95



ULTRA-COMPACT SHORTWAVE RADIO WITH PLL SYNTHESIZER CIRCUITRY

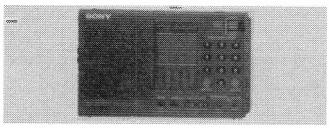
FM/LW/MW/SW reception • PLL synthesized circuitry • FM stereo • Continuous AM frequency coverage • 4 way tuning: 10 memory presets, auto scan, manual tuning, 10 key direct tuning • Programmable timer • Sleep function • Digital clock and alarm • LCD display with light function • Dual conversion system • 2 step tone control • Key protection • Record out socket • Supplied with stereo earphones shortwave guide and compact aerial • Power: 2×AA size battery.

ICF-SW800 ..... £94.95
ICF-SW1S KIT £195
ICF-SW20 ..... £59
AN-1 ANTENNA £49



SALE

ICF-SW7600 ..... £134.95



HIGH PERFORMANCE PORTABLE RECEIVER WITH PLL SYNTHESIZER CIRCUITRY AND CONTINUOUS AM FREQUENCY COVERAGE

LW/MW/FM/SW/SSB reception • PLL synthesized circuitry • FM stereo • Continuous AM frequency coverage • 4 way tuning: 10 memory presets, auto scan, manual tuning, 10 key direct tuning • Sleep function • Digital clock • Programmable timer • 2 step tone control • Antenna input socket • Headphone socket • Key protection • LCD display • Dual conversion system • Supplied with compact antenna, stereo earphones and AC power adaptor • Power: 4×AA size battery.

ICF-PRO80 Air/marine band scanner £275
ICF-AIR7 ..... £229
WA-8800 Full SW M-band stereo cassette recorder. £199
CR-V21 world band receiver – fax printout, RTTY weather rec £2699

SONY SPECIALISTS 071-637-03531 071-637-0590 Fax: 637-2690

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Full Worldwide Guarantees from SONY! CALL THE SONY SPECIALISTS 071-637-0353/0590!!
Mail Orders Welcome. 071-637-0590/0353 Fast – Efficient – Convenient. To your doorstep!!

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R727 5 bands – FM/MW/SW/LW/SW1-4 ..... £79.95
R747 3 bands £92.95
RF-M3 Tiny £59.95
RP-26 FM/MW/LW £81.95
RP-14 Cassette radio 4 FMs £60.95
RC-30 Mono cassette radio £51.95

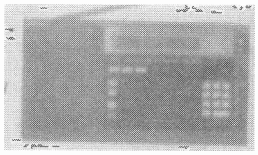
AWARD WINNERS
071-637-0353/0590

AN AWARD WINNING MASTERPIECE

ICF-2001D Kit ..... £319.95 ONLY
Finest all-round pro-receiver in the business.

FW/LW/MW/AIR mulit-band reception • 32 station preset memory • Synchronous detector circuit • PLL quartz-locked synthesiser circuit digital/analogue tuning • 2-way scan tuning (memory, broadcast, define) • 2-position tone control • Direct metre band access • 4-event programmable time • AM attenuator SSB reception • External antenna for AM, FM and AIR band • 288×159×52mm (w/h/d) 1.7kg. 2001 DSYSTEM-ICF-2001D with active antenna AN-1 in one complete package.

NEW ICF-SW77 Similar specification to 2001D but with jog-shuttle dial tuning for accuracy £329



GRUNDIG

SATELLIT 650 ..... £459.00
SATELLIT 500 ..... £275.00
SATELLIT Cosmopolit £91.90
YACHT BOY 220 ..... £56.99
YACHT BOY 230 ..... £73.00
CONCERT BOY 225 ..... £36.70

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D2345
• Portable Radio • LW/MW/FM/2 x SW • Fine Tuning Control • Mains/battery supply £24.95

D1875
• Compact 12-band Portable Radio • LW/MW/FM/9 shortwave • Large tuning control • Tuning LED indicator • Telescopic and ferroceptor aerial • DC supply connection • Earphone connection • Wrist strap • Attractive pouch £49.95

• All electrical digital world receiver • LW/MW/FM/13 x SW • Continuous tuning over total AM band • Direct keyboard tuning • 9 station memory • Variable pitch BFO for CW/SSB reception • Touch panel switching • LCD frequency display • Mains/battery supply

STILL ONLY!
£119.95
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PHILIPS D2935 RADIO

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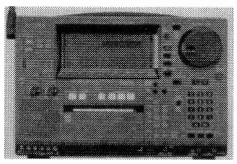

PROFESSIONAL W/BAND RECEIVERS £2699

WORLD BAND RECEIVER WITH MULTIBAND/SATELLITE RECEPTION AND RTTY/WEATHER FAX PRINTOUT

FM/LW/SW/SAT reception • Reception and print out of weather fax and RTTY weather satellite information with optional AN-P1200 aerial • Built-in printer • Triple loop PLL synthesized circuitry • 5 way tuning: 421 memory presets, scan tuning (auto, define and memory), spectrum analysed tuning (using graphical display of signal strength), manual tuning with jog dial, 10 key direct tuning • Continuous waveband coverage AM 9.29999.99 KHz, FM 87.5, –108 MHz, SAT 137.62/141.12 MHz • Synchronised detection system • Auto memory input for easy automatic storage of up to 10 stations • Priority reception • B Programme/1 week timer • TCXO (Temperature Compensated Crystal Oscillator) for ultimate stability of the reception frequency • Active search system • Memory list • Sleep function • Cassette player /computer interface for data storage and other uses • Built-in high resolution thermal printer using 110mm paper with horizontal resolution of 860 dots • Printer with enlargement capability • Dual power supply – AC adaptor/rechargeable battery pack • External active antenna • AF filter • Digital quartz clock • Large LCD display with contrast control • Squelch control • Key protection • AM attenuator, dual conversion system • RF gain control • Record out • External aerial sockets • Supplied with AC adaptor: Rechargeable battery pack, battery charger, active antenna with bracket and cable kit, dust cover, printer paper, shortwave guide, fax guide and operation table • Power: NP22.

AN P1200
Offset Parabolic antenna and frequency converter • Designed to augment the CRF-V21 • Capable of receiving fax broadcasts from meteorological satellites
• Size: 1.25m×2m×1.5m (w×h×d) £1599

SALE
PANASONIC RF-B900 W/BAND RECEIVER

YUPITERU AIR-POWER AT YOUR FINGERTIPS

VT-125 II £169.95
MVT-7000 ..... £289.95

PANASONIC

RF-B10 World band receiver – pocket size £59.95
RF-B65 S/pro multi band digital radio – memories preset ..£169.95
RF-B45 Digital m/band radio £129.95

071-637 0353/0590

ICOM

SCANNERS/TRANCEIVERS

IC-R1 15-1300 MHz 100 memories ...only £359.95
IC-2SET £289
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FULL RANGE STOCKED

MULTI-BAND RADIOS/SCANNERS/TRANCEIVERS

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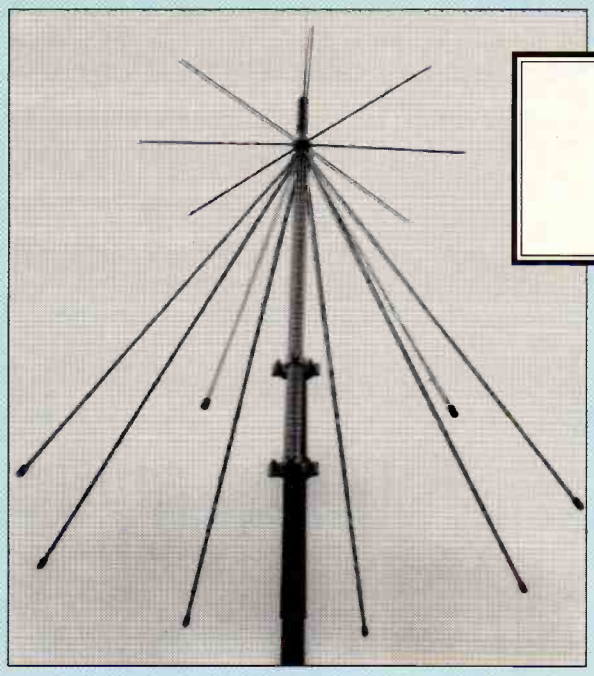

Save £10

Special Offer Price £49.95 post free.

Normal Retail Price £59.95

SPECIAL OFFER

Nevada WB 1300 Wide Band Omni-directional Antenna

Antennas are always popular with our readers, particularly when they are offered at a substantial saving on the full retail price.

This month we are able to offer you a great deal on a top quality antenna from Nevada Communications. Their WB 1300 is a superior, wide band, omni-directional, 8 plus 8-element, discone antenna, aimed at the scanning enthusiast and covering from 25MHz right up to 1.3GHz.

The antenna, which is British made, is supplied as a simple to assemble kit complete with the necessary hex wrench to tighten up the set screws holding the elements in place. Two aluminium mounting brackets are also supplied to enable the antenna to be clamped to any suitable vertical tube having a diameter of 25 to 52mm.

The coaxial feeder cable, which is not supplied, is connected to the antenna with an N-Type connector. This connection is well shielded as it is made at the base of the antenna inside the mounting tube. Of course, for the best results the feeder should be of the highest grade coaxial cable with minimum loss.

The WB 1300 antenna can also be used on transmit on the 50, 144 and 900MHz and 1.2GHz bands, for those amateurs amongst us.

Specifications

Frequency Range
Receive: 25MHz to 1.3GHz Transmit: 50, 144, 430MHz & 1.2GHz bands
Input Power: 200W
Input Impedance: 50Ω
Connector: N-Type
Dimensions: Height: 1.7m Weight: 1kg

(1)
To: Short Wave Magazine Special Offer (February), FREEPOST, Enefco House, The Quay, Poole, Dorset BH15 1PP

Please send me .....Nevada WB 1300 antennas @ £49.95 each.

Name.....

Address .....

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Postcode .....

I enclose cheque/PO (Payable to PW Publishing Ltd) £ .....

Charge to my Access/Visa Card the amount of £.....

Card No. | | | | | | | | | | | | | | | | |

Valid from .....to.....

Signature .....

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HOW TO ORDER

Complete both coupons, in ink, giving your name and address clearly in block capitals. Coupon (2) will be used as the address label to despatch your antenna to you. Send the coupons, with your cheque, to: SWM Special Offer (February), FREEPOST, Enefco House, The Quay, Poole, Dorset BH15 1PP.
If you wish to pay by credit card (Access, Mastercard, Eurocard or Visa only), please fill in your card details and sign the coupon where indicated.

(2)
Name .....

Address .....

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Postcode

If you do not want to cut your copy of *SWM*, you **must** send the Antenna Offer flash from the foot of the Contents Page of this issue.

PW Publishing Ltd., Poole, Dorset
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UK's Largest Distributor of Scanning Receivers

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VT 125 UK AIRBAND RECEIVER

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- Covers 108-142 MHz
- 30 direct entry memories
- Search, scan and keyboard operation
- Search steps 25,50, 100 kHz
- Very sensitive receiver
- Pass and delay functions
- Supplied with UK charger

£149 NEW LOW PRICE

MVT 7000 HANDHELD

The latest in a family of Three..!

- Frequency Coverage From 8 to 1300MHz.. (100KHz - 1300MHz at reduced sensitivity)
- 200 Memory channels
- Rotary or Keypad Frequency Control
- AM/FM Narrow & Wide FM Modes
- Large Easy Read Display with Signal meter.

£289 **Every set comes complete with:-** Full set of high power ni-cads, telescopic antenna, 240Vac mains charger, DC power lead and carry strap.

Just Arrived! **MVT 8000**

The new Yupiteru MVT 8000 base/mobile wideband receiver. Covers: 8-1300MHz continous. 200 memory channels with ultra sensitive receiver. Set is supplied with mains power unit.

£299

MVT 6000

Base/mobile scanner

- 25–550, 800–1300 MHz.
- 100 memory very sensitive receiver

NEW LOW PRICE.....£279

SCANNER ACCESSORIES

LOW NOISE PRE-AMP

These new Pre-Amplifiers are a must for the scanner enthusiast and will allow reception of signals that were inaudible without them.

MODEL M75

For base and handheld scanners

- 25-2100 MHz.
- Low noise GaAs FET.
- Selectable filters for improved performance.
- Variable Gain Control. **£69.95**

MODEL M100

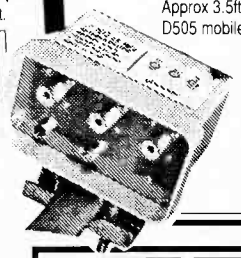
Same spec as M75 but with full RF switching, may be used with transeivers on transmit up to 5 watt o/p power. **£79.95**

MODEL M50

A new low cost pre-amp without filters or gain control. Offers low noise GaAs FET at 20 dB fixed gain. **£49.95**

DIAMOND D707 ACTIVE ANTENNA

(500kHz – 1500MHz) A base antenna with 20dB pre-amp. Approx 3.5ft fibreglass with mounting kit.....**£99.00**
D505 mobile version.....**£69.00**



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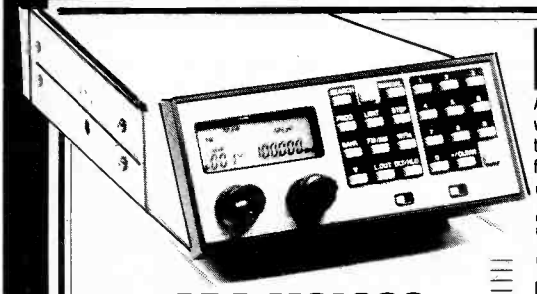
Select 2 antennas at the masthead remotely from one cable.
Frequency:- DC to 1.3GHz
Connectors:- N Type
£49.95



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FAIRMATE HP2000

- Continuous Freq. Coverage from 100kHz to 1300MHz
- 1000 Channels of memory
- Keypad or rotary control
- AM, FM and Wide FM Modes
- Search steps from 5kHz to 995kHz

EVERY SET COMES COMPLETE WITH:- Full set of high power ni-cads, 2 antennas, carrying case, earphone, DC cable, belt clip, strap & charger. **£269**

NEVADA MS1000

Modes:- AM / FM / WFM.
Freq Range:- 500kHZ – 600MHz, 805MHz – 1300MHz.

- Swithcable Audio Squelch
- Tape Recorder Output Socket
- Auto Signal Operated Tape Recorder Switching.
- All metal case for improved EMC compatibility.

ALL THIS AND MORE FOR JUST **£279**

BEARCAT 200XLT

BACK BY POPULAR DEMAND!

Yes this has been our most popular scanner over the years, its easy to use, reliable with a Sensitive Receiver.

• 200 Memories • 66 – 88MHz, 118 – 174, 406 – 512, 806 – 956MHz

(INCLUDING CHARGER/DELIVERY) **£229**

BEARCAT 760XLT

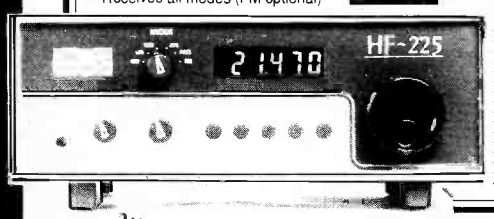
A mobile/base version of the popular 200XLT h/held, but with 100 memories supplied c/w AC adaptor for home use.

£235

COMMUNICATION RECEIVERS

HF225 SHORTWAVE RECEIVER

Covers 30kHz to 30MHz.
Receives all modes (FM optional) **£425**



£765 LATEST MODEL

AR3000A

Top of the range desk scanner. 100kHz to 2036 MHz with no gains

PLEASE NOTE This is NOT a cheap grey import model and has the full service backup of AOR (UK) Ltd.

AR 2002 NOW ONLY £399 INCLUDING FREE DELIVERY

The PSU 101 MK4 allows convenient use of any Handheld scanner at home.It will both charge and power your scanner from the mains whilst providing a convenient desktop stand. Suitable for many models including:- Fairmate HP100, HP200, HP2000, AOR 1000 2000,Yupiteru MVT 7000, MVT5000, Uniden 50XL, 70XLT, 200XLT etc.

£29.50

34

NEVADA COMMUNICATIONS

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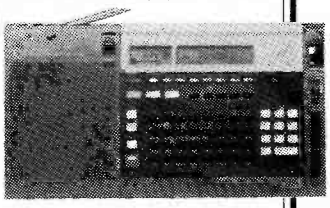
FOR THE RADIO ENTHUSIAST

SONY® RADIOS

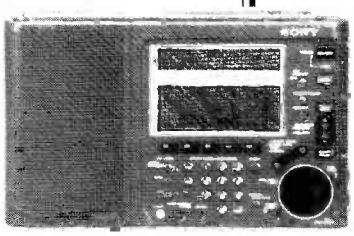
We stock the complete range of Sony shortwave products - Here is a selection of the popular models.

ICF 2001D



Full coverage shortwave, VHF and airband radio. (150kHz-136MHz). Receives AM, FM, SSB. **£299.95**

SW 77



SW77 multiband receiver (with VHF) covers 150kHz to 30.00MHz plus 76–108MHz.
FEATURES
* Rotary Tuning Dial
* Upper/lower sideband reception
* Scan tuning
* 125 memories

NEW MODEL SW77 £349

ICF SW1E Pocket SW plus VHF radio **£149**
AIR 7 Very sensitive airband H/held radio **£229**
PRO 80 Shortwave/VHF H/held radio **£299**
AN 1 An external active antenna with built-in pre-amp covers. (150kHz-30MHz)..... **£57.95**
SW 7600 A new pocket shortwave radio covering:- 150kHz-30MHz AM/SSb 76kHz - 108MHz FM **£149**

NEW RADIO FROM DRAKE

R8E COMMUNICATIONS RECEIVER

Drake has been America's No 1 name for communications since 1943. The new DRAKE R8E Communications Receiver goes beyond ordinary shortwave receivers – to give you the only receiver you will ever need to own!
The R8E has been designed as a "complete package". In fact the only peripherals you may want to add are a VHF converter and an external speaker. With the DRAKE R8E you get all this as standard equipment:-
- Wide frequency coverage:- 100 kHz – 30MHz (with optional VHF converter):- 35 – 55 MHz & 108 – 174 MHz
- Multi mode reception:- AM, FM, RTTY, CW, USB, LSB
- Five built-in filter bands widths 6/4/2.3/1.8/0.5 kHz
- Synchronous detector – for improved AM reception
- Non volatile memory
- RS 232C serial interface – for computer control
- Multiple scan functions
- 100 channel memory capacity
- Two operating VFO s
- Built in pre-amp & attenuator
- Timer function
- Dual time zone built in clock
- Dual mode noise blanker
- Pass band offset
- Selectable AGC
- Dual antenna inputs

Great Value!!

£965

icom

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Covers 25 – 2000 MHzwith all mode capability. Includes 900 memory channels with 5 different scan functions.
Automatic record function. ..... **£ CALL**

IC R72

Covers kHz – 30 MHz all modes (FM Optional). 99 memory channels and 10 dB pre – amp fitted as standard.
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IC R 7000

Icons most popular communications receiver covers 25MHz to 2 GHz with 99 memories and all mode reception..**£ CALL**

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Pocket size Wideband handheld scanner covers 150 kHz to 1300 MHz with 100 memories.**NEW LOW PRICE...£ 359**

BLACK JAGUAR MKIII

Civil & military airbands plus a lot more!
One of our most sensitive scanners covers 28-30, 50-88, 200-280, 360-520MHz – 16 memory channels **£179**

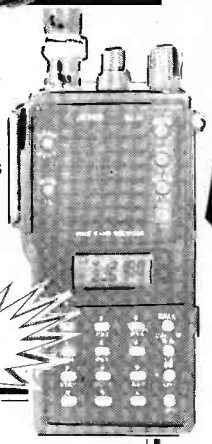
Steepletone Specialist Radios

MBR7 Multi Band 'Jumbo' Radio

Covers MW, LW, SW (2.3 – 22 MHz)
FM (88 – 108MHz)
Airband (108 – 136 MHz)
Marine Band (136 – 176 MHz)
Mains or Battery Operation.
..... **£69.95**

New Scanner!

ALINCO DJ-XI



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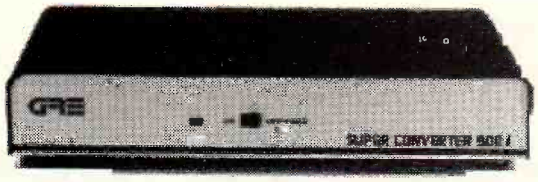
Super Converter 9001™ *(For Base Models)*

Super Converter 9001



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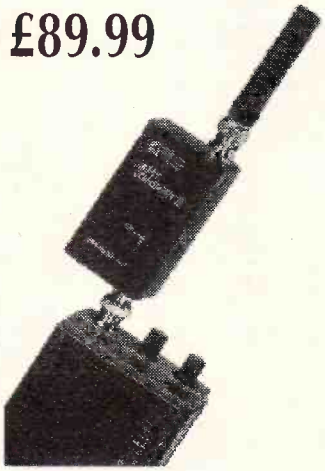

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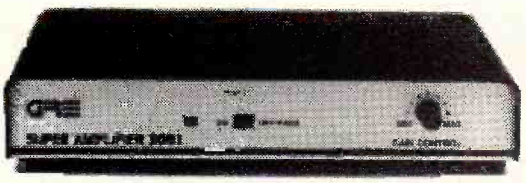
Super Amplifier3001™ *(For Base Models)*

Super Amplifier 3001



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The **Super Amplifier 3001** is perfect for scanners with low gain, and when weak signals are present.

Specifications and Features

- ☆ 100 MHz to 1 GHz receiving frequency
- ☆ 0 to 20 decibel adjustable gain
- ☆ Bypass switch converts back to original gain
- ☆ 50 0hm output connectors
- ☆ Includes 12" BNC-to-Motorola plug adaptor cable
- ☆ Uses 9 volt battery or external AC adaptor (not included)
- ☆ Dimensions: $5^{3}/_{4}$" W X $1^{1}/_{4}$" H X $3^{1}/_{2}$"D
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Super Amplifier™ *(For Handheld Models)*

Super Amplifier

NEW

The **Super Amplifier** is a compact pre-amp designed to work with hand held scanners and amplify the reception of the reception of the VHF/UHF bands from 100MHz to 1GHz as high as 20 db. The **Super Amplifier** has an adjustable gain which is controlled from the back of the unit and allows for a constant amplification level of up tp 20db thruogh all frequencies.

Specifications and Features

- ☆ 100 MHz to 1 GHz receiving frequency
- ☆ 0 to 20 decibel adjustable gain
- ☆ Bypass switch converts back to original gain
- ☆ 50 0hm output impedence load
- ☆ BNC Input/Output connectors
- ☆ Uses 9 volt battery or external AC adaptor (not included)
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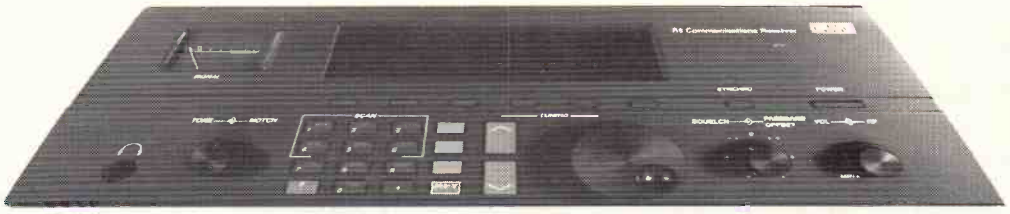
Drake R8E Communications Receiver



If you're looking for a top-of-the-range communications receiver, the new Drake R8E could be just what you've been waiting for. One of the first batch into the UK is reviewed here by Mike Richards.

The new Drake R8E is a very impressive communications receiver covering the whole of the l.f. and h.f. spectrum from 150kHz through to 30MHz. This coverage is supported by a wide range of useful features that included five i.f. bandwidths and seven receiving modes as standard. The styling and layout use different approaches to the Japanese models that we are used to seeing. So without more ado, let's take a detailed look at the R8E.

First Impressions

I'll start with a look around the external features of the R8E and then move in to examine some of the technicalities. As I've already mentioned, the styling is a little unusual with a plain black facia and control knobs. This gives a feeling of simplicity and I think much thought has gone into putting the operator at ease instead of intimidating him or her. In my experience some of the Japanese products seem positively bristling with knobs and buttons, many of which are rarely used in practice. The Drake design team have clearly taken care to ensure that all the key features can be accessed easily with the minimum number of controls.

Dominating the front panel is the well-lit l.c.d. unit that conveys all the key operational information. In fact, the only other indicator required is the analogue signal strength meter.

Manual tuning is carried out with either a large knob or the numeric keypad. Features that require a continuously variable adjustment use three dual concentric rotary controls. Access to adjustments such as i.f. bandwidth is achieved via the six push buttons below the display. These all have a dual role that is indicated by the bottom line of the display. You can see that the result of this careful planning is a very clean and user friendly front panel.

Moving round to the back there was a comprehensive range of connections that should please most operators.

There were two antenna inputs, one of which was a standard SO-239 type designed to handle 50Ω antenna systems. The second input consisted of three wire clips for accepting either balanced or long wire antennas. There was a choice or 50 or 500Ω impedance for this input.

In standard form, the R8E could accept either a.c. mains or a d.c supply. The a.c. mains option can handle 50 or 60Hz supplies between 90-132V and 180-264V.

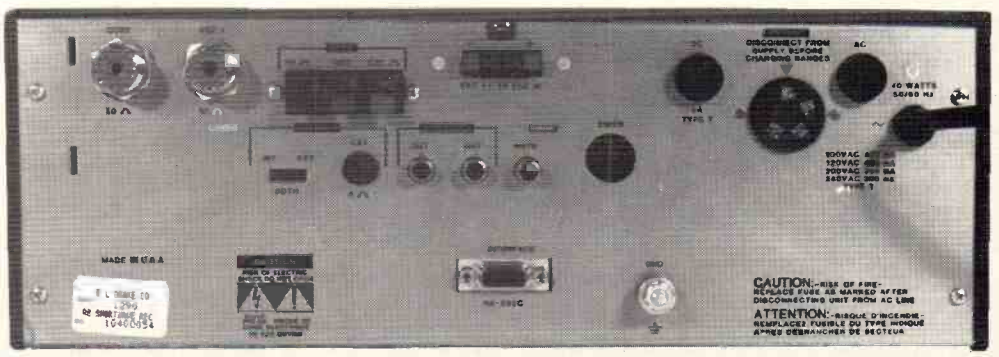
The d.c. supply option has been designed to be compatible with vehicle supplies and needs approximately 2 amps at between 11 and 16V d.c. Both the a.c and d.c. supplies are fitted with separate fuses on the rear panel.

Although the internal speaker was very good, there was provision for connecting an external speaker. This used a 6.3mm jack instead of the more usual 3.5mm type. The output power was 2.5W into a 4Ω load, so should suit most common external units. Next to the speaker jack was a three way switch so you could choose to use either internal, external or both speakers. Those with an interest in utility monitoring will be pleased to see that there were two line outputs provided. These were both capable of supplying 300mV of audio, independent of the volume control setting. The provision of two outputs was a useful luxury as it meant that a decoder and tape recorder could be left connected and ready for use. With most receivers you have to remember to change the connections.

Licensed operators can also use the R8E with a transmitter, thanks to the provision of a mute socket. This would normally be connected to the transmitter so that the receiver is muted during transmissions. However, it could be used for any occasion where remote muting would be useful.

I'll describe the timer operations later, but there was a socket provided to enable the internal timer to control external devices such as a tape recorder.

Last, but by no means least, was a standard 9-pin RS-232 socket. This used standard RS-232 signal levels and could be used for computer control of major functions - a feature that's often an optional extra on many other receivers.



The cabinet itself was featureless except for the provision of a pair of folding feet to tilt the cabinet at a useful operating angle for desk use.

Good Manual

As the review model was the first in the country, I was operating from a photocopy of the manual. I haven't seen a 'real' manual yet, so I can't comment on the final format. The temporary manual comprised twenty-seven A4 pages and was very clearly and logically laid out. One particularly good point was the coverage given to the panel and display details. Instead of just stating the function of the item in question, a description of its use was given. These descriptions were an extremely useful reference that saved much time during my first hour or so with the receiver. They also served as a very concise reference when you wanted to use one of the less common features.

The panel descriptions were followed-up by another well-constructed section that gave some very useful guidance for the newcomer to the receiver. This section contained some very useful hints and tips for a wide range of features. As you would expect, the memory scanning and computer control functions had their own sections.

The R8E's provisional manual was certainly one of the better ones that I've come across. Despite its somewhat small size all the important points were there and easy to find.

Frequency Selection

The R8E used a microprocessor controlled synthesiser for generating internal frequencies. This enables the designers to offer a range of frequency selection options. Despite these sophistications the most common tuning technique remains the manual tuning knob. The R8E used a large knob that had a very smooth feel. Although the knob rotated smoothly, the frequency changed in either 10 or 100Hz steps. The default setting for these steps was related to the mode in use, with 10Hz for all except a.m. and f.m. The operator could change the steps very easily. For large changes or direct frequency entry, the numeric keypad can be used. This acts in parallel with the main tuning knob so you can use either without any additional key presses. Frequency entry was logical and made in MHz, so 518kHz was entered as .518. Instead of using an extra ENTER key, the required frequency is completed with a second press of the decimal point. If you make an error this is shown very clearly with a beep and the word ERROR appearing in the top left hand section of the display. To enhance general operation two v.f.o.s were provided though in fact these were effectively two memories rather than two discrete v.f.o.s.

