short wave magazine

April 1991 £1.75 ISSN 0037 - 4261

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PHILIPS DC777 SHORT WAVE CAR RADIO

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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
Prestel MBX 202671191

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

REGULARS

Cover This month John Waite tests the latest Philips short wave car radio. In the centre of this issue you will find your free, pull-out copy of *Weather Watching*, aimed at providing you with the latest information on listening to weather broadcasts and watching facsimile transmissions and weather satellites.

...GOOD LISTENING

editorial

SWM SERVICES

Subscriptions

Subscriptions are available at £19 per annum to UK addresses £21 in Europe and £22 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 £32 (UK) and £37 (overseas).

Components for SWM Projects

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

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

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 £4.50 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.

You will have noticed that this issue has cost you £1.75 instead of the £1.60 you paid last month. Like most other things in life, the cost of producing magazines has risen over the past year and *Short Wave Magazine* is no exception. Our investment in the technology needed to allow us to produce the magazine to the high standards which you expect, together with the inexorable increases in the cost of paper in the 20 issues since the price last went up, means that we have had to bow to the inevitable and increase the cover price.

From your letters, I know that you like the new look and the new features. I believe that *SWM* still represents remarkable value for money. There is one way in which you can beat the price increase, however. I am informed by Kathy, who runs the Subscription Department, that the price of a 12-month subscription will stay at £19 until August 1 this year. A three-year subscription represents even greater value at £50 (UK only). Subscribers get free membership of the *SWM* Subscribers' Club with its special offers and competitions, as well as receiving their copies of the magazine through their letterbox two or three days before it appears in the shops. Fill in the form on page 30 now and save your money.

Weather Watching

Inside this issue you will find your free, pull-out copy of *Weather Watching*. Aimed at introducing you to this fascinating branch of the listening hobby, you will find it full of interesting facts and ideas to get you 'listening' to weather satellites, weather FAX transmisions and 'voice' weather forecasts. I hope that you enjoy reading it and I know that Lawrence Harris (Info in Orbit) and Mike Richards (Decode) both look forward to receiving your reports and pictures

letters

On the subject of Pirates...

Dear Sir

After reading your March 1991 edition, I feel I have to write concerning Mr Read's letter on your letters page. I must agree with him entirely on the point he made concerning the reporting of all short wave radio stations, as a short wave magazine I feel that it should be your responsibility to keep your readers well informed on all short wave stations.

Being a member of the British DX Club, I enclose an article from the February 1991 edition of the club magazine in reply to Mr Read's point about Radio Caroline.

"As reported last month, Caroline's crew were allowed to reboard and make safe the Ross Revenge on condition that there were no immediate plans to resume trasnsmissions. Although initially non-broadcast supplies were allowed to reach the ship, reports are now that the DTI is warning boat owners against supplying the ship - although according to Caroline's lawyers, Richard Butler, no offence is being committed. A film crew filming for Bob Geldof's documentary on Caroline thus had to be content with filming from the sea. One hope is that Caroline can secure a future by obtaining a licence to operate legally from another country - in France the Green Party and the Communist Party have asked that Caroline be given an honary French licence in protest at the UK's Broadcast Bill powers"....Taken from *Communication* the monthly journal of the British DX Club.

J J HACKETT
COVENTRY

Dear Sir

Having read every issue of *SWM* and *PW* since the early eighties and enjoyed all of them, I have for the first time been prompted to write to you. What prompted me was the matter of whether or not to publish reports of pirate stations. Tom Read's letter in particular! Tom has written to us in the past.

Our station broadcats on Sunday mornings on a frequency of 6.275MHz for an average of two hours per broadcast. Since November 1990 we have received, and answered, over 150 letters from people who have heard our broadcasts! Now I feel that for a station using only 20W of r.f. output to receive that sort of response, then that must make you think more on whether you should report such stations. Obviously the interest is there. Some stations have been using 48m for ten years and have many enthusiastic listeners who QSL every week!

I think the answer should be yes, you should report the existence of stations such as ours in your pages. But,

letters

And on the subject of reports...

Dear Sir
With reference to Mr Carrington's letter in the February issue of *SWM* regarding the authenticity of contributions made to 'Seen & Heard'.

I submit to Brian Oddy, at the end of each month, a genuine list of loggings made, along with everyone else who do this all the year round. Admittedly, I do possess copies of *WRTH* and *Passport to World Band Radio*, which are refered to, but the only way to hear stations is to listen to your receiver. This is time consuming but very enjoyable day and night.

Most stations announce who they are and in a lot of cases frequency and transmission times are given. If Mr Carrington wrote to some of these stations I am sure, as in my case when I first started, they would be only too pleased to send him their guide.

My suggestion to Mr Carrington and his friend is 'don't knock it before you try it'. Perhaps we may then see some of his contributions in future issues.

C M SHORTEN
NORFOLK

Dear Sir
I have followed with interest the letters about reports in 'Seen & Heard'. Before contributing to the column I made use of it to try out a new and fairly inexpensive mini-portable. My main interest was in DX, the column became my guide to receiver sensitivity. I was able to compare the new set to similar portables, checking my set's performance against their results.

'Seen & Heard' gives the details I needed. Information such as frequencies, times, antennas, etc., even the towns where the items were heard. The set failed miserably on all tests and was returned to the shop as unsuitable for my purpose.

I ordered the new Sony ICF-7600SW as a replacement and I had a three-months wait for delivery. This portable passed all the tests and I use it for my submissions to the column. I hope these and others' contributions prove useful to readers. They certainly helped me avoid an expensive 'lemon', thanks to Brian Oddy and *SWM*.

W N CLARK
ROTHERHAM

Dear Sir
I was pleased to read the letters in *SWM* March from readers who have obviously learned to make intelligent use of the *WRTH*.

The subject under debate used to be described as 'list logging' - the 'identification' of a station purely by matching the details of what was heard with a published listing. This can lead to disaster - such as the case a few years ago when a DXer 'identified' the Voice of America's French service to Africas as a 4kW regional station in Senegal!

As Editor of the most widely used reference, I am naturally very concerned about the misuse of our publication in this way. I am pleased that *SWM* has drawn attention to this subject.

Your readers may be interested to know that *Downlink* is only one of the ways we try to keep our readers informed. We are also actively contributing media news to various computer bulletin boards, and this is freely available for use by individuals and DX clubs.

We also help behind the scenes in researching material for the Radio Netherlands *Media Network* programme and we have our own *WRTH* news report on that programme every few weeks.

As a short wave listener myself, I always stress to our readers that, while we try to be as up-to-date as possible at the time of printing, changes are occuring every day and the active listener needs to have regular sources of information. That obviously includes *SWM*!

Notwithstanding the above, we do sometimes make genuine mistakes in *WRTH* and, of course, we always welcome corrections from readers.

ANDY SENNITT
EDITOR WRTH

Thanks to all readers who wrote to me about this topic. Your comments helped enormously in reshaping the 'Seen & Heard' section of the magazine by letting me know exactly how you used the information and what you wanted.

This topic is now closed, Editor.

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of course, we cannot expect you to glorify or condone such activities.

DAVE MARTIN
STATION MANAGER WNKR
KENT

Dear Sir
I notice you are still requesting comments from readers regarding the inclusion of clandestine stations in *SWM*. The opinion of the present readership is, of course, important, but the decision also has to include an estimate of the number of new readers this subject will attract. There are a small number of semi-underground news sheets that cater for this area of the market, but these are distributed by subscription, and not available in book shops. My own personal belief is that one should exercise one's freedom of speech right up to the legal limit if necessary, but at the same time retain a responsible professional attitude.

ANDY CADIER
FOLKESTONE

Dear Sir
I am writing in response to a letter printed in the March issue of *SWM*, from Mr Tom Reid suggesting that *SWM* lists 'unofficial' radio stations. This would be a worthwhile investment as you would gain a lot of readership.

As you are aware from the heading on my letter, I am myself such an operator. I would ask that you would consider this idea with an open mind.

ANDY CRAIG
THE NORTHERN IRELAND RELAY SERVICE

As I have said in the past, I listen to what my readers say and as a result of your replies I am arranging a regular column on Pirate Radio Stations. The new column will report on activity but will have to be careful not to promote or encourage pirate activity. It will appear as part of a three-monthly cycle of columns that will include Brian Oddy's Long Wave Maritime Beacons and a new column, covering the fascinating subject of amateur TV, written by Andy Emmerson. ***Editor.***

Dear Comradkis
Much thank yous to Meester Judd (G2BCX) for his excellente theesis on ze Rooshan Voodpeker, (March editioon). But sorry ze Professori Judd is rong agane.

It is, how does you Engleesh say, a rudey beeg skocking coil, locayted at ze Popoffski Institut for reetired Radio Amatoori. It was maid to cuure ze aiking joints. However, not mooch gud for ze joints, but eet sure makes de eyes vater.

As a speesial fayvoor ve vill let Meester Judd pay next month elektreecity bill. Keep up ze excellente verk *Short Wave Magazine*.

ALEXI ROODI
DIREKTOOR POPOFFSKI
INSTITUT
CHESTER

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.

grassroots

rallies

March 31: The Centre of England Amateur Radio Rally will be held at the National Motorcycle Museum, Bickenhill, near the NEC Birmingham. Admission £1, OAPs 50p and children free, Concessionary rates to visit the museum, Bring & Buy, Talk-in on S22, bar and restaurant available. The traders have decided to have a competition amongst themselves to see who can come up with the most outrageous and funniest Easter hat So be warned you could see some very odd creations walking about **Frank (0952) 598173.**

April 7: Lough Erne Amateur Radio Club will be holding their 10th Annual Mobile Rally in the Killyhevlin Hotel, Enniskillen. Doors open at 12 noon, talk-in on S21. Special guest Louis Varney G5RV. **Alwyn Magee GI0BFD QTHR. Tel: (0365) 323802.**

April 7: Cambridgeshire Repeater Group Amateur Radio Rally will be held at Philips Radio Communications Catering Centre, St Andrews Road, Chesterton, Cambridge. Doors open 10.30am, admission 50p. **G0HEM (0799) 23689).**

April 7: The 24th White Rose Rally will be held at The Refectory, University of Leeds. Doors open 11am. All the usual attractions, talk-in on S22, extensive FREE parking and food and drinks available. Entrance £1 by numbered programme, free monster prize draw, no raffle. Senior citizens, bored wives and kiddies free of charge. **Tony G4DXA, PO Box 73, Leeds, LS1 5AR.**

April 7: The 5th Launceston Amateur Radio Rally will be held at Launceston College. There will be a large Bring & Buy, well-known traders, hot snacks and a bar. Also official Morse Tests (pre-booked *via* the RSGB) will be held at the Rally. Doors open at 10.30am with talk-in on S22. **Maggie. Tel: (040921) 219.**

***April 14**: Trafford ARC will be holding their Great Northern Rally at G-MEX, City Centre, Manchester. Doors open 10.30am, rally closes 5pm. **Graham Oldfield 061-748 9804.**

April 21: Bury RS will be holding their Hamfeast '91 rally at the Castle Leisure Centre, Bolton Street, Bury. L.H. Jones, Bury Radio Society, Mosses Centre, Cecil St, Bury. **PLEASE NOTE THE CHANGE OF DATE.**

April 21: The Swansea ARS will hold their 10th rally in the Swansea Leisure Centre, which is located on the A4067 Swansea-Mumbles coast road. Usual facilities will include trade stands, Bring & Buy, books, demo station, full catering and licensed bar. The rally is open from 1030 to 1700. **Roger Williams GW4HSH. Tel: (0792) 404422.**

* Short Wave Magazine & Practical Wireless in attendance *

***Acton, Brentford & Chiswick RC**: 3rd Tuesdays, 7.30pm. April 16 - Making p.c.b.s. Paul Truitt G4WQO. 071-938 2561.

***Bedford & District ARC**. Tuesdays, 7.30pm. Allen's Club, Hurst Grove, Bedford. April 2 - Steam (Hot Air) by G1JZT, 9th - Social, 16th - Computers by Richard, Don & Ray, 23rd - Social, 29th - Pistol Shooting at Bedford Pistol Club. Glenn G0GBI. (0234) 266443.

***Braintree & DARS**: 1st & 3rd Mondays, 8pm. Community Centre, Victoria Street, Braintree. April 15 - Club Construction Contest. M J Andrews. (0376) 27431.

***Bromley & DARS**: 3rd Tuesdays, 7.30pm. The Victory Social Club, Kechill Gardens, Hayes. April 16 - A Simple Top Band RX Construction Evening. Geoffrey Milne. 081-462 2689.

***Bromsgrove ARS**: 2nd & 4th Tuesdays, 8pm. Aston Fields Working Men's Club, Stoke Road, Astonfields, Bromsgrove. April 9 - Night on the Air, 23rd - Antenna Construction Competition. (0527) 503024.

***Bromsgrove & District ARC**: 2nd Fridays. Avoncroft Museum of Buildings & Arts Centre, Bromsgrove. Trevor Harper. Bromsgrove 33173.

***Chelmsford ARS**: 1st Tuesdays, 7.30pm. Marconi College, Arbour Lane, Chelmsford. April 2 - The Radiocommunications Agency by Mr J C Taylor. Roy Martyr. Chelmsford 353221 ext 3815.

***Coventry ARS**: Fridays, 8pm. Baden Powell House, 121 St Nicholas St, Radford, Coventry. March 29 - Night on the Air & Morse Tuition. Neil. Coventry 523629.

***Delyn RC**: Alternate Tuesdays, 8pm. Daniel Owen Centre, Mold. Steve Studdart. Deeside 819618.

***Derby & DARS**: Wednesdays, 7.30pm. 119 Green Lane, Derby. March 27 - Using Oscilloscopes by Rex Beastall G1LRI, April 3 - Junk Sale. Richard Buckby. Ambergate 852475.

***Dorking & District RS**: 2nd & 4th Tuesdays, 7.45pm. April 9 - Informal at the Falkland Arms, 23rd - Open Meeting. John Greenwell G3AEZ. (0306) 77236.

***Fylde ARS**: 2nd & 4th Thursdays, 7.45pm. South Shore Lawn Tennis Club, Midgeland Road, Blackpool. March 28 - Computer Insecurity by G7CUL, April 11 - Choice of Own Subject by G3WGU, 25th - Packet Radio Demo by G6FCI. Eric Fielding G4IHF, 6 Thornton Avenue, St. Annes FY8 3RL.

***Hambleton ARS**: Mondays, 7.30pm. Room A5, Northallerton Grammar School. April 8 - HF/144MHz Ops Night, 15th & 29th - RAE Course, 22nd - Aerials by G3BQL. Nick Whelan G7COC. Northallerton 780476.

***Hastings E&RC**: 3rd Wednesdays, 7.45pm. West Hill Community Centre, Croft Road, Hastings. Fridays, 8.30pm. Ashdown Farm Community, Downey Close, Hastings. April 17 - Junk Sale and Bring & Buy. Reg Kemp, 7 Forewood Rise, Crowhurst.

***Horndean & DARC**: 1st Thursdays, 7.30pm. Horndean Community School, Barton Cross, Horndean. April 4 - RF Health Hazards by J Hogan. S.W. Swain. (0705) 472846).

***Keighley ARS**: Thursdays, 8pm. The Cricket Club, Ingrow, Nr Keighley. March 28 - Using Simple Test Equipment by G4TIV, April 4 & 18 - Natter Night, 11th - Selection of Personal Films by Edwyn Hodgson, 25th - Junk Sale. Kathy Bradford. (0274) 496222.

***Lothians RS**: 2nd & 4th Wednesdays, 7.30pm. The Orwell Lodge Hotel, Polwarth Terrace, Edinburgh. April 10 - Junk Sale. P.J. Dick GM4DTH, QTHR.

***Loughton & DARS**: 2nd & 4th Saturdays, 7.45pm. Loughton Hall, Rectory Lane, Loughton, Essex. April 5 - AGM, 19th - What is PEP? Mike Pilsbury G4KCK. 081-504 4581.

***Mansfield ARS**: 1st Thursdays, 8pm. The Polish Catholic Club, off Windmill Lane, Woodhouse Road, Mansfield. April 4 - Magnetic Loops by G4WBK plus judging of Construction Projects. Mary G0NZA. (0623) 755288.

***Midland ARS**: 3rd Tuesdays, 7.30pm. Headquarters Unit 22, 60 Regent Place, Birmingham B13NJ. April 16 - Video Show. John Crane G0LAI. 021-742 8712 (evenings).

***Mid-Warwickshire ARS**: 2nd & 4th Tuesdays, 8pm. St John Ambulance HQ, 61 Emscote Road, Warwick. April 9 - Junk Sale, 23rd - Computing Part 2 by G8TFF. Mike Newell. Kenilworth 513073.

***Norfolk ARC**: Wednesdays, 7.30pm. The Norfolk Dumpling, The Livestock Market, Harford, Norfolk. April 3 - AGM, 10th - Designing a QRP 80/40m Transceiver by G4UUB, 17th - Informal, 24th - 'Real Radio' evening and construction contest. Mike Cooke. (0362) 850591.

***North Bristol ARC**: 3rd Fridays. S.H.E. 7, Braemar Crescent, Northville, Bristol. April 2 - Visit to Madley Satellite Earth Station, 19th - Home-brew contest. Chris G0LOJ. (0454) 616267.

***North Ferriby United ARS** Sundays, 8pm. North Ferriby United Football Club Social Room, Church Road, North Ferriby. April 5 - Visit by Jandek Ltd, 12th - Night on the Air, 19th - The Trio TS-850 by G3ZRS, 26th - Surplus Equipment Sale. F W Lee G3YCC. (0482) 650410.

***Preston ARS**: Alternate Thursdays. The Lonsdale Sports & Social Club, Fulwood Hall Lane, Fulwood. April 4 - The Ribble Valley by Mr Green, 18th - The Abbey Walk by Mr Andrews. Eric Eastwood G1WCQ. (0772) 686708.

***Rhyl & District ARC**: April 1 - SSTV FAX Demonstration, 15th - Easter Activity Night, Home-brew Construction. (0745) 336939.

***South Bristol ARC**: Wednesdays. Whitchurch Folkhouse Assoc, Bridge Farm House, East Dundry Rd, Whitchurch. April 3 - Bristol RSGB/Organising Longleat 10th - 430MHz Activity Evening, 17th - Jandek, 24th - Exocet - Tactics of Modern Warfare by G4WUB. Len Baker. Whitchurch 832222.

***Southgate ARC**: 2nd & 4th Thursdays. Winchmore Hill Cricket Club Pavilion, Firs Lane, Winchmore Hill, London N21. April 11 - Grand Annual Surplus Equipment Sale, 25th - Youth Night. Brian Shelton G0MEE. 081-360 2453.