Comprehensive Memories

Most microprocessor-controlled receivers boast many user programmable memories and the R8E is no exception. It features a hundred memories that are arranged in ten banks of ten. Each of the memories can store the frequency plus mode, bandwidth, a.g.c., attenuator/pre-amp, antenna, notch, noise blanker and synchronous detector. The ability to store all these features is a great advantage and makes the memories very powerful. Programming and recalling the memories was very simple and logical.

A natural partner to the memory system is a scanning facility and the R8E has several options available. The prime scanning mode simply scans all programmed memories for activity. When a signal is detected that exceeds the squelch setting, there are three user settable options. These are:

1) Stop at first signal.

2) Stop for five seconds then continue.

3) Stop till carrier drops then wait five seconds before continuing.

This covers all the standard requirements, so should prove adequate. Rather than scan all the memories, you can lock-out any that you particularly want to avoid. You can also break the hundred memories into ten groups and then scan the groups in any order.

Besides the memory scanning options, the R8E could perform what, in the scanning world, is called a search. The operation of this is rather ingenious as it scans between the settings of v.f.o. A and v.f.o. B. This is one of the simplest and obvious ways of setting the scan limits. Once a scan has been started the frequency increases in steps determined by the chosen mode. The only exception to this is if the scan enters the 540 to 1600kHz broadcast band. In this case the steps change to 9 or 10kHz. If you wanted a different step size this could be programmed very easily.

Handy Timer

The R8E featured two internal clocks and a timer to supplement its performance. The provision of two clocks meant that one could be set to local time while the other tracked UTC. This was a handy feature, but with a snag - there was no battery back-up. This meant that the secondary clock needed resetting every time the power was removed. The main clock on the other hand could stand a twenty minute break without resetting. This is a problem that really should be addressed as the clock is all but useless without back-up.

Signal Processing

One of the attractive points about the R8E is the inclusion of so many receive modes in the standard package. Particularly noteworthy was the synchronous detector for a.m. reception. This is a great help when listening on the broadcast bands, as it reduces distortion and adjacent channel interference.

Another important feature was the pass band offset. The implementation used in the R8E gave a particularly wide adjustment range that proved to be extremely useful. If you have an interest in RTTY or other data modes, the pass band offset enabled you to make optimum use of the 500Hz i.f. filter.

In fact, the offset range was wide enough to allow reception of either 1245Hz or 2125Hz tone sets. This is just not possible on many other receivers. This wide adjustment range also proved to be useful for reducing interference when receiving voice transmissions.

Another essential accessory is the variable audio

Specification

Frequency Range:	0.15-30MHz (see note in Performance)
Modes:	a.m., l.s.b., u.s.b., c.w., RTTY, f.m., synchronous a.m.
Sensitivity:	s.s.b. & c.w. 10dB S/N <1µV 0.15-1.5MHZ <0.5µV 1.5-30MHz <0.25µV 5-30MHz a.m. 10dB S/N <3µV 0.15-1.5MHz <1.5µV 1.5-30MHz <0.8µV 1.8-30MHz f.m. 12dB SINAD <0.5µV 1.5-30MHz
Stability:	±10ppm -10 to 50°C
Accuracy:	±100Hz -10 to 50°C
Selectivity:	a.m., s.s.b., RTTY, c.w. 6kHz @ -6dB, 12kHz @ -60dB 4kHz @ -6dB, 8kHz @ -60dB 2.3kHz @ -6dB, 4.5kHz @ -60dB 1.8kHz @ -6dB, 3.6kHz @ -60dB 500Hz @ -6dB, 1.5kHz @ -60dB f.m. only 12kHz @ -6dB, 25kHz @ -60dB
Ultimate Selectivity:	>95dB
Image Rejection:	>60dB 100kHz - 1.5MHz >80dB 1.5 - 30MHz
I.F. Rejection:	>80dB 45MHz >100dB 50kHz
Dynamic Range:	>90dB 1.5-30MHz @ 20kHz spacing
Third Order Intercept:	>+5dBm @ 20kHz spacing >-20dBm @ 5kHz spacing
AGC Threshold:	0.8µV
Antenna Impedance:	50Ω Ant 1, 50 or 500Ω Ant 2
Notch Filter:	Audio 500Hz-5kHz, 30dB depth
External Speaker Output:	2.5W into 4Ω @ <10% distortion
Recorder Output:	300mV into 4.7kΩ
Demod Output:	300mV into 4.7kΩ
Clock Accuracy:	±2 seconds/month
Power Requirements:	100/120/200/240V a.c. ±10%, 50 or 60Hz @ 40Wd.c. 11-16V @ 2A
Operating Temperature:	-10 to +50°C
Weight:	5.9kg
Size:	334 (w) x 134 (h) x 330mm (d)

notch filter. The R8E had a very effective filter that enabled the operator to place a deep 30dB notch anywhere between 500Hz and 5kHz. The 30dB notch depth effectively rendered any interfering whistles inaudible.

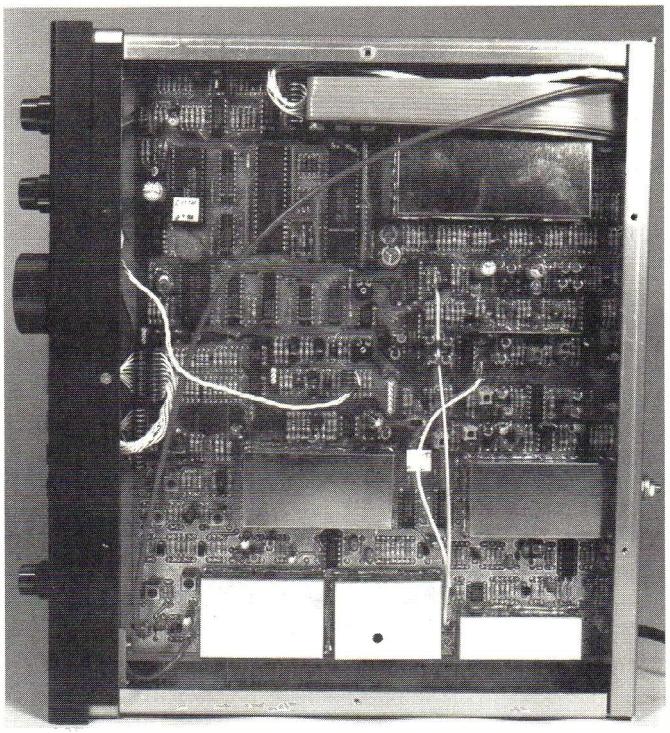
Many modern receivers feature an r.f. attenuator to help when suffering problems from very strong signals. The R8E however, has gone one step further and included a switchable r.f. preamplifier. The preamplifier provided 10dB of gain at all frequencies above 1.8MHz. In practice the preamplifier's main advantage is to be seen at the top end of the frequency range.

Impulse noise often presents problems to h.f. reception and the R8E features a two stage noise blanker to help solve these problems. The two settings have been designed to cope with ignition and woodpecker types respectively. Although the noise blanker worked well, I always feel happier with the variable threshold types.

For those of you who may want to extend the R8E's frequency coverage there is an optional v.h.f. converter available. This converter covers 35-55MHz and 108-174MHz giving access to the 50MHz amateur band, the air band and some p.m.r. transmissions.

Computer Control

External control of the R8E has been made very simple thanks to the built-in RS-232 serial port. This uses standard data transfer protocol with hardware handshaking and a data rate of 9600 baud. The range of functions that could be accessed remotely was very comprehensive and the command words were sensible. To illustrate this point, setting the a.g.c. to fast used the command AF, whereas slow was AS. To switch the a.g.c. off the command was AO. This level of simplicity makes the commands very easy to remember should you want to link the receiver to a dumb terminal. Probably one of the main advantages of the remote control is the potential to link the receiver directly to a computer held frequency list. Once this has been done you can jump straight to your favourite frequencies with a single key press. I'm sure once the Drake gets established there will be plenty of programs on the market and in the public domain. For those of you who may not want to wait, Drake produce an optional control program that runs on any IBM XT/AT compatible computer.



Performance

For this part of the review I used the R8E both in the *SWM* lab and in my own shack. The sensitivity measurements exceeded the specification for all modes. One unusual point about the specification was that the sensitivities were quoted with the pre-amp on. In practice, the specified s.s.b. sensitivities of 0.25µV were met without the pre-amp. As a matter of interest, I measured the improvement obtained with the pre-amp in circuit. Although it gave the specified 10dB gain, the improvement in 12dB SINAD sensitivity was just 3dB to 4dB at 28MHz. I'd recommend that this pre-amp, as with all h.f. pre-amps, should be used with discretion.

One important area for any modern h.f. receiver is the i.f. selectivity. This is also an area where the R8E does very well. A check of the specification shows that shape factors of 2:1 are claimed for all the bandwidths. For those of you not familiar with shape factors, they are simply the ratio between the bandwidths at -6dB and -60dB. If we take the 4kHz filter as an example, the -6dB bandwidth is 4kHz while at -60dB it's 8kHz, giving a shape factor of 2:1. When measured, the shape factors for all the R8E's bandwidths were excellent. Most gave a shape factor close to 2:1, the only exception being the 500Hz filter that gave 3:1.

I mentioned earlier that the pass-band tuning control was very useful, so I took the opportunity to take a few measurements. The adjustment range proved to be a very wide ±1.8kHz. What this means is that the centre of the i.f. filters can be moved up to 1.8kHz above or below the tuned frequency. It's this wide range that makes this feature so useful for minimising interference from adjacent stations. For RTTY and data enthusiasts this wide range means that high or low RTTY tones can be produced whilst keeping the signal centred on the narrowest filters. When used with the synchronous a.m. detector, the pass band tuning was particularly effective.

Frequency stability is another critical area where the R8E excelled. A good practical example of this is when receiving FAX images on l.f. With a frequency shift of only 150Hz and an image transmission time of up to 15 minutes stability is critical. I found that I was able to leave the R8E receiving these images unattended for many hours without any need for retuning.

The frequency accuracy also proved to be excellent. As an example of this, you could tune to the 2.182MHz emergency frequency and be sure that the signals would be perfectly tuned. This also applied when tuning in to more critical transmissions such as the FAX I mentioned earlier. Although the specification quoted coverage from 150kHz to 30MHz, the review model tuned down to a useful 100kHz.

One of the important measurements for an h.f. receiver is the third order intercept point. This gives an indication of the way the receiver will cope in the real world when your trying to copy a weak signal in amongst a number of much stronger stations. The +5dBm achievement with 20kHz spacing is excellent and puts the R8E up with the best.

Effective Audio

Moving on to the audio side the notch filter was the most impressive feature. This gave a very effective 30dB notch which, in practice, rendered any whistles inaudible. The only limitation of course was that it could only eliminate single pure tones. The rest of the audio performance was perfectly acceptable, though I would have liked to see a slightly lower audio distortion level.

As I mentioned earlier, the lack of a battery back-up system for the clock is quite unforgivable in a receiver of this quality.

Summary

There can be little doubt that the Drake R8E is a very impressive receiver. The inclusion of so many features that would traditionally be optional extras makes the price even more attractive. I'm sure the manufacturers or importers will find a solution to the clock back-up supply. The styling of the R8E is certainly different, and I'm sure this aspect will get a mixed reception. I was impressed by excellent filtering and comprehensive reception modes that make the R8E suitable for all types of short wave listening. I have no doubts about giving the R8E a very firm recommendation - in fact I'm sorely tempted to buy one myself!

The R8E is available from Nevada Communications price £965. My thanks to Nevada for letting me be among the first in the UK to get my hands on one!

Televisions for the TVDXer

Tim Anderson has often had to explain the fine details of TVDX. Once all the explanations are over the next question is always, "What sort of TV can I use for TVDX?". Closely followed by, "Where can I obtain such sets?". Surprisingly, the answer to the last question is "In the High Street - if you know what to look for."

The aim of this article is not to explain TVDX. That was covered by Hamer and Smith's excellent series of articles that appeared in *Short Wave Magazine* back in 1989, but to outline the type of sets and/or outboard tuners, converters,etc., that can be utilised to receive all these exotic signals. The various types of sets will be explained with a few comments on their good and bad points. A few hints and tips will be included on how to tell a DXTV set from the outside.

Many well-known manufacturers market multi-standard sets and they can be found on the shelves of High Street shops and in electrical chain stores. Whilst many TV shop assistants are very helpful and aware of what some of these TVs can do, unfortunately many would not know a multi-standard TV from a lamppost! There are many TV transmission standards in use around the world and not all sets will resolve all the sound/picture/colour combinations in use these days.

Up-converters

Probably the cheapest and easiest way to get into TVDX is to use an up-converter. As the name implies, these devices take a 'block' of frequencies and chnge them to a higher band of frequencies.

TV up-converters take the low v.h.f. and high v.h.f. foreign channels and change them to u.h.f. Plug the appropriate antennas into the input, plug the output into your ordinary domestic TV antenna socket, use the TV as a tuneable i.f. strip and you can watch Russia and Spain via Sporadic-E, Germany and Switzerland via tropo and possibly even Australia via F2 propagation. The key word is watch! In the UK we use 6MHz spacing between the sound and vision carriers and various other spacings are used in the rest of the world, this means that when you have the picture tuned in you will not be able to resolve the sound, this of course is one of the main drawbacks of up-converters. The other one is that up-converters change all the frequencies, not just the TV ones, in their range up to u.h.f. and viewing the latest test card from Czechkoslovakia can be rather spoilt by breakthrough from your local waterboard p.m.r. transmitter or even Radio Moscow on short wave. The obvious advantage of up-converters is cheapness, they can be found advertised in several of the radio and TV magazines at prices around £5-20 second-hand and £20-35 new. The fact that you don't have to buy a new TV to use this method may seem an advantage at first, but that will soon wear off when the arguments start.

What arguments? You want to watch Malaysia via F2 and the wife wants to watch *East Enders* - need I say more?

External Tuners

The next method is to use external tuners connected to a TV in various ways. The cheapest way would be to obtain one of the suplus three-band tuners sold by such companies as Sendz of Shoeburyness, build you own power supply unit and feed the output of the tuner (at i.f.) into the TV via an up-converter or disable the tuner in the TV and feed the signals into the i.f. section of the TV. The merit of using external tuners is that you can always add to the system later, adding selectable i.f. bandwidths prior to the TV's own i.f. stages. The disadvantages are still the ones of transmission systems standards. The modified TV will resolve the pictures, but will only cope with the sound systems covered by the TV itself. If the idea of not having to go to the expense of an extra TV, or even a multi-standard TV, appeals to you and you do not feel technically competent to cope with building p.s.u.s and modifying TVs the only other option is the HS Publications D100 Tuner System. This is an out-board tuner that will cover all foreign channels, has selectable i.f. bandwidths and by using a crafty system of 'syphoning' off the sound and feeding it to your hi-fi you can cover all sound systems. The price is around £90, a nice option, but remember you will still only be able to resolve the colour systems that you TV can cope with, in other words for most domestic TVs, PAL.

The HS Publications De-luxe D-100 DXTV converter.

Cheapest Option

Moving on to TVs themselves, the cheapest option would be one of the many small screen (as small as 4in) sets that can be purchased from specialist suppliers like Aerial Techniques and, increasingly, can be found in your local high street shops. These sets will usually be black and white only, although several small screen colour portables are beginning to appear in the shop windows and can even be found in those catalogues that come through your door with everything from the gas bill to your tax return!

How can you detect a TVDX set from the run-of-the-mill portable? Obviously, if you are contacting the special suppliers they will explain all the merits of all their sets to you, but if you are looking round the High Street emporiums and the assistants are not too helpful here are a few clues. Look closely at the tuning dials of these sets and it they have channel numbers 2-4 and 5-12 or v.h.f. low and v.h.f. high printed on them, along with the usual 21-69, they cover the main foreign channels. They will probably not cover the more obsure Eastern Block, Italian and Allbanian channels. One set I came across was marked 1A-1C and 1D-1J designed for the Italian market, but the tuning did cover the lower E2 and R1 channels but did not go low enough for the Australian and New Zealand channels. As for sound systems, look for a switch, usually on the back of the set, marked 5.5-6(MHz). This is the sound switching and will allow you to resolve UK or West European, African

and Australasian sound.

A few of these small portable sets will have a switch on the back to select positive going modulation of the video carrier, which in English means French pictures that appear in negative on most other sets, the Yoko sets can do this. These sets usually have their own telescopic whip as well as the external antenna socket. They often have battery compartments and/or can be operated from an external 12V d.c. and with all their other features make an attractive proposition as a first TVDX set or 'bung it in the car and dash up to the local high spot' type set. Prices vary from around £60-100 new for black and white sets and £150-300 for the smaller colour sets. Names to look for are Plustron, Yoko (beware they do produce some u.h.f. only sets), Orion and JVC who do a rather nice 6in colour set that will cope with PAL and SECAM, but not the French SECAM L unfortunately.

One very small colour TV that seems to crop up everywhere these days, especially in those catalogues I mentioned, is the Citizen TC53 a 2.5in l.c.d. TV with v.h.f. and u.h.f., its own telescopic whip and external antenna socket. At around £150 plus £25 each for the car adaptor and mains adaptor it is a bit pricey but you may feel it is worth it to be able to slip a DXTV into your pocket and take it abroad on your holidays and not miss the DX! I am trying to get my hands on one now.

All - Singing, All - Dancing

The penultimate option is, of course, the 'all - singing, all - dancing' multi-standard set. Many of the well-known TV manufacturers now produce sets that cope with all systems as standard allowing the sets to be marketed anywhere in the world without modification. Some makers prefer to produce a 'basic' chassis that can be adapted for various systems by adding complete modules to them as 'retrofits'. These sets at least allow you to buy something at a 'reasonable' price and add extra systems and Teletext afterwards. As a 'rule of thumb' the sets produced in Europe will cope with most systems other than NTSC, whereas the sets produced in Japan will cope with NTSC but very rarely SECAM L. Again, if you are buying from a specialist dealer there's no problem, he will be able to explain the ins and outs of his range of sets.

If you are buying from your 'unaware' High Street TV shop, what do you look for? Channels first, with the smaller portable and manual (non-remote) control sets, look for the channel numbers mentioned earlier. With the bigger remote control sets, life is not so easy. A quick glance at the manufacturer's lable on the back may just reveal the channel numbers, more than likely you will have to get the salesman to unearth the catalogue. If you can get your hands onthe remote control, put the set into its 'search' mode which can reveal some help. If the set just searches through channels 21-69 it is u.h.f. only. If the set will search through 01-69 and probably more there is a fair chance that it covers not only v.h.f. but the continental cable channels. These can be used to watch the more obscure Eastern Block, etc., channels. It is a hundred to one against that the set will be connected to a v.h.f. antenna or two in the shop and the odds are even higher that, if it was, there would be no conditions anyway, but searching through the lower channels should reveal lots of interference from p.m.r. radio and our own f.m. band. Next have a close look at the labels on the back of the set.You may well find PAL, SECAM and even NTSC printed there. This means that the set will resolve all colour systems except, perhaps, SECAM L. If you are in any doubt about the SECAM L, put the set in that mode and if a UK picture goes negative with funny colours the set can cope with the French system. Other clues may be the initials CCIR, the West European TV regulating body or OIRT, the Eastern Block TV regulating body, written on the back.

NTSC Problems

Be careful with sets that claim to resolve the NTSC system. There are two NTSC sound carrier standards, one for terrestrial transmission and one for video recorders. You will get colour pictures from a signals on either system but not necessarily the sound.

The advantages of these sets are, of course, the ability to cover all, or most, of the world's TV transmission systems. Many of these sets have video and audio output and/or SCART sockets giving you the ability to make better quality video recordings and add external descramblers for Canal+, the French pay TV channel. Many of the sets can resolve the European stereo/ dual channel sound systems, but very few as yet will cope with the British NICAM stereo sound. The disadvantages are the inability, without modification, of varying the i.f. bandwidth and the larger screen sets always seem to have poorer sync locking than smaller colour TVs and the small mono sets.

For the serious DXer with more than one set, a large colour TV set can cause problems to other DXTVs, especially when they are all on Band I. The high voltages needed for a large colour set produce interference around the bottom end of Band I, this usually appears as a couple of black lines floating across the picture or even a negative image of the picture on the large set appearing on the others. The other problem is caused by all the microprocessors inthese large sets generating interference across Band I, this usually appears as noise or a pattern of moving dashes or lines on you other DX sets. The final disadvantage is, of course, the price, which will range from around £275 for a small portable set up to £800 for a large screen (26-28in) all systems, Teletext set. Some names to look for are Finlux, Salora, JVC, Grundig and Loewe.

Dual-standard Sets

The final option is cheap, but not for the technically faint-hearted. It was at one time virtually the only way to get into TVDX. One can still find here and there old, working 405/625 dual standard sets, often stashed away in someone's loft or spare room. If you know what you are about - remember some of these sets had live or half mains potential chassis - you can alter the system switching to make the sets operate on 625 lines on v.h.f. as well as u.h.f. The biscuits in the turret tuners of some of these TVs can be altered to the foreign channels, few had continuous tuning on v.h.f. in those days, Varicap tuners were a thing of the future. The switching between the 405, 3MHz narrow bandwidth i.f. and the 625 6MHz wide bandwidth i.f. can be switched separately giving you a cheap TVDX set.

The Normende Galaxy 25 10in portable colour set which can be used on any of the Western European TV standards.

I hope these few hints and tips have helped any beginners looking for a first or a better DXTV set.

propagation

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

In Edinburgh, **Ron Livesey**, using a 2in refractor and 1.5in projection screen, located 3 active areas on the sun's disc on October 14, 15, 18, 28 & 29, 4 on the 9th & 17th and 5 on the 3rd.

Cmdr Henry Hatfield (Sevenoaks), using his spectrohelioscope, located 4 sunspot groups, 16 filaments and 7 small quiescent prominences at 1345 on October 13, 2gps, 2 slightly active spots, 10fs & 10 small qps at 1115 on the 14th and 2gps, 11fs & 8 small qps at 1135 on the 19th. Although condition were 'too murky' to count the filaments or prominences at 1217 on November 13, Henry did see 3 sunspot groups. At 1229 on the 15th he saw the 3 groups plus 10fs & 9 small qps, but, apart from counting 11fs, his observation at 1147 on the 21st was hampered by high level haze. Henry's radio telescopes recorded a minor solar noise storm, at 136MHz, between 1100 and 1400 on October 25 and individual bursts of noise on October 27, 28 & November 22. He also recorded isolated bursts at 1297MHz on October 27, 28 & November 11.

Auroral

Ron Livesey, the auroral co-ordinator for the British Astronomical Association, received reports of 'Corona' seen all over Scotland and 'rays' down to Northern Italy overnight on October 1/2 and corona again on 30/31. Further events described as 'active aurora' on 2/3, 4/5, 6/7, 9/10, 18/19, 19/20 & 28/29, 'glows' on 3/4, 5/6, 7/8 & 8/9, 'homogeneous arcs' on 22/23, 'rayed and homogeneous arcs' on 23/24, 'rays and rayed arcs' on 21/22, 'ray structures' on 28/29 and 'quiet rayed' on 31/01. The 'active aurora' on 6/7 & 9/10 were reported from North Dakota and the 'glows' on 3/4 were seen in Cheltenham.

Gordon Foote (Didcot) heard the German beacon DK0WCY give weak auroral warnings on October 26, 30, 31, November 8, 9, 10, 16 & 17 and a strong warning on the 1st. I heard the national news media report sightings of aurora, as far south as Bristol, during the evening of November 8 so I was not surprised to have the following 'stop press' from Ron, "Massive aurora all night in UK on November 8/9, coronal all over Scotland in evening and West Ireland. Major bright surge seen in South England about 0130, bright enough to read in West Ireland." An auroral sighting was reported by the ITN weather team at 2230 on the 9th.

"Enjoyed that Northern Lights spectacular on the evening of November 8. The sky was lit up in a glowing red -no other colours were present," wrote **Simon Hamer** (New Radnor). At 2230, he also saw auroral distorted pictures from Ireland's 'RTE1' in Band III and some European stations.

I feel sure that activity in the form of streams of charged particles being emitted from one of those two sunspot groups, **Fig. 1**, observed and drawn by **Patrick Moore** (Selsey) at 1030 on the 14th, caused the event. "More dead than dead," said **Fred Pallant** (Storrington) about the 28MHz band on October 29 & 30 and he wonders if the solar wind had 'blown the ionosphere away' on November 9 because the band was almost dead. Fred found almost identical conditions again on the 19th which show up well in **Fig. 2**. Gordon Foote found that conditions on the h.f. bands were 'particularly bad' on the 19th. Between them, **Tony Hopwood** (Worcester) and **Doug Smillie** (Wishaw) reported hearing auroral reflected signals (tone-A) on the v.h.f. bands on October 1, 2, 5, 10, 21, 28, 29, 30 & 31. Doug found the reflected signals on 144MHz were strongest on the 21st, 28th, 29th & 30th.

Magnetic

The various magnetometers used by Tony Hopwood, **Karl Lewis** (Saltash), Ron Livesey, **David Pettitt** (Carlisle) and Doug Smillie, between them, recorded storm conditions on October 1, 2, 6, 7 & 8 and from 26 to 31 inclusive.

Propagation Beacons

My thanks to Gordon Foote, Henry Hatfield, **Ted Owen** (Maldon), Fred Pallant, **Ted Waring** (Bristol) and **Ford White** (Portland) for their 28MHz beacon logs covering the period October 26 to November 25 from which I compiled the monthly chart in **Fig. 2**. Ted Owen and Fred Pallant added WJ9Z to the list and Fred also heard EA7PS on November 18.

Tropospheric

The slightly rounded atmospheric pressure readings for the period October 26 to November 25 can be seen in my television column elsewhere in this issue. Toward the end of November **George Garden** (Edinburgh) found that he could receive signals from the low-power stations at Selkirk (ILR Borders) on 96.8MHz and Radio Tay from Dundee on 102.8MHz. As from the 27th George was hearing one of the 'Radio Cracker', Christmas charity stations around 103MHz.

Simon Hamer received stations in Band II ranging from France to Ireland on the 22nd and from Denmark (P1, 2 & 3), Germany (AFN2, BFBS, Deutschlandfunk, NDR, R-Bremen and WDR), Norway (P1 & 2), Poland and Sweden on the 23rd.

Throughout November, **Michael Larsson** (Cheadle) kept an ear open for DX on Band II and was rewarded with a good haul of continental and Scandinavian stations. Among the countries he logged were France and Sweden on the 8th, France, Holland and Ireland on the 10th, France, Germany, Ireland and Norway on the 20th, France and Ireland on the 22nd, France, Ireland, Italy, Norway and Spain on the 23rd, Belgium, France, Germany, Holland, Italy and Spain on the 24th, France Ireland and Spain on the 25th and Sweden on the 26th.

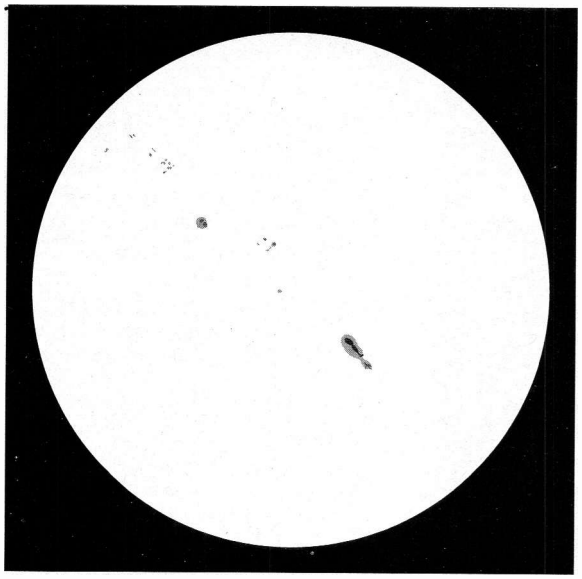


Fig. 1.