***Stourbridge & DARS**: 1st & 3rd Mondays. Robin Wood's Community Centre, Scotts Road, Stourbridge. April 8 - On Air Night, 22nd - Talk by a Trading Standards Officer. Dennis Body G0HTJ, QTHR.

***Sutton & Cheam RS**: 3rd Thursdays, 7.30. Downs Lawn Tennis Club, Holland Ave, Cheam. 1st Mondays in the Downs Bar. April 1 - Natter Night in the Downs Bar, 13th - Annual Dinner, 18th - Junk Sale, 20th - Visit to the National Remote Sensing Centre. John Puttock G0BWV, QTHR.

***Thornbury & DARC**: 1st & 3rd Wednesdays, 7.30pm. United Reform Church, Chapel Street, Thornbury. April 3 - AGM, 17th - HF Activity/Natter Night.

***Three Counties RC**: Alternate Wednesdays, 7.30pm. The Railway Hotel, Liphook, Hants. April 10 - IsoLoop HF Antennas by ICS Electronics Ltd., 24th - AGM. Dave G4VKC.

***Todmorden & DARS**: 1st & 3rd Mondays, 8pm. The Queen Hotel, Todmorden. March 4 - Trip to Brewery, 18th - Test Equipment by G8LTC. Mrs E Tyler. (0422) 882038.

***Torbay ARS**: Fridays, 7.30pm. ECC Social Club, Highweek, Newton Abbot. April 19 - DTI. Walt G3HTX. (0803) 526762.

***Trowbridge & DARC**: 8pm. TA Club, Trowbridge. April 3 - Winchester Disk Drives Explained by G3RSJ, 17th - Open Evening. G0GRI. (0380) 830383.

***Verulam ARC**: 2nd & 4th Tuesdays, 7.30pm. The RAF Association HQ, New Kent Road, St Albans. April 23 - Airborne Radar by Welsh.

***West Kent ARS**: 3rd Fridays, 8pm. The School Annex, Albion Road, Tunbridge Wells, Kent. April 19 - AGM.

***Wimbledon & DARS**: 2nd & last Fridays, 7.30pm. St Andrews Church Hall, Herbert Road, SW19. April 12 - General Activity Evening, 26th - Keys & Keyers by G3ESH. Chris Frost. 081-397 0427.

***Wirral ARS**: 1st & 3rd Wednesdays, 7.45pm. Ivy Farm, Arrowe Park Road, Birkenhead, Wirral. April 3 - Sale of Equipment, 10th - Committee Meeting, 20th - Scouts on the Air Special Event Station.

***Yeovil ARC**: Thursdays, 7.30pm & Fridays, 7.30pm. The Recreation Centre, Chilton Grove, Yeovil. March 28 - Natter Night, April 4 - Kirchhoff's Law by G3MYM, 11th - The Thevenin & Norton Generators by G3MYM, 18th - AGM, 25th - Natter Night. David Bailey G0NMM, QTHR.

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

After a slow start, the column is now starting to build-up a good following. So thanks to all of you who have taken the time to write to me.

Reader's Station

Colin Martin (14) of Newcastle-upon-Tyne wrote with details of his listening station. Colin has been interested in radio for about three years now and is fortunate in being able to share his Dad's station. His interest started when his Dad bought a PRO-2021 scanner and progressed with a portable short wave radio. The current station comprises ex-MoD R210 and Yaesu FRG-7 receivers that are fed by a whip antenna and a 30m long wire. An added bonus is an ERA Microreader that enables utility stations to be decoded and displayed.

Although they share the same equipment, Colin's interest centres around s.s.b. and utilities whilst his Dad prefers to listen to broadcast stations. Colin's best DX to date was JA6XMM (Japan) on the 3.5MHz amateur band at night. His favourite utility station is the IRNA news agency in Tehran. He has also received many QSL cards and letters from as far away as Australia and New Zealand. He has even had a letter read out on Radio Israel.

So keep up the good work Colin and I look forward to receiving more reports like yours.

International Reply Coupons

My first enquiry comes from **Mr Davis** on the Isle of Wight, who although not actually under sixteen has only been in the hobby a short time. As he asks a question that puzzles youngsters, I think that justifys me answering! The question is very simple - what are IRCs? I expect you've seen these mentioned in the magazine from time to time. As you may have guessed from the name, they are designed to be exchangeable for postage stamps in a wide range of countries. If you are requesting information from someone in another country and want to pay for the return postage then it's not much use including a UK stamp as it won't be valid abroad. The answer is to go to the Post Office and buy an International Reply Coupon. These coupons can be exchanged for stamps in most countries. To save you having to work out the postage costs, each IRC can be exchanged for the cost of a basic letter to a foreign country. So you can see this is a very handy system. When sending for QSLs (see last month's column), include an IRC and you are more likely to receive a reply.

Sometimes, you can buy things with IRCs too. Items such as certificates or awards or frequency guides can often be purchased from foreign sources for something like 7 IRCs.

Medium Wave Long Distance (DX)

Jamie Tullett (15) of Coleraine has been interested in radio listening for about eighteen months. His main interest is broadcast stations from l.f. right through to the h.f. bands. For this he uses a Realistic DX-440 receiver and a 100m random wire connected to an a.t.u. He has made many good contacts with this station including CKLM (Canada) on 1570kHz.

Jamie is now looking to experiment with medium wave loop antennas to improve transatlantic DXing. There have been several designs published in the magazine over the years but two you might like to take a closer look at are the Long Arm Loop and the Hexagonal Loop. Of these, the Hexagonal Loop is the largest being 610mm wide and 1200mm high. If you would like to try one of these a photocopy of the Hexagonal Loop (April '89) will cost 85p and a back issue of the Long Arm Loop (September '87) costs £1.85. There were some mods to the Long Arm Loop in the February '91 issue.

Some of you may be new to medium wave and wonder why the loop antenna is so popular. The reason is tied up with the comparitively low frequencies used on medium wave. You may remember a couple of months ago I explained about long wire antennas and the very long antenna lengths required on m.w. Because it's not possible for most people to have antennas this long other types have to be used. Another inportant reason for the loop is its directional properties. If you've tried listening on m.w. in the evening you will have noticed how very busy and noisy it is. This is probably the main problem facing the DX enthusiast. The loop antenna helps to cut through some of this noise by reducing the level of all signals except those coming from the desired direction. By rotating the antenna you can choose the point where the wanted signal is strongest and the interfering signal weakest.

Another attractive feature is that loop antennas are generally cheap and quite easy to build. There's lots of opportunity to experiment with different types. If you've had success experimenting with antennas drop me a line with the details and I'll pass on your experiences.

Help!

Mark Farr of Crewe has written asking for help with a constructional project. He's currently building the one- valve short wave receiver that was featured in the September '90 issue of *Short Wave Magazine*. This design used Denco Green Range coils that, sadly, are no longer manufactured. Mark needs the range 3, 4 and 5 coils and would very much like Nos 1 and 2 as well. If anyone can help, please send the details to the address at the head of the column - I'll then pass the details on to Mark.

Pen Pal

My first request for a Pen Pal comes from **Mark Farr** of Cheshire. He's very interested in home construction and is currently building a one-valve receiver. He also has a very generous grandfather who has just given him a Grundig 650 receiver. If you would like to write to Mark just drop me a line and I will pass your letters on.

If anyone else would like to enter this section just send me the following details:
Name, Address, Age and Interests.
Don't forget to enclose a large s.a.e. for the replies!

That's it for this month but please keep those letters coming.

news

DUBUS Subscribers

We have heard from the UK distributor of the very useful amateur radio publication *DUBUS*, that the first issue of the new year will be published this month. Several subscribers have overlooked the fact and the dead-line for subscriptions is 1 April 1991.

New Tools

Ungar have announced their own line of high-performance, quality hand-tools manufactured in California.

All Ungar EPA cutters have been designed with a shear-cutting action to minimise operator force and component shock. Soft, chunky handles reduce the concentration of force in the hand. Less than half the operator force of crush-cutting is required and the blade design ensures a neat, square cut with minimal acceleration.

The Economy, Super and ESD series have a line-up of five flush cutters. Two of these have a permanently-mounted safety-clip and one has a 75° angle which results in a more natural hand/arm position when cutting. Similarly, each series includes both smooth and serrated jaw pliers.

The Economy Series comprise well-made, durable, general-purpose hand-tools aimed at cost and quality conscious users. The Super Series features special heat treatment for extra toughness and durability and plating for corrosion protection.

The ESD-Safe Series is identical to the Super selection, but with static-dissipative hand-grips for safe cutting of even the most voltage-sensitive devices.

All hand-tool parts, including rivet joints, springs and cutting edges are life cycle tested.

Ungar, Eldon Industries UK Ltd., Clifton Road, Shefford, Beds SG17 5AB. Tel: (0462) 814914.

Stolen

An AOR2002 scanning receiver, serial number 09A23, was stolen from Derby between February 23 at 1600 and February 24 at 0845. Any information to John Arnold G4NPH. Tel: (0353) 741354.

TVDX News

Problems continue at Gibraltar Broadcasting, but the end of March '91 sees the end of the financial year and changes are likely in the structure of the station. The government props up GBC with an annual £600 000 grant (frozen at that level), but additional funding is necessary to maintain/improve programming. RTL, London Film (part of Central TV), two Spanish groups and Video Time Spa from Italy are all interested in commercial involvement, the latter has promised both English and Spanish language programming and is a favoured runner. The Gib. government will make a decision for GBS's future shortly. CLT Luxembourg is interested in a major stake with the Irish TV3 commercial TV network which hopes to be on-air mid/late 91.

Discussions have continued over the amalgamation of the West European EBU and East European OIRT in both technical, legal and programme matters. Both the EBU and OIRT organise international broadcasting in their respective areas. In the North, MTV Finland is producing a weekday breakfast TV programme over YLE-3 0430-0640UTC, it's called *Huomenta Soumi* (Good morning, Finland).

The Studio Zagreb 1st TV programme is transmitting an Albanian language news programme at 2230. Also in Yugoslavia,'TV Koper-Capodistria' has now ceased her Italian language service, it's now 'TV Koper' with only Slovene programming. Another change is that 'RTV Skopje' will be renamed 'RTV Makedonija' or 'Makedonska RTV'.Another new Italian TV network, 'TV-7 Pathe', will feature at least 30 local stations throughout major population centres. With large studios in Rome, TV-7 will make good use of the Pathe association with MGM.

It looks like Antenna 3 is now operating in the Canary Is on Ch.34 Teneriffe, Ch.36 Las Palmas. Canal + and Tele 5 will also be transmitting shortly..If you were using a scanner in the London area at 47.645MHz f.m. and heard, 'This is a test transmission from the East Tower', we think this originated from the BBC TV Centre, the signals were heard early February and audible in Southampton!

Regular NICAM stereo test transmissions are now being carried over the BRT-TV2 network. And a BDXC member visiting the Azores advises a new transmitter at Lages, Isle of Terceira operates Ch.E4 at 1kW e.r.p. Contrary to reports, George Gaskin (a TVDXer) from Gibraltar advises that NO Band 1 transmitter operates on the 'Rock'.

The Benelux DX Club have forwarded new transmitter lists for the French La 5, M6 and the Canal J (children's channel) - these will be featured space permitting. Canal J will transmit 0700-2000 local, Mons/Sat and school holidays 0700-2130 local.

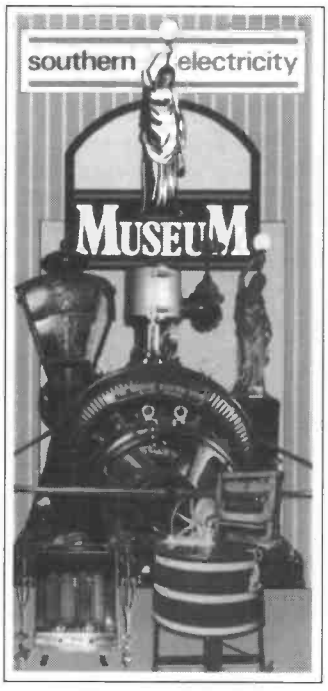
Not good news for TVDXers is that the Spanish PTT have agreed in principal for 50MHz radio amateur operation, details on spectrum, powers, times, etc., yet to be finalised. And in Greece the PTT will allow 50MHz operations outside of the capital - Athens - area. In Eire, Class B licence holders will be allowed access to the 50MHz band outside of TV hours (approx 2400-0900).

GBC-TV Ghana is now receiving CNN at its Accra a HQ and transmitting certain CNN material in her programmes. Rwanda has changed to the PAL standard from the earlier SECAM since most of the bought in programme recording are in PAL. Network upgrading is currently being discussed. A new regional u.h.f. station 'Canterbury TV' is about to open from studios in Christchurch, New Zealand, financed from local advertising.

Robert Copeman in Victoria, Australia reports in easing interference problems to their TV (and DXing) from illegally imported 49MHz baby alarms etc.

Finally the Norwegian government has given agreement for a 2nd terrestrial network, based regionally - Bergen the most likely - to operate commercially on a 10-year licence. Allowing up to 10% of transmitted time for advertising, the channel must provide a new service. There is no indication of when it could be on-air, though it will operate at u.h.f. **Roger Bunney**.

Special Event Stations



The weekend of May 11/12 will see the 10th Anniversary of the Southern Electric Museum, which is located in the Old Power Station, Bargates, Christchurch, Dorset.

The Museum, which is dedicated to the supply and use of electrical energy and equipment through the ages, is a unique collection and will be open to visitors from 11am to 4pm on both days.

The members and reps of the Bournemouth & District RAIBC Group will be operating the Special Event Callsign **GB3SEM** from the museum. A colour QSL card will be available for all reports and QSOs via the RSGB QSL Bureau or direct to G6DUN, sending an s.a.e. to 40 Fairmile Road, Christchurch, Dorset BH23 2LL.

The station will be active on 80 and 40m in the mornings and on 20/15/10m in the afternoons. Contacts and talk-in will be also available on 144MHz f.m.

The town of Scarborough has adopted the warship HMS *Fearless* and to celebrate the first visit to the resort of this newly commissioned veteran of the Falklands War, the Scarborough Special Events Group will be on the air as **GB0RN** from May 9 - 13 whilst the warship is at anchor in the bay.

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

Starter Tool Kit

Maplin Electronics have introduced a value for money starter tool kit into their range of products. The cloth tool roll contains a snip cutter, a pair of long-nose pliers, a light-duty flat blade 75mm long screwdriver, a No.1 crosspoint 75mm long screwdriver, a desoldering tool and a soldering kit containing a CS iron, a stand and a 5m pack of 18 s.w.g. solder.

The tool kit, order number SK01B, is available for £19.95 including VAT.

Maplin Electronics, PO Box 3, Rayleigh, Essex SS6 8LR.

Peter Brownbridge

Peter Brownbridge, the ebullient proprietor of Johnsons Shortwave Radio in Worcester died at home on Saturday, March 9 after a long illness.

Peter was one of those rare individuals who put his customers first. He would rather give them sound advice, even if it meant making less profit from the deal. Being partial to a long chat, he would always drop in at the *SWM* Editorial Offices when he was taking his annual holidays in Weymouth!

The business will be carried on, for the time being, by Anita, helped by Lara the dog.

Condolances to Peter's family from the staff at *Short Wave Magazine*.

NT Diamond Jubilee Award

The National Trust for Scotland Diamond Jubilee Award will be available during 1991 to either radio amateurs on a worked basis or s.w.l. on a heard basis. You need to contact GB60NTS and any four special event stations that will be held at various National Trust Properties throughout the year. To claim, forward log extracts only to **The Awards Manager, PO Box 59, Hamilton, ML3 6QB**. The cost will be £2 for the UK and Ireland or $6 or equivalent for overseas. There will be 12 National Trust stations on over the weekend of August 31/September 1 including GB60NTS.

A full list of all awards, events and an information pack on the Scottish Tourist Board Radio Group, can be had on application to **Paddy GM3MTH, 9 Ramsay Place, Coatbridge, Strathclyde**, enclosing $1 or 2 second class stamps.

Batteries & Chargers

A range of electrical and electronic accessories has been launched by NAMEX, a newly formed specialist division within the NAM International organisation.

The product range to be distributed exclusively by NAMEX includes rechargeable batteries and chargers, together with universal mains adaptors and torches.

NiCad batteries available at very competitive prices and packaged on point of sale display cards under the new NAMEX registered brand name include AAA, AA, C, D and PP3 sizes.

NAMEX is also launching four new domestic battery chargers. The NC5004M and NC5004P fast chargers will fully charge two or four standard size rechargeable batteries in just five hours and either one or two PP3 size batteries in 14/16 hours. Both feature reverse charge polarity protection and l.e.d. charge indicators.

NAMEX, NAM House, 22/26 Spencer Street, Hockley, Birmingham B18 6DS. Tel: 021-236 8628.

When you are ready to graduate to real listening

Look to Lowe

The NRD-535. JRC do it again.

JRC have triumphed again with the introduction of their new NRD-535. Latest in the line of NRD receivers, the NRD-535 represents a true step forward in features, performance, and facilities for the dedicated listening enthusiast.

Apart from looking quite stunning in appearance, the NRD-535 is equally impressive in use. The smooth tuning is the first thing you notice and JRC have developed a direct digital synthesiser (DDS) system which tunes in 1Hz steps. This means that you simply cannot tell that you are tuning a synthesised radio except for the fact that the accuracy and stability are of laboratory standard. Whatever the frequency readout says, you can believe; and what's more the readout itself is absolutely brilliant in its clarity. There is of course the front panel keypad for swift frequency setting, so you can browse around with the tuning knob or go direct to frequency if you wish.

All mode reception covers AM, USB, LSB, CW, FM, RTTY, and even FAX, and there are IF filter bandwidths to suit the modes. Using the same range of accessory filters as the NRD-525 means that if you want to trade-up you can keep your existing filters and transfer them to your new 535.

When it comes to winkling out the weak stations from the noise, the NRD-535 excels. Pass band shift is provided so that you can slide the IF filter around the signal so as to eliminate the adjacent interference, whilst a totally new notch system gives tunable rejection with a 40dB notch depth, 10dB better than even the legendary NRD-525. Both of these features are included in the standard spec. but if you want to have full control over IF bandwidth, a Bandwidth Control board is available as an option.

For the keen broadcast DX-er, JRC offer an optional plug-in ECSS board which has to be used to be appreciated. The ability to "lock-on" to an incoming AM signal and then pick off either sideband makes the NRD-535 the only choice for the serious listener.

The serious listener will also be impressed by the 200 memory channels, each of which stores frequency, mode, bandwidth, attenuator setting, and AGC setting (that's what I call comprehensive). The memories can be scanned of course and there are also comprehensive frequency sweep facilities under complete user control.