	October						November																						
Beacon	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
DF0AAB						X	X		X	X		X	X	X		X	X	X	X	X	X		X	X					X	X	
DL0IGI	X					X			X	X	X	X	X		X		X	X	X	X	X	X	X	X		X		X		X	X
EA3JA	X					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			X	X	X	X	X	X
HG5GEW									X	X			X	X				X	X	X	X		X								X
IY4M	X		X				X	X		X	X	X	X	X		X	X	X	X	X	X	X	X						X	X	X
KC4DPC						X		X	X	X		X	X				X	X	X	X			X						X	X	X
KD4EC						X	X	X	X	X		X	X	X		X	X	X	X				X	X					X	X	X
KF4MS													X	X			X	X	X	X	X			X					X		X
KJ4X						X	X	X	X			X	X	X				X	X	X	X		X	X		X			X	X	
KW7Y									X				X				X			X											
LA5TEN																	X														
NX20	X					X		X		X		X	X	X		X	X	X	X	X	X		X	X		X			X		X
N2JNT										X		X	X	X			X	X	X	X	X		X						X		
OK0EG	X					X		X		X																					
OH2TEN	X		X				X		X	X	X	X	X	X		X	X	X	X	X	X	X	X	X		X	X		X	X	X
PT8AA										X	X	X	X	X					X	X				X			X	X			
PY2AMI			X			X	X	X	X	X	X	X	X	X		X		X	X	X	X		X	X		X		X	X	X	X
SK5TEN									X				X				X	X											X		
VE1MUF										X			X																		
VE2HOT										X		X	X	X			X	X	X	X	X		X								
VE3TEN								X	X	X	X		X	X			X	X	X	X	X		X						X	X	X
VK2RSY							X	X		X	X	X	X	X		X	X	X	X		X		X	X	X	X				X	X
VK5WI								X				X					X		X										X		
VK6RWA									X	X	X						X	X	X						X						X
VK8VF							X	X	X	X		X	X	X			X	X	X	X	X		X			X			X		
WA4DJS	X		X		X	X	X	X	X	X		X	X	X		X	X	X	X	X	X		X	X		X				X	X
WC8E						X		X	X	X		X					X	X	X	X	X		X						X	X	X
WJ9Z								X				X	X	X			X	X	X	X	X									X	
W3VD	X					X		X	X	X		X	X	X	X	X	X	X	X	X	X			X		X			X	X	X
W8UR									X	X		X	X							X											
W9UXO								X	X	X		X	X	X			X	X	X	X	X								X	X	X
YO2X						X					X		X				X	X					X			X			X		
ZD8HF						X	X	X	X	X	X	X	X	X				X	X	X	X		X	X					X		
ZS1LA	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X		X						
ZS5VHF									X			X	X					X		X	X								X		
ZS6PW	X	X	X	X	X		X		X	X		X	X	X	X	X	X	X	X	X	X	X	X		X	X		X	X	X	X
Z21ANB	X		X		X	X	X		X	X	X	X	X	X		X	X	X	X	X	X		X	X		X	X	X	X	X	X
5B4CY	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Fig. 2.

ssb utility listening

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

I have been asked to act as a stand-in for your regular scribe, Peter Rouse, while he is unwell. Peter was at the Leicester Show in late October signing copies of his new book (see later) and looking at various 'goodies', and managed to pick up some sort of virus. I am sure that you will join me in passing on best wishes for a speedy recovery.

All about me

I think that it is probably best that I tell you something about myself, so that you understand the reasons why I am interested in 'SSB Utilities' and which aspects of the h.f. spectrum interest me. I live in a small village called Harlington in west London; the village is adjacent to London Heathrow airport, so I have no problems hearing Heathrow Tower on v.h.f.! For h.f. listening I use a Sony ICF-2001D with a full-size G5RV antenna fed through a CM Howes a.t.u. kit. This set-up works very well for me and I can hear Australia most mornings. My main interest is aviation and I'm an avid aircraft spotter. I became interested in h.f. communications when I had the chance to listen to an AR-88D and heard aircraft crossing the Atlantic. From then on, I was hooked. I mainly listen to the h.f. aeronautical bands and I prefer the military communications that can be heard. I also listen to some of the weather broadcasts so that I can check on propagation conditions throughout the day. During the Gulf War I took my radio into work and everybody was surprised to hear 'Baghdad Betty' and aircraft operating in the region and on the way there. People were also impressed with hearing the events before they appeared on TV and radio broadcasts.

Update

I have had to complete this section in quite a short time, so most of it will be either providing additional information to recent columns, or details from personal loggings. Hopefully, your letters to Peter will be forwarded to me soon.

In the November '91 column, **Chris Broughton's** mystery of an unidentified station on 9.495MHz has been solved. What Chris has heard is part of a military exercise which took place during early September. Exercise "Elder Joust 91-2" was held between the 9th and 12th in conjunction with maritime exercises "North Star '91" and "Vendetta '91".

The signal that Chris recorded is a NATO early-warning E-3A AWACS aircraft. These aircraft are crewed by personnel from a mixture of NATO nations, so the crew could come from anywhere from Turkey through to Norway, but definitely not Eire or South Africa! They were operating over the North Sea co-ordinating the aircraft involved in the exercise. I heard a lot of activity on September 10 and at about midday everything became a bit frantic when some Russian (I presume) 'intruders' appeared. Several tanker and interceptor aircraft were sent up to 60°N 5°E to meet them. Also heard on that day was an RAF weather broadcast on the strange/new frequency of 6.697MHz, and a Danish Air Force aircraft talking to station 'OVL' in Copenhagen on 6.720MHz.

From the list of callsigns that **Paul H** supplied, callsign *Gambler* is because the squadron badge contains a pair of dice; *Nickel* is because the unit concerned is the 55th TFS, and a 'nickel' is American slang for 'five'. Both these squadrons are based at RAF Upper Heyford flying F-111E aircraft. *Banter* is the SAC command post at Mildenhall, there is a similar command post for MAC aircraft but without its own callsign; others in Europe are *Falcon Ops* at Torrejon near Madrid, Spain, and *Ratchet Ops* at Zaragoza, Spain. Paul H also mentions the Presidential aircraft, SAM 26000 is no longer used for the vice-president as they now have two VC-25A Boeing 747s; the old *Airforce 1 & 2* are now used as ordinary VIP transports. On the subject of VIP aircraft, way back on May 27 I heard a VIP VC-135 Boeing 707 depart from RAF Mildenhall going to Florida. Soon after take-of they made contact with Croughton on 11.1776MHz and set up some 'discrete' frequencies for the flight. At various times through the day the aircraft was heard on 10.881MHz, 6.757MHz and 6.716MHz. More recently, President Bush visited The Netherlands, and several aircraft flew into Amsterdam with cars and helicopters to support his visit. One of these, a C-5 Galaxy on 6.11, asked for the SAM frequencies in use there, and was given 4.495MHz and 4.560MHz. These two may be worth monitoring when Mr Bush is flying overseas, particularly when he next comes to Europe.

US Coast Guard

I have spent some time recently monitoring some of the listed USCG frequencies. The most active ones appear to be 5.696MHz and 8.984MHz. I hear them clearly from about 2300 onwards, the ground stations (e.g. CommSta Miami, Boston, Portsmouth and New Orleans) are quite clear, but the aircraft and helicopters are only occasionally heard. The latter use their aircraft serials as a callsign, prefixed *Rescue* for actual rescue missions and *Coastguard* for other flights. For example, on 29.100 *Rescue 1510* (an HC-130 Hercules) spoke with CommSta Portsmouth, requesting the v.h.f. marine frequency to contact ship *Nordic Prince* at 31°02'N 67°12'W. A day later CommSta Portsmouth was co-ordinating a rescue mission at 44°N 68°46'W. *Rescue 1502* (an HC-130 Hercules) reported that *Air Force Rescue 98* was 'unable to pick up the remaining survivors', but would drop life-rafts to them and return later. One of the less frequently used frequencies is 11.201MHz, but on 18.700 *Coastguard 1712* (another HC-130 Hercules) was heard while searching for a missing fishing vessel off the coast of Puerto Rico. I can recommend that you try these frequencies from about 2230 onwards, much of the traffic is routine reports of positions and ETAs, but just occasionally something good crops up. They don't appear to be so active at weekends though.

New Equipment

At the Leicester Show there were several new h.f. receivers available, either just released or 'ready soon'. Sony have just announced their new SW-777 model which is the replacement for their ICF-2001D h.f. receiver. It boasts 162 memories, and the unique ability to store a station name with its frequency; a novel idea is being able to list a number of alternate frequencies for a station, allowing quick and easy QSY when a station signal fades away. The radio is roughly the same size as the ICF-2001D, but it has rounded edges and a more comprehensive frequency display. The push-buttons are a bit smaller and all together the radio appears quite delicate.

Also just announced was the HF-150, the new 'baby' from Lowe Electronics. This model follows on from the success of the HF-125, HF-225 and HF-235 receivers. It has the same clear l.c.d. display, large main tuning knob and very simple controls as the others, but all contained in a much smaller metal casing. It has 60 memories and can use some of the other accessories (e.g., keypad) available for the rest of the range of Lowe receivers.

Finally, at the other end of the price range comes the new Drake R8E. This is about the size of some of the smaller h.f. transceivers, but the R8E has fewer controls to confuse you. It can be controlled from a computer via a suitable interface cable, and its twin v.f.o.s allow you to 'be in two places at once'. The 100 memories store details of frequency, band and mode, and you can scan either of the v.f.o.s or through the memories.

If anyone has one of these, I would like to hear your comments on how good (or bad) they are, and how you think they compare with other receivers.

Your Logs and Letters

Reader **Colin W** from Wokingham asks why he finds it so difficult to hear many of the transmissions mentioned in this column. He asks, is it a case of patience, good antenna system, or just good luck? Well, I think that it's a mixture of all three. My antenna is a G5RV, but it is suspended around my loft space into a loop, it still picks up good signals from all over the world. A good antenna via an a.t.u. is obviously much better than the kind of telescopic antenna that comes fitted to many receivers these days, I would always recommend an external antenna fitted as high as possible. A lot of patience is also needed in this hobby, when the bands are quiet you can always be busy at something else, but when the bands are busy you need to give it 100% attention. Luck also helps, but with time and patience you get a 'feel' for the bands and when things are more likely to be busy. Do any of you have any tips or suggestions for improving your reception?

A Blatant Plug

I am quite sure Peter won't mind if I plug his latest book *Shortwave Communications*, which was mentioned in the December '91 column. I got my copy at the Leicester Show (thanks for the autograph Peter!), and now it sits beside my radio. A quick glance showed that it contained a good introduction to the hobby without anything too technical, followed by sections covering radio controls and antennas, then some very detailed sections covering international frequency allocations and various categories of s.s.b. transmissions (marine and air bands), including detailed frequency listings. There are also chapters covering amateur bands, and one offering advice on buying a radio. It's a very handy book for 'dipping in' when something is heard on the radio, and also a good read when there's nothing on the radio. If Santa didn't bring you a copy, it's an ideal way to use up all those book tokens. The *SWM* Book Service will also be glad to sell you a copy, tell them I sent you!

. . . And Finally

Who knows what next month will bring. I would like to cover more of the maritime frequencies, but I only have a very limited knowledge of these frequencies. Which are the busy ones? Which are the strongest/loudest in your area? Does anyone have any favourites? When is the best time to listen?

Somebody out there must know, please write and tell me. Also, does anybody have any success monitoring NASA? Their frequencies are well known, but I hear nothing, even when there is a rocket launch - what am I doing wrong? I look forward to receiving your letters at the address given at the top of the page.

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bandscan

NORTH AMERICA
Gerry L. Dexter, RRA,
Box 110, Lake Geneva WI, 53147 USA.

This ship was once destined to be the home of High Adventure Ministries' 'Star of Hope' station, beaming to China.

Back again with our quarterly report about what's happening on the short wave scene in the Americas, and it seems there's a good deal happening these days - or scheduled to happen.

We are to the point now where most s.w.l.s - if called upon to give a figure - would have to stop and count the number of United States-based religious short wave stations that have come on the air in the last few years. Awhile back I mentioned that a Catholic group was beginning work on a huge installation that will feature multiple 500kW transmitters.

The latest group planning an entry into the religious radio ranks is Worldwide Gospel Radio, that now has a construction permit covering two 50kW transmitters to be operated at the town of Upton in Kentucky. Currently, the group owns and operates WJCR on 90.1MHz f.m. - one of those so-called 'community stations' the FCC now allows to operate in territory once reserved for educational (mostly university) broadcasters. The group currently produces a programme called *Prayerline* that airs on WWCR short wave Monday - Friday at 0400. No target date announced, but I'd guess sometime this year.

More High Adventure Adventure

California-based High Adventure Ministries, which operates KVOH from Simi Valley and the King of Hope stations in southern Lebanon has been trying for several years now to get its 'Star of Hope' station on the air - meeting problems at every step. The station was first planned as a seagoing operation, broadcasting from a vessel off the China coast, but that didn't work out. Next came Guam. A site was found and a full compliment of broadcasting equipment brought in. Then a dispute arose over who had title to the proposed site that has resulted in High Adventure giving up on Guam as a location. They've now focused on two South Pacific islands. Depending upon land acquisition and local government approval, they'll end up either on Palau or Rota. Star of Hope will beam religious programming to China, but a target date seems anyone's guess.

On a similar front, Dr Gene Scott has now taken over the Caribbean Beacon station on the island of Anguilla and is pushing for contributions so he can get his short wave station on the air from there. Again, no target date has been announced but, based on Scott's ability to pull in the contributions, I'd guess it'll be sooner, rather than later.

Many Happy Returns

It's always welcome news when stations that have been off the air on short wave for periods of as much as several years come back on the air. This time there are several such cases! The Argentine, Radio Malargue in Malargue has resumed broadcasts on its former 6.160MHz frequency, though it's actually being reported on 6.1607MHz. Heard in Spanish around 1100UTC.

Radio Nacional Arcangel, which is located in the Argentine Antarctic has been off short wave for a year or so but now is active again. Heard on 15.474MHz, slightly variable running to a sign off time at 2305 or slightly later. Although most of the programming is in Spanish and English identification announcement is reported - complete with an invitation to send a reception report and receive a QSL. Apparently, they also give at least one station ID in Portuguese.

In Venezuela, Radio Continente, Caracas, active for many, many years before it went silent for a lengthy period, has also returned to short wave. It is active on its old 5.030MHz frequency and said to be running 7.5kW. No schedule reported but the 0000-0400 period is probably the best chance.

Another returning South American station is Radio El Sol in Lima, one of the old time, main line Peruvians. South American DXers report this is active on its old frequency of 5.970MHz. This, too, might be hearable in Europe in the 0000-0400 period, or later.

And coming back - maybe. La Voz de Galapagos in the Galapagos Islands is supposed to return to short wave. At least they would like to. Their transmitter needs an overhaul and there is no money available to accomplish this at present. If and when it can be done, then the station should go back on short wave, likely on its old 4.810MHz frequency. Some radio country lists, including that of the widely used North American Shortwave Association, consider the Galapagos a separate radio country as the return of this station would have special importance to country hunters.

Still Expected

Radio Miami International is still waiting for FCC approval to start construction of its station in Miami. The station would concentrate on coverage of the Caribbean. At present, the organisation is airing some programming on WWCR and WRNO - and also acting as a representative - arranging for other groups to get air-time on these stations. So far, most of these are Cuban exile groups who are programming to Cuba. Another Radio Miami endeavour seems to be making faster progress. RMI has been assigned frequencies and call letters for its proposed station in Honduras. The call will be HJRA and the station will use 1kW on 9.950 and 15.670MHz.

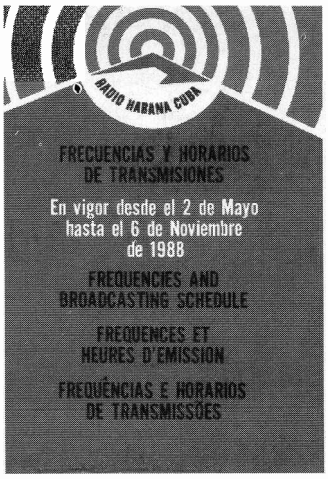
FCC 'Busts' Anti-Castro Broadcaster

La Voz de la Federacion Mundial de Ex-Presos a Politico de Cubano (Voice of the World Federation of Former Cuban Political Prisoners) had been airing a broadcast on 7.080MHz about three evenings per week, from around 0130 to 0200. The FCC's Tampa, Florida office located and closed the station, which, according to a report in the *DX South Florida* bulletin, had been in the Drew Park section of the city of Tampa, Florida, just east of the international airport.

Looking Ahead with the VoA

The Voice of America still has a variety of technical irons in the fire - both short and long term. After the recent commissioning of a new set of transmitters at the Bethany, Ohio site, the VoA's next new signal sources will be in Botswana. Indeed, the first two (of four) new 100kW short wave transmitters should be in operation right now and the other two by spring.

On other VoA fronts, work continues towards the final goal of having ten new transmitters active in Tangier, Morocco. This won't be fully operational until early 1993, which means some of them should become active this year. Agreement has been reached with the Sri Lankian government to put three new transmitters on the air at that island site. The new short wave relay at Udorn, Thailand will be active in 1994. The Israel relay project remains in limbo, awaiting further environmental test at the site and then a court decision as to whether the station can be built after all. The VoA has had a technical improvement plan going now since 1981.



Radio Havana Cuba may put a transmitter on the air on 120m, just for DXers.

Croatia - Tennessee - Chicago

Now there's a strange combination! But is **is** tied together. WWCR in Nashville, Tennessee is now airing a program called Radio Free Croatia on Mondays, Wednesdays and Fridays at 0100-0130 which - like Radio Libertas and Croatian Radio, carried on US short wave outlets - is on the air as a result of the Croatian declaration of independence and the Yugoslavian civil war. The programme is produced in Chicago. The address is the Chicago Media Workshop, 4829 N. Talman Avenue, Chicago, Illinois 60625, USA.

This and That

The Alaskan religious broadcaster, KNLS, has cut back on its English broadcasts and now airs only one such segment - currently at 1300 on 7.355MHz.

Radio Surinam International, which was on the air for about an hour each day up on the 16m band, via a RadioBras transmitter in Brazil has discontinued its broadcasts.

The Canadian medium wave station CFCF, Montreal, relayed by CFCX - 6005 has changed its call letters to CIQC and adopted a country/western format.

In *The Journal* of the North American Shortwave Association, Tom Sundstrum reports that Radio Havana Cuba may put a transmitters on the air on 120m, mostly just for DXers to try their hand at hearing!

That's the story for this time. Back in three months with more news from the 'other side'.

Radio SRS was the predecessor of Radio Surinam International, which recently discontinued its short wave broadcasts via a RadioBras transmitter is Brazil.

satellite tv news

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

As this column is prepared just before Christmas 1991, we can look back on an eventful year, perhaps the one thing that brought satellite TV news into a new era was the Gulf War. Suddenly we were live at the war front, missile alerts, explosions, pinpoint accuracy of missile attacks with inbuilt cameras. One of the most dramatic TV airings was from the CNN Jerusalem bureau with their reporter attempting to continue a live on-air commentary/ report during a Skud attack whilst donning gas protective clothing. During the Gulf War, several satellites were pressed into service for linking the on-site portable satellite news gathering equipment (SNG) back to respective national broadcasters' newsrooms - this resulted in the sharing of news feed circuits and it was possible to sit on a given downlink and watch a succession of desert located reports back to the studio. Such was the sudden call for satellite circuits that both Eutelsat and Intelsat pushed into service an additional satellite each at 4 and 57°E respectively.

Then August brought the Russian overthrow of their established Communist system with rioting in the streets, again carried live (unheard of a year ago!) from the Moscow streets over Gorizont satellites at 11, 14°W - well, as live as it could be given the lack of ground based radio linked cameras...hand held news cameras recorded the scenes to be hurried back to the Visnews bureau for backlinking into the West. At such times its interesting to see that the established terrestrial and satellite broadcasters drop their advertised programmes to take 'live' the events unfolding - usually with the CNN, etc., logo in the corner. During the year there were several live political meetings around the World and, of course, it was the year of the hostage releases with several Damascus originated feeds carrying the first pictures of both British and American hostages in their first hours of freedom.

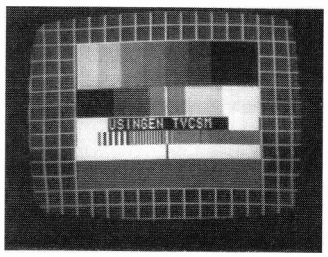
November 18 saw Terry Waite walk free and interesting that much of this was carried over Gorizont 14°W into the UK. After considerable delays Eutelsat's long awaited series II F3 successfully launched from Cape Canaveral on December 7 at 2247UTC into the correct orbit and after testing will be operational at 16°E by mid January, pictures of the launch were carried over Eutelsat II F1 13°E at 10.98GHz horizontal. Rumours suggest that BaeCom have already leased 2 transponders in the Telecom band on this bird for Starbird SNG operations. The next day news feeds were seen from various craft covering material ex Summit talks in Holland.

With the TV Norge move to the Tele X satellite at 5°E in the Telecom band, keep a look out for other activity on a couple of other nearby transponders, on December 3, a corporate video conference was being carried on 12.64GHz, the other transponder at 12.72GHz often features programme circuits and conferences. Interesting that all 3 transponders on this bird are lefthand circular so switching vertical/ horizontal will make little difference.

Unusual sighting by me on December 13/14 at about 2°E with unmodulated carriers - 11.00 and 12.52GHz - which may suggest that new II F3 is slotted at a test position. It's common practice for newly launched satellites to locate at a test slot for downlink tests and system evaluation. Cyril Willis (Kings Lynn) noted very strong carriers from 38°W early December at 11.153GHz over several days, this is the favoured test slot for all North Atlantic path Intelsat bird evaluation, it's likely that Cyril's sightings were of the newly launched VI F1 which will move to 27°W early January.

Since this column was launched there has been a steady growth of interest by satellite orientated readers. Take for instance **Darren Salter** from Cambridge, he is using a junked Cambridge Computer's receiver and LNB - some of the local remains of the firm when they relocated north of the border. Darren has fitted additional sound sub-carrier tuning and with 3 dish options (the largest being a 900mm) and covers the sky most effectively. Several other readers are using the standard 650mm Amstrad dish/receiver combination and moving the dish across the Clarke Belt, it's possible on a 'good' package with lower than average noise LNB to usefully receive signals from Intelsat 27°W and other satellites. **Nicholas Earley**, Victoria, Australia also an enthusiast has now invested in a 1.5m dish and imported receiver for reception of AUSSAT and already received 7 transponders, 3 being in B MAC and cannot be resolved satisfactory.

Readers too in South Africa! **Ken Kirkley** in Botswana has forwarded a 'BOP-TV' sales sheet for their decoders, apparently they use the standard Videocrypt system similar to Sky and decoders for cash can be obtained from Thompson in Germany for $250, rather a high price when the original decoders here in the UK can be purchased from about £50 upwards. BOP-TV sell a year's SMART card for $140, BOP signals downlink from Intelsat VI F4 27°W, 3.88GHz in C Band. The recent photograph of Astra 1A reception (Teleclub) in South Africa has prompted **Frank Heltz** of Durban, South Africa to write - Frank, a satellite dealer says that a 4.2m solid dish (i.e. the reflective surface is solid metal and not mesh) will provide sparklie free reception from Astra 1A on MTV, Filmnet, Teleclub, RTL-4, Screensport and Lifestyle channels. The LNB is a 0.8dB noise Gardener fitted onto a



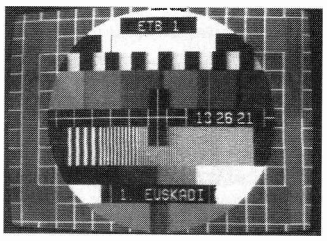


Fig. 1. (above): The NDR-3 (W. Germany) Satellite feed via Astra 1B. (Peter de Jong). Fig. 2. (top right): Test pattern from the Usingen, Germany Earth station, over Eutelsat II F1. Fig. 3. (right): The Greek EBT-1 feed via Eutelsat I F4 11.66GHz. Peter de Jong, using a 90cm dish.

Chaparrel C/Ku feedhorn, meanwhile Frank's neighbour uses a single John Levick Ku band feed with an improvement factor of 15%! Astra 1B and Eutelsat I F5 can be seen but very weak. Receiver is an Echosphere 4500 with inbuilt threshold extension and reduced video IF bandwidth switching.

Incidently if you want to check your equipment on System M NTSC 525 lines then try PanAmSat PAS-1 45 West on the NHK feed 11.67GHz horizontal - the transponder is usually downlinking a test pattern for most of the time when not actually carrying programme and news material

I am pleased to hear from readers' of their reception and equipment whether they operate a Jodrell Bank or a more modest setup, if you have any queries we'll try to answer but please include an s.a.e. with your letter.

As predicted some months ago in these pages, the Dutch based Filmnet group has started D2MAC with Eurocrypt scrambling over a Eutelsat II F1 downlink formally used by Nordic Channel 11.63GHz horizontal, dual-beaming with their 11.67GHz horizontal which remains in Satbox encryption until their subscribers have retrofitted to the new standard - it's likely that the Astra 1A 11.36GHz. horizontal transponder will also go D2MAC in due course, which will spell the end for the many pirate decoder boxes that supports a large industry base throughout Europe. The attraction to the UK market was the interest in the Wed/Sat night adult moves, which may in part be satisfied when the 'After 12' channel starts up in late December on Eutelsat II F1 13°E over the former Galavision trdr 11.596 again using Videocrypt encryption (like Sky with Smart cards) which is rapidly becoming the standard for Europe. No news on the rival adult HVC 'The Adult Channel' which hopes to air early 1992.

THAILANDSAT 1 should launch late '93/early '94 via Arianspace which will provide internal telecommunication and TV carriage with spillover into neighbouring countries - use of the spillover coverage will be encouraged. Neighbouring Malaya have also bought Arianspace launch expertice for the launch of their MEASAT satellite during 1994. And the Korean satellite which will fly October 1995 will be called 'MUGUNGHWA' - the Rose of Sharon - after the Korean national flower!

Intelsat K

1993 will see the launch of the high powered Intelsat K with her entire payload of 16 Ku band transponders (including Telecom band), running into 47 - 50dBW footprints in designated regions. Three specific areas are targeted, Western Europe extending to the Russian border, the United States reaching into the mid-West and 2 Latin beams into South America, one being across Peru, Columbia, Ecuador and Venezuela, the other across Argentina, Chile, Uruguay and Paraguay. Versatile cross switching of the available uplink beams will allow various routings of the downlink options within the regions as detailed. The satellite will carry all types of TV transmission and encryption standard in either analogue or digital form. The launch of this bird during hopefully Spring 1992 will bring a great deal of interest to Ku band observers located at 21°W

Eutelsat launches 1992

Eutelsat II F3 should slot into 16°E by week 2 January; Eutelsat II F4 should launch February/March 1992 to slot at 36°E; Eutelsat II F5 should fly late 1992 and will slot at 7°E. There is a future II F6 though no details of this craft are yet to hand.

amateur bands round-up

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

This is being put together at 1300 in December half-light, when band conditions are - er, unsettled. 'Nuff Said!

A voice from the past first; **Mike Davis** of Thornton Heath is still listening, though, and takes his Morse test in the run-up to the Christmas festivities. Congratulations in advance! Mike has been looking at the question of S-units and S-meters and as a result is thoroughly puzzled. To summarise his questions - 1. Is there a standard scale for S-meters? 2. Is there a standard S-unit? 3. If not, what's the use of an S-meter anyway? With regard to item 1, we are usually told S9 is given by 50µV. Is this the output of the signal generator, or the input appearing across the receiver terminals? Some signal generators are calibrated to the former, some to the latter, so you may have to set 100µV on the gennie to get 50 at the receiver, or you may not. Again, the S-Meter is usually adjustable by a potentiometer at the back, and it will probably go over to full scale regardless when you back off the r.f. gain. 2. Some people regard an S-unit as being 6dB, some use 4dB. Anyway, in 40+ years in this hobby I have never seen an amateur receiver S-meter whose calibration held to any form of S unit across the range of signal strengths. Hence, in real terms the answer to 3. is that as an indicator against which to report, the S-meter is useless.

Not a Measuring Instrument

That having been said, perhaps John Q. Ham across town wants to compare two antennas. In that case we can look at the meter and say on the basis of its reading that one antenna gives us a better signal than the other. How much better we can't really say - unless we can switch to an accurately calibrated signal generator, set it to first the larger, then the smaller levels, and do a sum. For an s.w.l. report, maybe we can plot the variations in our S-meter readings of a distant station for a period of time. Such a report will merely tell the recipient there was fading, or the band was going out or perking up - but at least it'll go some way to justifying a QSL in return! If you monitor a particular station over a period of weeks, you can of course check conditions by logging the observed meter readings with the receiver and a.t.u. controls at a specified setting. However, a measuring instrument it is NOT!

Pensioned Off

Now another voice from the past, namely **Philip Davies** of Market Drayton. Philip has pensioned off his old Eddystone 840A in favour of an Icom R72; a Maplin a.t.u. has been put together and the bits-and-bobs accumulated for an outdoor long-wire. Arising from this, Philip sent in a list of the 'specials' heard, reflecting the great changes in the world of late. For instance: R3A heard from the Russian Parliament during the coup time. 4J7GWB for Armenian Independence, EK3DNJ, the New Jerusalem Monastery in Moscow, EN50PQ and GB50RC both celebrated the fiftieth anniversary of the Russian Aid convoys of WW2, HG32JP for the Papal visit to Hungary, OM5SCT from Czech Scout Hq in JOTA, LY91BQJ the Lithuanian National Games, T40PAN for the Pan-American Games in Cuba, EI2TSR, GB2TSR and GB4TSR were all for the Tall Ships Race. A couple of 'expedition' stations operated by YLs were DL1SCQ/TF7, Ann, Westman Island, Iceland, and KP2A/KP5 operator Judy, from Desecheo. Two expeditions in QSO were GT3FLH, St Patrick's Island, IoM, for the National Trust, working EJ4DW Aranmore Island, off Donegal. RY75BL was an expedition to Lysonia Mountain, Ternopol, 4L3IR came from the St Petersburg (ex Leningrad) International Radio Rally, while DK0IFA was from the Electronics Fair in Berlin. GB2SM was the Science Museum station and VE3OSL was the Ontario Science centre. 5J500D/3 was celebrating 500 years, presumably since Europeans found it, from Bogota, Colombia - imagine that call on c.w! Finally G2LO from the BBC's Ariel Radio Club in Warwick in an RSGB contest, and 9K0JH, commemorating the final dousing of the Kuwait oil-well fires. We might finish by asking Philip what he thinks of the beer in the Stags Head!

Next letter in the pile comes from **Gerald Bramwell** from Swinton, Greater Manchester. On 28MHz, Gerald found WA4WTV, K6GJD/7, W0NBA, and some Europeans, while 24MHz yielded only LZ2TU. On 21MHz the only DX-y signal noted was YB6HJE, the rest being Europeans; but the only signal logged on 18MHz was W1TRV. However, 14MHz came good with KZ4C, WB2MWW, XO1TX, VE3EBT, WB2SRL, KA1JC, KC4DWI, VE3FRW, VE3OSC, VY2SS, VO1TA, N2KVN, VE2TBK, N2OK, VE3FGL, AC4JO, W1IKO, VE3YJ, XO1FG, various Russians and Europeans, 9K0CS, 9K0DT, EA8RR, PS8YL, TR8JH, TT8SA, PY4AH, YV5MQA, TG9GI, 3B8FU, CX7BC and VP2SEI. The DX on 7MHz included ZP1XCP, TU2XZ, JA5AQC, 9K2ED, 5U7M, 9K2HA, 4X4JP, PZ1EL, JY5EC/OD5, EA8RR and 4X1MO, UH8EA, RA9SFL, RZ6LYQ, UF6FJ, European Russians and of course other EU signals. One very new G noted was GU0PSP. Things on Eighty were quite good, with VO1XC, VO1CMR, VO1EM, R6L, JA6XMN, JA4VUQ, 4X1EL, 9X5SW, JA1JAK, 7X4AN, EA9TL, 4X6ZK, JF6AYK; among the Europeans we noted calls such as G3KKJ, and G6LX. Finally, Top Band, on which Gerald noted RB5CU, plus G3VER/P, G2LO, G0JIP, G0IVZ, G3WAS and G3NGD. The G2LO call by the way was originally the call of the first broadcaster - London Calling - back in 1923-ish.

On to **Dennis Sheppard** of Earl Shilton. Dennis reports his results achieved with a Trio 9R59; on 28MHz VE1PBM, W9FHW, TA1BE, on 24MHz ES5D, SV0HV/SV9, UM8MBA, VO1NE, J68AS, 8P6CC, W8AH, XN1YX, RO5OP and WB2MWW. To date Dennis hasn't located 14MHz so a 'nil' report there, but on 7MHz SV1FH, TI2IDX, 4X6KA, ZL2SN were noted, with 3.5MHz FM5ON, ZL2APW, WA6IZT, 8P6JB, JA1JRK, 7X2BK, 7X2DG and lots of W/N/K/A signals. Top Band sideband produced GW3KFE - who's he? - and GW4GNY plus HB9ABT and HB9ADQ. Listening for a.m. signals on the band produced G3KPJ, G3OA, G3RGF, G3RCX all in Essex. However, a little bird tells us Dennis has now managed to find a Racal RA17.

Over the water now to Malta, where **Vince Cutajar** listens to 18MHz and 24MHz. This time Vince mentions the sideband from 3C1EA, V73AZ, H44QM, C21NI, P40P, N7PBX (Nevada), KE0QQ (N Dakota), YX5LA, 9L1US, LZ2VU, W6SAI, ZB2AZ, JT1JA, 6Y5EW, TZ6VV, J68AS, WB8GEX/VP5 and TU4XM all on 24MHz, while a little time on 18MHz produced SV9ANH, 5V7DP, P40P, YX5LA, 3B9FR (Rodrigues) and J68AM.

Mervyn McPeake reports from Ballymena, where he has an inverted-vee cut for 7MHz at 21m, plus coaxial feed. The first activity was on 14MHz, with ZA1QA, LZ2KLW, 9H3NU, F6IIO, LX1CN, PA3FWZ, LX/PA3DPK and DF9YM. There was then an enforced close-down for about a month, as a storm had blown down the antenna. When activity recommenced it was mainly on 7 and 21MHz and to date some 63 countries are 'in the bag' with lots and lots of Stateside signals, and of course Europeans.

Patchy

Down West at Yeovil, **D. L. McLean** comments that conditions have been patchy thanks to the solar upsets, with periods when all bands were virtually dead in the DX sense. The sideband pippin on 3.5MHz was CR3A, while on Forty we can admire ZA0RS. 14MHz yielded BV2FF, BV4OB, C6AFQ, CE0YAD (Easter Is), FT4YD, IK5DNE/IA5 (EU-28 for Iota fans), J37H, J80D, J82A, KL7RA, PJ9W, V31ZR, V47NS, YW1A, ZC4ST, ZF8AA, ZS6DL, 5H3DC and 9M2DM. Just K6YRA and OD5ET on 18MHz, but old favourite 21MHz managed to produce BZ4RBX, C6AFQ, FM6A, HZ1AB, J8OD, J82A, KG4QQ, LU8XPD (Tierra del Fuego), OA4QV, OX3KM, P40T, PJ7A, PJ9W, S03UN, V31IZR, V47KP, V63JC, VE7PL, ST0DX, TV6MN, YI1AFC, ZF2JI, ZF2ND, ZF2QX/8, ZF8AA, ZP0Y, 5Z4DU, 6D2X, 6W7/YU5AU, 8P9Z, 9L1US, 9Y4H and 9Y4VU. A trawl on 24MHz came up with A45ZZ, FM5DN, FR5GL, FY0EK, HI8MEQ, PP0F, SV1UM/8 (EU 75 for IOTA), TA1AL, UF6FL, VP2V/KU7F, WJ6Q/M, YS1DRF, YV2BYT and ZA1QA. Finally, 28MHz and BZ4RBX, D68RH, HB0/HB9AON, HI8A, HZ1HZ, J82A, KP2A, NT7Y (Utah) V47NS, VE6TK, VK2AHM, P40T, P40W, PJ1B, TI4CF, XX9AW, YN/SM0OIG, Z21HQ, 4U1UN, 6D2X and 9L1SL.

Feeder Problems

It was back along in 1966 when **Andrew Marriott** first reported from Bishops Stortford to the column in the old *Short Wave Magazine*, so much water has gone under the bridge. However, at the present Bath QTH the water missed the bridge and filled the traps in the multi-band antenna instead - not to mention feeder problems into the bargain! Hence, silence while repair work goes on.

Hastings is the home of Top Band specialist **John Heys**, who mentions listening for six hours in the sideband leg of the CQ WW Contest, and finding 35 countries in five zones including as the pick the calls of OY9JD, TK5BF, LX1FJ, LX6A, HG7BX, HG73DX, LY2ZO, RY7D, YL1ZW, RZ1A, CR3A, UC2IDC, LZ9A, EA9LZ, RH2E, UL0A, HB0/HB9AON, ZB2X, RT5UO, PI4TUE, RY1U and ZA0RS. Turning to c.w., John heard ZA1HA on October 9 on the band, at the early time of 1817 and thought he was yet another ZA pirate, but it turned out to be the real McCoy, proven by receipt of the veri.

QSLs

Ted Trowell in Sheppey offers some addresses for QSLs; TA7KA, Box 176, Trabzon 61000; ZA1TAD, Box 66, Tirana; ZD8LII, PO Box 2 Ascension Is; SU1HV via IS0LYN; FY5YE via W5JLU; V29W via KD6WW and RO40A via SP9HWN.

The EA RTTY Contest runs February 8-9, 1600Z to 1600Z. EAs send RST plus 'Prefijo Provincial' comprising two letters, the rest of the world RST plus CQ Zone. Score one for a QSO in own continent, two for a different continent, on 14/21/28MHz. On 3.5 and 7MHz score three for a QSO in own continent six for other continent. The multiplier is the sum of the DXCC countries and EA prefixes on each band. Final total, sum of QSO points, times the sum of the band multipliers. Use a separate log for each band, include a summary sheet showing scoring and other essential information. Mailing deadline for entries is April 10, addressed EA RTTY Contest Manager, Antonio Alcolado, EA1MV, PO Box 240, Aranda de Duero (Burgos), Spain.

Deadline

The address, as always, is at the head of the piece. Your letters should land in the Box by March 6, April 10, and May 8. Don't forget, it is your input which feeds the column; so the more letters, the merrier!

dxtv round-up

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

First, my congratulations to **Dr. John Mason** (Yapton, Sussex) on his recent election to the post of President of the British Astronomical Association. I have known John a long time, he is a very able astronomer who broadcasts, lectures and writes about the subject. Furthermore, in addition to being deputy editor of the magazine *Astronomy Now*, he is joint author, with **Dr. Patrick Moore** (Selsey), of the book *The Return of Halley's Comet* (ISBN 0-85059-667-X). His ability in electronics combined with a specialists knowledge has enabled him to study fireballs and meteors in both the radio and optical fields. Along with Patrick Moore and **Cmdr Henry Hatfield** (Sevenoaks), John is the third contributor to hold this high and very important office.

Band I (Upper Ionospheric)

In India, **Lt. Col. Rana Roy** (Meerut) noticed periods of ionospheric disturbance, giving the typical multi-image, smeary and distorted pictures, at times on September 8, 9, 10, 12, 13, 14, 28, 29, 30, October 1, 2, 6, 7, 8, 9, 10, 25 to 29 inclusive and November 2 & 3. Among his catch was unidentified 525-line 'rolling' pictures, on Ch. A-2 (55.25MHz), from SE. Asia on September 8 and October 1 (possibly Vietnam), 6th (Philippines), 7th and 25th (Philippines) and possibly the Philippines again on the 27th and 29th. At 2231 on October 9 he identified 'Bangkok TV3', on Ch. E2 (48.25MHz), by the 'smeary '3' insignia, **Fig. 1** and saw one of their films, identified by the '3', lower right **Fig. 2**, at 1934 on November 3.

Briefly, such distortion to pictures takes place when the normal state of the ionosphere has been disturbed and the paths of the video signals are being reflected, refracted and deflected by randomly reforming clouds of ionised gas. Although their countries of origin are generally uncertain, Rana deduced from such signals adverts, announcers, cartoons with English sound, a digital clock caption, a film dubbed in Thai, football, news-readers, plays, prayers in Arabic, Teletext and, at one time, sound in Thai language. However, he positively identified 'Dubai TV' with Arabic songs and Teletext, on Ch. E2, at 1650 on October 9.

Back in the UK, around 0800 on November 13 and 14, **Simon Hamer** (New Radnor) identified signals, during an 'F2' opening, from Australia (Star Television on 46.172MHz), China on Ch. C1 (49.75MHz), New Zealand on 45.250MHz, Malaysia and Thailand on Ch. E2 and later, at 1230, came Dubai, Iran and Zimbabwe. **Bob Brooks** (Great Sutton) also reports seeing unidentified pictures, via 'F2', on Ch. E2, at midday on the 13th and 15th.

Band I (Lower Ionospheric)

Simon Hamer received 'pings' of picture, via meteor trail reflection, from an unidentified station on Ch. R1 (49.75MHz) at 1230 on the 21st, Denmark on Ch. E3 (55.25MHz) on the 22nd, Norway on Ch. E2, with a glimpses of their news (Dagstevyen) at 1830 on the 23rd and Iceland (RUV), on Ch. E4 (62.25MHz), at 1230 on the 28th. Bob Brooks watched dancing from Spain (TVE) and news from Germany (ARD) while short-lived Sporadic-E was active at 1100 on the 4th and 2145 on the 5th respectively.

Picture Archives

George Garden (Edinburgh) often uses his Panasonic video camera to record, from screen, any DX signals that he receives at one of his portable locations. He then converts them to colour prints by taking photographs from the play-back with a 35mm camera. The weather forecast from BBC North's Sandale/Caldbeck transmitter **Fig. 3**, and a test-card from Holland **Fig. 4**, were captured for posterity by this method. Bob Brooks kindly sent photographs of a Czechoslovakian ident **Fig. 5**, and a logo **Fig. 6**, and station ident **Fig. 7** from Spain's 'TVE' that he received, via Sporadic-E, back in 1983/4.

Satellite TV

Radio and television engineering and broadcasting has come a long way since those first signals were received on earth, around 20 and 40MHz, from that 184lbs orbiting satellite, Sputnik 1, launched by the USSR on 4 October 1957. I often think of those early days when I read the latest reports about the pictures you have received from the broadcasting satellites. From 1015 to 1045 on October 21, **Mike Bennett** (Slough) saw adverts and the programmes *Maude* and *Young Doctors* on Sky One, around Ch. R11 (215.25MHz) in Band III. Mike reports that the weather was very foggy at the time and the pressure and temperature was 30.35in and 8°C respectively so conditions were right for a lift in Band III. Any ideas about the source of this signal readers?

"We are now watching BBC World Service TV every day via ASIA SAT," said Rana Roy, who uses a 'C' band antenna. He finds the BBC programmes very interesting especially those about the environment, other countries and Network East. In addition Star TV provides him with channels for entertainment, music, sport and a Chinese channel. In Holland, satellite watching for **Peter de Jong** (Leiden) in October and November, via Astra and Eutelsat, produced interesting captions from NDR (Germany) **Fig. 8**, Nordic Channel **Fig. 9**, the USSR (translates 'TV Inform') **Fig. 10** and a test-card of a French Telecom satellite **Fig. 11**.

Weather

"We are having pleasant weather now with temperatures between 23°C in the day and 10°C at night," wrote Rana Roy on November 22. The slightly rounded atmospheric pressure readings for the period October 26 to November 25 **Fig. 16**, were taken daily, at noon and midnight, from the Barograph installed at my home in Sussex. I also recorded 3.85in of rain during November and although the month was generally mild with high winds and fog at times, early morning frosts occurred on days 6, 10, 15 and 21. The latter was the most severe with temperatures down to 28°F in the small hours. During the last three weeks of November, **Clive Brook's** barograph, at his home in Plymouth, ranged between 29.1in (985mb) and 30.2in (1024mb)

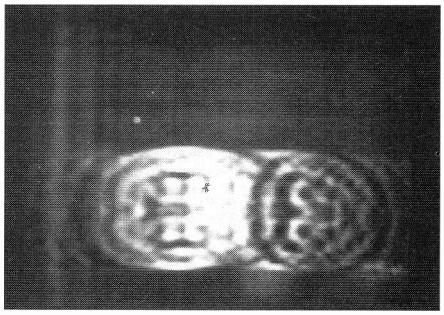


Fig. 1: Bangkok.

Fig. 2: Bangkok.

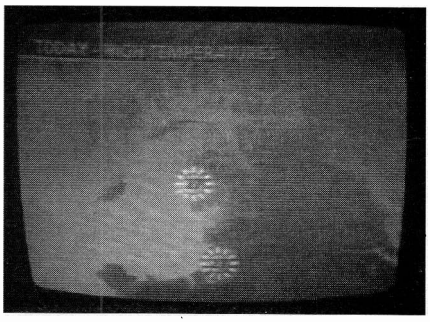


Fig. 3: BBC North.

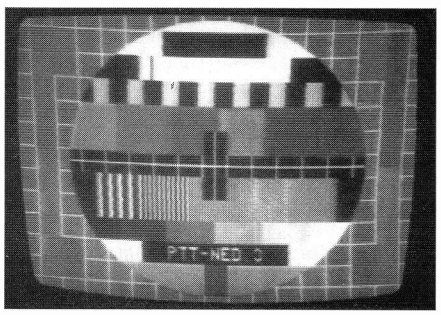


Fig. 4: Holland.

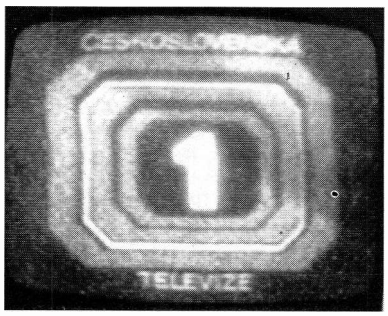


Fig. 5: Czechoslovakia.

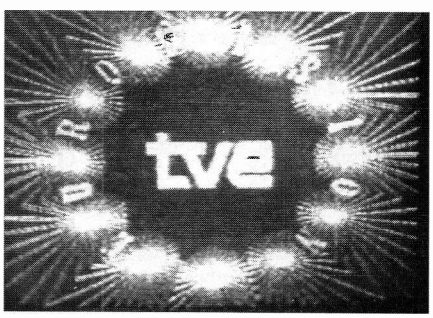


Fig. 6: Spain.

Fig. 7: Spain.

Fig. 8: Germany.

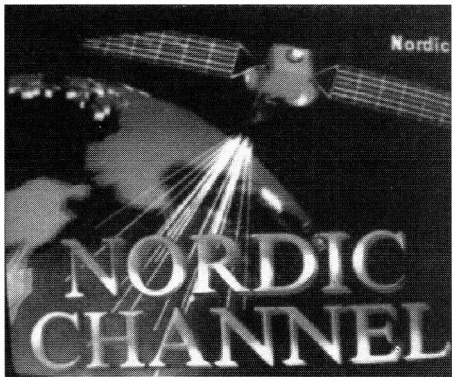


Fig. 9.

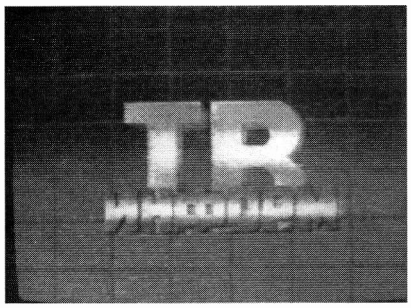


Fig. 10: USSR.

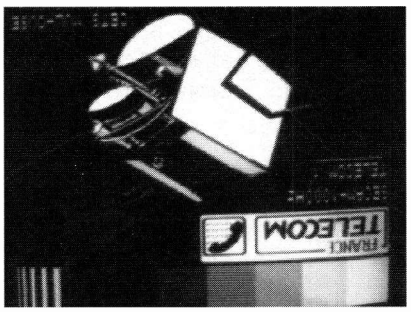


Fig. 11: French Telecom satellite.

Fig. 12: Jalahandhar.

Fig. 13: Germany SSTV.

Fig. 14: USSR SSTV.

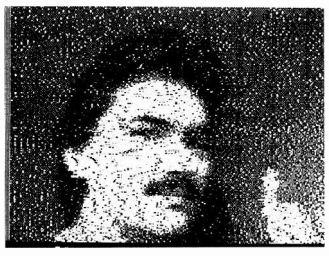


Fig. 15: Germany SSTV.

Tropospheric

Between 1500 and 1700 on August 20, **P.R. Guruprasad** (Bophuthatswana, S. Africa), using a Sony colour set with built-in antenna, received 'snowy with intermittent colour' pictures from the United Arab Emirates Television Service, Abu Dhabi, plus a clear picture from U.A.E Radio and Television-Dubai on Ch. 33. Rana Roy received tropo signals, in Band III, from Lahore, on Ch. E5, between 2000 and 2235 on September 16 and 17 and Breakfast TV on days 18, 24 and 29 and October 1, 6 and 27 from Agra and Jalandhar **Fig. 12** on Ch. E9, Bhatinda (E12), Lahore and Kasauli on Ch. E6. Note the horizontal lines of co-channel interference on the signal from Jalandhar, **Fig. 12**, that Rana received at 0805 on October 27.

While DXing at Cairn O' Mounth on November 23, **George Garden** (Edinburgh) received pictures, on Ch. 59, from the Selkirk transmitter of Borders ITV. As George turned his horizontally polarised log periodic antenna around toward 90, CH.4 came up. In this position, he turned his antenna vertical and noted the same film as was being shown by Borders ITV. "This was rather a surprise to me," said George who, in his usual way, checked the IBA transmitter tables and thinks that this strong signal was coming from either of Caldbeck's low-power, 2kW, satellite stations at Barskeoch Hill or Haltwhistle. The pressure was high at the time and the weather was 'cloudy and perishingly cold'. Once again George has shown the value of careful antenna adjustment to find weaker stations and he plans to check these findings again on his next expedition.

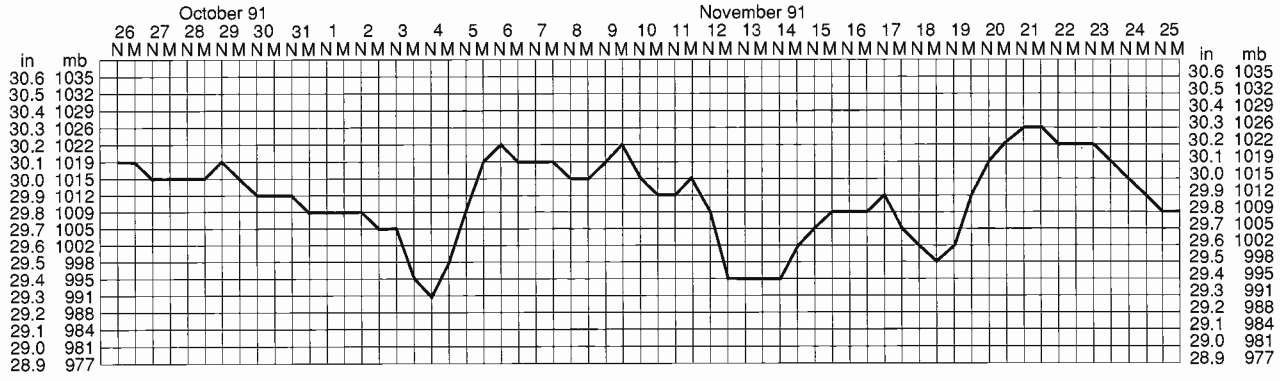
John Woodcock (Basingstoke) received pictures from France on Chs. L5, 6 and 7 during the afternoons of November 24 and 28. "Some of the pictures were quite good at times, on the 28th they lasted over an hour", said John. While tuning through Band III and the u.h.f. bands, Simon Hamer, found pictures from Belgium, France, Holland, Ireland and Spain on the 22nd and Germany (ARD1, DFF, HESSEN3, NDR3, RTL+, SAT1, West3 and ZDF), Poland (TVP1) and each Scandinavian country on the 23rd.

Bob Brooks received a very strong signals from Ireland's 'RTE' on Ch. H1 (207.25MHz) from the 24th to the 29th inclusive. November 30 was "a dull, hazy and mild day with the pressure rising past 30.1in (1019mb) and a massive high building over Europe," said **David Glenday** (Arbroath). At 1300 he heard a test-card tone on Ch. E27 and sound on Chs. E26 and 40 during the afternoon, "same programme - probably 'DR' [Denmark] TV2", David remarked. He also noted pictures and/or sound on Chs. E30 and 43, but, by early evening conditions were flat again.

SSTV

During the month prior to December 2, **John Scott** (Glasgow) received slow scan television signals around 7.046MHz and between 14.233 and 14.227MHz. He copied 'CQ' captions on the latter band from stations in Germany **Fig. 13** and Sweden, saw a 'change-over' between stations in Finland and the USSR **Fig. 14**, an ident from Berlin and most likely an operators photograph, **Fig. 15**.

Fig. 16.



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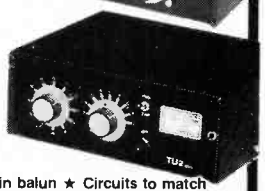

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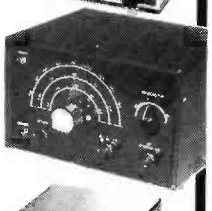

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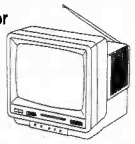

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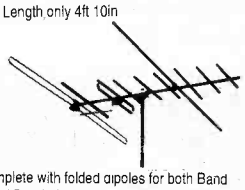

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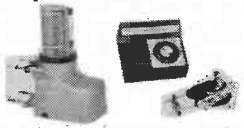

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airband

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63 The Drive, Edgware, Middlesex HA8 8PS

Tornado GR1 with ALARM anti radar missiles. (RAF Crown copyright).

The purpose of this column, as I like to remind everyone from time to time, is to fill in the technical background to flying to enable the aviation enthusiast to find deeper enjoyment from their interest. I know that readers include pilots and among those, some professional ones; other readers also have diverse jobs in aviation. So here we have a column that is in the fortunate position of being a meeting place between aviation enthusiasts of all types, with interest and enjoyment being the common link.

Having said that, pilots should keep a watchful eye on any developments that affect them and, given the typical lead time required to produce a magazine article, NOTAMs must be regarded as the primary source of information. This column discusses public domain information at a more leisurely pace, but sometimes in greater depth.

For the benefit of pilot readers, and so that others may understand how the system works, it is timely to consider a safety topic that came to light in a recent reportable accident. Over much of the country military low flying training takes place between 0700-2300 on weekdays not below 250ft (from the nearest object or the surface) and not faster than 450kt. The low flying part is less than 1000ft above the surface and the speed involved is clearly several times faster than typical light aircraft. When taking off and landing at a licensed aerodrome, light aircraft are protected by the ATZ (although there have been conflicts between low flying military aircraft and light aircraft that were climbing out of farm strips). The danger starts when light aircraft descend below 1000ft outside the ATZ for activities such as photography (as in the recent accident) or crop spraying. If you intend doing this, let the military know by calling Freephone 2230 and asking for the London Military Low-Flying Controller in the Tactical Booking Cell at LATCC.

Pleasure Flight

For the 'Airband' Pleasure Flight to take place (as mentioned in December), I need to know that there will be a sufficient number of interested participants. The expected format is roughly as follows. The plan is for a daylight flight during this summer or early autumn, duration around an hour (block time) at a weekend. The flight will arrive back at the airport of departure which will be in the south-east or the Midlands. Guess who'll be providing a detailed technical commentary (complete with radio frequencies and procedures) direct from the cockpit. If we're lucky, costs might be contained below £40 per head but, as stated, this all depends on receiving money in advance from enough people.

What aircraft type will be chosen? **Brian Taylor** (Woking) hoped it would be the Ju-52 but I doubt that this would be possible. Most likely, a twin-engined turboprop (such as the Fokker F.27/50 or Shorts SD.330/360) would represent a good compromise between performance and cost, being able to cover a sufficiently interesting area and being able to attain the height to enter airways. These particular types also have the advantage of high wings, enabling an unimpeded view of the ground.

If there is insufficient interest after the publication of this issue then the plan will lapse due to poor response. Are you interested?

You Write

As a teenage Air Training Corps member **Chris Haigh RS92164** (52 Penistone Road, New Mill, Huddersfield, W. Yorkshire HD7 7BT) experienced his first flight in an Avro Anson in the 1950s. His first commercial sortie came in a Viscount from Manchester to Heathrow in 1962.

I'm unable to sort out your request for frequency information, Chris. You ask if 137.4MHz could be a civilian air traffic control centre but it's outside the airband so I doubt it. Also, 13.354MHz is listed as Pacific and not New York in my information. Chris also offers a useful one-page A4 list of h.f. propagation predictions if any reader would care to send a pre-paid reply envelope direct to him. Thanks for the kind offer.

Follow-Ups

Last month I tied up the information that many of you had submitted on the Russian Knights display team. **Peter Cardwell** (2 Hayfield Place, Frechville, Sheffield, S. Yorkshire S12 4XH) is obviously keen on this team and sent some neatly produced computer-generated pictures of an Su-27 Fulcrum as flown by the Knights. Now, can anyone provide (sell?) Peter with a genuine Russian Knights cloth badge (as intended to adorn flying suits)? These were available but are now scarce due to their obvious collectable value. Please write direct to Peter if you can help.

December's mention of Shoreham, home of the Popular Flying Association, brought back memories for **Denis Bosher** (Gwynedd) who had his first flight from there. That this was in an Avro 504K, was won in a raffle at the local cinema, and that cinema tickets cost 4d at that time, will unfortunately give away Denis' age!

Propagation and Modulation

Despite his claim to be one of the older readers, **Des Reed** (Malton) sounds young at heart. His cycling activities even took him on a visit to the Yorkshire Gliding Club at Sutton Bank. Des raises some interesting technicalities from a general radio point of view.

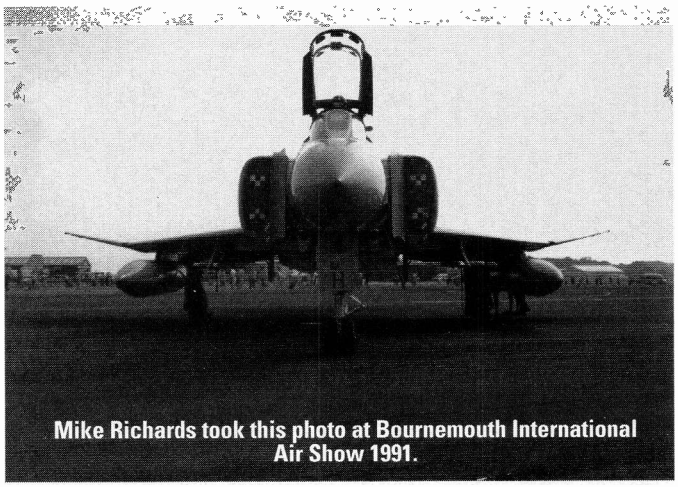
First, what can make v.h.f. signals propagate over unusually great ranges at certain times? Is it fog? Well, the fog could be a pointer to enhanced propagation but isn't the cause of it. Sometimes fog forms when the air close to the ground is cooler than air slightly higher up - this condition is known as a temperature inversion. The two air layers have a different refractive index, and bend any radio waves that try to pass across the boundary between them. This causes the waves to be bent back towards the ground so they can be received again - instead of just heading off into space at a tangent to the earth's surface.