When it comes to user control, the NRD-535 is almost unique, because there are no less than 16 different functions which can be programmed from the front panel by the user, to "tailor" the receiver to suit their own particular needs. These cover everything from tuning rates to the precise BFO offset on CW, so everyone can have the receiver of his choice.

For the advanced user, the NRD-535 is fitted with computer control facilities, and an RS-232C interface is provided as a standard feature. The user manual contains comprehensive details on the 28 different receiver operations which can be computer controlled. You will need a computer or dumb terminal of course, but given a modicum of computer literacy, there is almost nothing which cannot be done by remote computer control.

All in all the NRD-535 is a truly excellent advance on the 525, and is worthy of carrying the JRC banner forward into the future. When you see that the price is the same as that of the NRD-525, you can only marvel at what JRC have done. See it soon.

NRD-535 HF Receiver	**£1095**
CMF-78 ECSS option	**£198**
CMH-530 RTTY option	**£102**

FREE

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

LOWE ELECTRONICS LIMITED

Chesterfield Road, Matlock, Derbyshire DE4 5LE Telephone 0629 580800 (4 lines) Fax 580020

When it comes to scanners
Look to Lowe

The new WIN-108
The finest handheld airband receiver in the world

The new WIN-108 is the latest version of this world beating air band radio, which has been acknowledged all over the world as the best hand held VHF radio available.

Now covering 108 to 143MHz, and with all UK and European channels covered in the now standard 25kHz spacing giving 1400 channels for your use, the WIN-108 will give you total listening satisfaction, at home or out on the airfield.

Everything you need is provided by the WIN-108; 20 memory channels, memory scanning, frequency searching between your chosen limits, a priority channel which you can programme to any frequency in the airband, direct frequency entry from a simple keypad, up/down tuning, and so on and so on.

Best of all, the WIN-108 comes from a respected manufacturer and is backed by the best service in the business from Lowe Electronics.

Airband radios are getting quite complex, and many people are confused by the increasing numbers of apparently similar radios on the market. To help you choose, here is a check list of absolutely essential features you must have in an airband radio. If the radio you are going to buy has any of these features missing. DON'T BUY IT, because you will be disappointed.

THE QUESTIONS

1) Does it have frequency coverage from at least 108MHz to 137MHz *for all new channels?*
(The WIN-108 covers from 108 to 143MHz.)

2) Does it have channel spacing of 25kHz?
This is crucial, because all important frequencies are now using 25kHz channels. The old standard of 50kHz is totally useless. (The WIN-108 has 25kHz channels.)

3) Can you use ordinary pencells if you want to?
Having re-chargeable batteries is all very well, but it doesn't help you at an air show when they run flat. You can always get a set of Duracells from somewhere. (The WIN-108 uses easy to obtain batteries.)

4) Can you search for new signals between user-programmed limits?
If you have to search the entire Nav and Coms band all the time, it wastes valuable searching time when signals can be lost. (The WIN-108 has programmable search limits.)

So – four simple questions which you MUST ASK. For full details on the WIN-108 and all the other radios from our exciting range, simply ask for our airband information pack, which includes a free copy of our ever popular "Airband Guide".

Happy listening. (It will be with a WIN-108.)

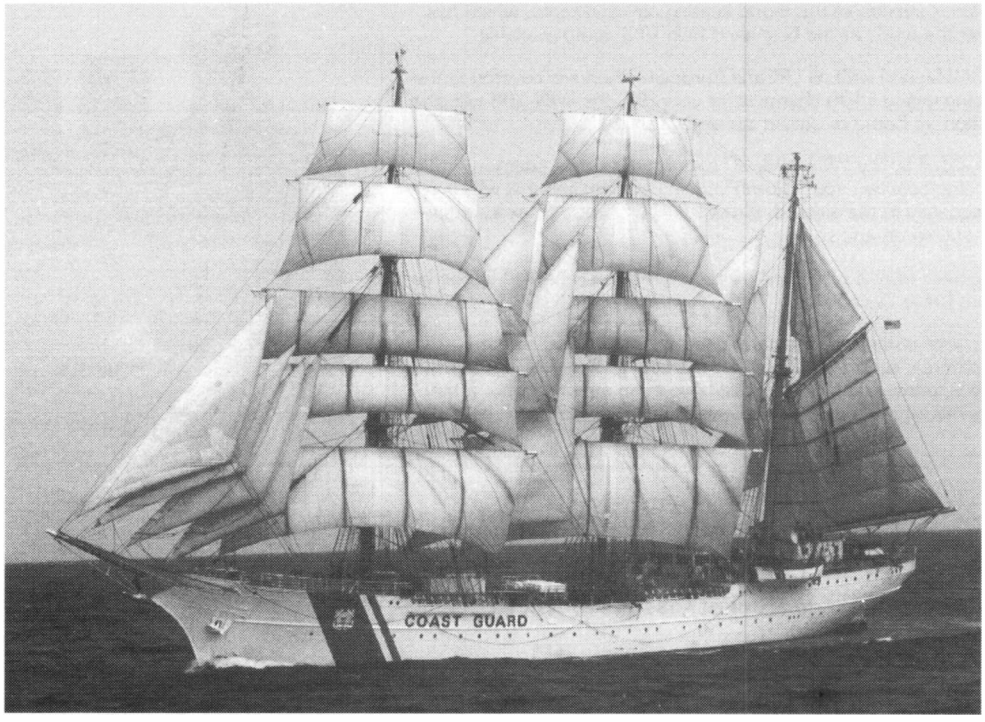
WIN-108 £175 inc. vat.
Available from good dealers everywhere.

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

***BOURNEMOUTH** 0202 577760. ***BRISTOL** 0272 771770. **CAMBRIDGE** 0223 311230. ***DARLINGTON** 0325 486121.
***GLASGOW** 041-945 2626. **LONDON (EASTCOTE)** 081-429 3256. **LONDON (Heathrow)** 0753 45255.
S. WALES (BARRY) 0446 721304. *Closed all day Monday.

The US Coast Guard

Last summer, the United States Coast Guard celebrated its 200th anniversary. Bill Black gives us some interesting facts about one of the ships operating in the service.



US Coast Guard

Monitoring the Coast Guard Services of nations around the world can provide some of the most intriguing listening available on short wave radio, ranging from the rescuing of vessels in distress to the chasing of drug smugglers. To help in those missions, the Coast Guards of the United States and other countries have ships, aircraft and shore stations with a full range of modern radio equipment. One US Coast Guard vessel, however, combines its up-to-date communications gear with a centuries-old technology - sails.

US Eagle

That ship is the US Coast Guard *Eagle*, a floating academy for cadets and new officers. The vessel has an overall length of 90m and, at its widest part, a beam of 12m. Its three masts reach more that 40m into the air and are rigged with sails that have a total area of more that 1800 square metres. Normally, the crew consists of some 175 cadets and instructors from the Coast Guard Academy in New London, Connecticut.

The German Navy built the ship in 1936 to serve as a training school for its cadets as that nation built up its military capability before World War II. After the War, the United States took the vessel as a war prize, renamed it, and commissioned it into the US Coast Guard in 1946.

The *Eagle* might look like something out of the last century, but a visit last summer found its radio room filled with equipment very similar to that seen on many other coast guard or naval vessels - and even more modern gear was to be installed during a refitting being carried out over the winter.

Among the existing units were two 100W h.f. transmitters, a 1kW linear amplifier and three h.f. receivers. There were also other transmitter and receiver units used for the marine frequencies in the 400-500kHz range. One special 'auto-alarm' receiver was tuned just to the marine distress frequency of 500kHz. The radioman could select from five m.f. and h.f. antennas, one whip and four long wires ranging from 30 to 45m in length.

Radioteletype

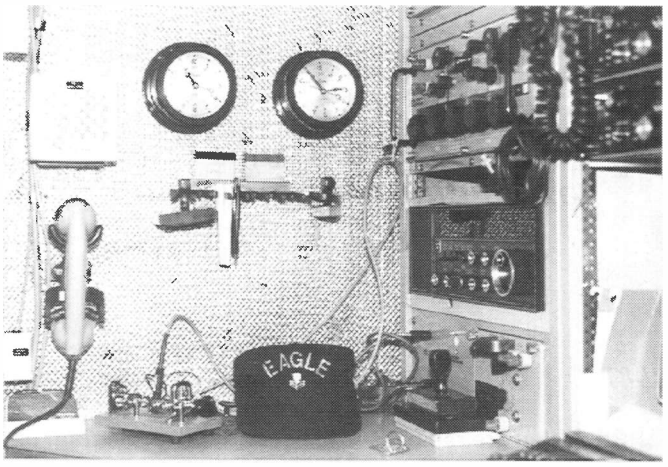
The vessel is equipped with v.h.f. transceivers, but they are handled by the ship's officers, instead of the radioman.

While the vessel does use s.s.b. voice comms at times, the bulk of the official traffic is sent with other modes, reported Anthony McCullough, who was serving as the ship's radioman during its 1990 sailing season. Like the other radiomen who have been assigned to the ***Eagle***, McCullough was to be on the vessel for less than a year, and then would rotate to a position on another Coast Guard ship or at a shore station.

While the bulk of his work was done with RTTY, McCullough also occasionally used c.w. "It's my personal favourite," he commented, but admitted it isn't as efficient as teletype. "The traffic load is too great to rely on Morse code," he reported. "At 40 words per minute, I'd be in here (the radio room) all day."

With this winter's dry dock renovations, the sending of routine traffic will be even more efficient on the next voyage of the *Eagle*. The old RTTY unit is to be replaced with a new computer-based SITOR system. Also to be installed is a satellite communications unit that will use the INMARSAT system. Another receiver being added to the radio room is a NAVTEX unit, for navigation and weather bulletins and other maritime notices. "They're trying to get us in line with the rest of the Coast Guard,"

The US Coast Guard celebrated its 200th anniversary in August 1990.



The radio room of the US Eagle with the Morse key and two of the h.f. receivers in the rack.

commented one officer involved in the renovation project.

Because the *Eagle* does not have law enforcement duties like other US Coast Guard ships, none of the messages to and from the vessel is classified.

While serving on the *Eagle*, McCullough stood watch in the radio room from 8am to 12 noon local time, any two hours between 6pm and 10pm and any other two hours of his choice. He handled routine traffic in the mornings and the evenings. When not tied up with that, he often contacted amateur radio operators through their Military Affiliate Radio System (MARS), to carry telephone calls from crew members to their relatives and friends. "That makes me a popular man," McCullough commented.

When on the MARS frequencies, the ship uses the callsign NNN0NCJ. For other voice traffic, the vessel identifies itself as the *Eagle*. On other non-voice modes, it is NRCB.

Most of the radio traffic handled by the US Eagle is via RTTY, but c.w. and s.s.b. are also used.

Sailing Log

The *Eagle* generally travels away from its home port of New London only during the summer. During 1991, it will leave the US at the end of April on its way to the Azores, with arrival there scheduled for May 22. During June, it will visit Cherbourg, France and Lisbon, Portugal. Around July 5, the *Eagle* will stop in the Madeira Islands and, on July 27, Bermuda. The ship will arrive back in the US in early August.

A good time to catch the *Eagle* on short wave will be while it is sailing between these sites. When near the US, its communications are carried in the duplex US Coast Guard frequencies in the 4, 6, 8 and 12MHz bands, while travelling around Europe, the vessel is more likely to be in contact with the same marine shore stations that other ocean-going ships use. Specific frequencies to monitor are listed in a number of directories of marine and utility radio communications.

Also worth checking are the MARS frequencies. The *Eagle* uses the same ones as the US Navy and Marines. Many of these channels are located just outside the amateur bands. One frequency noted in the past is 13.974MHz.

Although the *Eagle* was handling most if its radio traffic on short wave, at various times during the summer of 1990 the ship utilised some very unusual v.h.f. frequencies - the cellular phone channels. While the ship was travelling up and down the East Coast of the US, there were a few occasions when solar flares knocked out h.f. communications. Nevertheless, the ship was close enough to shore to use its cellular phone equipment.

QSLing

Regardless of the frequency on which you hear the ***Eagle***, its radio operators have made it a practice to respond to all reception reports. Send yours to: USCG Barque Eagle (WIX327), FPO New York, NY 09568-3906, USA. In reply, you might receive a card stamped with a special commemorative seal in honour of the Coast Guard's 200th anniversary, or one of the souvenir 'coins' given to tourists who visit the ship. ■

Abbreviations

h.f.	high frequency
INMARSAT	INternational MARitime SATellite
m	metre
m.f.	medium frequency
MARS	Military Affiliate Radio System
MHz	megahertz
RTTY	Radio TeleTYpe
s.s.b.	single sideband
s.w.	short wave
SITOR	SImplex Telegraphy On Radio
v.h.f.	very high frequency
W	watt

Starting Out

It is four years since Brian Oddy G3FEX started writing this series explaining the ins and outs of radio. Starting Out now takes a break and concludes with a complete index to the series.

1987

APRIL: What are radio waves?
MAY: Long and medium wave propagation. Ionosphere.
JUNE: Tropical bands. Allocation chart.
JULY: Short wave bands. Allocation chart. Sky wave propagation.
AUGUST: Characteristics of s.w. transmissions. Sunspots. Schedules.
SEPTEMBER: Identifying signals & record keeping. Time zones. GMT, BST and UTC. Standard time/ frequency transmissions. Preparing calibration graphs.
OCTOBER: Reception records. Signal ratings. SINPFEMO code. SINPO and SIO code. QSL cards. Compiling a reception report.
NOVEMBER: Logging s.w. signals. Relay stations.
DECEMBER: Difference between sound and low frequency radio waves. Modulation. Characteristics of amplitude and frequency modulation. Sidebands. Layout of simple a.m. transmitter.

1988

JANUARY: Reception of a.m. Tuned circuits. Simple superhetrodyne receiver explained.
FEBRUARY: Important aspects of receiver specification.
MARCH: Advanced receiver designs.
APRIL: Local oscillator stability.
MAY: Design of a frequency synthesiser reference oscillator. Simplified v.c.o. block diagram. Block diagram of counter with l.e.d display.
JULY: Detection in a superhet. Modulation envelope. Demodulation of a.m. signal. Audio filters.
AUGUST: Upper and lower sidebands. Role of carrier. Operation of a diode bridge modulator.
SEPTEMBER: Carrier insertion. Use of b.f.o. Product detectors. Carrier insertion oscillators.
OCTOBER: Music via s.s.b. systems. Reception of d.s.b. & i.s.b. signals. Synchronous a.m. detection.
NOVEMBER: Manual and automatic r.f. gain control. Forward & reverse a.g.c. systems.
DECEMBER: Radio frequency interference. Natural & man-made r.f.i. Mains filters.

1989

JANUARY: Reduction of man-made r.f.i. Noise blankers. Bi-stable (flip-flop) multivibrator.
FEBRUARY: Simple tuning indicators.
MARCH: Signal strength meters. The RST and SINPO codes and S-meter calibration.
APRIL: Crystal calibrator. Preselectors. Monoband pre-amps.
JUNE: Extending the range of simple receivers. Up & down converters.
JULY: Operating close to a local transmitting station. Installing wave traps. Attenuators.
AUGUST: Filters.
SEPTEMBER: Reception of c.w. Beat frequency oscillator. Audio c.w. filters.
OCTOBER: Improving selectivity of a receiver. *Q* multiplier. Properties of a coil or inductor (L) - the henry (H). Properties of a capacitor (C) - the farad (F). Inductive reactance (XL). Capacitive reactance (XC). The combination of L and C to form a series or parallel tuned circuit. Dynamic resistance (RD). Magnification factor (Q).
DECEMBER: Batteries.

1990

JANUARY: Expense of dry cells. Add-on power supply unit.
FEBRUARY: The decibel (dB). Power ratios. Response of the human ear.
MARCH: Receiver audio stages. Common emitter transistor pre-amp. Class A operation. Power amps.
APRIL: Common emitter; common base; common collector (emitter follower). Darlington pair. Characteristics of bi-polar transistor when in common emitter, base and collector (emitter follower) mode.
MAY: Attenuation and phase distortion in audio stages. Negative feedback. Expressing n.f.b. in dB.
JUNE: Methods of applying n.f.b. to transistor and valve amplifiers. Fault finding in amplifiers containing n.f.b. circuits.
JULY: Squelch circuits
AUGUST: Correct alignment of the variable tuned circuits in front end of superhet. Frequency synthesisers.
SEPTEMBER: Miniaturisation of receivers. Semiconductor diodes. Atoms. Molecules. Protons. Neutrons. Electrons. Current flow through materials. Semiconductors. Doping. Manufacture of *n*-type and *p*-type materials.
OCTOBER: Suitable antennas. Radio waves - electric and magnetic fields. Basic antenna. Resonance. Directional characteristics of half-wave antenna.
NOVEMBER: Erecting a half-wave antenna. Multi-band operation. Transmission lines. Characteristic impedance. Matching.
DECEMBER: Advisability of erecting a half-wave antenna away from the house. Attenuation of transmission lines. Importance of matching. The dipole. Balanced to unbalanced transformer (Balun).

1991

FEBRUARY: Simple dipole for multi-band operation. Inverted V configuration. Effect on resonance. Antenna noise bridge. Traps. Dip oscillator.
MARCH: Using antenna directivity to optimise reception. Mercator maps. Use of terrestrial globe. Great Circle route and maps.
APRIL: Index.

South Midlands Communications Ltd.

Southampton *(0703) 255111* ***Leeds*** *(0532) 350606* ***Chesterfield*** *(0246) 453340*
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RECEIVING O.K.?

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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.

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.

SMC are pleased to be able to offer the SONY range of Multiband Receivers. They feature all the latest technology allowing unequalled 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 **ICFSW7600** is a sophisticated portable receiver that combines power and flexibility with one-touch convenience. Freq. range AM 150-29995kHz and FM 76-108MHz.

The **ICFPRO80** is a hand held professional receiver with air band capability and an 8-way tuning system. Frequency coverage 150kHz-108MHz and 115.15kHz to 223MHz with FRQ 80 frequency convertor.

The **HP100E MkII** is a 1000 channel, programmable, handheld scanner. AM, FM and FM wide for commercial channels covering 8-600MHz and 830-1300MHz. Supplied complete with NiCad, Antennas, DC cable, shoulder strap, carry case and earpiece.

The **ICFSW1E** is possibly the world's smallest shortwave radio, fully featured with a multiple tuning system and PLL synthesised circuitry for digital precision. AM 0.15-30MHz & FM 76-108MHz.