What's with all this refractive index? This complicated physics is enough to put you off reading 'Airband!' An everyday example is the appearance of a twig sticking out of clear water at an angle. It gives the illusion of being bent where it surfaces. The light waves change speed when they hit the water, and the resulting distortion of the image gives rise to the illusion. Likewise, the path taken by radio waves at an inversion gets distorted - bent - when the waves hit the warmer air and consequently change speed slightly. Remember, the speed of light (physical constant) that you learn in school only applies in a vacuum. The speed in air, water, or solids (like glass) is slightly different in each case. Radio waves and light both travel at the same speed in a vacuum, hence the comparison. They are also subject to similar behaviour, since both are examples of electromagnetic radiation but on different frequencies.

In summary: certain weather conditions can alter the path taken by v.h.f. radio waves and thereby enable the transmission to be received over unusually great distances. Sometimes, the weather conditions that cause this are also conducive to fog formation.

Now to Des' next point, "s.s.b. is a.m., isn't it?" Yes. No. Actually, it's not that simple. The presence of a plain radio wave can be detected but, other than that, conveys no useful information. The next stage is to turn the signal on and off according to some pre-agreed cipher. It's like at a seance: "Knock once for no, twice for yes." Apparently, this is necessary as ghosts can't speak. Even better, a more complex code could convey even more information; this is not original, Samuel Morse has already thought of it.

But we still aren't conveying speech - just a code consisting of turning a plain radio wave on and off at the right time. To add audible sound requires a little more effort. Amplitude modulation takes a radio wave and changes its strength in sympathy with the audible tones. Let's consider a 1MHz radio signal conveying just a 1kHz tone: the tone will have gone through one cycle in the same time as the radio wave emits 1000 cycles. In fact the tone is used to vary the strength of those 1000 cycles of radio wave; each adjacent cycle is a little stronger or weaker than the one before, and when they're all strung together the information conveyed by this variation actually represents one cycle of the audible tone. Complex audio - like speech - works in the same way but the variations in amplitude between



Mike Richards took this photo at Bournemouth International Air Show 1991.

➡ 53

scanning

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

The subject of scanning and crime is almost becoming a regular feature in this column, my thanks to all the readers who have written in with suggestions, comments and newspaper cuttings all of which were gratefully received. The most amusing one must be a report which appeared in one of the national newspapers regarding an incident which occurred in Holland. It would seem that the Dutch police arrested 150 people who arrived at a specific location after hearing reports of a u.f.o. landing being passed over police radio channels. It is not clear if this was as a result of a hoax call, or had been deliberately set up but it still had the same end result, so don't believe everything you hear.

Judging by the various trade magazine and local newspaper articles stories you have sent, it would seem that the Home Office has now decided to introduce scrambled radio systems on a national basis over the next three years. As I anticipated, the more specialised departments will be issued with digitally encripted equipment such as Racal Cougarnet, 10 channel v.h.f. radios which are similar to those already used by the military. All other departments are likely to use less sophisticated analogue scrambling, using some form of 'rolling code'. The most likely option being considered at the moment seems to be the replacement of external speaker-microphones with new units incorporating scrambling circuits. By doing this the cost of implementation can be kept to a minimum whilst existing equipment only has to be modified as and when required. Alongside this development it is likely that the Metropolitan Police will change over to a u.h.f. personal radio system during the next few years, in line with the majority of other forces. Some form of trunked system may also be employed in order to make the most efficient use of the limited number of radio channels available for such a scheme.

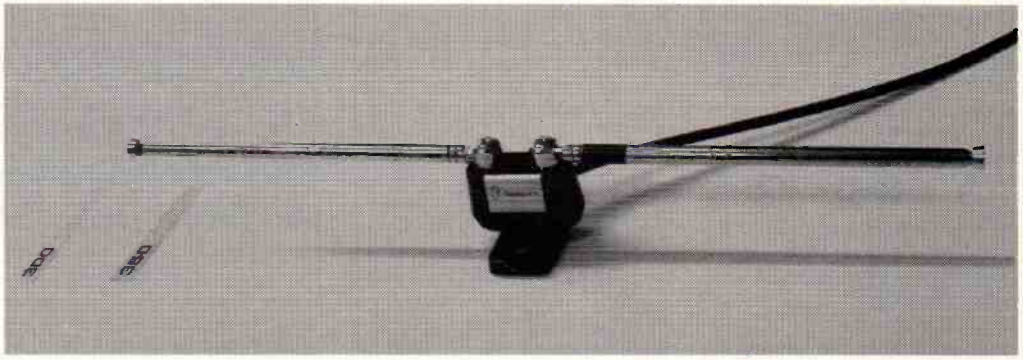
Although some readers may be surprised, I must say that I am relieved that this course of action has been adopted instead of the rather unrealistic alternative of trying to ban the sale and use of scanners. Once all the Police forces have become encripted and the present analogue cellular telephone system is slowly replaced by the digital GSM system, we may see fewer of the 'man caught listening with scanner' headlines that seem to be appearing with increasing regularity. Perhaps it will also mean an end to the 'logging' of scanning receiver sales by certain retail outlets. I wonder how many stores actually comply with this anyway?

Blind Operation

Regular reader **Bill Wilson** of Aberdeen sent me a long letter packed with useful information. The first part will I hope be of use to Mr D Trusler who I mentioned in the October '91' column. Mr Trusler, who is blind, was wondering which scanners would be the most suitable for use by people with impaired vision. Bill has a friend who is blind and suggests that the most convenient models are the Realistic PRO30, 32, 37 series. Once these are programmed by a sighted person the keyboard can be locked leaving just the 'Scan', 'Manual', 'Volume' and 'Squelch' controls operable.

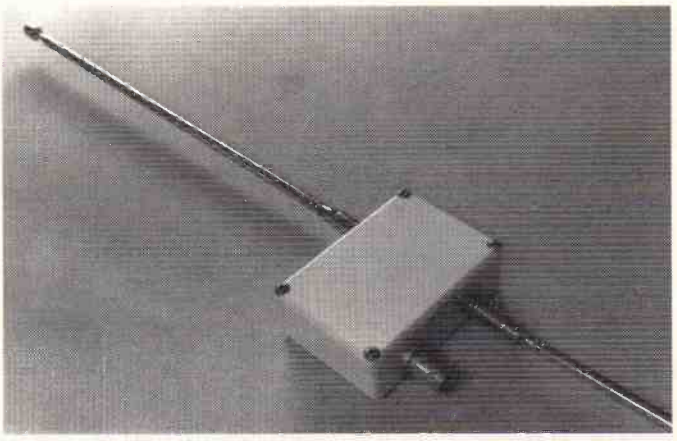
The main problem with nearly all digital radios is the display, as this is often used to provide information whilst operating the set. This is less of a problem with older models as each button on the keyboard usually has only one function, as opposed to many of the current models which combine second, and sometimes even third functions on one key.

One other scanner which may be worth considering is the Icom IC-R7000 - although this is quite expensive I consider that it would permit a blind operator control of all the main functions. The digital speech option overcomes the problem of the frequency display and as the majority of controls perform only a single function and are well spaced out it makes them suitable for tagging with Braille markers. I was able to program my R7000 to Search, Scan, determine the contents of memory channels and manually tune across frequencies with my eyes closed, simply by knowing the position of the various controls and making use of the speech synthesizer. The price may seem more attractive if you purchase one of the models modified to give hf coverage, as you would also have the advantage of short wave reception at little extra cost. The modified receiver operates in the same way as the standard model so you wouldn't have to learn how to use a new set of controls once you had mastered the basics. I would be interested to know which model you finally decide upon.



Simple Portable Antenna

Bill also included details of an simple portable antenna based on a unit he obtained at an Amateur radio convention. This was a brand new, surplus stock, 'Rabbit's Ear' antenna which had been originally designed for use with a domestic receiver. The unit consisted of two telescopic elements which were mounted on a plastics base so that they could swivel at almost any angle. This makes it ideal for use with a scanner as a vertically mounted dipole, each telescopic element being extended until it is a quarter wavelength long at the frequency of interest. The only modification Bill had to make to the unit was to replace the existing 300Ω ribbon cable with 50Ω coaxial cable. Some units may also contain a built in matching transformer, this should be removed and the braid of the coaxial cable connected directly to one of the elements and the inner to the other.



Bill goes on to say that if you can't track down one of the units he used you can make your own by mounting a couple of 'replacement' telescopic elements on a small plastics box. Most electronic component retailers sell suitable items but you should choose the type of telescopic element to suit the frequency range you are most interested in. For example if you wish to monitor the low vhf bands then it is important to obtain the longest possible element. If on the other hand you are more interested in the uhf bands then it is important to choose elements which can telescope down to as short a length as possible. To estimate the resonant frequency of a telescopic element in MHz, divide seventy five by the length in metres. For example if the element is 980mm long, 75 divided by 0.98 equals 76.5MHz. On the other hand when the element is telescoped down it may only be 275mm long, so 75 divided by 0.275 equals 272.7MHz. The longer the element is the lower the resonant frequency and the shorter it is the higher the frequency. By now you may have realised that the best choice is a long element made up from as many short telescopic sections as possible in order to give the greatest frequency range.

He also suggests that you could convert such an antenna into an active device by building a small pre-amplifier into the plastics box forming the base. However care should be taken if you intend to use such a unit with any of the current generation of wide frequency coverage handheld scanners, as this will almost certainly result in overloading on strong signals.

My thanks to Bill for passing on this information which I am sure many of you will use as the basis for further experimentation. I know from the letters I receive that many readers have been surprised at the difference to reception even a simple external antenna makes so why not give this one a try.

Continued over

Portable Scanning

Bill's letter reminded me of the small 'kit' of scanning accessories I carry around with me in my car. I first had the idea when I was working away from home for a few weeks. Scanner reception in my hotel room was not very good, so I decided to try and improve things by connecting an external antenna. The easiest option seemed to be resting an antenna against the window. This made a big improvement but the antenna seemed to develop a regular habit of falling over and the scanner's internal batteries always seemed to go flat just a few seconds after first switching on. I then hit upon the idea of using a small attache case to carry all the useful accessories around with me. I found a suitably sized (and priced) case whilst looking around a branch of 'Rymans' office supplies. The next step was to cut down a sheet of aluminium so that it would fit inside the case lid. This forms a ground plane for the portable antenna which attaches to a mount fixed through the centre of the lid. I connected a few metres of coaxial cable to the mount on the inside of the case, which also provides storage for the antenna and spare car gutter mount, cigar lighter plug, d.c. and r.f. leads and adaptors, small 12V - mains power supply, preamplifier, earphones, note pad, pen, spare batteries and torch. The last two items being particularly important if the mains fails.

One additional item which I find to be of great use is a small 'pocket memo' type tape recorder. These are now becoming very cheap and provide a means of quickly 'noting down' information such as frequencies and callsigns whilst mobile. The more sophisticated models have dual tape speeds and voice operated recording or 'vox' which allows you to automatically record activity on your scanner without wasting tape. Although I have listed the items which I carry around you may well be able to think of other accessories which would come in handy - why not drop me a line and share your idea.

Emergency Callout

Danny Ferris writes from Cumbria asking me about the pagers used by Lifeboat crews. His brother is a crew member and Danny was wondering what frequency the pager was likely to use. After some research I have found that it would seem that the both the RNLI and Coastguard use a variety of different paging systems depending on local requirements. For example where paging is only likely to be used locally or within a well defined area such as in a small town for crew callouts, the paging signal may sent as a series of sequential tones and voice on v.h.f. marine channel 00 (156.00MHz). This is used exclusively by the RNLI and Coastguard and has the advantage of being able to be directly monitored on a marine radio. However if paging is required over a larger area it is normal to use the BT national paging system. This operates in the band 153-153.5MHz and uses entirely digital codes to activate individual pagers and send textual information which can be displayed on the pager if it is equipped with a l.c.d. screen. As far as I am aware no voice paging is used in this band making it rather uninteresting to monitor.

Digital Communications

Radiopaging was perhaps one of the first commercial uses of digital radio transmission. I suspect that one of the major changes we will see during 1992 is the shift away from voice traffic to digitally transmitted textual information. One new service utilising modern digital transmission techniques is called 'COGNETO'. Users of the system can send and receive typed messages by means of what looks like a cross between an electronic personal organiser and a display pager. The unit is self contained, unlike other rival systems which usually need to be connected to a cellular phone and modem. The system is currently being targeted at professional people such as sales staff, who mainly work away from their office. Advertisements describe it as being the equivalent of a mobile electronic mail terminal. The main advantage is that the portable units can receive and send information to and from each other as well as the head office, even if the user has left the terminal unattended.

The new system uses frequencies in the lower sub-band of the old TV Band III allocation, which is now becoming increasingly full of various digital data signals and trunked base stations. This seems to be fairly typical of the way most commercial Private Mobile Radio systems are now operating. Many companies who previously operated their own base stations are now changing over to new systems which are operated and maintained by the equipment suppliers. The economics make it more attractive to do this, and as the channels are shared between users, it also permits much more effective use of the limited radio spectrum.

I believe that we will see greater expansion of digital data rather than analog voice transmissions during the next few years. It well may be that future scanning enthusiasts will place more emphasis on monitoring signals with home computers rather than actually listening - So watch this space!.

Until next month - Good Listening.

Airband

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adjacent radio wave cycles follow a far more complicated pattern.

Now to the clever part. When the 1MHz transmission, modulated by a 1kHz pure tone, is picked up on a radio set, the resulting signal gives the impression of consisting of three discernible parts. The 1MHz wave is there all right. But, 1kHz higher in frequency, at 1.001MHz to be precise, is another weaker signal. And 1kHz below the main 1MHz carrier, at 0.999MHz, lies another such weak signal. When speech is transmitted, a whole range of such frequency mixtures appears just above and just below the central 1MHz signal but the spread to each side isn't very great - perhaps a few kHz at the most.

Where's the useful information? In the weak parts to each side of the central 1MHz carrier! And what's more, the information is in duplicate - one part above and another below the carrier. That's a.m. Now if we just transmit one of these spread-out information components and forget about the other duplicated part and the carrier, we are actually transmitting all the useful speech information but with no waste! The speech part is called a sideband and, because a.m. has both sidebands present, s.s.b. is indeed a close relative of old-fashioned inefficient a.m.

In practice, though, you need a receiver specifically capable of resolving s.s.b. On an ordinary a.m. receiver the s.s.b. sounds like someone talking with a mouthful of rags whilst being half-strangled. The specialist s.s.b. receiver actually makes its own carrier wave (which remains inside the set, it's not transmitted) which it adds to the incoming s.s.b. in order to produce an intelligible product. With careful tuning even a simple b.f.o. as used to receive Morse can make s.s.b. intelligible again, but there are more sophisticated ways too.

In summary: s.s.b. is a development of a.m. but, to make sense of it, you need a receiver specially designed for the job.

Frequency and Operational News

GASIL 11/91 from the CAA introduces Beverley (Linley Hill), a new, licensed, aerodrome with air/ground on 123.5MHz as "Linley Radio." At Blackpool, 135.95 has been replaced by 118.4 and at Norwich 118.9 by 124.25MHz.

The next three deadlines (for topical information) are February 7, March 6 & April 10. All correspondence to 'Airband,' c/o The Godfrey Manning Aircraft Museum, 63 The Drive, Edgware, Middlesex HA8 8PS.

Abbreviations

a.m.	amplitude modulation
ATZ	Aerodrome Traffic Zone
b.f.o.	beat frequency oscillator
CAA	Civil Aviation Authority
ft	feet
GASIL	General Aviation Safety Information Leaflet
h.f.	high frequency
kHz	kilohertz
kt	knots
MHz	megahertz
NOTAM	NOTice to AirMen
s.s.b.	single sideband
Su	Sukhoi
v.h.f.	very high frequency

info in orbit

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

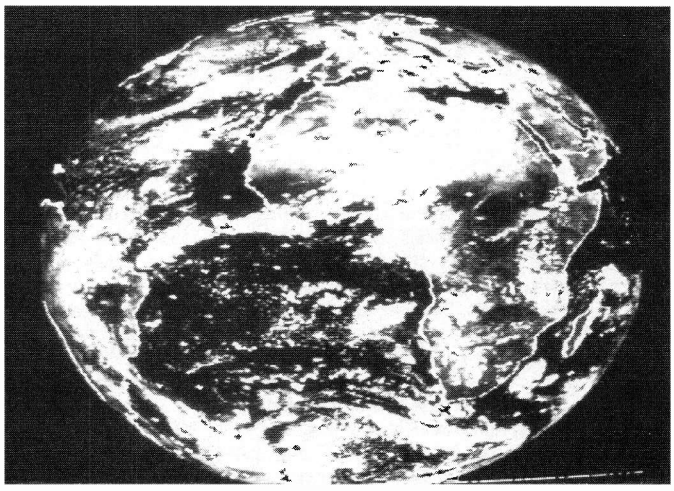

Fig. 1: METEOSAT whole disk format from Peter Cotton

The dark days from November to January result in the visible pictures from NOAA 11 that are received during the afternoon, having very low contrast. As the satellite travels northwards, the visible picture gets darker and then changes over to the infra-red format. This can be heard by listening to the change in the signal, even without seeing the picture. By the time that NOAA 9 passes the UK a couple of hours later, the visible picture is blank (dark). In case anyone wonders why this visible picture doesn't seem to change over to infra-red, it is worth remembering that the craft is not operating as a normal WXSAT but has been officially designated as 'experimental'. A check on NOAA 9 transmissions during the early morning shows that it does switch to infra-red at this time.

NOAA Infra-red

These NOAA WXSATS have five channels operating in different parts of the spectrum. Channel 1 senses visible light, channel 2 is also in the visible but nearer the i.r. end. Channels 3, 4 and 5 all operate in different sections of the i.r. and all five channels can resolve detail down to 1.1km. The VHF transmissions that we are receiving at 137.50 and 137.62MHz, although originating from the high resolution radiometers, have been degraded to allow their transmission at these relatively low frequencies. The original data is of course also transmitted but at about 1700MHz. So in sunlight the NOAAs normally transmit the visible channel, followed (after the usual synchronisation signals) by channel B, which can be selected from any of the remaining four. During the night-time part of their orbits, two i.r. channels will be transmitted.

The METEORS

A study of METEOR 2 satellite orbits shows that they slip forwards about 20 minutes per day. Their orbital planes are always changing and so as METEOR 2-20 approached the morning terminator during mid-November, predictably it was commanded off and METEOR 2-19 came back on to replace it. That has been travelling north-bound during the day and so a close look at the transmitted picture shows how the aperture indicator was opening wider every few seconds.

Finally when it has been fully open for a few seconds, the satellite switches off automatically as the dark north polar regions are approached. Conversely, METEOR 3-4 has been travelling southbound during the day in autumn and as soon as its visible transmissions start, the aperture indicator is at maximum and can be seen to gradually close as the ground illumination improves. The difference is of course that METEOR 3-4 also transmits an infra-red picture while it comes over the dark pole and so the switch-over can be watched (or heard) continuously.

Earlier in November METEOR 3-5 was operating normally, but as readers such as **Peter de Jong** of Leiden in Holland have commented, its picture quality deteriorated and the only question was at which point would the Russians switch satellites. METEOR 3-4 came on on November 25 showing a good quality visible picture, and while monitoring this at 1217UTC, up came METEOR 3-5 still operating (and on the same frequency) and so the pictures merged! METEOR 3-5 was switched off the next day.

FENGYUN?

Brian Dudman of Harrow is one of a number of readers reporting occasional signals (if not interference) on 137.80MHz. He comments that they sound like the NOAAs, which of course is exactly what the Chinese FENGYUN 1-2 satellite should sound like. I haven't yet heard a convincing signal myself but his report is most interesting.

OKEAN 3

No-one seems to have heard this Russian oceanographic satellite recently, which occasionally transmits short picture sequences on 137.40MHz. The winter months will almost certainly bring some radar images because the satellite carries radar and other scanners on-board to help with navigation for the ships near icebergs. The most likely times occur when OKEAN is passing over Norway and Sweden.

METEOSAT 2

On December 2 I had another search for signs of the expected Russian GOMS geostationary satellite and did find an unexpected tone just a few degrees west of METEOSAT 4. However, my suspicions that it was something else were confirmed by an administration message broadcast by METEOSAT 3 stating that METEOSAT 2 was being operated on December 2 for one last scan. Unfortunately I saw that message too late and so I missed the scan! Did anyone catch it?

METEOSAT 3

I have been monitoring this satellite every few days to see whether any tropical storms were visible. Its signal is very strong but it follows the American habit (e.g., GOES 2) of switching off on most occasions when there is no scheduled transmission. This means that locating it can be difficult without a broadcast schedule. I gave the address for obtaining this in last month's column, but for quick results remember that there is almost always a transmission sequence during the last 15 minutes of each hour.

METEOSAT 4

All seemed to be OK with this geostationary satellite, but a letter from Peter de Jong (mentioned previously) points out that there are steadily worsening corruptions of the pictures. I have noticed occasional degradation and Peter sent some pictures to illustrate the problems.

GOES 2

I have run my tracking program (InstantTrack) with the latest GOES Kepler elements and the following may help those who wish to pick up the transmissions. GOES 2 does not broadcast from a fixed position - it moves through several degrees each 24 hours. The period from 0430UTC until 1430UTC sees the satellite above 15° elevation, reaching a maximum of about 20° around 1100UTC. At other times it is much lower, reaching only 5° at about 2100UTC. When searching for it, its azimuth is several degrees south of west.

Beginners

A number of readers have requested information on taking the first steps to set up a station to receive weather satellite pictures. **M G Mee** of South Shields asks about obtaining information on Kepler elements, the radio frequencies used, and generally what the satellites do. **Piotr Herko** (my apologies if I have misspelt your name) writes from Poland asking for help to locate information on receiving RTTY, packet radio and satellite telemetry. He has a PC-XT computer and would like to contact other hobbyists. His address is: 05-090 Raszyn, Mlynarska 73, Poland. Piotr is looking for software for his XT, sources of Kepler elements and frequencies. The latter two are regular features in this column.

Let's have a look at the satellites themselves and the equipment that they carry, their orbits, transmissions and the various types of equipment that can be used to receive and decode this picture data. Associated equipment such as satellite tracking programs and, of course, sources of each product and the choices available - all will be covered during the next few months. In order to bring my own records as up-to-date as possible I have written to several suppliers during recent months. Three well-known names have not responded at all!

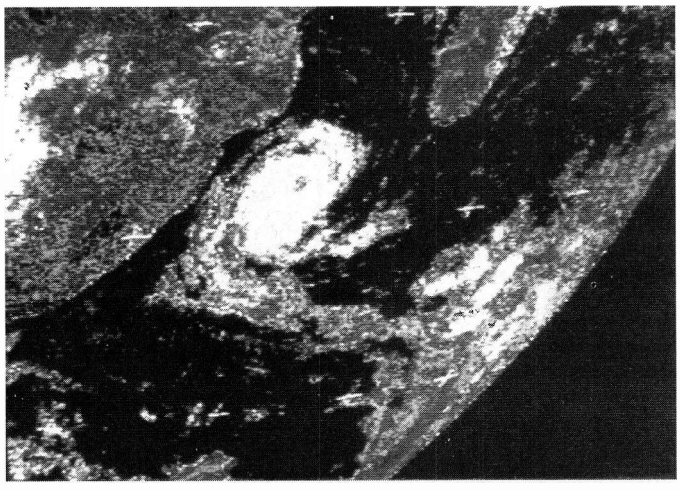

Fig. 2: METEOSAT showing cyclone near S Africa from Peter Cotton

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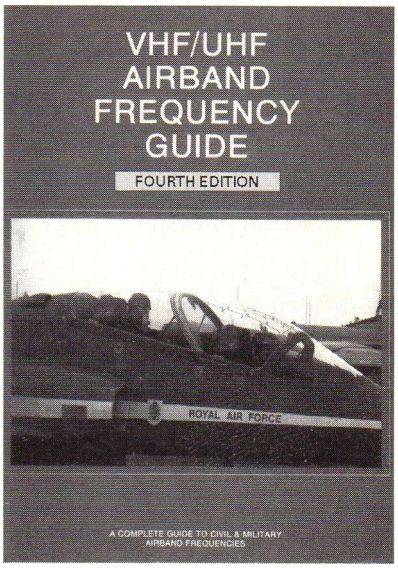

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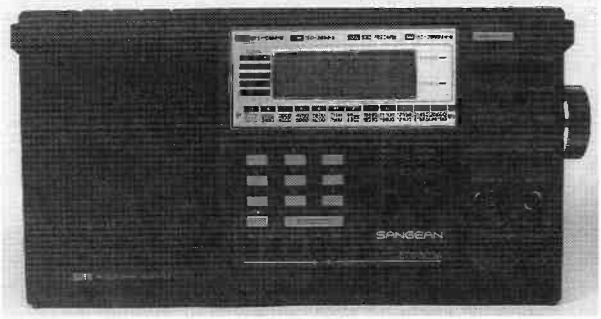

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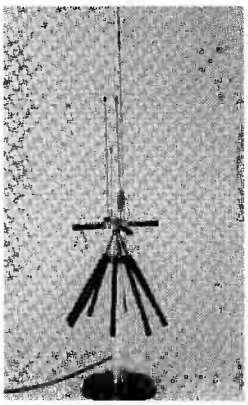

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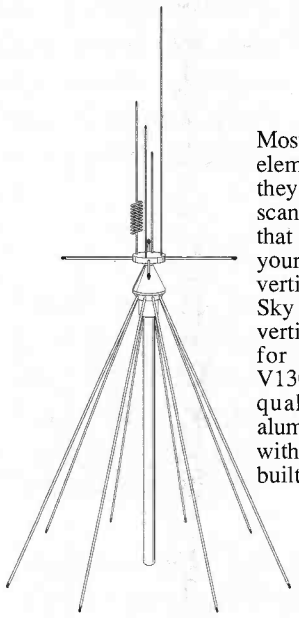

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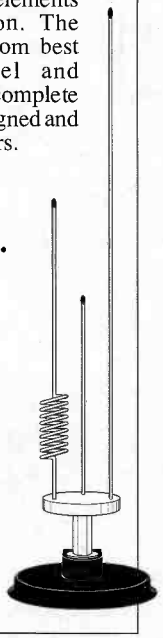

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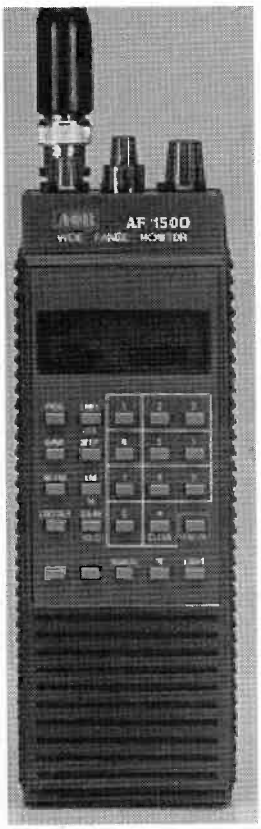

The AR1500 is a hand held wide band receiver featuring SSB as standard, many said it couldn't be done! Coverage is from 500kHz to 1300MHz with no gaps. Channel steps are programmable in multiples of 5kHz and 12.5kHz. Modes available are NFM, WFM, AM and SSB (USB, LSB and CW with the BFO switched on). Many features have been carried across from the popular and reliable AR2000 receiver but fitted into an even smaller cabinet, the AR1500 truly has to be seen to be believed. There are 1000 memory channels and the usual AOR collection of search, lockout, priority etc. Power is from an internally fitted NiCad pack or from an external 12V D.C. source, all accessories are provided to enable you to switch on and start listening. All this from a small cabinet of approximately 170mm (H), 55mm (W), 45mm (D) including projections except aerial. The weight is a mere 345g with NiCads fitted.

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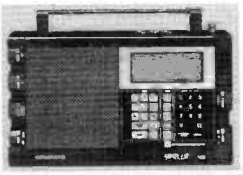

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VISA Access

The Beginnings

The very first satellite was of course the Russian Sputnik 1 and its launch started the space age on 4 October 1957. It weighed in at about 84kg being a sphere of 580mm diameter. Within three years (on 1 April 1960) the Americans launched TIROS 1 (Television and Infra-Red Observation Satellite) which was their first weather monitoring satellite. TIROS-1 was crude by today's standards, but later improvements led to the launch of ITOS (Improved TIROS Operational Satellite). The Automatic Picture Transmission service (APT) was under test in 1963 on TIROS-8, then on NIMBUS-1 in 1964, and continued on ESSA-2 in 1966.

The original Vidicon cameras were replaced by radiometers on NOAA-2 launched in 1972. The earlier ITOS satellites were in almost circular, sun-synchronous orbits some 1450km high. The first of the new series was called TIROS-N of which the first launch was in 1978 to an 850km high orbit. Data was now collected along a swath width of about 2700km and global coverage was achieved twice each day. These weather satellites carried new equipment and included the Advanced Very High Resolution Radiometer (AVHRR) instead of the VHRR used on previous craft. The AVHRR features 'in-house' (on-board) data processing. After scanning the earth below in five channels (instead of just three used as in the VHRR) the data are digitally processed with both on-board and external calibration targets to provide reference temperatures.

Other instrumentation measures the vertical profiles of atmospheric temperature and water vapour using the TIROS Operational Vertical Sounder (TOVS), which supplements the measurements made by balloons carrying radiosondes. The National Oceanic and Atmospheric Administration (NOAA) assumed the responsibilities for weather prediction and warnings, space environment monitoring (such as solar flares), and other projects. To perform these tasks two series of satellites are used, the polar orbiting ones just referred to, (currently NOAA 9, 10, 11 and 12) and a series of geostationary satellites, called GOES. The two groups are complementary, the first providing world-wide coverage over a large spectrum (visible and thermal imagery), and the geostationary group having the ability to continuously monitor storm areas, particularly near the tropics. As well as carrying American equipment, there are also contributions from Britain and France. The Stratospheric Sounding Unit is of UK origin, while France provides ground station facilities and more instrumentation.

Russian APT

Russia has also maintained a weather satellite programme for the same reasons as America. Their responsible organisation is (or was?) the USSR Research Centre for Earth Resources Exploration, which is under the State Committee for Hydrometeorology. Their data receiving and processing centres are based at Moscow, Novosibirsk, Khabarovsk and Tashkent, with over 80 simplified receiving stations elsewhere. Information on the Russian WXSAT scene in the early days was very difficult to obtain because of the intense secrecy in which the USSR kept its satellite programme.

From the start of the Gorbachev era, details have increasingly been made available to the west. My first enquiries were made in 1966 of the Russian Embassy and resulted in some rather dated booklets being sent to me, containing little real information. In contrast, my enquiry of the Russian Meteorology Service, made two years ago produced a most helpful booklet on their METEOR and OKEAN series, and from which some of this information has been extracted.

Their first experimental craft for collecting earth resources data was launched in July 1974, and the series became known as METEOR-PRIRODA and acquired multi-channel information. The first two were put into orbits of about 900km high and with inclinations of about 82°. This orbit is significantly different from the current NOAA orbits which are sun-synchronous. Some months ago I described both the METEOR 2 and 3 series of WXSATS, in which the series 2 currently includes METEORS 2-17 through 2-20. These have orbits of average height 950km compared to the METEOR 3 series, which includes 3-2 through 3-5, which are some 1200km high. The series 3 craft also continuously transmit, visible pictures in sunlight and infra-red during the night.

How Many?

So with different types of orbit being used for differing purposes, one can wonder how many satellites can be received, assuming that suitable equipment is to hand. We have seen that there are up to four NOAA WXSATS available. The Russian METEOR groups vary more frequently in their operations; the series 2 group currently has either METEORS 2-19 or 2-20 operating, both using 137.85MHz. The series 3 group currently has METEOR 3-4 transmitting on 137.30MHz following the picture fault mentioned earlier. So there are usually two Russian satellites available. Finally, for those able to receive s.h.f. transmissions using either a dish or Yagi and a down-convertor or direct s.h.f. receiver, there are two (or maybe even three) geostationary satellites available. METEOSATS 3 and 4 continue to provide regular transmissions and further westwards, GOES 2 can occasionally be heard near the horizon at about 250° azimuth which is just south of due west.

Letters

James Price of Merseyside recently bought a PC with an SVGA monitor and then bought PCGOES/WEFAX from Comar Electronics and PCSAT3 from Timestep Weather Systems! I thought that I was the only person with both systems fitted to the same computer (for review purposes!) A number of readers, including **Mark Phillips** of Slough have written asking for a list of recommended reading. If you send a large s.a.e. to 'Weatherwatch UK', RAE Lasham, Lasham Airfield, ALTON, Hampshire GU34 5SH, they may have copies of their publication about the Environmental Satellite Information Service. Mark already receives the television satellites including the news gathering units and is now investigating WXSATS.

Jim Boyle of Worcester has recently entered the WXSAT world and has been experimenting with his Kenwood R5000 receiver. Jim is receiving some 12 minutes of signal per pass and has been manually tracking the frequency change while the satellite passes over the UK. The Kenwood receiver, like other general purpose receivers can pick up many WXSATS as long as the antenna is reasonably high. Unlike other sources of v.h.f. transmissions the satellites can be heard over a wide area while the signal is above the horizon, but the movement ideally requires the use of a dedicated receiver.

Satellite APT Frequencies

NOAAS 9, 11 a.p.t. on 137.62MHz
NOAAS 10, 12 on 137.50MHz
METEOR 2-19 or 2-20 on 137.85MHz
METEOR 3-4 or 3-5 on 137.30MHz
OKEAN 3 on 137.40MHz occasionally
FENGYUN 1-2 was on 137.80MHz (keep watching)

Kepler Elements

I will send a print-out of the latest elements upon receiving an s.a.e. All known weather satellites are included, together with their transmission frequencies if operating.

The Book

I have been looking through my records of seasonal changes monitored by the WXSATS (for instance the ice melting seen along the south-eastern coast of Greenland during summer and winter), as part of a list of projects for schools. Many education establishments have satellite receiving equipment and my hope is that these various projects can be utilised as part of the general science curriculum. So far ten projects have been documented for geography classes.

Sorry!

I receive several phone calls as well as letters each month, and sometimes a caller makes an interesting point worth mentioning. I normally ask for permission to publish comments or queries and invariably callers are happy for me to do so. I have received my first ever letter of complaint, from a reader who believes that I did not ask permission. To him I extend my apologies. I remain happy to take callers - my current (un)employment situation makes it likely that I will be available!

Special Thanks

To **Brian Dudman** of Harrow who sent me an early Christmas present - a waterproof Maplin box for my METEOSAT down-converter which has been unprotected since my other box cracked!

Credits

Over the years I have collected information from sources such as NASA, USSR Hydrometeorology Committee, Weatherwatch-UK and radio and computer enthusiasts here in Britain. Some of the information published here is from those, and other sources to whom I extend my thanks.

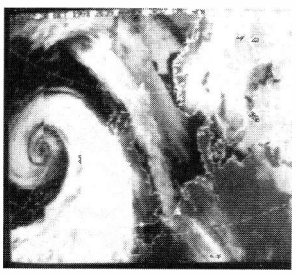


Fig. 3: METEOSAT AVHRR format from Peter de Jong

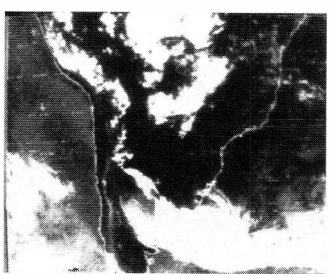


Fig. 4: METEOSAT 3 showing S America from Peter de Jong

decode

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

A Second Harmonic! It's a girl! Yes, Elaine gave birth to a bouncing 7lb 15oz daughter on Sunday December 8 at 0330UTC. It wasn't easy, but both are fine and doing extremely well. Our thanks go to everyone who has sent cards and good wishes.

Readers' Letters

A bumper postbag this month so I'll get straight into action.

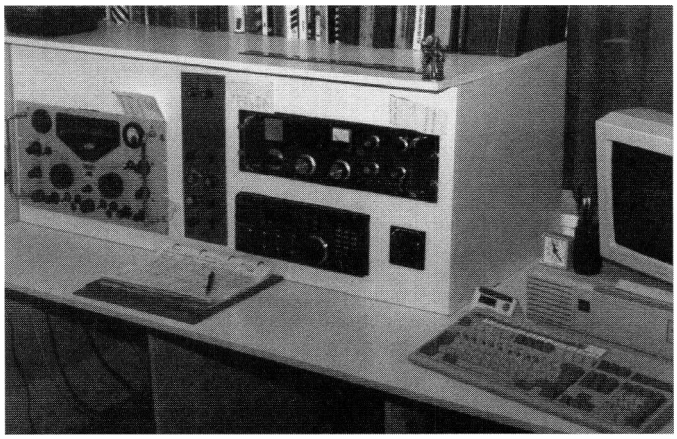
Tim Anderson of St Leonards write accusing me of keeping him up all night! Apparently, he recently bought a PK-232 for use on the amateur bands and, through my column, has discovered some of the other interesting transmissions the unit can receive. Tim's station comprises a Kenwood TS-850S transceiver feeding the PK-232 decoder. The decoder being controlled from his Amiga 500 computer running Amiga Pakratt software. The combination works well but he is having a problem when trying to send FAX files. All that happens is that the PK-232 sends sync pulses then closes down. If anyone has an answer to this please drop me a line and I will pass the details on to Tim. The antennas in use are a 5/8 vertical for 28MHz and a 20m centre fed dipole and a.t.u. for the other bands.

Tim also asks what are the narrow shift RTTY type signals that are so common on l.f. and v.l.f. frequencies? Well some of these are RTTY signals, examples being Warsaw meteo on 111.3kHz and Halifax on 122.5kHz. However, there are three German 300 baud systems that need a special decoder to resolve. These stations use the following frequencies: 110.6, 129.1 and 140.3kHz. The transmission system is known as F7B and uses a modified ITA-5 alphabet running at 300 baud. In addition to these there are a number a narrow shift FAX transmissions sending a mixture of meteo and press photos. Full details of these transmissions are to be found in the Klingenfuss *Guide To Utility Stations* reviewed elsewhere in this month's column.

Tim's next question concerns TDM signals and he asks why they spend so much time idling. Lets start with a brief explanation of TDM which stands for Time Division Multiplex. In simple terms all this means is that the time available for transmission is shared between more than one link. A crude example of this is system used by amateurs when more than two are conversing. What happens is that they arrange a order then take it in turns to speak. So the time is divided-up to cope with the number of people wishing to talk - i.e. time division. The multiplex bit just means more than one message share the same transmission path.

The TDM signals that Tim refers to are sophisticated ARQ TDM systems that support either two or four channels with overall data rates of up to 192 baud. So why are they left sending idles for so long? These systems are usually just a small part of a complex communication system which may involve both land lines and satellite systems. The radio link is often just used as a standby to take traffic when the rest of the system is busy. Another reason for leaving the systems idling is to monitor the quality of the links. When a message needs to be sent, it will then be routed to the system with the lowest error rate.

Thanks for all the questions Tim, which I hope I've answered successfully.



Day Watson's station. Receiver on the left is the Racal RA17 with the Eddystone EC958/S above the JRC NRD525 (centre).

Dave Woods is normally operating maritime mobile onboard the R/V *Western Artic* but managed to get home for Christmas. Dave asks if anyone has any experience of using PC-HF FAX on a laptop PC. If you can help drop me a line and I'll put you in contact with Dave.

Peter Hyde is a yachtsman from Taunton who has recently taken an interest in amateur radio. He would like to use his BBC B computer to receive NAVTEX transmissions but is having difficulty finding an economical solution. I'm not aware of any public domain software for this, but Grosvenor Software do a very good decoding package that should be suitable. The address is 2 Beacon Close, Seaford, East Sussex BN25 2JZ. Alternatively you can phone on (0323) 893378. If anyone does know of any public domain software for NAVTEX/FEC please let me know so I can pass the details to Peter.

Mark Phillips of Slough has been very busy building himself a FAX decoding system based around his BBC B computer. The problem is he need some details of how the charts are transmitted in order to finish the software. A detailed description of this can be found in the Klingenfuss *Guide To Facsimile Stations*, but I'll give a brief outline here.

There are two key parameters that define the way in which a FAX image is transmitted. These are the drum speed and index of co-operation. FAX images are usually generated by wrapping the picture around a drum which is subsequently rotated. The common speeds for this are 60 and 120 r.p.m., though many Russian stations use 90 r.p.m. Closely linked to this is an optical scanner that transverses the image at a constant rate. The index of co-operation defines the link between the drum speed and scanner speed. If a FAX is received with the wrong IOC, you'll find that the resultant image is either stretched or squashed. The key to recognising the correct IOC is in the start tone. An IOC of 288 is indicated by a 675Hz tone while 300Hz is used for an IOC of 576. At the other end of the transmission a standard stop tone of 450Hz is used for all IOCs.

If you'd like a more comprehensive tutorial on FAX or any other mode, please drop me a line.

Photo Call

This month's listener for this section is **Day Watson** of Clevedon. He's been a regular contributor to the column for some time now and has built-up a very comprehensive station. You can see from the photo, that the station is very neatly laid-out with a purpose built unit to house the receivers.and ancillary equipment The prime receiver is an NRD-525, but Day also has a Racal RA-17 and an Eddystone EC958/5. On the decoding front he uses the very versatile Hoka Code-3 package with his Tandon PCA/12SL, which has been enhanced to cover most of the complex modes. The Code-3 has been expanded to include most of the complex modes along with the oscilliscope and ASCII storage options. The latter option being particularly useful when monitoring stations that spend long periods of time sending idles.

On the antenna front Day has recently added a magnetic balun to his 53m long wire antenna. He reports that the improvement is well worth while giving a couple of extra S points in signal strength. Incidentally the Magnetic Longwire Balun was supplied by Lowe Electronics.

On the logging side, Day is currently experimenting with Dbase III to produce his own utility log. He has also devised a system of worksheets to help corelate the frequencies and operating times of stations. This system shows at a glance the active frequencies at any given time.

If you would like to be featured in the Photo Call section just send me a photgraph of your station with a description of the equipment and your main interests.

World Press Services Frequencies

I've just been sent a review copy of what looks to be a very interesting American publication. It's entitled *World Press Services Frequencies* and is imported by Axdon Books in Perth. Knowing that many reader find press transmission particularly interesting I thought I'd include a short review in the column. The book is presented as a 84 page A4 softback and uses a large type face. I'm sure this latter feature will prove very popular with those who frequently while away the small hours searching out those illusive transmissions. The first twenty or so pages are devoted to a tutorial and reference section. The newcomer will no doubt find this particularly useful as it covers some of the basics of data transmission.

Moving on to the main core of the book, the station lists are presented in three different formats. The first is a list of stations in chronological order. This is one of the most useful formats as it enables the operator to quickly find an active transmission at any time of day or night. Against each time is a list of all the active stations along with details of the frequency and language being used.

The second listing gives the stations in frequency order covering the spectrum from 2.2MHz through to 26.5MHz. Each entry shows the station name, callsign, mode and operating times.

The final list comprised a straightforward alphabetical country list. The obvious used of this was to check broadcasts from a particular area. As with the other lists, frequency, callsign and transmission times were given against each entry.

The abbreviations used in the book were all explained a the back together with some further reference material. There was even a listeners log in the final few pages, which I'm sure some readers will find useful.

My verdict - well one point that you ought to note is that both the alphabetic and chronological guides are straight copies of these sections in the Klingenfuss *Guide To Utility Stations 9th edition*. There is no credit to this

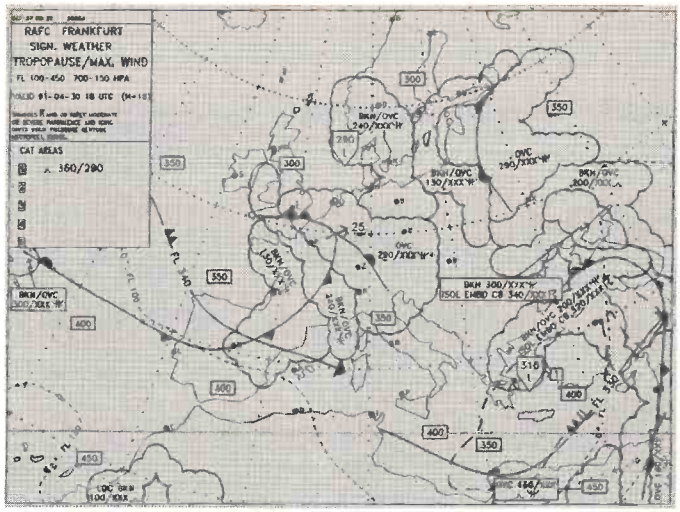
effect in the book, but I've checked that Joerg Klingenfuss has given his approval for the reprint. However, the book is still extremely useful. The main advantages come from having all he press information in one publication combined with the very clear typeface. The World Press Services Frequencies is well worth considering. My thanks to Bill Kay of Axdon Books for the review copy.

Weather Update

It seems that my reports on RTTY weather signals have been extremely popular. I've received lots of mail requesting copies of Bill Nicoll's decoding program for the BBC B computer. My reports prompted **Mark Phillips** of Slough to write with another BBC decoding program. This is much smaller than the previous one and should be easily adaptable to other implementations of the BASIC language. If you'd like a copy just send me an s.a.e.

Klingenfuss - New Releases

This month sees the publication of two new editions from this famous author. The first is the tenth edition of the *Guide To Utility Stations*. This book has become the standard reference for utility enthusiasts the world over and this new edition will doubtless be just as popular. The format of this latest version remains the same and the new typeface, that first appeared in the last edition, is used again here. The main reason for buying the new version is to keep up-to-date with the ever changing frequency spectrum. This, tenth, edition boasts some 903 additional frequencies, 138 extra callsigns and a total 9329 changes since the last edition.



FAX 1 weather chart from William Clark. IOC = 576; RPM = 120; Frequency 117.4kHz; Time 0848UTC; Date 30April 1991. The 'peppery' background is caused by the interfering signal usually found on Offenbach II.

Next for review comes the twelfth edition of the *Air and Meteo Code Manual*. Those who've been following my recent features on coded weather stations will already know how useful this book can be.

The first half of the book is dedicated to meteorological information and contains a wealth of useful explanations and charts. All the standard message codes are covered in detail, with full explanations on how the codes are constructed. The codes covered were: AIREP, ARFOR, BATHY, METAR, PILOT, ROFOR, SHIP/SYNOP, SPECI, TAF, TEMP, TESAC, TRACKOB, WINTEM, AFRED, GEOALERT, PRESTO, RECUR, TENCM, OFOFH and UMUFH. The final part of the meteo section comprises a listing of all the station index numbers. This is the number used at the start of every coded message to show where the observation was taken.

Air & Meteo

The second half of the manual is dedicated to information relevant to the aeronautical services. This begins with a useful explanation of the abbreviations and terms used in aeronautical communications. This was followed by a run-down on the AFTN and ATS message systems. As with the meteo information, a list of location codes is essential and the *Air and Meteo Code Manual* contained a comprehensive listing. Supplementing this were addressee designator aircraft type lists. This mine of useful information concentrated in one publication makes the *Air and Meteo Code Manual* essential reading. Both of these books are available from the *Short Wave Magazine* Book Service see pages 74 and 75. My thanks to Joerg Klingenfuss for the supply of the review copies.

QSL Addresses

For those of you who like to QSL with utility stations, I've gather together here a few that I've received over recent months.

Swiss PTT
Berne Telecommunications Headquaters
Mobile HF Radio Services
Laupenstrasse 18
CH-3030 Berne

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

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

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

Romaradio PT
Statione Ricevente
Via Della Cesarina 282
00139 Roma - Italy

Qatar Public Telecommunications Corporation
PO Box 217
Doha
Qatar

Frequency List

The list for this month column has been compiled primarily from logs supplied by Day Watson and Dave Woods. I've used my normal format of: frequency, mode, speed, shift, callsign, time and notes.

If you'd like a copy of my full frequency list just send three first or second class stamps to the address at the head of the column.

3.196MHz, RTTY, 50, -, -, 2300, Prague Met
3.333MHz, RTTY, 50, -, -, 0100, Moscow Met
3.55MHz, RTTY, 50, -, -, 0005, Ankara Met
4.232MHz, c.w., 15, -, FUF, 0430, French Navy
4.253MHz, c.w., 17, -, TAH, 2023, Istanbul Radio
4.7775MHz, FAX, 120, 576, IMB51, 0730, Rome Met
6.336MHz, RTTY, 75, -, GYA, 0245, Royal Navy
6.958MHz, RTTY, 50, -, -, 2115, China Met
6.972MHz, RTTY, 50, -, YOG59, 1930, ROMPRESS
7.52MHz, RTTY, 75, -, BZP57, 0035, Beijing Xinhua
8.02MHz, RTTY, 50, -, HMF85, 1845, Pyongyang - press
8.030MHz, RTTY, 50, 400, IRF50, 0808, ANSA Rome
8.049MHz, RTTY, 50, -, 9BC25, 1910, Tehran IRNA
8.437MHz, c.w., 21, -, -, 0513, Port Said Radio
8.5265MHz, RTTY, 50, 170, CTW8, 2000, Portuguese Coast station
9.075MHz, ARQ/E, 48, 875, RFFA, 2356, MoD Paris
9.2415MHz, FAX, 60, 352, LRO64, 2241, DyN Buenos Aires Press
10.258MHz, 50, 400, RDZ71, 1655, TASS Moscow
10.515MHz, 50, 160, -, 0101, Swiss Radio International
10.972MHz, RTTY, 75, -, -, 0100, Voice of America
11.638MHz, RTTY, 50, 400, DDK8, 0035, Hamburg Meteo
12.223MHz, RTTY, 75, -, -, 0350, Voice of America
12.315MHz, RTTY, 50, 400, -, 0830, TASS Moscow
12.682MHz, SITOR, 100, 170, LGB, 0503, Rogaland Radio
16.135MHz, FAX, 120, 576, KVM70, 1928, Honolulu Met
16.971MHz, FAX, 60, 576, JJC, 0715, Tokyo Radio Press
18.496MHz, RTTY, 50, 400, CNM80X11, 0849, MAP Rabat Arabic
18.552MHz, FEC, 164.5, 370, V5G, 1133, MFA Bucharest
20.607MHz, ARQ/SWE, 100, 400, SAM, 0814, MFA Stockholm
26.441MHz, FEC, 96, 400, DFZ64H2, 1225, PIAB Bonn

long medium & short

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

We'll start with the long wave reports.

Note: l.w. & m.w. frequencies in kHz; s.w. in MHz; Time in UTC (=GMT). Unless otherwise stated, all logs were compiled during the four week period ending November 23.

Once again the signals from Leningrad, USSR on 234kHz have been heard by **Eddie McKeown** in Co.Down. He heard the 1000kW broadcast for the first time in September. This time, their signal became audible at 0400UTC and was SINPO 21311. Also logged after midnight were Oslo, Norway on 216 (200kW) 34233 at 0227 and Minsk, USSR on 279 (500kW) 13211 at 0230.

A marked improvement in reception has been achieved by **Phil Townsend** (E.London) by using a home-built antenna tuning unit (a.t.u.) to tune his random wire antenna resonance, he logged 14 signals during daylight.

In Edinburgh, **Kenneth Buck** has been experimenting with a fully screened home-built loop plus screened source follower. Delighted with the performance he says, "I would never use an unscreened loop again". During daylight he heard 19 signals, but Lahti, Finland and Tipaza, Algeria were inaudible on 252kHz because the very strong signal from Atlantic 252 could not be completely nulled out.

Medium Wave Reports

Some m.w. broadcasts from Canada, the USA and the Caribbean area have been received in the UK. Those from CJYQ in St.John's, NF on 930kHz were the first to reach **Jim Willett** in Grimsby, rated SIO333 at 0010. Later, he heard the Caribbean Beacon, Anguilla on 1610, but reception was marred by interference from Vatican R, Italy on 1611. At best the signal was SIO222 at 0100. At 0150 the Atlantic Beacon, Turks and Caicos Islands was logged on 1570 as SIO222. Five broadcasts from Canada and the USA became audible after 0200, all SIO222.

Five signals from Canada and the USA were logged by **Simon Hamer** in New Radnor in a brief check at 0200. His list included WBAL, Baltimore on 1090 and CFGO, Ottawa on 1200, both run 50kW.

Sky wave signals from some N.African stations have also reached here after dark. Those from Algeria were Ain Beida 521 (600/300kW) heard at 2000 by **Cliff Stapleton** in Torquay; Les Trembles 549 (600kW) SIO333 at 1958 by **Ted Walden-Vincent** in Gt.Yarmouth; Algiers 891 (600/300kW) logged by **Sid Morris** in Rowley Regis; Algiers 981 (600/300kW) SID222 at dusk by **George Millmore** in Wootton. Also noted were Sidi Bennour, Morocco 540 (600kW); Tunis-Djedida, Tunisia on 630 (600kW) and 963 (200kW) by Darren Beasley in Bridgwater.

In Congleton, **Tim Bucknell** added several m.w. local radio stations to his growing list. He says, "I could hardly believe my ears when I logged ILR Devonaire, Radio Tay, Northsound, Invicta, County Sound and BBC Northampton for the first time!"

Short Wave Reports

Good reception has been noted in the h.f. bands, but from time to time solar activity, still at a high level, has disturbed the ionosphere. A slight reduction in co-channel interference has been noted since early November, when some broadcasters altered their schedules, but is still a serious problem.

Although conditions in the 25MHz (11m) band varies daily, the broadcasts usually reach their target areas well. Good reception of R.Australia's Darwin signals on 25.750 (Eng to Asia, M.East 0900-1100) has been noted here. A rating of 35444 at 1030 was quoted by **Don Philips** in Bridlington.

The band occupants include the Voice of the UAE in Abu Dhabi 25.690 (Ar to ? 0900-1100) 45343 at 0943 in Co.Down; R.Norway Int, Oslo 25.730 (Norw to Aust, NZ 0800-0830, 0900-0930; to S.Am 1100-1130; to S.Asia 1200-1230; to Europe, W.Africa 1300-1330; to M.East 1500-1530) 55544 at 1320 by **John Nash** in Brighton; R.Denmark via RNI 25.730 (Da to areas quoted for RNI, but 1/2hr later); DW via Julich 25.740 (Ger to SE.Asia 1100-1200; to E.Asia 1200-1355) SIO454 at 1130 by **Richard Radford-Reynolds** in Guildford; RFI via Issoudun 25.820 (Fr to E.Africa 0700-1550) SIO333 at 1000 by **Bill Clark** in Rotherham and 35323 at 1113 by **P.R.Guruprasad** in Madikwe, S.Africa; R.Nederlands 25.940 (Du to Asia? 1030-1125 Sun only), also 25.970 (Du to M.East, Africa? 1030-1125, Sun only) both SIO455 at 1100 in Edinburgh.

The 21MHz (13m) signals from R.Australia have also reached here. The Carnarvon transmission to Asia 21.775 (Eng 0100-1000) was 24532 at 0625 by **David Edwardson** in Wallsend; to S.Asia, M.East via Darwin 21.720 (Eng 1100-1430) SIO444 at 1215 by **Cyril Kellam** in Sheffield.

Many 13m broadcasts are beamed to Europe. Those noted came from R.Japan via Moyabi 21.640 (Eng, Jap 0700-0900) SIO444 at 0800 by **Bryan Kimber** in Hereford; R.Pakistan, Islamabad 21.520 (Eng 1100-1120) SID444 at 1100 in Edinburgh; UAE R.Dubai 21.605 (Ar, Eng 0615-1640, also to N.Africa) SIO444 at 1300 in Rotherham; R.Romania Int, Bucharest 21.665 (Eng 1300-1400) SIO222 at 1313 by **Julian Wood** in Elgin; WCSN, Maine 21.670 (Eng 1400-1600, also USA) 45554 at 1545 by **John Parry** in Northwich; RCI

Transatlantic DX Chart

Freq kHz	Station	Location	Time (UTC)	DXer
		USA		
880	WCBS	New York, NY	0250	B
1090	WBAL	Baltimore, MD	0210	A
1520	WWKB	Buffalo, NY	0215	B
		Canada		
580	CFRA	Ottawa, ON	0220	B
590	VOCM	St.John's, NF	0200	A,B
930	CJYQ	St.John's, NF	0010	A,B
1200	CFGO	Ottawa, ON	0205	A
1220	CKCW	Moncton, NB	0205	A,B
		C.America & Caribbean		
1570	Atlantic B'con	Turks & Calcos Is	0150	B
1610	Caribbean B'con	Anguilla	0100	B

DXers:
A: Simon Hamer, New Radnor.
B: Jim Willett, Grimsby.

Local Radio Chart

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

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

Listeners:-
A: Tim Bucknall, Congleton.
B: Tim Bucknall, Llandudno.
C: Francis Hearne, Bristol.
D: Sheila Hughes, Morden.
E: George Millmore, Wootton, IOW.
F: Sid Morris, Rowley Regis.
G: Hugh Quinn, Co.Kildare.
H: Phil Townsend, E.London.
I: John Wells, East Grinstead.

via Sackville 21.545 (Eng 1700-1730) SIO454 at 1717 in Guildford; WYFR, Florida 21.500 (Eng, Ger, Fr 1700-2000) 44344 at 1826 by Rhoderick Illman in Oman and 21.615 (Eng 1900-2000) 21122 at 1950 by **Chris Haigh** in Huddersfield; HCJB, Ecuador 21.455 (u.s.b. + p.c. 24hrs) 34333 at 1920 by Sheila Hughes in Morden.