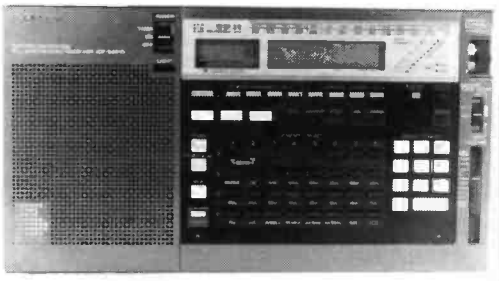
The **Air 7** is an all purpose handheld multiband receiver with continuous waveband coverage including air band and utilising a 6-way tuning system AM 150-2194kHz. FM 76-108MHz, Air 108-136MHz and PSB 144 -174MHz.

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

The ultimate Multiband receiver, the **ICF2001D** combines sophisticated shortwave technology with the ease and versatility of both digital and analogue tuning. Freq. range AM 0.15-30MHz, FM 76-108MHz and AIR 116-136.6MHz.

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.

The **VHF HANDY** and **AIR HANDY** are two compact thumbwheel controlled handheld receivers. Light in weight and easy to use makes them an ideal introduction to receive. The AIR handy covers 118-136MHz and is AM. The VHF Handy is FM and covers 141-180MHz.



The **NRD525** is a high-class, general coverage receiver with expandability looking to the future. combining traditional technology unique to JRC with the most advanced digital technology gives superb performance whilst remaining extremely easy to use. The NRD525 covers 90kHz-34MHz and with an optional VHF/UHF converter also covers 34-60, 114-174 and 423-456MHz. Modes of operation CW, SSB (USB/LSB), AM, FM and RTTY with optional demodulator.

Lowe receivers are available from Reg Ward & Co Ltd. Some Icom receivers available from most branches.

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9am.-1pm Sat

Leeds *(0532) 350606*
SMC Northern. Nowell Lane Ind. Est. Nowell Lane, Leeds LS9 6JE.
9am.-5.30pm. Mon-Fri
9am.-1pm Sat

Chesterfield *(0246) 453340*
SMC Midlands, 102 High Street, New Whittington Chesterfield,
9.30am.-5.30pm. Tues-Sat

Birmingham *021-327 1497*
SMC Birmingham. 504 Alum Rock Road, Alum Rock, Birmingham B8 3HX.
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YAESU FT290

FT290R II £395
2 METRE TRANSVERTER
TOKYO HX240 Transverter £229
WITH AUTO SWITCH £249

With the HX 240 feed in 3 to 10 watts on 2m and transmit on 10-15-20-40 or 80 with 40 watts output.

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Probably the most versatile dual band hand held available!

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Packed with so many features that we haven't the room to list them all. But we will try a few:

Full Duplex
Dual Receive
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RECEIVE 130-175
330-470
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OPTIONS: CTCSS

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STAR ITEM

THE AMAZING ICR1

Scan Receiver now at a new amazing price!

PHONE FOR BEST PRICE!

Frequency range 100kHz to1300MHz no gaps AM or FM Also available on easy terms.

Other Scanners Available - JUPITER II FAIRMATE UNIDEN

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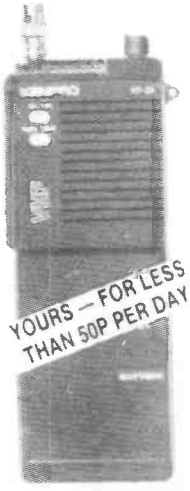
Now a 2 Metre Hand - Held transceiver made by Kenpro. Model KT22E for **£139** inc. VAT

Package includes NICAD pack charger and antenna.



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Educational Software for Basic Electronics - Part 4

These two programs, by J.T. Beaumont G3NGD, demonstrate the principles of frequency modulation and logic gates.

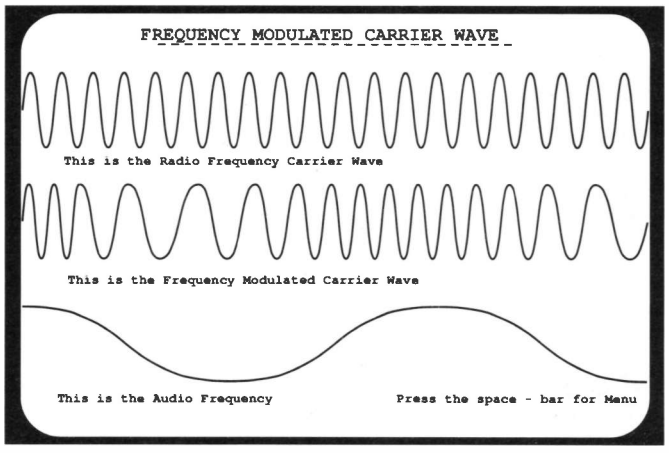


Fig. 4.1.

To obtain the programs described in Part 4, send a 5.25in disk and mailer, together with two 1st Class stamps, to the Editorial Offices. We will copy the relevent programs onto your disk and return it. Later on this year a set of disks will be available containing all the programs described in this series. However, if you cannot wait then send your disk now. Please note that we are only able to provide programs for the BBC computer.

The first program (P6) shows the principles of frequency modulation. It could be used together with Program P4 (Part 2, February 91) to show the difference between amplitude and frequency modulation.

When the program is RUN, a 'screen menu' lists three options:

1. A demonstration of frequency modulation,
2. An explanation of modulation index.
3. Exit from the program.

At the start of the demonstration, a radio frequency carrier wave is drawn on the screen, followed by an audio frequency waveform. These two waveforms are then mixed together and the resultant waveform is plotted on the screen. This is shown in the screen example **Fig. 4.1**.

It will be seen that the frequency of the carrier wave slows down during the negative half-cycles of modulation and speeds up during positive half-cycles.

Logic Gates

A logic gate is a circuit which allows a signal to pass through when it is open but stops the signal when it is closed. The gates in this program are the simplest types and have only two inputs.

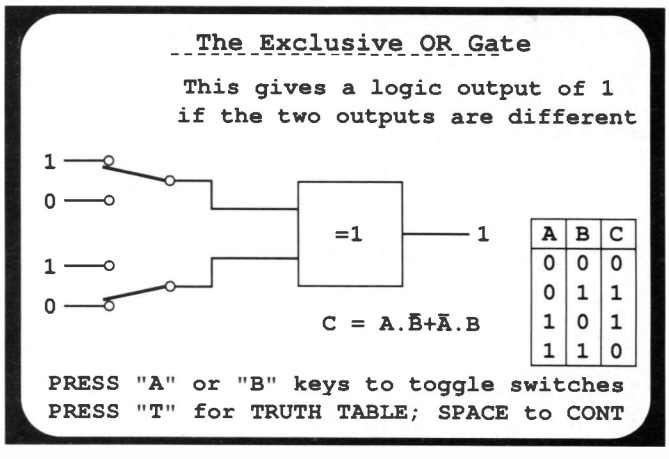
When the program is RUN a menu of options is listed on the screen:

1. Introduction.
2. The AND gate.
3. The OR gate.
4. The NOT gate.
5. The NAND gate.
6. The NOR gate.
7. The exclusive OR gate.
8. The exclusive NOR gate.
9. Exit the program.

The program is designed as a self-learning tutor' and the student can open and close the gates directly from the keyboard. On pressing the letter 'T', a 'Truth Table' is printed on the screen so that students can check their answers (**Fig. 4.2**).

It should be noted that the logic symbols used in this program are drawn the BS3939. This is as called for in the CGLI Electronics Servicing Course 224 syllabus. It is also important that students learn the US MIL-Specification symbols as, although not used by City & Guilds in their examinations, are used by industry. ■

Fig. 4.2.



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BEARCAT 760XLT

New Model with 900MHz Coverage

With 100 memory channels and coverage of the UHF band, the 760XLT is ideal at home or in the car. Pre-programming of preset bands is possible for fast access. Freq. Coverage 66-88, 136-174, 406-512 MHz) **£235**

BEARCAT UBC 175 XLT

(16 CH. Memories) An economical base scanner covering all the popular aircraft, marine and public service bands. Coverage 66-88, 118-174, 406-512 MHz **£169.99**

BEARCAT UBC 200 XLT Handheld

Top of the range handheld easy to use and very sensitive. Features 200 memory channels, ideal for civil airband, marine, pmr and 900 MHz. UHF band. (Coverage 66-88, 118-174, 406-512, 806-956 MHz) **£229**

BEARCAT UBC 100 XLT

Baby brother of the 200XLT with the same performance but only 100 channels of memory – ideal for airband reception. Coverage 66-88, 118-174, 406-512 MHz **£199**

The 100 XLT and 200XLT handhelds feature removeable battery packs for easy charging - and have proved popular because they are simple to operate giving excellant performance and reliability.
SPARE BATTERY PACK.....£29.95

ASA DIGITAL AIRBAND RADIO

This new low cost receiver is designed for aviation enthusiasts featuring a digital display for accurate reception and tuning. Coverage: 85-108MHz FM, 118-136MHz AM, 162-165MHz weather, 520kHz-1.6MHz **£59.95**

MASTHEAD ANTENNA SWITCH

For Scanning Enthusiasts select 2 antennas at the masthead remotely from one cable. Frequency: DC to 1.3 GHz Connectors-'N' Type **£49.95**

SONY RADIOS

We are the main short wave stockist

Sony ICF SW1E Short Wave + VHF, world's smallest s/wave radio **£149.95**

Sony ICF 2001 D (150kHz-136MHz)..... **£275**
Sony ICF 7600 D Pocket s/wave s/hand. **£99**
Sony Air 7 airband h/held..... **£229**
Sony Pro 80 wideband h/held..... **£299**
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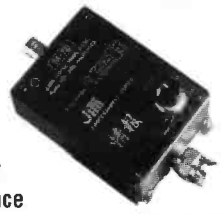
Lowe HF225 (30kHz-30MHz)..... **£429**
Kenwood R2000 (150kHz-30MHz) 10 memories..... **£595**
Kenwood R5000 (100kHz-30MHz) 100 memories..... **£875**
ICOM R71E (100kHz-30MHz) 32 memories..... **£855**
ICOM R9000 (100kHz-2GHz) 1000 memories..... **£3995**

LOW NOISE PRE-AMPLIFIERS

MODEL M75



For base and handheld scanners.
- **25—2100 MHz**
- **Low noise GaAs FET**
- **Selectable filters for improved performance**
- **Variable Gain Control £69.95**

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

MODEL M100

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

MODEL M50

NEW

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

AOR SCANNERS

AR 3000 wideband scanner 100 kHz to 2036 MHz with no gaps!Now available **£765**

AR 2002 popular base scanner with coverage 25-550 MHz, 80-1300 MHz and 20 memory channels **£487**

AR 2800 NEW MODEL
500 – 600 MHz, 805 – 1800 MHz
All modes available shortly.
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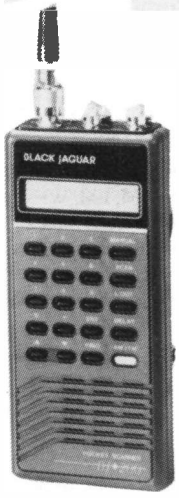
BLACK JAGUAR MkIII



Independantly tested by a European magazine, the Black Jaguar was found to be the most sensitive handheld scanner on the market! That probably explains why it is still so popular.Features include 16 channel memories, selectable AM/FM and the facility to power the set from the mains/car using one of the many accessories now available. Covers civil and military airbands plus lots more! Frequencies: 28-30, 50-88 MHz, 115-178 MHz, 200-280 MHz, 360-520 MHz. **£199**

BLACK JAGUAR ACCESSORIES
(SUITABLE FOR ALL MODELS, BJ200, CHALLENGER ETC.)

Mobile Mount **£6.95**
Base Mount **£5.95**
BJ1 Car Supply (Mk111 version only) **£14.95**
BCA6 Mains Slow/Fast Charger **£14.95**
Airband Rubber Duck Ant **£6.75**
SA7 UHF Stub Antenna **£5.95**
Telescopic Antenna **£6.75**
BCA3 Mobile Antenna Charger **£14.95**

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Essential for optimum performance with wideband UHF scanners. We have directly imported this cable which has exceptional low loss and is good for frequencies up to 3 GHz. Loss at 1 GHz for 10 mtrs is 1.3 dB
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VT 125 AIRBAND RECEIVER

A small but sensitive airband radio that is set to take off in the UK!
* Covers 108 – 142MHz
* 30 Memory Channels
* Priority Monitoring
* Pass and Delay Functions
* Supplied with UK Charger

NEW
• 25/50 kHz Channel spacing version **£179**

ICOM NEW

We are ICOM specialists and carry the complete range in stock including these NEW models:-

IC-R1 The new miniature wideband handheld scanner that covers 150 kHz to 1300 MHz with 100 memories and many features..... **£399**

IC-R100 Mobile or base extra wideband scanning receiver covering 500 kHz to 1.8 GHz with 100 memory channels and reception of AM, FM, WFM **£499**

IC-R72 A new HF communications receiver covering 100kHz to 30MHz. Receivers SSB/AM/CW with FM board as optional extra 99 memory channels and 10dB pre-amp fitted as standard **£645**

IC-R7000 ICOMS Most popular communications receiver. Covers 25 MHz to 2 GHz with 99 memories and all mode reception **£925**

Call Paul our ICOM specialist for details of other ICOM amateur radio products we stock - or for details of the latest models and prices.

BOOKS

Short Wave Confidential Freq List **£8.95**
VHF/UHF Frequency Guide **£5.95**
Marine Frequency Guide **£4.95**
VHF/UHF Airband Guide **£3.50**
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Scanners II by P. Rouse **£7.95**
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Flight Routings Guide 1990 ..... **£4.95**
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Nevada WB 1300 discone (25-1300 MHz) Stainless steel top of the range 'N' type connector **£49.95**
CTE Micro Scan (180-1300 MHz)
New low cost ground plane **£12.00**
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Magnetic Mount **£27.90**

DIAMOND D707 ACTIVE ANTENNA

(500 kHz – 1500 MHz)
A superb base antenna with 20dB pre-amp. Approx 3.5ft fibreglass with mounting kit **£99**

FAIRMATE

As the UK distributor for Fairmate we are constantly working with them to update and produce new features and models.

This month we can announce the arrival of the new
FAIRMATE HP200
1,000 CH Scanner exclusive to Nevada dealers!
Freq Range:- 500 kHz – 600 MHz
805 MHz – 1300 MHz
Modes:- AM – FM – Wide FM
A improved version of the HP100E
The new HP 200 has superior performance and stability.
Accessories included as standard are:- **£269**
*VHF Antenna *UHF Antenna *Telescopic Antenna
* UK spec. DC charger/adaptor
* Earphone * Carrying case
NOTE: Sensitivity below 2 MHz:- 10μV for 20 dBQ 60% Mod. AM

NEVADA MS1000

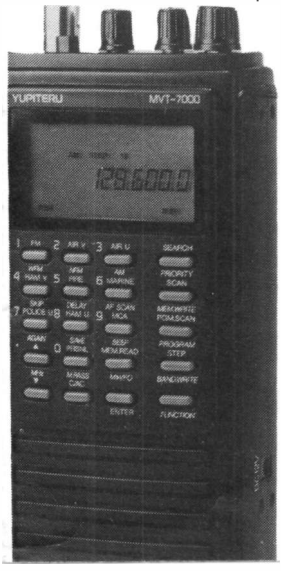
The worlds first 1,000 channel mobile scanning receiver. Modes:- AM – FM – Wide FM
Freq Range:- 500 kHz – 600 MHz
805 MHz – 1300 MHz

NEW FEATURES
* Switcheable 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**

UNIVERSAL SCANNER BASE UNIT PSU101 MkIII

A mains operated unit which will both charge and power the handheld scanner. Complete with convenient desktop stand for use at home. Suitable for the following models:-
Fairmate HP100E,Yupiteru, AOR 1000, ICOM 1C-R1, Uniden BC 50XL, Uniden BC 55XL, Uniden BC 70XLT, Realistic PRO 38,Uniden 200 XLT, Uniden 100 XLT.
£29.50 **NEW VERSION**



MVT 5000 HANDHELD

This handheld has received many rave reviews we found it particularly sensitive at 900 MHz. Features include 100 mem. channels coverage (25-550 MHz, 800 - 1300 MHz) Supplied complete with all accessories and full 1 year guarantee. **£249**
Includes express delivery

MVT 6000

Base/mobile version of the MVT 5000 handheld. Supplied with all accessories..... **£299**
Includes express delivery

NEW MVT 7000 HANDHELD

8–1300 MHz continous coverage – multi-mode. am/fm/wfm. 200 channel memory - very sensitive.S meter **£289**

NEW 1991 CATALOGUE JUST RELEASED SEND IN £2 FOR YOUR COPY (Includes £2 Voucher)

A Small Power Supply for Valved Receivers

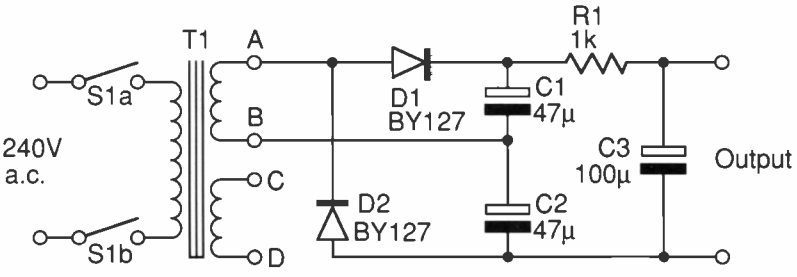
Chas Miller needed a small power supply unit to provide the high tension and low tension voltages for his simple valved receivers. This is the design that he came up with.

This small power supply unit provides around 50V - 60V high tension and various low tension voltages for a number of simple one or two-valve receivers I have built in the recent past. It is designed around a mains transformer of the type used in hybrid, colour TV receivers to provide a 25 - 30V source for the transistors and perhaps 6.3V for the c.r.t. heater as well. Such transformers are widely obtainable from scrap sets. The 25V or 30V secondary is used with a voltage doubling rectifier and smoothed by the conventional resistance-capacity method. For my own units I use a valve rectifier but the circuit diagram shows a couple of BY127s solid-state diodes instead. The reservoir and smoothing capacitors need to be rated at no more than 100V d.c.

Voltage Doubler

The action of the voltage doubling rectifier is quite simple although it may appear unorthodox. The positive-going swings of the secondary voltage will charge C1 through D1, then the negative-going swings will charge C2 through D2. As these two capacitors are in series the voltages developed across them are effectively added together. The output voltage is taken off from the positive side of C1 and the negative side of C2. Whether or not the output is truly double that of the secondary voltage depends on a number of factors - especially the load placed on the output. But in general, using solid-state rectifiers it will be around, or even a little above, the nominal.

Fig. 1: Circuit diagram of the power supply.



Heater Supply

If the transformer possesses a 6.3V winding, originally used for the c.r.t. heater, this can be used to power the filaments of the valves. Otherwise they are connected across points A and B in conjunction with a suitable dropping resistor. For the 955 valve, which requires 6.3V at 0.15A the resistor is found by taking the difference between 6.3V and the voltage across points A & B and dividing the result by 0.15. (Ohms Law states that V/I = R.) For instance, for a 25V secondary the resistor needs to be 18.7/0.15 = 125Ω. The power rating (wattage) of the resistor is found by multiplying the voltage across it by the current passing through, so that in our example 18.7 x 0.15 = 2.8. In practice a 3W resistor would be used.

Construction

The type of construction used will depend to a large extent on the components used. The diodes, capacitors and resistor could be mounted on a tagboard which, together with the transformer, should then be fitted into a suitable box. ■

YOU WILL NEED

Resistors
Carbon film, 0.25W, 5%

1kΩ	1	R1

Capacitors
Electrolytic, 100V axial leads

47µF	2	C1, 2
100µF	1	C3

Semiconductors
Diodes

BY127	2	D1, 2

Miscellaneous

Mains transformer (see text); Tagboard; Box.

Abbreviations

A	amperes
c.r.t.	cathode ray tube
d.c.	direct current
V	volts
W	watts
Ω	ohms
µF	microfarads
%	per cent

PLEASE NOTE THAT FROM NOW ON WE WILL ACCEPT PHOTOCOPIES FOR COMPETITION ENTRIES BUT YOU MUST ENCLOSE THE CORNER FLASH AT THE BOTTOM OF THIS PAGE, CUT FROM YOUR ISSUE, AS PROOF OF PURCHASE.

WIN ONE OF THESE! AN EASY STEP BY STEP VIDEO CONSTRUCTION GUIDE TO ELECTRONICS, KINDLY DONATED BY MAPLIN ELECTRONICS.

WORDSEARCH COMPETITION

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T	P	O	F	R	Q	U	A	R	A	N	I	R	O	A	N	G
U	F	N	M	G	Y	T	C	D	K	N	E	M	R	I	C	R
W	C	S	W	T	C	U	I	B	O	K	P	E	R	A	D	R
N	E	T	A	H	I	O	J	R	A	O	T	E	P	E	L	T
I	Z	R	M	T	K	I	T	E	N	S	D	A	D	U	B	R
L	J	U	S	J	V	C	P	E	E	L	C	W	L	D	B	A
P	O	B	E	M	E	S	N	Y	O	I	R	T	I	X	B	N
A	O	T	W	L	D	T	L	S	T	K	S	U	U	G	E	S
M	E	O	E	U	S	O	N	O	H	S	I	K	B	A	U	I
M	D	R	O	J	P	C	R	A	N	F	W	S	N	B	L	S
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A	V	T	O	U	N	B	R	E	C	E	I	V	E	R	A	O
S	R	O	T	S	I	S	E	R	V	N	P	A	L	T	I	R
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This month we have one of our occasional competitions open to all readers. As prizes we have two of the latest Electronics Starter Kits kindly donated by Maplin Electronics. These normally retail at £11.95 each, so they are well worth trying to win.

The Maplin Electronics Starter Instruction Kit is a complete educational 'build-it-yourself' kit with step-by-step instructions on a VHS video cassette. Designed to assist the inexperienced hobbyist and school classes to construct a working radio receiver which can power a loudspeaker, the kits are complete with all the parts needed to build a medium wave t.r.f. (tuned radio frequency) reflex loudspeaker radio. All you need in addition to the kit are tools and a PP3 battery. If you do not have the necessary tools then Maplin's Electronics Starter Tool Kit, containing cutters, pliers, screwdrivers, desoldering tool, soldering iron with a stand and 5m of solder, is available from Maplin Electronics for £19.95.

To enter the Competition all you have to do is mark the twenty different 'radio' words which have been hidden in the letter grid. They have been printed across (forwards or backwards), up and down or diagonally, but they are always in a straight line without odd letters in between. You can use the letters in the grid more than once for different words, and they're not all used. Once you have found all Twenty words, mark them on the grid and send in your answers.

Send your entry to PW Publishing Ltd., April 1991 Wordsearch Competition, Enefco House, The Quay, Poole, Dorset BH15 1PP. Closing Date last post received Tuesday 30 April 1991. The Editor's decision on the winner is final, no correspondence will be entered into.

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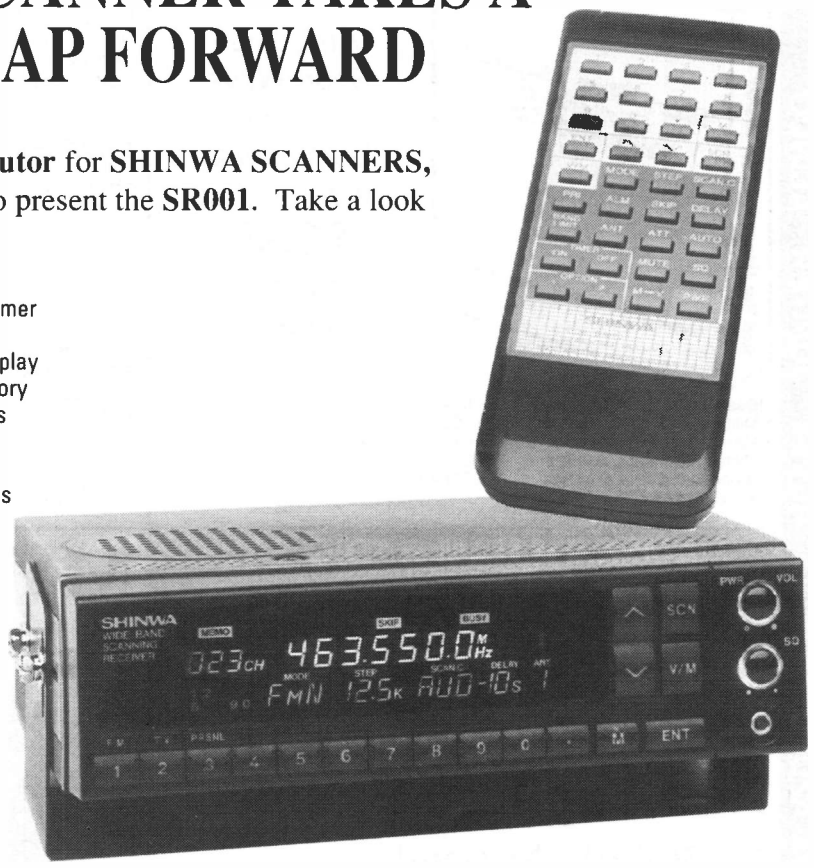

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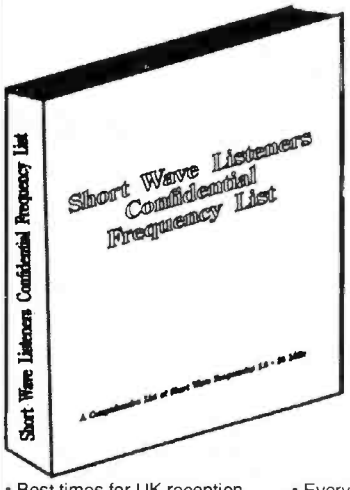

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Ladies on the Key

The idea of a female hand on a Morse key seems remote nowadays, the gentle sex were well represented in the early days of telegraphy. Stan Crabtree G3OXC looks at the part played in the development of telegraphy.

Training telegraph operators on the buzzer. From* The Wireless World *February 1916 courtesy GEC - Marconi Ltd.

The position of telegraphist for a lady was accepted in the best circles during the male dominated period which saw the start of telegraphy and usually taken up by unmarried 18-30 year olds who might well be the daughters of clergymen or government clerks. The hours were long - often a 9-10 hour day, six days a week - but the wage of around 30s (£1.50) per week was relatively high when compared with other occupations.

The Electric & International Telegraph Company are on record as employing some 200 women operators in their offices in Moorgate between 1855 and 1868. After six weeks training, they took a test at 6w.p.m. and failure meant dismissal. Many experienced ladies were capable of 27w.p.m. A commentator at the time described them as 'admirable manipulators of instruments'.

In America, the use of women as operators on commercial and railroad telegraph circuits was quite common. Miss Anna Nevins left Western Union in 1906 to take up an appointment at wireless station 'NY', installed at the top of 42 Broadway, New York. She later transferred to 'WA' which was established on the upper floor of the Waldorf Astoria Hotel. Both these stations served as early marine coast stations on the East Coast of the USA, exchanging traffic with the North Atlantic liners calling at New York. Miss Nevins settled in quickly and soon gained a reputation as a clean and fast operator. At this time 'American Morse' was used - some eleven characters of the code differing from the 'Continental' version. American Morse was used at sea between US ships until 1912.

Ladies at Sea

Western Union was also the source of what was probably the first lady sea-going wireless operator. Miss Graynella Packer had two years experience on land line telegraphy behind her when she joined the United Wireless Company in 1910 at the age of 22. There were no licence requirements in force at this time, but a seven-week course at the Company's New York training school was sufficient for her to grasp the rudiments of spark operation and adjustment.

Miss Packer made her first voyage as a professional operator on the Clyde Lines flagship SS *Mohawk* on 29 November 1910. With 300 passengers on board for the voyage from New York to Charleston and Jacksonville, she was kept very busy. As her town was Jacksonville she presented good copy to local newspapermen who clamoured on board at the ship's arrival at the southern ports. She was reported as having been attracted to the post of shipboard operator by the heroism of Jack Binns, celebrated operator of the White Star Liner *Republic* when in January 1909 the vessel was rammed in thick fog by the Italian freighter *Florida*. Miss Packer's career at sea was brief and she left maritime life a year later, possibly due to the publicity that seemed to follow her on her ocean travels.

During a strike of cable company telegraphers in 1911, a few women gained seagoing appointments of the West Coast of America. Miss Edith Coombs sailed from Seattle on the SS *Roanokes* and a Miss Tucker is recorded as having served on the SS *Indianapolis*. When the question of Miss Coombs remaining at her post in the event of an accident was raised she insisted that the passengers would not need to worry as to their safety on her account. Interviewed at San Francisco prior to returning to Portland she stated she would remain at her duty post until 'the last flickering spark of electricity' could be transmitted from the ship. If necessary, she declared the intention of remaining on board with the Captain until the last soul had been rescued. The expression 'ladies first' would not apply to Miss Coombs!

The possibility of women serving as wireless operators on British ships had apparently been put forward. A paragraph in *Marconigraph* of July 1912, undoubtedly outlining the Company's view, reported:

'The question of employing ladies to act as relief operators on liners has recently been alluded to in the Press. That women have not been employed in this capacity has nothing to do with efficiency; it would be a physical impossibility for women to do such work. The life of an operator at sea is scarcely a suitable one for a woman'.

In contrast was the situation on the other side of the Atlantic. With the appointment of Miss Mabel Kelso as wireless operator to the liner *Mariposa* at San Francisco, a question was raised in the US Congress as to whether a woman should be entrusted with the protection of lives in this responsible position. The Department of Commerce & Labour at the time of the appointment held that there was nothing in existing law to stop women being in charge of wireless telegraphy apparatus.

In 1913, some 30 women are recorded as being licensed and serving as operators on vessels trading between San Francisco and Seattle. The ladies had to develop new sending techniques at sea. On landline circuits they had been accustomed to using the semi-automatic 'bug' key, originated by Horace Martin at the turn of the Century to ease the 'glass arm' complaint of telegraphers. With the early marine wireless equipment, large 'pump handle' types were essential to handle the often high currents being keyed.

War

Whilst many women continued as landline telegraphists in the British Post Office, there is no record of them working on wireless circuits in the United Kingdom at this time. The situation changed with the outbreak of World War I.

Early in 1915, the Women Signallers' Territorial Corps were formed and described in the London *Standard* as 'undoubtedly the most

effective of all the semi-military organisations of women'. When the contribution of wireless was more fully appreciated, arrangements were made early in 1916 for women in the Signallers' Corps to attend the East London Wireless College for instruction in wireless telegraphy. The Marconi Company provided apparatus to enable the ladies to undertake regular practice and familiarisation with wireless methods of working. In the jingoistic atmosphere of the period, the stated aim of the Corps was to 'link up every town and village throughout the Kingdom and to release men for the firing line'. They were also to be prepared to act as instructors to men in the services destined to become wireless operators in the front line. The authoritarian attitude by the Government at this time may well have sown the seeds of the Suffragette Movement. As an example, "The habits of discipline and co-operation inculcated by the (wireless) training should prove invaluable in fitting them (the women) to take their share of responsibility in the present crisis'.

Whether or not they took up positions is not known, but the first ladies to qualify and be certified as wireless operators in Great Britain in 1913 are recorded as Miss Parker of London, who later became the wife of a naval officer, and Miss Turnbull of Innellan, Argyllshire. A Miss A C Raine received wireless training at the North British Wireless School, Glasgow and was reported to 'have carried out important wireless duties' during WWI.

Special Duties

In 1917, there is a report of a 'number of young ladies' performing special duties at 'one of the great wireless stations in Wales'. This was probably at the trans-Atlantic receiving station at Towyn. This location also served as the keying centre for the high-power transmitter at Carnarvon which came into operation in March 1914.

Also in 1917 was the news that in the United States, Miss Maris Dolores Estrasa had passed an examination for the highest class licence then awarded by the Department of Commerce - the first lady to receive a First Grade Commercial Wireless Operator's Licence. Miss Estrada must have been quite a lady. Born in Zacatecas, Mexico in July 1890 she graduated as a telegraphist at the age of 15. She soon reached the rank of Chief Telegraphist and moved between various telegraph offices. She was at Villanueva when the first Mexican Revolution broke out and joined the staff of the leader, Madero. When he triumphed, she was appointed in charge of the Mazapil Telegraph Office. During later turmoil in the country she was less fortunate. In 1913, having this time chosen the losing side, she ended up in jail with her mother. After being released and enjoying further adventures she went to the United States in 1916 to study English. She later obtained her wireless licence in five months.

Nell Corry G2YL operating on the key.

Male Chauvinism

Wireless World spoke with the voice of the male chauvinist in an editorial in March 1918. Commenting on the rumours that other countries were training women as wireless operators it left no doubt as to the Marconi Company's view: 'Operators were training not so much to decorate a "painted ship upon a painted ocean' as to sit calmly and unruffled at their posts when face to face with death and disaster'. It pointed out that with few exceptions, 'the feminine temperament is an uncertain factor in times of emergency. Although proving an excellent student in wireless school there was always the likelihood of the natural weakness revealing itself at a critical moment'. It ended rather magniloquently with 'to introduce women (for wireless work) on board would be unfair to womankind and the mercantile marine'.

Social behaviour in confined Britain could in no way be compared with that of the wide open spaces of the North American Continent and the Americans' outlook on life and leisure activities. Prior to 1912, due chiefly to the lack of licensing regulations in the United States, early amateur wireless operation had escalated and many of these enthusiasts were female.

The process of 'courting' was frequently undertaken by young Americans with the aid of keyed spark transmitters, often to the annoyance of commercial stations with which they frequently interfered.

In Britain at this time, the role for women, in all but the upper classes, was very much in the home and taken up with often hard and certainly dreary domestic duties. The first reported female to be active as an amateur in the UK was Miss Barbara Dunn in 1928, although it was not generally known until 1930 that, in fact, a lady was at the key of G6YL. She was followed five years later by Miss Nell Corry G2YL. Mrs C E Ingram of Ilford, Essex is on record as being granted an experimental (amateur) licence before WWI and issued with the callsign 'IXI'. But this may well have been because of business interests and her association with Ingrams' Commercial and Wireless School.

Moving Ritual

A rather moving ritual took place at the BT radio station at Highbridge, Somerset (better known as Portishead Radio) early in 1988. Ms Hilda Whittle, who joined the Post Office to train as a telegraphist in 1916 was invited to tour the station and during her visit, allowed to exercise her prowess at Morse. Armed with paper and pencil she sat alongside a radio officer at a Teletype computer terminal and copied a message in Morse code from a container vessel. She was surprised to find the message addressed to herself and delighted to find it had been pre-arranged and congratulated her on seven decades of knowledge of the Morse code. Until 1928 she had been taking down telegrams onto a pad with a pencil.

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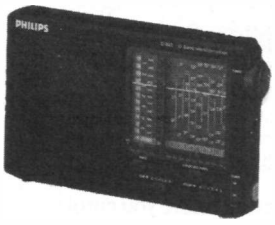

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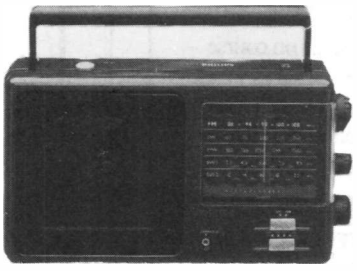

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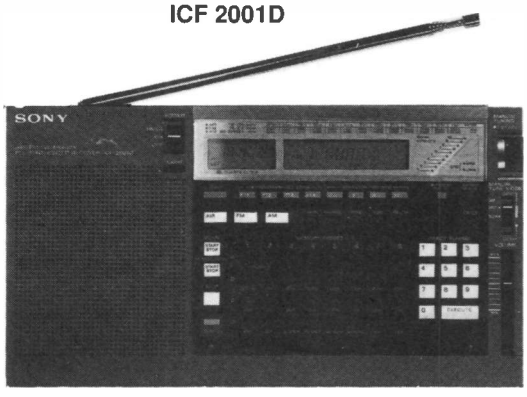

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Philips DC777 SW Car Radio

It's not very often that a car radio gets a review in this magazine. But the new DC777 from Philips, reviewed here by John Waite, has a few special features.

This new car radio/cassette from Philips features the normal long, medium and v.h.f. coverage. What makes this model particularly interesting is the provision of eleven short wave broadcast bands. Although this may seem an odd feature to include in a car radio, it's likely to be of great interest to anyone who travels widely.

Besides the short wave facility, the DC777 has all the features you would expect to find in a modern car radio, including a security code. So let's take a more detailed look at this interesting receiver.

Installation

Perhaps one of the most important aspects of a car radio is that it must fit into a standard housing. You may be thinking this is a strange point to put first, but ease of use is vital for a receiver such as this. With most modern cars, the only place a radio could be mounted is in the slot provided, so there's not usually any choice. You'll be glad to hear that the DC777 has been designed to fit into a standard 182 x 53mm dashboard housing. According to the manual, there are specialised mounting kits available to suit some of the more popular models. When installing the DC777, using the supplied mounting hardware, you first need to secure the metal sleeve to the dash. This gives the main support for the receiver, though in some cases you may have to fit an optional rear support bracket.