Some to other areas were also logged: R.Prague, Czechoslovakia 21.705 (Eng, Cz to Asia, Pacific areas 0730-0830) 44344 at 0740 by **Chris Shorten** in Norwich; RFI via Issoudun 21.620 (Fr to E.Africa 0600-1800) 43333 at 1040 in Bridgwater; BBC via Ascension Island 21.660 (Eng to Africa 0900-2000?) 55344 at 1103 in S.Africa; SRI via Schwarzenburg 21.770 (Eng to Pacific areas, Asia 1100-1130) 55555 at 1108 in Co.Down; Vatican R, Italy 21.710 (Sp to the Americas 1200-1212) SIO444 at 1209 by **Philip Rambaut** in Macclesfield; R.Sweden via Horby 21.500 (Sw, Fr, Sp, Eng to USA 1430-1600) SIO433 at 1430 in E.London; BSKSA, Saudi Arabia 21.505 (Ar to N.Africa 1100-1700) SIO333 at 1618 in Gt.Yarmouth; VOA via Tangier 21.625 (Eng to Africa 1600-1800) 53544 at 1645 in Brighton; WCSN, Maine 21.640 (Eng to Africa 1600-2000) SIO433 at 1645 in Rowley Regis; R.Nederlands via Bonaire 21.685 (Eng to C.Africa 1830-1925) 24222 at 1835 by **Jim Cash** in Swanwick.

The 17MHz (16m) broadcasts to Pacific areas from R.New Zealand Int. via Rangataiki attract many listeners outside the target area. The 100kW signals on 17.770 (Eng 2200-0630) were SIO232 at 0000 in New Radnor, 43332 at 0448 in Oman and 34543 at 0625 in Wallsend. R.Australia's Darwin broadcasts to Asia 17.750 (Fr, Eng 0600-1000) have often reached here, 35443 at 0800 in Brighton.

In the morning R.Japan via Yamata 17.890 (Jap, Eng to Oceania 0600-0800) was logged as SIO433 at 0715 in Hereford; R.Prague, Czechoslovakia 17.840 (Eng to Asia, Pacific areas 0730-0800) SIO333 at 0745 by **Francis Hearne** in Bristol; R.Beijing, China 17.715 (Eng to S.Pacific 0900-1000) SIO444 at 0900 in Sheffield; R.Finland via Pori 17.800 (Eng, Fin to E.Asia, Pacific areas 0930-1100) 45333 at 0955 in Bridgwater; R.Pakistan, Islamabad 17.902 (Eng to E.Europe 1100-1120) 54444 at 1110 in Norwich; AIR via Delhi 17.387 (Eng, Ta to E.Asia 1100-1245) 45534 at 1120 by Sergi Olijnik in Kalush, Ukraine.

Later, R.Yugoslavia, Belgrade 17.740 (Eng to USA 1230-1300) was heard in Bridlington; R.Moscow, USSR 17.670 (Eng to Africa? 1400-1705) was 44444 at 1500 in Morden; HCJB, Ecuador 17.790 (Eng to Europe 1900-2000) 43133 at 1909 by **Chris Haigh** in Huddersfield; RCI via Sackville 17.820 (Eng to Africa 1900-1930) 34433 at 1910 by **Ron Damp** in Worthing and 45444 at 1928 in S.Africa; also 17.875 (Eng to

Medium Wave Chart

Freq	Station	Country	Power	Listener
520	Hof-Saale	Germany	0.2	B
531	Ain Beida	Algeria	600	P*,Q*
531	Leipzig	Germany	100	A*,B,J*,K
531	Oviedo	Spain	10	B*,K
531	Beromunster	Switzerland	500	A*,O*
540	BRT-2 Wavre	Belgium	150/50	A*,B,G,J*,K,L*,O*,P*,Q*
540	Ga-Rankuwa	S.Africa	50	O
540	Solt	Hungary	2000	K
540	Sidi Bennour	Morocco	600	A*
549	Les Trembles	Algeria	600	A*,P*,R*
549	OLF Bayreuth	Germany	200	A*,G*,J*,K,L*,O*,Q*
549	Nordkirchen	Germany	100	B
558	Espoo	Finland	100	J*
558	Valencia	Spain	20	A*,B*,J*
567	Berlin	Germany	100	J*
567	RTE-1 Tullamore	Ireland (S)	500	A*,B,C,K,L,P*,Q*,R*
576	Stuttgart	Germany	500	A*,J*,K,O*,P*
576	Radio Metro	S.Africa	100	D
585	Orf Wien	Austria	600	K
585	FIP Paris	France	8	K
585	RNE-1 Madrid	Spain	200	A*,B,J*,K,L*,O*,Q*
585	BBC Dumfries	UK	2	B,C
594	Frankfurt	Germany	1000/400	A*,B,J*,K,L*
594	Muge	Portugal	100	A*,K
594	Duba	Saudi Arabia	2000	Q*
603	Lyon	France	300	A*,G
603	BBC Newcastle	UK	2	B,J*,O
612	Kiel	Germany	10	K
612	RTE-2 Athlone	Ireland (S)	100	A*,B,C,K,L,P*
621	RTBF-1 Wavre	Belgium	80	A*,B,J*,L*,N,O*,Q*
621	Selebi-Phikwe	Botswana	50	D
621	Barcelona	Spain	10	A*
630	Vigra	Norway	100	A*,J*
630	Tunis-Djedeida	Tunisia	600	A*,B*
639	Praha	Czech	1500	A*,J*
639	La Coruna	Spain	100	A*,B*,G,J*,K
648	BBC Orfordness	UK	500	A*,B,J*,K,L,O
657	Burg	Germany	250	J*
657	RCE-2 Madrid	Spain	20	A*,J*,Q*
657	Sadiyat	UAE	50	H*
657	BBC Wrexham	UK	2	B,C,J*,L*,O
666	Bodenseesender	Germany	300/180	A*,B,J*,K,O*,Q*
666	R.Vilnius	USSR	500	J*
675	Marseille	France	600	K,L*,P*
675	Hilversum-3	Holland	120	B,C,J*,K,O*,Q*
684	RNE-1 Sevilla	Spain	250	A*,B*,G,J*,K,Q*
693	Berlin	Germany	250	J*
693	BBC Droitwich	UK	150	A*,B,L
702	Aachen/Flensb'g	Germany	5	J*
702	Ga-Rankuwa	S.Africa	100	D
711	Tallinn	Estonia	50	B
711	Rennes 1	France	300	A*,B,J*,K,Q*
720	Langenberg	Germany	200	K
720	BBC Lisnagarvey	Ireland (N)	10	B,O
720	Norte	Portugal	100	J*
720	BBC-R4 London	UK	0.5	A*,K
729	RTE-1 Cork	Ireland (S)	10	A*,J*,K,L*,P*
729	Oviedo	Spain	50	A*,B
738	Paris	France	4	J*,K
738	RNE-1 Barcelona	Spain	250	A*,J*,O*,Q*
738	Cheyiabinsk	USSR	50	B*
747	Hilversum-2	Holland	400	A*,B,J*,K,L,O*,P*,Q*
756	Brunswick	Germany	800/200	A*,B*,J*,K,O*,Q*
756	Bilbao	Spain	5	K
756	BBC-R4 Redruth	UK	2	K,O
765	Sottens	Switzerland	500	A*,B*,J*,K,O*
774	BBC Enniskillen	Ireland (N)	1	J*,O
774	S. Sebastian	Spain	60	A*,J*
783	Burg	Germany	1000	A*,J*
792	Limoges	France	300	A*,B,J*,K,Q*
792	Sevilla	Spain	20	A*
792	BBC R.Ulster	UK	1	B
801	M'chen-Ismaning	Germany	300	A*,B*,J*,Q*
810	AIR Delhi	India	100	H
810	SER Madrid	Spain	20	A*,J*
810	BBC Burghead	UK	100	A*,B
810	BBCWesterglen	UK	100	B,C,J,K,L,O,Q*
819	Bordeaux	France	20	A*,J*
828	Hanover	Germany	100/5	B
837	Nancy	France	200	J*,K,O*,P*,Q*
837	Sevilla	Spain	10	A*,B*
846	Rome	Italy	540	A*,K,L*,O*,P*,Q*
855	Berlin	Germany	100	O*
855	Murcia	Spain	125	A*,I*,J*,K,Q*
864	Paris	France	300	A*,J*,K,Q*
873	AFN/Frankfurt	Germany	150	A*,J*,L*,O*,P*,Q*
873	Enniskillen	UK	1	B,J*,O
882	BBC Penmon	UK	10	B
882	BBC Washford	UK	100	A*,J,K,L,O,Q*
891	Algiers	Algeria	600/300	A*,J*,L*
891	Hulsberg	Holland	20	J*,K,Q*
900	Milan	Italy	600	A*,J*,O*
909	BBC	UK	200	A*,B,L
918	Madrid	Spain	20	A*,J*
927	Wolvertem	Belgium	300	B,J*,K,L*,P*,Q*
936	Bremen	Germany	100	A*,J*,K,Q*
945	Toulouse	France	300	A*,J*,K,O*,Q*
945	Rostov-na-Donu	USSR	300	B*
954	Oobrochov	Czech	400	Q*
954	RCE Madrid	Spain	20	A*,J*,R*
963	Pori	Finland	600	A*,C,J*,K,M*,O*,Q*
963	Tir Chonaill	Ireland (S)	10	C
963	Tunis-Djedeida	Tunisia	200	A*
972	Gabarone	Botswana	50	D
972	Hamburg	Germany	300	A*,J*,K,L*,O*,P*,Q*
972	Nikolayev	USSR	500	B*
981	Alger	Algeria	600/300	A*,J*,K,Q*,R*
990	Berlin	Germany	300	A*,G,O*,P*
990	SER-R.Bilbao	Spain	10	A*,G,J*,Q*
990	BBC-Tywyn	UK	1	B,J*,O
999	Madrid	Spain	20	A*,J*,Q*,R*
1008	Flevo	Holland	400	A*,G*,J*,K,L*,Q*
1017	Rheinsender	Germany	600	A*,J*,K,O*,P*,Q*
1026	Graz-Dobl	Austria	100	J*
1035	Milan	Italy	50	P*
1035	Prog.3 Lisbon	Portugal	120	J*
1035	Tallinn	USSR	500	B*
1044	Dresden	Germany	250	G*,J*,K,O*,Q*
1053	BBC Droitwich	UK	150	B
1062	Kalundborg	Denmark	250	G*,J*,O*,Q*
1071	Brest	France	20	J*,K,O*
1071	Lille	France	40	J*
1080	Katowice	Poland	1500	B*,G*
1089	Weimar	Germany	20	J*
1089	BBC-R1	UK	150	A,O*
1098	Bratislava	Czech	750	G*,J*,K
1098	Ga-Rankuwa	S.Africa	100	D
1098	RNE-5	Spain	10	G*
1107	AFN via Munich	Germany	40	J*,R*
1107	Santander	Spain	10	J*
1107	BBC Wallasey	UK	0.5	B,C
1116	SER-Pontevedra	Spain	2	J*
1125	La Louviere	Belgium	20	J*,K
1125	RNE 5	Spain	10	J*
1125	BBC	UK	1	B,C
1134	Zadar	Yugoslavia	1200	J*,K,L*
1143	AFN via Stuttgart	Germany	10	B*,J*,L*,O*
1161	Strasbourg (F.Int)	France	200	J*,O*,P*
1170	Krasnodar	USSR	500	B*
1179	Santiago	Spain	10	J*
1179	Solvesborg	Sweden	600	B*,J*,K,L*,O*,P*,Q*
1188	Kuume	Belgium	5	J*,K
1197	VOA via Munich	Germany	300	L*
1197	BBC Enniskillen	Ireland (N)	1	J*,O
1197	BBC-R3	UK	0.5	K
1206	Bordeaux	France	100	J*,K
1215	BBC Droitwich	UK	30	L
1215	BBC Lisnagarvey	UK	10	O
1215	BBC-R3	UK	100	B
1224	Vidin	Bulgaria	500	J*
1224	Nasiriya	Iraq	300	B*
1233	Meinik	Czecho	400	J*,P*
1242	Marseille	France	150	J*
1251	Marcali	Hungary	500	P*
1251	Huisberg	Netherlands	10	J*,O*
1260	Valencia	Spain	20	G,K,P*,R*
1269	Neuminster	Germany	600	J*,K,L*,O*
1278	Strasbourg	France	300	K,Q*
1278	Dublin/Cork	Ireland (S)	10	C,J*,K,L*,P*,R*
1287	Litomysl/Liblice	Czech	300/200	J*,K,Q*
1296	San Sebastian	Spain	5	I*,P*
1296	BBC Orfordness	UK	500	J*
1305	Orense (RNE5)	Spain	5	J*
1314	Kvitsoy	Norway	1200	G*,J*,K,L*,O*,P*,Q*,R*
1323	BBC Zyyi	Cyprus	50	H*
1323	R.M'cow/Leipzig	Germany	150	B,J*,L*,O*,P*
1332	Rome	Italy	300	J*,Q*
1341	Lisnagarvey	Ireland (N)	100	B,C,K,L,O
1350	Nancy/Nice	France	100	E*,J*,K,L*,O*,P*,Q*
1359	Berlin	Germany	250/100	J*,L*
1368	Manx R., Foxdale	IOM	20	J*,O
1377	Lille	France	300	B,E*,J*,K,O*,P*,Q*
1386	Kaliningrad	Lithuania	500	B*,J*,Q*
1395	R.Tirana/Lushnje.	Albania	1000	G*,J*,K,N*,O*,Q*,R*
1404	Ajaccio	France	20	B
1404	Brest	France	20	K,O*,Q*
1413	BBC/Masirah Is.	Oman	1500	F*
1413	RCE Zaragoza	Spain	20	J*,K,O*
1422	Heusweiler	Germany	1200/600	J*,K,L*,O*,P*
1422	Riyadh	Saudi Arabia	20	H*
1431	Dresden	Germany	250	J*
1440	Marnach	Luxembourg	1200	C,K,L*,N*,O,P*,Q*
1467	TWR M Carlo	Monaco	1000/400	G*,J*,L*,O*
1476	Wien-Bisamberg	Austria	600	B*,K,L*
1494	Clermont-Ferrand	France	20	O*
1494	St.Petersburg	USSR	1000	J*,K,L*
1503	Stargard	Poland	300	E*,J*,K,N*
1512	BRT Wolvertem	Belgium	600	B,E*,G*,K,L*,N*,O*,Q*
1521	Kosice	Czech	600	P*
1530	Vatican R., Rome	Italy	150/450	K,P*,R*
1539	Mainflingen	Germany	700	J*,K,O*
1557	Nice	France	300	E*,O*
1557	DW via Cyclops	Malta	600	H*
1566	Nagpur	India	1000	F*
1566	Sarnen	Switzerland	300	J*,P*,Q*
1575	Burg	Germany	250	J*,O*
1575	Genoa	Italy	50	K,Q*
1584	Pamplona	Spain	2	I*,Q*
1593	Langenberg	Germany	400/800	B,E*,J*,K,L*,O*,Q*,R*

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

Listeners:-
(A) Darren Beasley, Bridgwater.
(B) Tim Bucknall, Congleton.
(C) Tim Bucknall, Llandudno.
(D) P.R.Guruprasad, Madikwe, S.Africa.
(E) Chris Haigh, Huddersfield.
(F) Simon Hamer, New Radnor.
(G) Sheila Hughes, Morden.
(H) Rhoderick Illman, Thumrait, Oman.
(I) Cyril Kellam, Sheffield.
(J) Eddie McKeown, Co.Down.
(K) George Millmore, Wootton I.O.W.
(L) Sid Morris, Rowley Regis.
(M) Roy Patrick, Derby.
(N) Don Phillips, Bridlington.
(O) Hugh Quinn, Co.Kildare
(P) Cliff Stapleton, Torquay.
(Q) Phil Townsend, E.London.
(R) Ted Walden-Vincent, Gt.Yarmouth.

long medium & short

Europe 2000-2150?) SIO455 at 2036 in Edinburgh; RHC Havana, Cuba 17.705 (Eng to Africa, M.East 1900-?) 43333 at 1944 in Swanwick; BBC via Ascension Is 21.880 (Eng to C.Africa 1900-2030) SIO444 at 2026 in Guildford; VOA via Greenville 17.640 (Fr to Africa 1830-2200) SIO444 at 2020 by **John Coulter** in Winchester; WSHB Cypress Creek 17.555 (Eng to N/C/S.America 2000-0000) 22112 at 2104 in Co.Down.

Potent 15MHz (19m) signals from R.Australia have been reaching the UK. The Shepparton broadcast to Pacific areas on 15.240 (Eng 2200-0930) was SIO544 at 0750 in Guildford. Unfortunately R.New Zealand's 100kW transmission on 15.120 (Eng to Pacific areas 1800-2200) is often marred by severe co-channel interference. At best, it was SIO333 at 1905 in Rotherham.

Some 19m broadcasts to Europe were noted: R.Japan via Moyabi 15.355 (Sw, It, Fr, Ger 0530-0700) 35553 at 0612 in Wallsend; VOA via Tangier 15.205 (Eng 1700-1900) 43443 at 1720 in Worthing; RNB Brasilia, Brazil 15.265 (Port, Eng, Ger 1630-2100) SIO333 at 1800 in Sheffield; WWCR Nashville 15.690 (Eng, Sp 1200-0000) 21122 at 1950 in Huddersfield; RCI via Sackville 15.325 (Eng 2000-2100) heard at 2000 in Bridlington; WYFR, Florida 15.566 (Eng 2000-?) SIO444 at 2045 in Edinburgh; WSHB Cypress Creek 15.665 (Eng 2000-2200, also to USA, Caribbean) 44444 at 2105 in Co.Down; SLBC Colombo, Sri Lanka 15.120 (Eng 2000?-2130) 45544 at 2110 in Brighton; R.Korea, Seoul 15.575 (Eng 2030-2130) 44344 at 2110 in Norwich; RAE, Argentina 15.345 (Sp 2300-0000, Sat/Sun) 35223 at 2300 in Bridgwater.

Also logged were RFO, Tahiti 15.170 (Fr, Tah to SE.Pacific 1600-0930) 23333 at 0820 by **Peter Perkins** in Hemel Hempstead; DW via Antigua 15.205 (Port to S.America 1000-1050) 44554 at 1000 in Northwich; R.Finland via Pori 15.400 (Eng to USA 1400-1455) 43333 at 1420 in Oman; RSA Johannesburg 15.160 (Eng to Africa 1600-1800) SIO433 at 1700 in Hereford; also 15.365 (Fr to W.Africa 1800-2000) 55444 at 1800 in Swanwick; Vatican R, Italy 15.090 (Eng to Africa 1730-1800) SIO544 at 1745 in Rowley Regis; VOA via Greenville 15.160 (Eng to Africa 2000-?) 44433 at 2000 by **Darran Taplin** in Brenchley; DW via Antigua 15.410 (Ger to C/S.America, Europe 2200-0000) SIO343 at 2220 in Torquay; TWR, Ned.Antilles 15.445 (Port to S.America) SIO333 at 2340 by Antonio De Abru-Teixeira in Evesham; HCJB, Ecuador 15.155 (Eng, Fr, Jap to USA 0000-0700) 34333 at 0030 in Morden.

Particularly good reception of R.Australia's 13MHz (22m) broadcasts was noted. Those to Pacific areas via Carnarvon on 13.755 (Eng 1500-2100?) were 44344 at 1725 in Hemel Hempstead and 44434 at 1727 in Oman; to Pacific areas via Shepparton 13.605 (Eng 1900-2130) SIO433 at 1935 by **Alf Gray** in Birmingham; to Asia via Carnarvon 13.705 (Eng, Th 2100-0000) 42443 at 2130 in Bridgwater.

Good reception was also noted from R.Austria Int. via Moosbrunn 13.730 (Ger, Sp, Eng, Fr to Europe 0400-1700) SIO444 at 1100 in Winchester and 13.730 (Ger, Eng, Fr, Sp to Africa 1800-2100) 55544 at 1845 in Worthing; DW via Julich 13.610 (Eng to Africa 1500-1550) SIO343 at 1540 in Rowley Regis; R.Pakistan, Islamabad 13.665

Long Wave Chart

Listeners:-
A: Kenneth Buck, Edinburgh.
B: Tim Bucknall, Congleton.
C: Sheila Hughes, Morden.
D: Eddie McKeown, Co.Down.
E: George Millmore, Wootton, IOW.
F: Sid Morris, Rowley Regis.
G: Fred Pallant, Storrington.
H: Don Phillips, Bridlington.
I: Phil Townsend, E.London.

Freq kHz	Station	Country	Power (kW)	Listener
153	Bechar	Algeria	1000	G*
153	Donebach	Germany	500	A,B,C,D,E,F*,G,I
153	Brasov	Romania	1200	A,B
162	Allouis	France	2000	A,B,C,D,E,F*,G,I
171	Kaliningrad	Lithuania	1000	A,B,C,D,E,F*,G,I
177	Oranienburg	Germany	750	A,B,C,D,E,F*,G,I
183	Saarlouis	Germany	2000	A,B,C,D,E,F,G,I
189	Motala	Sweden	300	A,B
198	BBC Droitwich	UK	500	B,C,D,E,F,H*,I
198	BBC Westerglen	UK	50	A,B
207	Munich	Germany	500	A,B,C,D,E,F*,G,I
216	Roumoules	Monaco	1400	A,B,C,D,E,F*,G,I
216	Oslo	Norway	200	A,B,C,D*
225	Konstantinow	Poland	2000	A,B,C,D*,F*,G,I
234	Junglinster	Luxembourg	2000	A,B,C,D,E,F,G,I
234	St.Petersburg	USSR	1000	A,D*
243	Kalundborg	Denmark	300	A,B,C,E,F*,G,I
252	Tipaza	Algeria	1500	C*
252	Atlantic 252	S.Ireland	500	A,C,D,E,F,G,I
261	Burg	Germany	200	E,I
261	Moscow	USSR	2000	A,C*,F*,G
270	Topolna	Czechoslovakia	1500	A,C*,D,E,F*,G,I
279	Minsk	USSR	500	A,C*,D*,E,G*

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

Tropical Bands

Freq MHz	Station	Country	UTC	DXer
2.310	A8C Alice Springs	Australia	2030	H
2.325	ABC Tennant Creek	Australia	2030	H
2.485	ABC Katherine	Australia	2030	H
2.560	Xinjiang	China	2335	E
3.215	R.Orange	S.Africa	2000	H,L
3.223	AIR Simla	India	1800	U
3.240	TWR	Swaziland	1815	O,R
3.260	P8S Guizhou Guiyang	China	1500	M
3.270	SWABC 1, Namibia	SW.Africa	1818	R
3.295	Reykjavik	Iceland	2000	H,O,P
3.315	AIR Bhopal	India	1540	M
3.325	FRCN Lagos	Nigeria	2128	E,O,Q
3.355	R.Botswana	Gabarone	1730	P
3.355	AIR Kurseong	India	1530	O
3.365	R.Rebelde, La Julia	Cuba	2008	G
3.365	AIR New Delhi	India	1540	O,P
3.365	GBC Radio 2	Ghana	2130	K,O,P,Q,R,U
3.370	R.Tezulutlan	Guatemala	0140	O
3.380	RRI Malang	Indonesia	2010	G
3.905	AIR Delhi	India	1553	E,O,P
3.915	BBC Kranji	Singapore	1600	J,O,P
3.930	R.Capital	Transkei	2015	U
3.950	P8S Qinghai Xining	China	2300	E,O,P
3.955	BBC Daventry	England	2000	B,I,K,P,Q,T
3.960	RFE/RL Munich	W.Germany	1930	B
3.965	RFI Paris	France	1930	B,I,K,T
3.980	R.Porvenir, Trujillo	Peru	2042	G
3.980	VOA Munich	W.Germany	1830	B,I,K,Q
3.985	R.Beijing, China	via SRI	2200	E,C,P
3.985	SRI Berne	Switzerland	1930	B,I,K,T
3.990	Vo Pujiang,Shanghai	China	1500	M
3.995	OW Cologne (Julich)	W.Germany	1930	B,G,K,Q,T
4.000	Bofoussam	Cameroon	0710	L
4.010	R.Frunze 1	USSR	0000	M
4.035	P8S Xizang Lhasa	Tibet	0005	U
4.040	R.Yerevan 1	USSR	2230	P
4.055	R.Moskva 1 (Kalinin)	USSR	1930	P
4.220	P8S Xinjiang	China	2300	P
4.330	P8S Xinjiang	China	0000	P
4.500	Xinjiang	China	1620	E
4.520	R.Moskva 2	USSR	1730	O
4.600	R.Baghdad	Iraq	1900	L,O
4.635	R.Dushanbe Tadzhik	USSR	0135	O
4.735	Xinjiang	China	2315	E,O
4.740	R.Afghanistan	via USSR	1800	O
4.750	R.Bertoura	Cameroon	2012	N,O,Q
4.755	R.Educ CP Grande	Brazil	0345	L
4.755	Sani Radio	Honduras	2340	U
4.760	Yunnan Kumming	China	2200	O,P
4.760	R.Moscow	USSR	2219	Q
4.765	Brazzaville	PR Congo	1900	I,K,L,N,O,Q,S
4.765	R.Moscow	via Cuba	0140	U
4.770	FRCN Kaduna	Nigeria	1910	C,E,I,K,L,N,O,P,Q,S
4.775	RRI Jakarta	Indonesia	1552	L
4.780	V.Carabobo	Venezuela	0320	U
4.785	R.Baku	USSR	2001	N
4.790	Azad Kashmir R.	Pakistan	0130	P
4.790	TWR Manzini	Swaziland	1800	O,P
4.795	R.Nueva America	Bolivia	0305	L
4.795	R.Douala	Cameroon	1810	L,O
4.795	R.Moscow (Kharkov)	USSR	2000	B,C,I,N,O
4.795	R.Ulan Ude	USSR	2046	G
4.800	P8S Xinjiang	China	2310	O
4.800	AIR Hyderabad	India	1715	J,L,O,Q
4.800	LNBS Lesotho	Maseru	2025	L,N
4.810	R.Yerevan 2	USSR	2112	E,I,L,N,O,P,Q
4.815	R.diff TV Burkina	O'gadougou	2128	N,O,U
4.820	E.Prov.Huila	Angola	2110	I
4.820	La Voz Evangelica	Honduras	0325	L
4.820	R.Moskva 4	USSR	2112	I,N,O,P,Q
4.825	R.Moscow	USSR	2112	G,N,P
4.830	Gaborone	Botswana	0845	F
4.830	R.Tachira	Venezuela	0320	L,O,P
4.835	R.Tezulutlan, Coban	Guatemala	0140	O

Freq MHz	Station	Country	UTC	DXer
4.835	RTM Bamako	Mali	2147	E,L,N,O
4.835	RTM Kuching	Sarawak	1450	M
4.840	Heilongjiang, Harbin	China	2144	N
4.840	AIR Bombay	India	1640	M
4.840	R.Andahuaylas	Peru	0228	L
4.845	RTM Kuala Lumpur	Malaysia	1430	M
4.845	ORTM Nouakchott	Mauritania	2012	E,N,O
4.850	R.Yaounde	Cameroon	2100	C,K,L,N,O,Q
4.850	AIR Kohima	India	2148	N
4.850	R.Tashkent 2	USSR	0125	O
4.850	R.Capital, Caracus	Venezuela	0235	U
4.855	RRI Palembang	Indonesia	1630	L
4.860	AIR New Delhi	India	1700	O,P
4.860	R.Moskva 2 (Chita)	USSR	1859	G
4.860	R.Moscow	USSR	1805	B,I
4.865	PBS Lanzhou	China	2240	E,O,Q
4.865	V of Cinaruco	Colombia	0215	L
4.870	R.Cotonou	Benin	2000	N,O,P,U
4.875	Super R.Roraima	Brazil	0200	O,L
4.875	R.Tbilisi	USSR	2100	O
4.880	AIR Lucknow	India	1500	M
4.885	R.Clube do Para	Brazil	0200	L,O
4.885	R.Beijing	China	1540	M
4.885	Voice of Kenya	Kenya	1824	E,J,N,O,R
4.890	RFI Paris	via Gabon	0425	O
4.890	ORTS Oakar	Senegal	2128	L,N,O
4.895	R.IPB AM C' Grande	Brazil	0010	D
4.895	Voz del Rio Arauca	Colombia	0210	L
4.895	R.Moscow (Kalinin)	Lithuania	1730	A,N
4.900	V. of the Strait 2	China	2212	L,P
4.900	V de la Rev.Conakry	Guinea	2210	U
4.905	R.Nat N'djamena	Chad	2015	A,N,O
4.910	R.Zambia, Lusaka	Zambia	1740	N
4.915	R.Anhanguera	Brazil	0020	D
4.915	PBS Guangxi	China	1500	M
4.915	R.Ghana, Accra	Ghana	2000	K,L,N,O,P,U
4.915	Voice of Kenya	Kenya	1738	N
4.915	R.Cora, Lima	Peru	0200	L
4.925	R.Nacional, Bata	Eq.Guinea	2100	M
4.930	R.Moscow	USSR	1705	A,N,P,Q
4.935	Voice of Kenya	Kenya	1825	K,N,R
4.940	R.Kiev 2	Ukraine	1705	A,G,I,K,N,O,Q
4.958	R.Baku	USSR	1720	A,L,O,P
4.960	AIR New Delhi	India	2229	D,O,Q
4.970	R.Rumbos, Caracas	Venezuela	0120	L,U
4.975	R.Uganda, Kampala	Uganda	1935	N,D
4.980	PBS Xinjiang	China	2300	O,P
4.980	Ecos del Torbes	Venezuela	2323	D,E,L,M,O
4.990	AIR via Madras	India	0000	O,P
4.990	FRCN Lagos	Nigeria	2118	A,I,N,U
4.990	R.Moscow (Yerevan)	USSR	1930	N,D
5.005	R.Nacional, Bata	Eq.Guinea	2001	A,N,O,P
5.005	R.Nepal, Kathmandu	Nepal	1700	L,M,O
5.010	R.Garoua	Cameroon	2150	L,N
5.010	SBC Singapore	Singapore	1350	M
5.025	R.Parakou	Benin	2010	I,L,M,N,O,P
5.025	R.Rebelde, Habana	Cuba	0030	D
5.030	R.Catolica, Quito	Ecuador	0034	D
5.035	R.Bangui	C.Africa	2030	N,U
5.035	R.Alma Ata	USSR	2003	I,L,O,P
5.040	Vos del Upano	Ecuador	0130	U
5.040	R.Tbilisi 1	USSR	1705	L,O,Q
5.045	R.Cultura do Para	Brazil	0038	D,O
5.047	R.Togo, Lome	Togo	2121	A,I,L,N,O
5.050	AIR Aizawal	India	2015	U
5.050	SBC Singapore	Singapore	1350	M
5.055	RFO Cayenne	Fr Guiana	0715	I,U
5.060	PBS Xinjiang	China	1630	O
5.075	Caracol Bogata	Colombia	0015	U
5.085	R.Pakistan, Karachi	Pakistan	0130	P
5.260	R.Alma Ata 2	USSR	2050	G,L,O,P,Q
5.290	R.Moskva 1Krasno'k.	USSR	1615	L
5.440	PBS Xinjiang	China	0000	P

DXers:-
(A) Darren Beasley, Bridgwater.
(B) Kenneth Buck, Edinburgh.
(C) Jim Cash, Swanwick.
(D) Antonio De Abreu-Teixeira, Evesham.
(E) David Edwardson, Wallsend.
(F) P.R. Guruprasad, Madikwe, S.Africa.
(G) Chris Haigh, Huddersfield.
(H) Simon Hamer, New Radnor.
(I) Sheila Hughes, Morden.
(J) Rhoderick Illman, Thumrait, Oman.
(K) Sid Morris, Rowley Regis.
(L) John Nash, Brighton.
(M) Sergei Olejnik, Ukraine.
(N) Fred Pallant, Storrington.
(O) Peter Perkins, Hemel Hempstead.
(P) Don Phillips, Bridlington.
(Q) Hugh Quinn, Co.Kildare.
(R) Philip Rambaut, Macclesfield.
(S) Darran Taplin, Brenchley.
(T) Phil Townsend, E.London.
(U) Jim Willett, Grimsby.