Electrical connections were made using a standard car antenna socket and four multi-way plugs and sockets on the rear panel. The connection options provided were very comprehensive and should suit just about every possibility. One of the four sockets was used to carry the various power supply connections and was supplied with a matching plug and screw terminal connectors.

Besides the basic supply, there were two switched outputs from the DC777. One of these was for connection to an electric antenna, while the other could be used to power auxiliary equipment. This could perhaps be a slave amplifier or active speaker system. The great advantage of this system is that the power to all parts of the system is controlled from the on/off switch of the DC777. A further refinement was provided as a night illumination lead. This could be connected to the instrument lighting circuit of the vehicle so that the DC777 lighting came on at the same time as the vehicle dashboard lights.

Moving on to the audio connections, these were equally versatile. The DC777 could be configured to drive either two or four speakers by selecting the appropriate connections from the supplied lead. The impedance requirements of the speakers was the standard 4Ω, so should present no problems. Besides the speakers, there was another 7-pin socket on the rear panel. This carried the line outputs for connection to a graphic equaliser or slave amplifier. Although there was no plug supplied for the line out socket, it was available as an optional extra.

With all the connections made, installing the DC77 was simply a case of sliding it into the mounting sleeve. One of the beauties of this system is that removal is equally simple. Philips had even included a pair of handles to simplify the removal. This ease of removal is great from the security point of view. The user is encouraged to remove the radio if the vehicle was being left unattended for a length of time.

To help deter theft, the DC777 is fitted with a security code feature. This is a clever, but simple, system that should prove very effective. The way it works is that a security code is supplied with the radio - Philips call it a 'passport'. Once the security code feature has been enabled, a four-digit code has to be entered whenever the main power supply has been interrupted. In practice, this means the code has to be used after the DC777 has been removed from the car. Until the correct code had been entered the receiver remains silent. I must say it's good to see a large equipment manufacturer taking security seriously and providing the motorist with some positive help. With the

installation complete it was time to take a close look at the DC777's range of operational features.

Ingenious

One problem facing car equipment manufacturers is the limited front panel space afforded by the standardised car radio slot. Because of this, a fair degree of ingenuity is required when incorporating short wave bands.

The first example of this on the DC777 is the multi-function volume, fader, balance, treble and bass control. This is all handled by combining one rotary control with a touch button. This control normally acts as a conventional volume control. However, when the AUDIO button is pressed, its operation cycles through the four other modes. An indication of the current mode is given by the display showing FAD, BAL, LO or HI. To keep the operation as simple as possible for the driver, this control automatically reverts to volume if it remains unoperated for ten seconds. You could also quickly silence the radio by pressing the MUTE button.

The short wave enthusiast will be pleased to hear that the frequency selection options were very comprehensive. The basic system employed is search tuning which, as the name implies, causes the radio to search for stations. The way it works is that you select the appropriate band and then press the < or > button to start the search. The radio then stops at the first signal that exceeds its detection threshold. The search can be continued by repeated pressing of the buttons. This is an effective system for in-car use as the radio does the work rather than the driver. There was also the option to use the < and > buttons for manual tuning. This was particularly useful if you wanted to listen to a station that was too weak for the search to pick up.

The short wave listener will find the direct frequency entry extremely useful. Access to this function is rather ingenious and involves the release of a fold-out, numeric key pad from the front panel. Selecting a frequency is simplicity itself - you just enter the frequency in kHz followed by the E key. The only problem with this mode is that it's really not suitable for operation whilst driving. One solution is to utilise the DC777's forty-five pre-set memories. These are arranged as five memories on each of the long, medium and v.h.f. wavebands, with twenty available for short wave. This is backed by a further ten auto-store memories that are only available on v.h.f. and medium wave. The auto-store memories are likely to extremely useful for the traveller as, when activated, they automatically search and store the five strongest stations in special memories. These stations can then be recalled at the press of a button. That completes the tuning options, but the DC777 has plenty of other interesting features.

Cassette Player

Besides being a very capable short wave receiver, the DC777 includes an auto-reverse cassette player. Operation of the cassette deck is very simple and included the usual forward and reverse winding. In addition to automatically reversing direction at the end of a tape, the direction could be reversed at any other time at the press of a button.

Other features included were a digital clock and three timers. These timers could be set to operate to any of the memories. I must admit though, I was at a bit of a loss to think of a practical use for these timers!

Performance

Rather than just look at the on-air performance I took the opportunity to carry out a few measurements. The first test was to check out the DC777's sensitivity. These tests showed some very good results throughout the DC777's range. The short wave bands turned in a best sensitivity of 0.5µV for 12dB SINAD at 9.5MHz while the worst case was 1.5µV at 21.45MHz. Moving on to the medium and long wave, these were equally sensitive and more than adequate for the task. The v.h.f. sensitivity also proved to be very good at 1.0µV for 12dB SINAD.

Test Results

I next looked at the distortion of the recovered audio signal. This proved to be good with long, medium and short wave giving distortion levels of less than 1%. As expected the v.h.f. distortion was significantly lower at 0.3%.

With the measured results looking good, I turned my attention to evaluating just what the receiver was like to use. I was particularly impressed with the performance of the search tuning feature. I have seen many implementations of this and most suffer from an inability to exclude interference.

Because of these failings the search is rarely effective on the more congested bands. Philips seem to have cracked most of the problems and the DC777's search performance was excellent, even on busy short wave bands. There was no indication of the technique used, but it really was effective.

The Auto Store also worked extremely well and was particularly useful when travelling outside your normal area. In my home area, the search and store routine took about thirty seconds to complete.

The direct frequency entry was another good point, though in practice, it could only be used whilst stationary.

Specification:

Frequency Range	
v.h.f. (f.m.)	87.5 - 108MHz
l.w.	144 - 288kHz
m.w.	531 - 1.629MHz
s.w	
90m	3.2 - 3.4MHz
75m	3.95 - 4.0MHz
60m	4.75 - 5.06MHz
49m	5.95 - 6.2MHz
41m	7.1 - 7.3MHz
31m	9.5 - 9.9MHz
25m	11.65 - 12.05MHz
21m	13.6 - 13.8MHz
19m	15.1 - 15.6MHz
16m	17.755 - 17.9MHz
13m	21.45 - 21.85MHz
Audio Power	4 x 7W or 2 x 20W (into 4Ω)

Summary

The Philips DC777 is certainly a very capable mobile radio/cassette unit with an impressive range of well thought out features. The inclusion of short wave coverage adds extra interest and gives it the edge over many others. The performance and operational feel of this model was really very good and well up to standards required. The DC777 should have appeal strongly to anyone who travels widely.

The Philips DC777 can be purchased from any authorised Philips outlet and is priced at £299.99.

Thanks to Philips UK for the loan of the review model. ■

SWM SUBSCRIBERS' CLUB

If you have a subscription then you will know about the *Short Wave Magazine* Subscribers' Club. If you do not have a subscription then doubtless you will be wondering just what this new page is all about. Membership of the *SWM* Subscriber's Club is free and automatic for all Subscribers and is our way of saying thank you to all those who have enough faith in their favourite magazine to pay for it 'up front'. Each month there will be Special Offers and occasional competitions with some really useful prizes to be won.

This month we have two special offers for *Short Wave Magazine* Subscriber's Club members. Godfrey Manning has often mentioned videos of aircraft subjects in his 'Airband' column and two titles which he particularly likes are *Wings at War,* capturing the story of military air power from World War 1 to Vietnam, and *Wings: The Jet Age,* the story of the jet aeroplane using a unique blend of archive and original material to trace the path of progress to the modern supersonic aircraft.

As a member of the *Short Wave Magazine* Subscriber's Club you can obtain your own copy of *Wings at War* for £12.25 and *Wings: The Jet Age* for £9.50. Both prices include VAT and Post & Packing.

The closing date for this special video offer is 31 May 1991. Please mark your orders SWM Subscriber's Club April, PW Publishing Ltd., FREEPOST, Enefco House, The Quay, Poole, Dorset BH15 1PP.

This offer is limited to one copy of each video per subscriber and your order must be accompanied by your Subscriber Number or a subscription order using the form printed below. We regret that only *SWM* Subcriber's Club members can apply.

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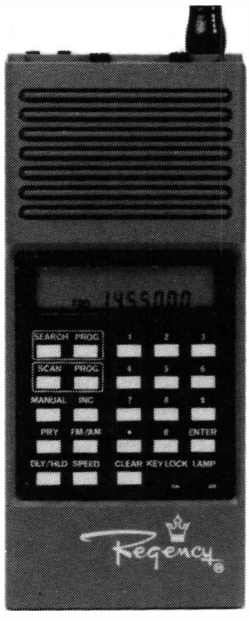

BAND: 118-136MHz (Aircraft)
MODE: AM
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INCREMENT: 12.5kHz

BAND: 138-174MHz (VHF High)
MODE: FM
REC.
INCREMENT: 5kHz

BAND: 406-490MHz (UHF)
MODE: FM
REC.
INCREMENT: 12.5kHz

BAND: 490-512MHz (UHF "T")
MODE: FM
REC.
INCREMENT: 12.5kHz

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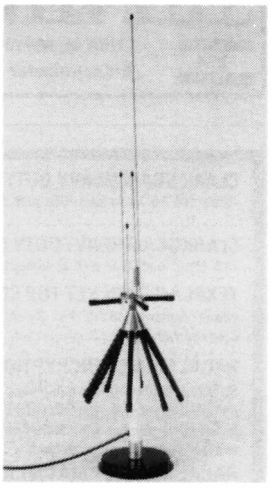

Built and designed for use with scanners. Coverage: 25 to 1300MHz Total height - 36ins - 9ins at widest point. Comes complete with 4 metres of RG58 coax cable and BNC connector fitted. Ideal indoor - high performance antenna and can also be used as a car antenna when your car is static. REMEMBER YOUR SCANNER IS ONLY AS GOOD AS YOUR ANTENNA SYSTEM!

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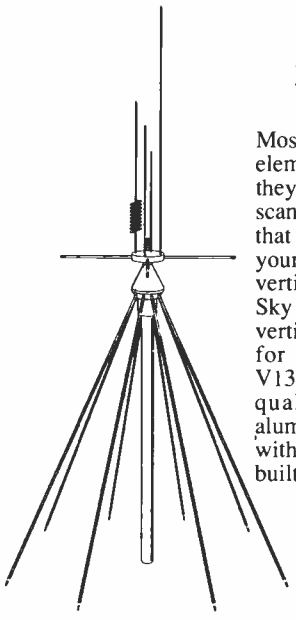

Most discones only have horizontal elements and this is the reason that they are not ideal for use with a scanner. Most of the transmissions that you are likely to receive on your scanner are transmitted from vertically polarised antennas. The Sky Scan V1300 discone has both vertical and horizontal elements for maximum reception. The V1300 is constructed from best quality stainless steel and aluminium and comes complete with mounting pole. Designed and built for use with scanners.

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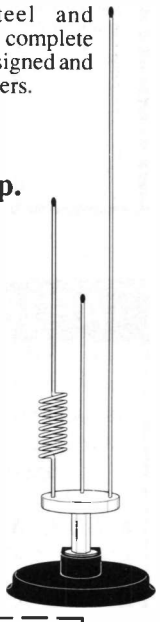
For improved performance, wide band reception, 25 to 1300MHz. Comes complete with protective rubber base, 4m RG.58 coax cable and BNC connector.
Built and designed for use with scanners.



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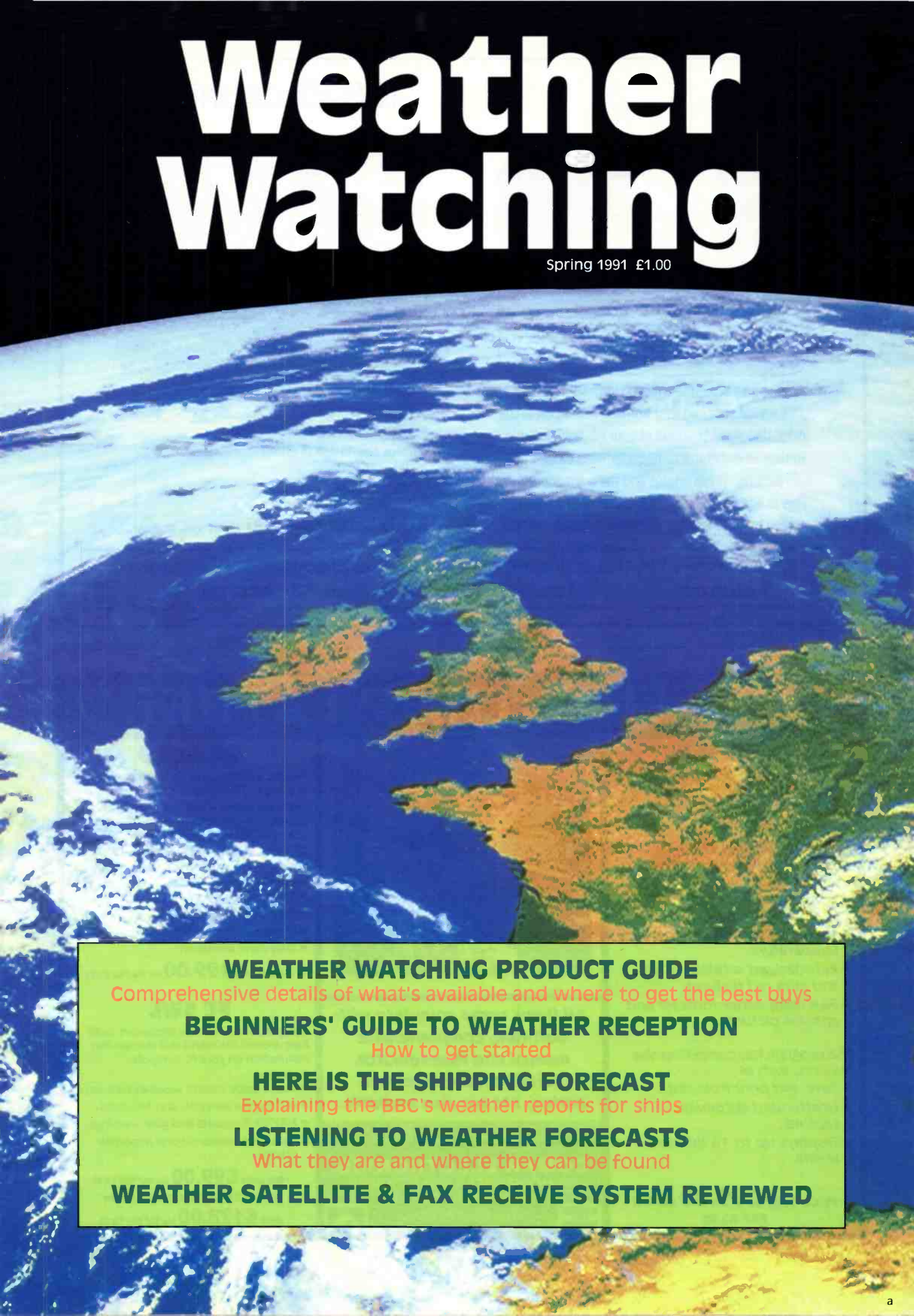
Spring 1991 £1.00



WEATHER WATCHING PRODUCT GUIDE
Comprehensive details of what's available and where to get the best buys

BEGINNERS' GUIDE TO WEATHER RECEPTION
How to get started

HERE IS THE SHIPPING FORECAST
Explaining the BBC's weather reports for ships

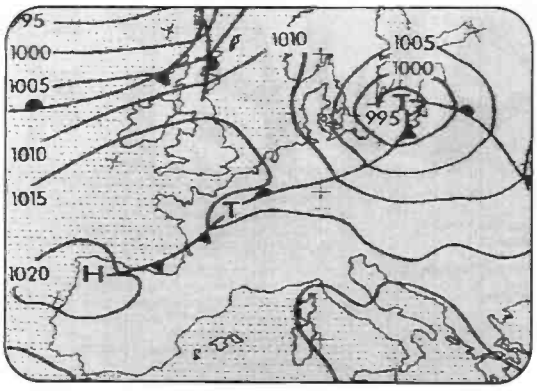
LISTENING TO WEATHER FORECASTS
What they are and where they can be found

WEATHER SATELLITE & FAX RECEIVE SYSTEM REVIEWED

ICS

ICS Electronics Ltd.

Instant grey scale facsimile on your IBM-PC! Just connect the supplied lead from the serial port to the extension speaker socket of your HF radio receiver to receive isobar maps, re-transmitted cloud cover pictures, press photos and radio amateurs.
This is a really easy to use package with its own on screen tuning indicator. Excellent value for money!



- Compatible with CGA, EGA, VGA and Hercules graphics standards.
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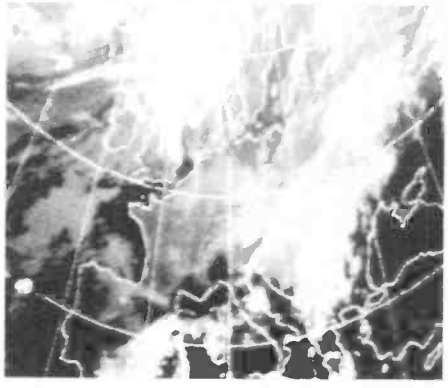

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Weather Watching Product Guide

This Product Guide has been compiled especially for *Weather Watching* by Lawrence Harris who compiles the 'Info in Orbit' column each month in *Short Wave Magazine.*

General Information

Some retailers sell complete systems of varying complexity, so it is important for the prospective purchaser to have a clear idea of what they wish their system to be able to do - see the 'Beginners' Guide'.
The product list is not exhaustive - it includes summaries of products that I have been able to locate from various manufacturers, but remember prices and specifications do change, so enquire first. In compiling this list I have taken great care but errors or omissions may have occurred. All prices quoted include VAT.

Manufacturers and Retailers

Several manufacturers and retailers who supply products for this market responded to my requests for product lists. This alphabetic list includes addresses, telephone numbers and the code letter used to identify them in the Product List.

ACS Systems, 19 Cilhaul Terrace, Mountain Ash, Mid-Glamorgan CF45 3ND Tel: (0443) 476040. **(A)**.
Cirkit Distribution Ltd., Park Lane, Broxbourne, Herts EN10 7NQ. Tel: (0992) 444111. **(B)**.
Comar Electronics, 1A Birmingham Road, Cowes, Isle of Wight PO31 7BH. Tel: (0983) 200308. Code **(C)**.
Dartcom, Powdermills, Postbridge, Yelverton, Devon PL20 6SP. Tel: (0822) 88253. Code **(D)**.
Garex Electronics, Station Yard, South Brent, South Devon, TQ10 9AL, Tel: (0364) 72770. Code **(E)**. Garex are dealers for Timestep.
Spacetech, 21 West Wools, Portland, DT5 2EA. Tel: (0305) 822753. Code **(F)**.
Maplin Electronics, P O Box 3, Rayleigh, Essex SS6 2BR. Tel: (0702) 554161. Code **(G)**.
Martelec Ltd, 8 Kimber's Lane, Farnham, Surrey GU9 9PT. Tel: (0252) 737620. Code **(H)**.
Short Wave Magazine Book Service, Enefco House, The Quay, Poole, Dorset BH15 1PP. Tel: (0202) 665524. Code **(I)**
Technical Software, Fron, Upper Llandwrog, Caernarfon LL54 7RF. Tel: (0286) 881886. Code **(J)**.
Timestep Weather Systems, Wickhambrook, Newmarket, CB8 8QA. Tel: (0440) 820040. Code **(K)**.