Jim Willett's shack in Grimsby.

(Eng to M.East 1600-1630) 53333 at 1615 in Norwich; KHBI Siapan, N.Mariana Is 13.625 (Eng to SE.Asia, India 1600-2000) SIO243 at 1721 in Guildford; ISBS Reykjavik, Iceland 13.855 (Ic to Europe 1856-1930) heard at 1900 in Bridlington; also 13.855 (Ic to USA 1935-2010) 35434 at 2010 in Kalush, Ukraine; WHRI Noblesville 13.760 (Eng to USA, Europe 1600-0000) 42144 at 2022 in Huddersfield; WCSN, Maine 13.770 (Eng to Europe, M.East, Africa 2000-0000) SIO555 at 2025 in Edinburgh; R.Nederlands via Flevo 13.700 (Eng to W.Africa 2030-2125) 44333 at 2030 in Morden; SRI via Sottens 13.635 (Eng to Africa 2100-2130) 34222 at 2116 in Co.Down; Voice of the UAE in Abu Dhabi 13.605 (Ar, Eng to N.Africa 2200-0000) SIO434 at 2215 in Torquay; RCI via Sackville 13.650 (Eng to Europe 2200-2300) 55555 at 2215 in Brighton.

R.Australia's 11MHz (25m) broadcasts have also been reaching the UK The Shepparton transmission to Asia 11.910 (Chin 1300-1530?) was SIO433 at 1400 in Hereford; to S.Asia via Carnarvon 12.000 (Eng 1430-2100) 43343 at 1602 in Bridgwater.

Many 25m broadcasts are meant for Europe. Those noted came from RTV Sfax, Tunisia 11.550 (Ar 0700-1800) SIO444 at 1125 in Winchester; RCI via Daventry 11.935 (Fr, Eng 1500-1530) SIO454 in Rowley Regis; RFI via Issoudun 11.670 (Fr 1800-2000) 42144 at 1848 in Huddersfield; AIR via Aligarh 11.620 (Hi, Eng 1845-2230) 55454 at 1850 in Worthing; R.Beijing, China 11.500 (Eng 2000-2200) 43233 at 2031 in Swanwick; R.Portugal, S.Gabriel 11.740 (Eng 2000-2030) SIO322 at 2010 in Birmingham; R.Damascus, Syria 12.085 (Eng 2005-2105) 55545 at 2013 in Norwich; R.Cairo, Egypt 12.050 (Ar 0700-0000, also to M.East, E.Africa) SIO455 at 2035 in Edinburgh; Voice of Israel, Jerusalem 11.585 (Eng 2000-2030, also to USA) 55544 at 2020 in Brenchley; R.Japan via Moyabi 11.735 (Eng 2300-0000) 33133 at 2323 in Co.Down.

During the day there are numerous broadcasts to other areas. Among those logged were RFO Papeete, Tahiti 11.827 (Fr, Tah to SE.Pacific 1600-0930) SIO232 at 0600 in New Radnor; VOA via Tinang 11.715 (Eng to E.Asia 1200-1330?) 22532 at 1310 in Brighton; Voice of the Mediterranean, Malta 11.925 (Eng, Ar to N.Africa 1400-1600) heard at 1400 in Bridlington; FEBC, Philippines 11.685 (Eng to SE.Asia 1430-?) 33433 at 1430 in Ukraine; DW via Kigali 11.965 (Eng to Africa, M.East 1500-1550) 54344 at 1510 in S.Africa; KSDA AWR Agat, Guam 11.980 (Chin, Jap, Eng to C/E.Asia 0900-1700) SIO222 at 1630 in Rotherham; RSA Johannesburg 11.880 (Eng to Africa 1600-1800) SIO433 at 1700 by **Fred Pallant** in Storrington and 33333 at 1710 in Oman; KHBI, N.Mariana Is 11.580 (Eng to NE.Asia, S.Asia, India, E.USSR 1600-1800) SIO333 at 1752 in Macclesfield; King of Hope, Lebanon 11.530 (Eng 2000-2200) heard by Roy Patrick in Derby; Voice of Indonesia, Jakarta 11.752 (Eng 2000-2100) 32232 at 2047 in Hemel Hempstead; R.Globo, Brazil 11.805 (Port to S.America 0900-0300) SIO142 at 2107 in Guildford; Voice of Israel, Jerusalem 11.605 (Eng to USA? 2230-2300) SIO434 at 2230 in Torquay; R.Dif.Nacional Bogata, Colombia 11.821 (Sp, Eng to S.America 0930-0500) SIO333 at 2310 in Evesham; R.Prague, Czechoslovakia 11.990 (Eng to USA 0000-0030) SIO444 at 0000 in Bristol.

Good 9MHz (31m) DX reception has been noted in the UK. The signals from R.New Zealand Int. to Pacific areas on 9.700 (Eng 0730-1210) have often reached here. A typical rating of SIO433 was noted in Hereford at 0930. Two of R.Australia's broadcasts have also been heard: 9.770 via Shepparton (Eng to Asia 1430-?) SIO333 at 1430 in New Radnor; 9.860 via Carnarvon (Eng to Asia 1430-2100) SIO353 at 1449 in Guildford and 34333 at 2040 in Hemel Hempstead.

Quite a few of the broadcasts to Europe were mentioned: DW via Antigua 9.690 (Ger 0800-1000, also to Aust, NZ) 32133 at 0900 in Huddersfield; R.Norway, Oslo 9.590 (Eng 1300-1330 Sat/Sun, also E.Africa) SIO544 at 1305 in Hereford; R.Polonia, Warsaw 9.640 (Eng 1600-1630) SIO332 at 1627 in Gt.Yarmouth; BBC via Skelton 9.410 (Eng 0915-2200) SIO344 at 1830 in Rowley Regis; R.Tirana via Lushnje 9.480 (Eng 1830-1900) 55555 at 1832 in Brighton; REE via Noblejas 9.875 (Eng 1900-2000) 42222 at 1950 in Swanwick; VOIRI, Iran 9.022 (Eng 2000-?) 44333 at 2000 in Co.Down; R.Pyongyang, Korea 9.345 (Eng 2000-2100, also to M.East, Africa) 34433 at 2035 in Wallsend; Voice of Vietnam, Hanoi 9.840 (Eng 2030-?) 44433 at 2045 in Brenchley; R.Kiev, Ukraine 9.865 (Eng 2100-2200) SIO433 at 2100 in Sheffield; R.Cairo, Egypt 9.900 (Eng 2115-2245) 32332 at 2130 in Bridlington; VOFC, Taiwan 9.852 (Eng 2200-2300) 43443 at 2200 in Morden; R.Sofia, Bulgaria 9.700 (Eng 2300-2330) SIO555 at 2300 in Edinburgh.

A few to other areas were also noted: BBC via Limassol 9.660 (Eng to M.East 0500-0730, 0900-1130; also 0730-0815 Sat/Sun) 42553 at 0750 in Northwich; SRI via Schwarzenburg 9.560 (Eng to Australia, Pacific areas 0830-0900) 54554 at 0855 in Bridgwater; DW via Kigali 9.735 (Eng to Africa, M.East 1500-1550) 43232 at 1500 in Oman; Voice of UAE in Abu Dhabi 9.600 (Eng, Ar to USA 2200-0200) SIO434 at 2230 in Torquay; R.Rumbos Caracas, Venezuela 9.660 (Sp 0855-0600) SIO333 at 2350 in Evesham; R.Yugoslavia, Belgrade 9.555 (Eng to USA 0230-0315) 54344 at 0230 in Norwich.

Amongst the 7MHz (41m) logs were RSA Johannesburg 7.270 (Eng to Africa 0400-0500) 43333 at 0405 in Norwich; WHRI Noblesville 7.315 (Eng to USA 0000-1100) 44444 at 0800 in Morden; KTBN Salt Lake City 7.510 (Eng to USA 0200-1600) at 0900 in Bridlington; WWCR Nashville 7.490 (Eng to USA 0730-1200) SIO333 at 0931 in Macclesfield; R.Australia via Brandon 7.240 (Eng to SE.Asia 1100-2100) SIO232 at 1430 in New Radnor; R.Beijing, China 7.420 (Russ to USSR 1800-2000) SIO434 at 1845 in Winchester; AIR via Aligarh 7.412 (Eng, Hi to Europe 1845-2045) 43454 at 1910 in Northwich; R.Korea, Seoul 7.550 (Kor, Ar, Eng to M.East, Africa 1700-2130) 42332 at 2030 in Bridgwater; Voice of the UAE in Abu Dhabi 7.215 (Eng to USA 2200-0000) SIO444 at 2315 in Rotherham.

Broadcasts in English to Europe were noted in the 6MHz (49m) band from R.Austria Int via Moosbrunn 6.155 (0830-0900) SIO444 in Bristol; R.Nederlands via Flevo 5.955 (1430-1525) SIO555 in Rowley Regis; R.Austria Int via Moosbrunn 5.945 (1830-1900) SIO333 in Birmingham; BRT via Wavre 5.910 (1900-1925) heard in Bridlington; R.Sweden via Karlsborg 6.065 (1930-2030) 54333 in Swanwick; R.Pyongyang, Korea 6.576 (2000-2050) 24322 in Co.Down; R.Prague, Czechoslovakia 5.930 (2100-2130) SIO333 in Elgin; R.Riga, Latvia 5.935 (2130-2135) 44444 in Morden; SRI via Schwarzenburg 6.190 (2230-2300) 54554 in Bridgwater.

Also logged were Xinjiang, China 5.800 (Uig to China 2300-0200) 34333 at 2320 in Derby; R.Santa Cruz, Bolivia 6.135 (Sp 0900-0100) SIO232 at 2350 in Evesham; R.Caracol, Bogota, Colombia 6.150 (Sp 24hrs) 35443 at 0315 in Brighton.

Station Addresses

BBC Radio Nottingham, York House, Mansfield Road, Nottingham NG1 3JB.
ILR Radio Wyvern (WYVN), 5-6 Barbourne Terrace, Worcester WR1 3JZ.
ABC, Box 9994, GPO 4001 Brisbane, Australia.
Radio Thailand, External Service, Government Public Relations Dept, Rajchadamnern Klang Rd, Phra Nakhon Region, Bangkok 10200, Thailand.
Radio CHAM, 151 York Blvd, Hamilton, Ontairo, LR8 1Y6, Canada.
Radio WEVD, 770 Broadway, New York, NY 10003, USA.

Equipment Used
Darren Beasley, Bridgwater: Philips D2935 + loop or a.t.u. + 10m wire.
Kenneth Buck, Edinburgh: Lowe HF-225 + loop or r.w. in loft.
Tim Bucknall, Congleton: Sony ICF-2001D + AN-1.
Jim Cash, Swanwick: Kenwood R5000 + trap dipole.
Bill Clark, Rotherham: Sony ICF-SW7600 + built-in whip or r.w.
John Coulter, Winchester: Yaesu FRG-7 + r.w.
Ron Damp, Worthing: Racal RA17 + 30m inverted V dipole.
Antonio De Abreu-Teixeira, Evesham: Sony ICF-2001D + 9.5m wire.
David Edwardson, Wallsend: Trio R600 + inverted V trap dipole.
Alf Gray, Birmingham: Codar CR70 + PR30 + a.t.u. + Ex-Army whip.
P.R.Guruprasad, Madikwe, S.Africa: Sony ICF-7600DA + built-in whip.
Chris Haigh, Huddersfield: Lowe HF-225 + Lowe W-225.
Simon Hamer, New Radnor: Sony ICF-2001D + a.t.u. + r.w. or loop.
Francis Hearne, Bristol: Sharp GFA3 cassette radio + r.w.
Sheila Hughes, Morden: Sony ICF-7600DS or Panasonic DR48 + 15m wire.
Rhoderick Illman, Thumrait, Oman: Sony ICF-7600DS + whip or 23m wire
Cyril Kellam, Sheffield: Sony ICF-7600DS + AN-1 or 25m wire.
Bryan Kimber, Hereford: Zenith R7000 or Realistic SX190 + 20m wire.
Eddie McKeown, Co.Down: Tatung TMR-7602.
George Millmore, Wootton, IOW: Tatung TMR-7602 or Racal RA17L + v.l.f. converter + loop.
Sid Morris, Rowley Regis: Kenwood R5000 + 31m wire.
John Nash, Brighton: Kenwood R5000 + Lowe Balun + r.w.
Sergei Olejnik, Kalush, Ukraine: Ishim-003 + 70m wire.
Fred Pallant, Storrington: Trio R2000 + r.w. in loft.
John Parry, Northwich: Realistic DX-400 + 33m wire
Roy Patrick, Derby: Lowe HF-125 + 44m wire.
Peter Perkins, Hemel Hempstead: Icom R72 + a.t.u. + 17m wire.
Don Phillips, Bridlington: Yaesu FRG-8800 + a.t.u. + 12m wire.
Hugh Quinn, Co.Kildare: Lowe HF-225 + FRT-7700 + 15m wire in loft.
Richard Radford-Reynolds, Guildford: Sangean ATS-803A + 6m wire.
Philip Rambaut, Macclesfield: Int.Marine Radio R-700M + r.w.
Chris Shorten, Norwich: Matsui MR-4099 + 10m wire.
Cliff Stapleton, Torquay: Trio R1000 + dipoles or 25m wire.
Darran Taplin, Brenchley: Yaesu FRG-7700 + FRA-7700 or FRT-7700 + Zepp.
Phil Townsend, London: Lowe SRX-30 + a.t.u. + r.w.
Ted Walden-Vincent, Gt.Yarmouth: Grundig Satellit 1400L + r.w.
John Wells, E.Grinstead: RCA AR88D + Loop.
Jim Willett, Grimsby: RCA AR77 + 4m loop or Trio 9R-59DS + a.t.u. + X dipole.
Julian Wood, Elgin: Kenwood R2000 + Yaesu FRT-7700 a.t.u. + 6m wire.

watching brief

Andy Emmerson G8PTH
71 Falcutt Way, Northampton NN2 8PH

In the last column we touched on the cheapest amateur television band, 10GHz. Of course, to achieve worthwhile results you do need to know what you are doing and a seasoned 10GHz operator Bob Platts G8OZP has provided a digest of ways of getting started.

More ATV on the Cheap

Bob estimates there are around a dozen active ATVers using 10GHz (or 3cm) equipment, with a lot of interest being shown by others. Equipment performance surprises most people: a reasonably simple transmitter/receiver combination into a medium sized dish (30in diameter) should give contacts of up to 50km over a line of sight path. A good system will work even better, say up to 100km with the same size of dish. Then again, a souped-up state-of-the-art system will achieve even more.

With all this we are assuming a low-power transmitter using a doppler radar module. With higher transmitter power or more antenna gain you could start to operate non line-of-sight paths, relying on scatter, though phasing could do funny things to your picture, due to multipath effects. Even the most basic system should achieve 4 to 5km contacts on a line-of-sight path.

Down to Basics

So what is this typical basic system? The transmitter can be a surplus Solfan or AEI gunn diode oscillator, the sort you can now buy at rallies for as little as £5. Alternatively you could build one yourself following the instructions in the RSGB *VHF/UHF Manual* or the Microwave Society's publication. Either way you should be able to produce 8 to 12mW at 10.250GHz (the TV simplex frequency). Surplus gunn diodes are often available from Birketts of Lincoln.

The Gunn oscillator needs a stable 6 to 9 volt supply with the video signal superimposed on it (about 100mV peak-to-peak for the Solfan). An excellent modulator circuit is described in the BATC's *ATV Compendium* and a printed circuit board is available from BATC members' services. Modulators designed for use in voice Gunn diode transmitters are not really suitable, suffering from lack of bandwidth and pre-emphasis.

On the receive side you can start off by using Gunn oscillators feeding an inline mixer. This is the same as used on 10GHz f.m. voice rigs and several designs are available (RSGB handbook again or Microwave Society). You can use an IF of around 39MHz and follow this with 40 to 60dB of i.f. amplification (which must be wideband). This is then fed into the BATC's design of f.m. demodulator (again, a p.c.b. is available). This produces video ready for connecting to a normal video monitor.

More advanced receivers use double conversion with a tunable first i.f. in Band IV/V and a TV tuner. Again the second i.f. is at 39MHz, feeding a BATC demodulator. The first mixer and local oscillators use dielectric resonant oscillators (DROs) for stability and low noise, feeding a balanced or very low noise mixer diode. You also need an input filter to reduce image noise. A modified Ku-band LNB could also be used (see state-of-the art system below).

An Advanced System

Let's turn now to a state-of-the-art system, bearing in mind of course that the state-of-the-art is changing constantly! The basic systems already described can be a lot of fun and provide an excellent grounding in the band and the ATV mode. But for the real addict, devices are now available to allow the design and construction of high-performance designs.

The transmitter starts off with a 94MHz crystal oscillator multiplied by bipolar devices to around 2GHz, then quadrupled by as GaAsf.e.t. amplifier to 9GHz. This is mixed in a GaAsf.e.t. mixer with a phase-locked source of 1.250GHz modulated with video. The resulting 10.250Hz is filtered and amplified by GaAsf.e.t.s to the required output level (half-watt devices are readily available on the amateur market in the USA).

This cheerful looking chap is DJ7JG as received in P4 colour near Margate, Kent. Ron G6GHP took the photo during a period of enhanced propagation - the hook-up was on the 24cm band using f.m.

Our receiver employs a Ku-band satellite LNB modified for use on 10.250GHz input and 1.2GHz output. A normal satellite TV receiver can then be used, alternatively the 1.2GHz i.f. can be amplified by GaAsf.e.t.s and passed through a bandpass filter into a GaAsf.e.t. mixer together with a 730MHz crystal-controlled source. The resulting 470MHz second i.f. is delivered via bandpass filters and four MMIC amplifiers to a 470MHz p.l.l. demodulator.

Repeaters

The new 3cm repeater GB3XT for the Burton-on-Trent area is intended to use the system just described, under the control of a microcontroller designed by Trevor G8CJS. The input to GB3XT will be 10.250GHz, the output on 10.150. The receive antenna will be a 20dB gain collinear and the transmit antenna a sectional horn. Initially the signal will be beamed north and with no input signal the unit will revert to beacon mode, providing an accurate signal for test purposes.

At the moment a lot of Ku-band equipment is appearing on the surplus market as home satellite systems become more sophisticated. Obviously the dishes have a use, either with a centre feed (penny or scalar) or with an offset feed (like the Amstrad) with a suitable horn. A 1m dish can achieve 36dB gain, enabling a half-watt transmitter to achieve an effective radiated power (e.r.p.) of 2kW! Even a 10mW source becomes a very respectable 40W.

Some of the surplus LNBs can be converted (look for names like the Skyscan model L1 and the Echostar LNB1905), though the Amstrad ones are definitely unsuitable. Satellite receivers can often be used if the bandwidth is reduced and the video output provided with extra gain. With all this Bob predicts a good future for ATV on 3cm!

Sign-off

Remember, if there are any topics you would like covered in this column, please write in and tell us. A stamp won't cost you much and your letters are most welcome!

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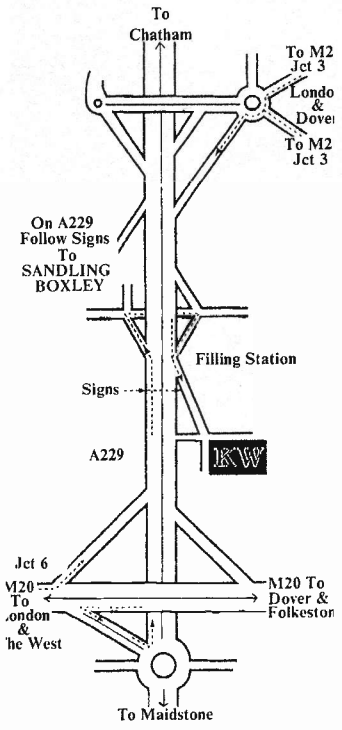

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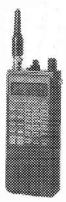

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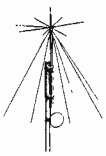

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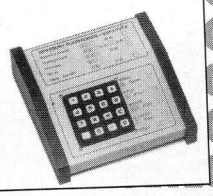

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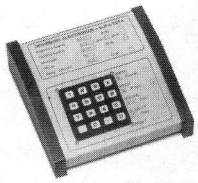

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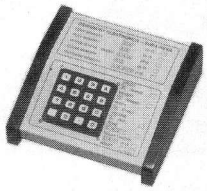

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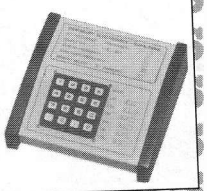

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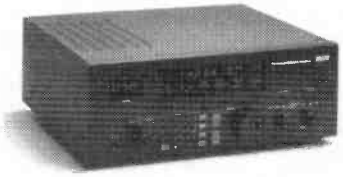

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FOR SALE software for the BBC computer, RX4 plus TIF1 interface, £40. Logbook, £5. SATFOOT, £7. All 5.25in disc, 80 track. 40/80 track drive for BBC-B, new Jan 1991, £45. Other BBC bits. Tel: (0636) 77944 after 6pm, Newark.

FOR SALE Trio R1000 communications receiver with manual and circuit diagram, very good condition, £210 o.n.o. **WANTED** good condition a.t.u. either Global AT1000 or FRT-7700. Mike Davies. Tel: (0445) 733922 7pm onwards, Barry, South Glamorgan.

FOR SALE Akai GXC 730D auto reverse record playback cassette player, £45. Colour Genie EG2000 computer with BASIC and technical manuals, plus c.w., RTTY decoder tapes, £15. Tel: 081-524 3193.

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trading post

FOR SALE Facit 4510 Serial Matrix Printer, £70. Tape recorder, reel-to-reel, Akai 1772L, £35, four track. Hitachi CCTV camera b/w, 240V, £35. Tel: 081-524 3193.

FOR SALE Sony PRO80 scanner with airband and 8-way tuning 150kHz-108MHz and 115-223MHz, complete, boxed, very good condition, £195. Tel: (0283) 30962 Burton-on-Trent.

FOR SALE Lowe HF-125 receiver, 20kHz-30MHz, manuals and original box, good condition, £150. Tel: 051-639 8948 Wirral.

FOR SALE Sony CRF-320 world-zone, best 32 band, h.f., s.s.b., digital radio money can buy, superlative condition, £375. MkII Pathfinder, 150kHz-470MHz, a.m., f.m., b.f.o., s.s.b., squelch, v.h.f., u.h.f., (same as Pan-Crusader 12-band receiver), excellent condition, £125. Tel: 061-743 1570 Salford.

FOR SALE Sony PRO-80 scanner with airband and 8-way tuning 150kHz-108MHz and 115-223MHz, case, earphone, manual, boxed, 6 months old, as new, £170. Tel: (0954) 781140 Cambridge.

FOR SALE Yaesu FRG-7700 communications receiver 150kHz-30MHz with FRT-7700 a.t.u., manual, v.g.c., £230. Also Serviscope S32A, £45. Tony. Tel: (0742) 488231 Sheffield, evenings and weekends.

FOR SALE ICS SC1200 dot matrix printer, super quality, RTTY, NAVTEX, FAX printing, £75. Dee-Comm s.w.l. a.t.u., asnew. £20. Ex-BT dumb terminal, v.d.u., keyboard, £30. Tel: (0904) 658928 York.

FOR SALE Nevada MS1000 base or mobile scanner, £150. Realistic 2021 base scanner, £100. PRO34 Realistic hand-held scanner, £60. All as new and boxed. Tel: (0283) 30036 Burton upon Trent, Staffs.

EXCHANGE Fairmate HP100E Mk2 boxed with NiCads, power supply, charger, excellent condition, for general coverage h.f. RX in good order. Write with details Harry Gardiner, 35 Edgehill Road, Northfield, Birmingham B31 3RU or Tel: 021-477 9898.

FOR SALE Scanmaster for AR2002 by EMP Computer Interface, £130. Black Jaguar/ Challenge scanner, £120 o.n.o. Epson PX8 portable computer +128 Ramdisk and ROM software, £130 o.n.o. PSU. Michael. Tel: 051-480 8073.

WANTED Grundig Satellit 1400, will exchange Record 405 Multiplane, perfect condition. Also would like Hacker portables, especially Super Sovereign or Helmsman. Tel: (0420) 477508 Hants.

FOR SALE scanner, Realistic PRO-2024, 68-88, 118-136, 138-174, 380-512MHz, sixty memories, full scan and search, priority, usual features, small mains operated unit, as new, £65. Peter. Tel: (0268) 287176 (answerphone).

WANTED British Mk123 transmitter receiver with associated accessories (spare mini valves, mains plug, etc.). Tel: (0366) 500867 evenings, Norfolk.

FOR SALE Sony ICF PRO-80 scanner. Hardly used, in original packaging, £200 o.n.o. Also Sony ICF 7600DA s.w./l.w./ m.w./f.m. receiver, £70. Paul Atkinson. Tel: (05242) 72056.

FOR SALE Loew HF-225 receiver, 8 months old, £330. Skyview FAX radio FAX and RTTY demodulator for PC, £50. Tel: (0533) 770159 Leicester.

FOR SALE Trio R2000 all mode receiver, good condition, £290.Tel: (0952) 610408 Telford.

FOR SALE AOR3000 scanner, 100kHz-2036MHz, a.m., s.s.b., n.b.f.m., w.b.f.m., 400 memories, free delivery 70 miles, free frequency guides and headset, £590 o.v.n.o. Tel: (0292) 311926 Ayrshire.

FOR SALE Pye 70cm Xtal RBO, TX RX, RB4 RX, RBL RX, RB15 TX RX, RB1 RX, 6U TX RX, tone burst in nice condition with cradle, £60 o.n.o. Tel: (0406) 22649 after 6pm.

FOR SALE Yaesu FRG-8800 communications receiver, FRV-8800 v.h.f. converter, FRA07799 active antenna-pre-amplifier, £500, good condition. Tel: (0695) 28945.

FOR SALE ICS FAX1 demodulator, receives WXFAX maps, RTTY, Navtex from s.s.b. receiver to printer, boxed, with manual, as new, £125. Tel: (0602) 232588 Nottingham area.

WANTED manual (or copy) for AR88LF to buy or borrow. Tom. Tel: (0908) 653346 day, (0234) 266656 evenings.

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