Other Products

Software: Instant Track - satellite predictions program with good graphics and much more. £25. **(K), (E)**.
Framestore analogue to digital conversion range adapter: this device can be fitted inside the YU3UMV framestore and allows the optimum setting of the analogue to digital converter for infra-red pictures leading to an improved number of grey levels. £19. **(D)**.
Books: numerous titles of interest to satellite hobbyists available from various sources. **(F), (I)**.
Posters and teaching materials: various sources including **(F)**.
Pictures, videos and slides: various sources including **(F)**.

VHF Transmissions - NOAA/METEOR/OKEAN

Antennas
Dartcom crossed dipole (rugged design). £86 **(D)**.
Kit to build 4-element antenna. £11.45 **(G)**.
Kit to build crossed dipoles inc. phasing harness and mast clamps. £17.50 **(B)**.
MSA20 Crossed dipole with phasing harness and cable. £46 **(H)**.
Crossed dipole with phasing harness and cable. £39 **(F)**.
Crossed dipole with phasing harness. £39.95 **(K)**.
CD137 Crossed dipole. £35 **(C)**.
VC20 20m antenna cable and plugs. £15 **(C)**.

Pre-amplifiers
137MHz 12dB gain with good filtering, requires boxing. £14 **(D)**.
137MHz 14dB gain, kit (extras needed). £10 **(G)**.
137MHz boxed. £21 **(H)**.
137MHz boxed. £23 **(F)**.
137MHz 13dB gain with good filtering. £25 **(K)**.

Receivers
Kit to build receiver module. Needs boxing and other parts. £49. **(B)**.
136-138MHz synthesised scanner module: with or without l.c.d. direct frequency readout. £160 or. £131. This module needs to be wired and completely boxed **(D)**.

Dartcom receiver as above, but completed. Available to RIG members. £398.
Dartcom receiver as above, with computer control. £448.

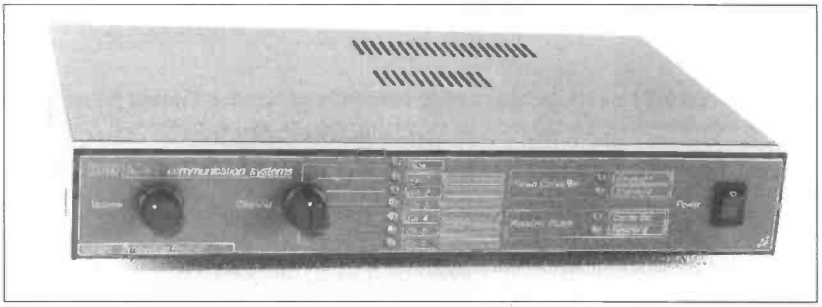
Maplin kit to build v.h.f. receiver. £75 (plus additional costs for box etc). **(G)**.

MSR30 synthesised 6-channel v.h.f. scanning receiver for NOAA/METEOSAT. £335. **(H)**.
MSR30S micro-controlled 200-channel scanner. £476. **(H)**.
MSR30SD as for the MSR30S with computer control port. £793. **(H)**.
NOAA 2-channel receiver with high immunity to interference. £150. **(K), (E)**.
PROSCAN 8-channel crystal controlled scanner includes all standard frequencies, intelligent squelch relay and computer interface. £299. **(K), (E)**.
WXR137 crystal scanner with computer control, switched tape, audio output, and 'S' meter (inc. p.s.u.). £310. **(F)**.

Framestores:
Not often sold as separate items but can be obtained second-hand sometimes from RIG members - see their quarterly magazine for advertisements. Hardware having similar functions is listed here.

Cirkit weather satellite interface. Data from the Circuit receiver is converted to digital form to be compatible with BBC computer using their SATPIC siftware. £39. **(B)**.

Graphstore BBC system. MSG20 a framestore for use with the BBC computer range, having on-board a half-megabyte memory with several processing facilities and providing resolution to 512 x 512 x 128 grey levels, but only for NOAA/METEOSAT: boxed module. £407. **(H)**.

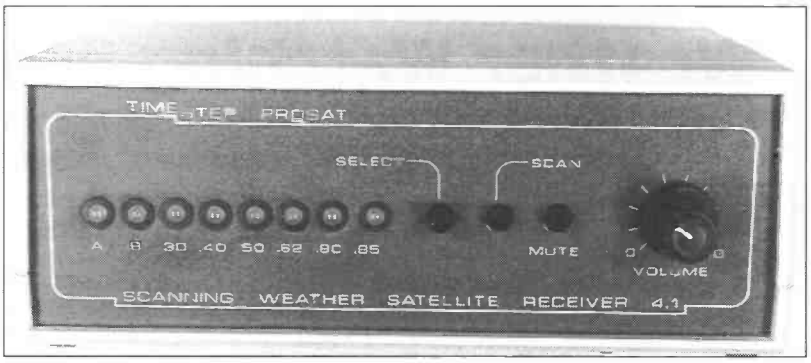


Martelec MSR30 synthesised 6-channel scanning NOAA receiver.

VHF Transmissions - NOAA/METEOR/OKEAN (continued)

Maplin decoder kit. Converts a.p.t. signals into digital 8-bit data for home computers. approx. £80 plus box, etc. **(G)**.

Maplin framestore kit. A detailed study of the various options should be undertaken before starting this as a project. The cost of the 'high resolution' unit is about. £85 but the necessary components will add several more pounds. Do not undertake this project lightly! approx. £100. **(G)**.



Front panel of the Timestep PROscan 4.1 receiver.

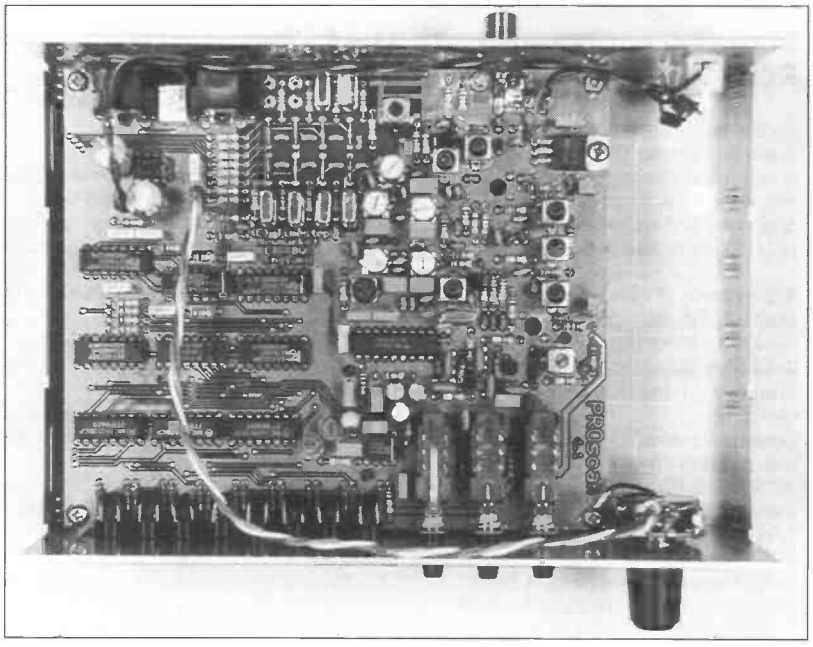
Computer Cards

These are 'cards' which fit inside the computer and contain the electronics necessary to convert the audio output of a weather satellite receiver into data that is in a form that the computer can process.

There are cards made for different computers and some manufacturers make more than one card for the same computer - giving a choice. The electronics may be mounted on an external unit (a module) for connection. Note - prices exclude the computer.

AMIGAFAX. Interface and software. Details not received yet but believed to retail at around £110. **(A)**.

AMIGASAT. Comprises software and hardware for the Commodore Amiga computer models 500, 1000, 1500 and 2000 with minimum of 1Mb RAM. Facilities include 8-bit resolution from tape or live source providing 16 grey shades, digital signal processing, zoom, image compatibility with IFF packages. Currently about. £150. **(H)**.



Inside view of the Timestep PROscan 4.1 scanning receiver.

APT-1. WXSAT module for the Spectrum computer; must be used with the interface unit and decodes pictures directly on to a dot matrix printer - no video display: two modules needed costing. £40 and. £59. **(J)**.

DIGISAT. Runs on an IBM-compatible PC, having 640Kb of RAM and preferably an EGA or VGA monitor giving 800 x 600 x 64 grey levels. The card takes the audio signal (2.4kHz a.m. modulated a.p.t.) from the receiver and there are some adjustments to be made for setting up purposes. Decoding of FAX is also provided on this card, as is animation. £176. **(H)**.

PC-GOES. Hardware interface and software - runs on an IBM-compatible PC giving 640 x 480 x 16 grey level resolution. No animation but hard copy printer driver included. METEOSAT image downloading facility. £199. **(C),(H)**.

PCSAT III. This card slots into an IBM-compatible computer and stores the full transmitted resolution on disk. Caters for all satellites and takes tape recordings, including METEOR without needing a sync track. Contrast, colour and an animate facility are included. £199. **(K),(E)**.

WXSAT MSS20. A BBC computer based decoder system. Takes audio data from a receiver and processes it for the BBC user port, giving a resolution of 160 x 250 x 8 colours. Features include zoom, colour setting, picture inversion, adjustment and screen dump routine. £90. **(H)**.

Dartcom acquisition board for PC-compatible computers, available to RIG members. £723.

Receiving Station (excluding computer)

METPK METEOSAT system. Includes MRS2/R receiver, LY1961 Yagi, MSPA pre-amp, 10m cable, PCGOES software and demodulator. £694. **(C)**.

Dartcom VGA system. Requires a minimum PC AT 286 with mouse, VGA monitor and 1Mb extended memory. £2400 plus delivery. Dartcom also do other systems at much higher prices.

Dartcom Macsat system. Runs on Apple Macintosh II or LC colour computers.Priced outside the amateur market. Agents, NCS Ltd. (0661) 25515.

Spacetech NOAA station. Includes podule, software, v.h.f. receiver, antenna and cables. Archimedes system. £659, Acorn system. £704, Atari system. £636. **(F)**.

Spacetech METEOSAT station. Includes podule, software, s.h.f. receiver, Yagi and pre-amp plus cables. Archimedes system. £948, Acorn system. £1005, Atari. £925. **(F)**.

Spacetech Archimedes, Acorn and Atari systems for v.h.f. and s.h.f. Various combinations available and the price includes the podule or interface, software, s.h.f. receiver, antenna and pre-amp, v.h.f. antenna and receiver and all cables eg., for the Archimedes system v.h.f. and s.h.f. (NOAA and METEOSAT). £1269. Acorn system. £1326. Atari system. £1245. **(F)**.

Timestep. Equipment combinations available for the Atari, Amiga, Archimedes, Nimbus and PC clones and they also retail computers. Examples for PCs, include dish, feed, pre-amp, cable, receiver, PCSAT3 and cable: eg METEOSAT. £715. One NOAA system includes antenna, pre-amp, 50m cable, PROscan receiver, PCSAT3 and box. £613. **(K)**.

SHF Transmissions - METEOSAT & GOES

Antennas
Dish, feed and mount clamp. £253. **(D)**.
Dish (Timestep) patio mounting. £256. **(F)**.
Yagi LY1691 44-element loop, length 2.794m, gain 20dB, beamwidth 16deg. £178. **(C)**.
Yagi (SHF Comms in Germany). £214. **(F)**.
Yagi 55-element. £124.95 **(K)**, **(E)**.
MSD20 patio dish including feed. £174. **(H)**.
Combination Yagi, pre-amp and down-converter (Yagi to be assembled), some extras required. £180. **(G)**.
MC10 10m low-loss cable and plugs. £23. **(C)**.

Pre-amplifiers (1.690GHz band)
24dB gain for 1.5dB noise figure. £92. **(K)**.
16dB gain for 1.0dB noise figure, GaAs - f.e.t. type. £126. **(F)**.
Good specification pre-amp in kit form (some extra components required) available to RIG members. £40
MSPA 15dB gain, weatherproofed. £92. **(C)**.

Receivers
WXR1690 s.h.f. 2-channel receiver with computer control. £345. **(F)**.
METEOSAT/GOES 2-channel receiver; 1.7GHz in and audio out. £199. **(K)**.
MSR2/R 2-channel 1.6GHz receiver; 0.25µV sens. £279. **(C)**.

Martelec patio-style dish antenna for METEOSAT and GOES systems.

Down-Converters
DC1691. Conversion gain 33dB with 1dB noise figure. £425. **(C)**.

MSC20. 2-channel 28dB gain with 1dB noise figure. £177. **(H)**.
RIG (Dartcom). 2-channel. £160. **(D)**.

Complete Systems
METEOSAT. The 'plug in and go' type of system which does not require anything else; compact framestore system, includes Yagi, pre-amp, cable, 2-channel microwave receiver, framestore, 12in b/w monitor and all cables. £795.95. **(E)**.

Timestep. Package includes all hardware listed under 'Receiving station' plus the computer. Price is dependant on options selected. **(K)**.

High Resolution Picture Transmissions - HRPT
Equipment prices are considerably higher in this field because the development costs have to be recovered at an early stage, rather like a.p.t. was five years ago! There are a few manufacturers developing systems which are normally far beyond the pockets of the amateur market. I have included just two for this review.

Equipment Requirements:
NB: Not all items will be available for immediate purchase.

Good sized dish or Yagi
High specification pre-amplifier
HRPT receiver
HRPT data card (for computer)
HRPT software

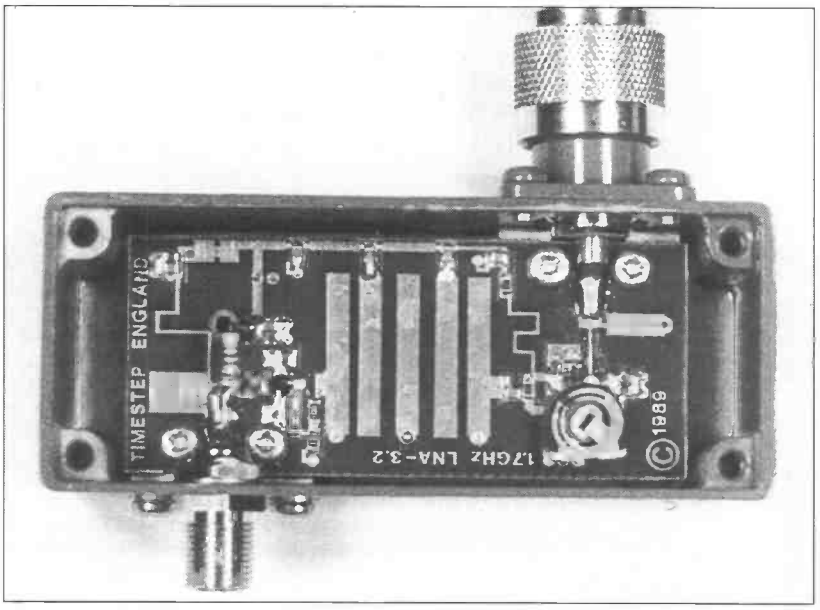
Antennas:
As for METEOSAT - the signal is transmitted in the 1.690GHz band at various frequencies for METEOSAT, NOAA and FENGYUN but a high quality pre-amp is essential.

HRPT Receiver:
8-channel receiver with 1.7GHz input: Approx. £500. **(K)**.

PC Data Card:
Card fits into a suitable computer and receives data from the receiver and stores it directly on the hard disk. (Watch this space!)

HRPT Software:
Likely to be supplied with the data card.

For the professional purchaser with no funding problems, Dartcom of Postbridge in Devon have joined with British Aerospace to produce an HRPT system that is, perhaps, the ultimate weather satellite computer decoding system. It has a price tag of around. £70 000!



Timestep 1.7GHz low-noise pre-amp for METEOSAT receive systems.

Beginners' Guide to Weather Satellite Reception

Lawrence Harris explains what weather satellite watching is all about, how you can make a start and, of course, how much it all might cost you.

Everyone who watches the television news has seen pictures from weather satellites, because they are regularly used to show the movement of weather systems. However, the actual pictures transmitted are of far better quality than those shown.

Many people have set up equipment to receive the signals from these satellites and new products have been produced to decode them. The development of ever faster and cheaper computers has added to the choice of systems available to produce pictures.

What are Weather Satellites?

There are many thousands of satellites orbiting the earth and a couple of hundred actually work. Of these, some 10 or so are weather satellites. The American ones include NOAAs 10 and 11 which transmit continuously on 137.50 and 137.62MHz respectively, with a third, NOAA 9 also transmitting on 137.62MHz most of the time. The Russians operate their METEOR series on 137.30, 137.40 or 137.85MHz, though currently only METEOR 2/19 is transmitting, but they change from one satellite to another, sometimes monthly! The Chinese have FENGYUN 1B which has used 137.80MHz, though it is not currently operating. In addition, the European Space Agency operate METEOSAT and the Americans have GOES, both in geostationary orbit and using the 1.690GHz band.

The satellites carry sensors to look at the earth below and transmit the image in a format such that standard equipment can be used to receive and decode all pictures. The signal is transmitted in either the 137MHz or the 1.690GHz band. Image data from the sensors amplitude modulates a 2.4kHz sub-carrier, which then frequency modulates the main carrier to which we tune our receivers.

The polar orbiting satellites (such as the NOAAs and METEORs) are between 810km and 1200km up taking some 100 or so minutes per orbit. Oceanographic satellites (such as OKEAN 2) carry slightly different equipment and operate about 650km up. Geostationary satellites (such as METEOSAT-4) are about 35 600km above the equator taking 24 hours to orbit the earth and so appearing to hover in the sky. Each type of satellite has something different to offer the 'watcher'.

Fig. 2: NOAA11 received May 1989 at 1230UTC.

What Can We See?

The satellites have at least two types of sensor. The visible light one produces a black-and-white image of the earth below, and does not record colour information, those that you see in books have been artificially produced for aesthetic purposes.

The other sensor detects infra-red (heat) radiation and so can produce pictures continuously. The satellites have two such sensors, the second responding to water vapour concentrations. Many years ago I was involved in ground-based measurements of the amount of water vapour above a field, using this type of sensor to investigate the effect of rain on future satellite links!

Heat sensors normally show hot features (like deserts in the day-time sun) darker than cool features (like high-altitude clouds). Desert sands are hot during the day and cold at night so the change can be seen in infra-red. The Russian METEOR 3 series of weather satellites can produce infra-red images but these are reversed - cold clouds appear as black and the warm oceans as white!

The OKEAN satellites carry a visible light scanner, a microwave sounder and radar. Some of the most interesting pictures that I have recorded were from OKEAN 'seeing' through cloud.

How Much Detail Is Visible?

Being lower than the geostationary satellites, the polar orbiters see more detail - objects about 1km. Higher orbiting satellites see details down to a few kilometres. However, there is an important point here - both NOAA and METEOSAT have two types of transmission each requiring different equipment for its decoding, and providing a choice of resolution.

High resolution imagery is transmitted as digital data using the 1.690GHz band and the equipment needed to decode it is very pricey, especially for the beginner. My 'Info in Orbit' column will keep readers up-to-date with developments in this exciting field.

Here, I will be looking at medium resolution pictures that are the original pictures but with some data removed, so allowing the whole picture to be transmitted in a shorter time or at a lower frequency.

Receiving Equipment

Having decided to investigate weather satellite reception, the next step is to see what equipment is needed. Several combinations of equipment can decode pictures, ranging from one of the cheapest modules that can be attached to a computer, to a complete system which does everything but at a price. We'll look at the various options later.

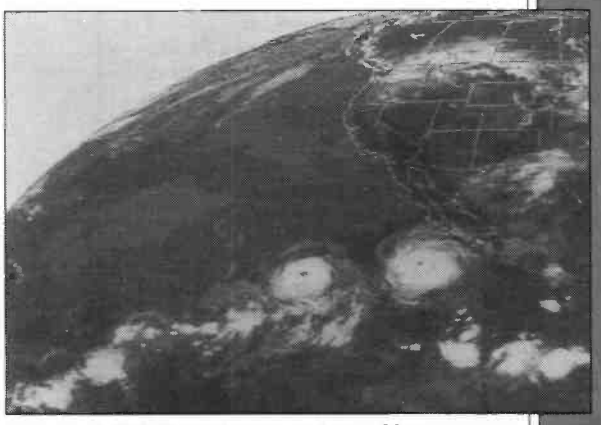


Fig. 1: GOES live picture using a Yagi antenna.

Dipoles, Dishes and Yagis

Any receiving system ultimately depends on its antenna. You could spend £70 000 on a computerised satellite station, but with a poor antenna you will not get good results. Start with a good quality antenna.

Satellites are normally spin stabilised so we use right-circularly polarised crossed dipoles. For better directivity we have one set of reflectors below the main dipoles. You can make a simple dipole to receive signals for test purposes by connecting some cable (inner core and outer sheath) to two copper rods (each 510mm length). Commercial units cost between £15 - £80.

Your v.h.f. antenna should be as high as possible and feed the receiver via good quality cable of matching impedance. For cable over 20m long you may need to use a pre-amplifier at the antenna end.

To receive METEOSAT (1690MHz) you need a dish or Yagi and a **down converter**. The dish should be one metre or more in diameter and a Yagi should have at least 40-elements. You may find that a pre-amp is not needed if METEOSAT is transmitting at full power. This s.h.f. signal is usually changed to 137.50MHz using a down-converter, to feed your v.h.f. receiver, just like the polar satellite signals. You can buy METEOSAT receivers which accept the s.h.f. signal and decode it to produce the audio signal, by-passing the down-converter.

Dishes can be home-made, as was my first dish, using chicken wire on a wooden frame, or bought in - see the products review elsewhere in *Weather Watching*. For home-construction you need to build to a parabolic shape, though the errors tolerated by the system are about 20mm! Yagis constructed for METEOSAT can work well and are included in the products review mentioned earlier.

The antenna/pre-amp/cable feeds your v.h.f. **receiver** which must be properly designed for weather satellites having good out-of-band signal rejection. Ordinary v.h.f. receivers cannot cope with the signal format used by weather satellites. The output is in the form of an audio signal having recognisable tones and data content and with experience you can tell what type of satellite is being heard.

You may want to look at different satellites and so will need several frequencies. Receivers have either crystal or microprocessor (chip) synthesised frequencies, the latter covering a wide range. A new satellite may transmit on a frequency not covered by a crystal receiver - check what the manufacturer will do if this happens!

Scanning

A scanning facility allows you to leave the receiver looking sequentially at each selected frequency e.g., 137.30, 137.40, 137.50, 137.62 and 137.85MHz and stopping when a signal or interference is picked up, depending on your squelch setting. The squelch allows you to set the signal strength you wish to detect before the receiver stops scanning. If set too low, then noise or interference may hold the receiver instead of allowing it to scan. Too high a setting results in missed signals. Well designed (intelligent) scanners may ignore interference and look for the genuine signal. My son Tim designed a 2.4kHz detector that does this job!

For good signal decoding your receiver should have an i.f. bandwidth of about 50kHz to allow for Doppler effects (the satellite is moving rapidly).

Sensitivity is the receiver's ability to detect a signal in the presence of noise. New components enable receivers to have sensitivities of about 0.2µV for 12dB quieting, this refers to the fact that without a signal an f.m. receiver produces noise.

Recent receivers allow the programming of frequencies to be done by computer, offering opportunities to monitor satellites in your absence and to record signals (on tape) and the associated frequencies.

To convert the signal into a picture requires a suitable decoder which can be a **framestore** or a **computer** fitted with a module. Some framestores are still available - see the product reviews - and you can construct your own from kits if you are skilled. But, without any doubt, the trend is to use a computer fitted with suitable hardware and running associated software. This will continue because of the enormous flexibility of these systems.

It is essential to know what you require of a framestore before spending hard-earned cash on a unit only to find that it doesn't do what you had expected.

Quality Image

It should allow you to produce a quality image with some 64 grey levels. You will want to decode infra-red pictures as good as the visible light images, but infra-red data is contained in a smaller dynamic range so the black-and-white level settings on the framestore need to be adjusted. Beware of any unit which cannot provide quality infra-red images unless it is offered at a low price and you are buying it as an introduction to the process.

It should allow selection of all types of transmission, i.e. METEOSAT, NOAA, METEOR and OKEAN formats. Will it provide high quality pictures for a good monitor? Can it offer a choice of resolutions? See one demonstrated if at all possible. However, you must remember that the framestore needs a good signal to do a proper job!

Framestore construction is a major electronics project requiring considerable time, and includes the alignment of many circuits. You can join a specialist club such as the Remote Imaging Group which can provide expert advice. Various component specialists can provide the parts used to 'populate' the printed circuit boards - I hope that you have more success than I did in the early days!

An alternative to tackling the whole project yourself is to buy the boards from a supplier and pay an expert to do the soldering and alignment of the principal circuits.

The trend towards computers fitted with suitable decoding boards to produce pictures must continue. For quality results you need to use a modern machine and there are several decoders available. The first consideration is to balance your requirements against the cost. Do you already have a suitable computer? Products are available for the Archimedes, Atari, Amiga, Macintosh and PC clones.

You can use computers like the BBC and other relatively low memory units that have had software written for them by professionals. They will produce pictures, but they may not be of the highest quality obtainable from more expensive machines fitted with recently designed decoding boards. However, you may well be satisfied with results from the cheaper machines when first starting out.

There are too many products to review them all, so once again try to see some demonstrations. If you are starting from scratch, I would recommend considering a 286 PC clone with VGA monitor.

Revealing Details

The first requirement is to be able to stretch the **contrast** in images like winter visible-light or infra-red to reveal details not otherwise obvious.

Computers can be programmed to show land, sea and clouds in their normal **colours**. The limitation in accuracy is because the original image was based on reflectance (albedo) where white is cloud and dark is sea - so there will be ambiguities because land, sea and cloud can have the same albedo differing in colour only, indistinguishable by the sensors.

Infra-red imagery can be effectively displayed in red and blue - red representing warm and blue, cold. This limitation results in some coloured satellite pictures showing features with 'wrong' tinges. Careful selection of the boundaries can minimise these shortcomings!

The final picture is displayed on a **monitor** or **printer** and there are many types available. If bought separately the monitor will need to match the existing system and should ideally be at least ECD (enhanced colour display) and preferably VGA (versatile graphics adapter, sometimes called videographics array) or even SVGA (super VGA). You can get acceptable results from cheaper models though.

The Future

The weather satellites will continue to provide decodable data for years to come, according to published plans for new launches and I believe that new computer systems will allow even more applications to be developed. Schools have great opportunities to use these systems for all topics from geography - (this IS the river Nile) to mathematics - (why is METEOSAT geostationary?).

For the individual the ever changing weather, iceberg watching, hurricanes, etc., make it far more interesting than conventional television!

WW

Abbreviations

dB	**decibel**
ECD	**enhanced colour display**
f.m.	**frequency modulation**
i.f.	**intermediate frequency**
kHz	**kilohertz**
MHz	**megahertz**
s.h.f.	**super high frequency**
SVGA	**super VGA**
v.h.f.	**very high frequency**
VGA	**versatile graphics array**
µV	**microvolt**

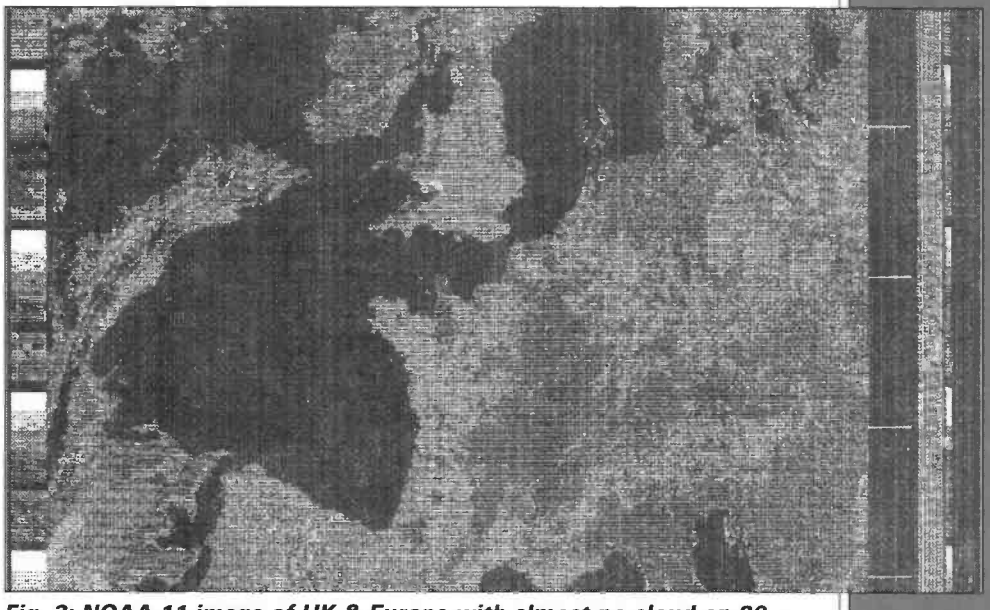


Fig. 3: NOAA 11 image of UK & Europe with almost no cloud on 20 July 1990.

Here is the Shipping Forecast

Regular listeners to BBC Radio 4 will be familiar with the litany of names and figures which announcers fit so skilfully into a precise, five-minute broadcast at 05.55, 13.55, 17.50 and 00.33 daily. Joan Ham lets us into some of the secrets behind the shipping forecast.

In spite of the enchanting technicolour graphics of the television weather forecasts and the comfortable regional voices on radio telling us that it will be fine and sunny for the cricket, there is something magnetic about the the exact formula of the BBC shipping forecasts. Those five-minute bulletins are a vivid voyage around the British Isles with a panorama of changing weather, flying clouds, winds, rain and sun like a speeded-up film. Regular listeners also gain a degree of personal skill in assessing the next day's local weather from the data.

Names

How did the seas around our coasts get their names?

The sea areas are named from islands or sandbanks within their boundaries and are thereby instantly recognisable to mariners using them. The BBC first broadcast shipping forecasts in 1925 from 5XX (Daventry), when the vaguely-defined areas were just Shetlands, the North Sea divided into a large eastern block of Forties and Dogger with Tay and Humber covering the coastal stretch from Shetland to The Wash, followed by Thames (Yarmouth to Dungeness), the southern area consisting of Wight and Channel; Severn, Mersey and Clyde progressing up the Irish Sea, and Shannon and Hebrides as the Western area completing the Atlantic side of the forecast areas.

In 1932, the northern part of the map was extended and the boundaries redrawn to add Faeroes and Orkney and the Shetland area boundaries were moved eastwards, taking in part of the large Forties section. This catered for the trawlers which used those waters in increasing numbers.

It was not until after WWII when peacetime shipping needed more information over a wider area that the boundaries were again redrawn and new ones added. The compass-point divisions were abandoned and the seas divided by blocks which ran parallel to latitude and longitude lines in the Atlantic out to 15°W. The Channel and North Sea were sectioned into neat ruled blocks, of which Forties and Dogger were still the greatest areas, with Heligoland and Humber south of them between the Danish coast and England from about Bridlington to Cromer. Thames, Dover, Wight, Portland and Plymouth divided the Channel out to a point due south of Wexford, Ireland, and the area between the northern boundary of Forties and Iceland became three blocks called Fair Isle, Faeroes and Iceland. Cromarty, Forth and Tyne replaced the old Scottish and east coast Tay and Humber areas as far as Bridlington.
These names survived unchanged until 1955 when meteorologists decided that Heligoland should be renamed German Bight which was more familiar to people living adjacent to it. The North Sea areas underwent other changes in the Forties and Dogger region when Viking was added to take in part of Fair Isle and Forties and the eastern part of Dogger became Fisher. There was a squaring northwards of the German Bight area and Iceland was further clarified as SE Iceland. These names survive to this day, with one new addition made in 1984, when Utsire was designated east of Viking and Forties for the benefit of Norway.

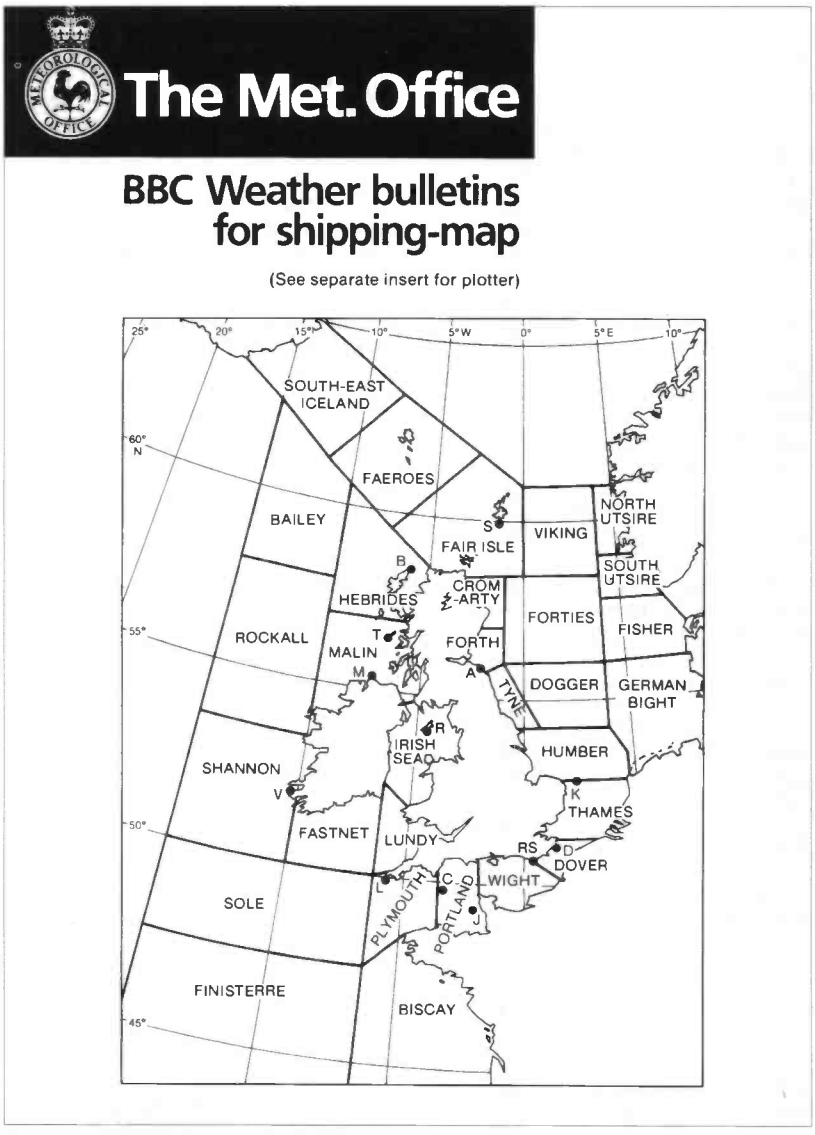


Fig. 1: BBC Weather bulletins for shipping-map as published by The Met. Office.

The Bulletins

The old 5XX transmissions were the first public telephony broadcasts of weather and were sent out on 1600m twice a day. Gale warnings had been sent out for shipping as early as 1911, becoming a regular service in 1921, mostly in code and even spark transmissions for ships that had no other wireless. The Air Ministry station GFA sent out the c.w. transmissions, which could be received over great distances, but the BBC shipping forecast as we know it began in 1925 from 5XX. These were general weather observations and pressures followed by wind and visibility forecasts for the next 12 hours. The shipping forecasts were discontinued during both World Wars, as the information was naturally of strategic importance.

Today's 'Sea Area Forecasts' begin with any gale warnings, which are issued when winds are expected to reach Force 8 (34 - 40 knots) or more, followed by a general synopsis of the pressure systems and their expected movements for the ensuing 24 hours. The areas are then listed in order, followed by figures denoting wind speed and direction, weather and visibility.

Equipment And Data

The weather ship scheme began after WWII, when 13 stations were established in the North Atlantic manned by various nations. Although this was officially ended by the

World Meteorological Organisation in 1989 to save costs, three of the countries continued independantly. Norway operates *Polarfront* out of Bergen at station 'Mike', 66°N, 02°E; USSR has Odessa-based ships at station 'Charlie', 52°45'N, 35°30'N which is almost in the middle of the N.Atlantic between Ireland, Greenland and Newfoundland and Great Britain's *Cumulus* out of Greenock at station 'Lima', 57°N, 20°W is between the other two. *Cumulus* is mobile, not fixed, and returns to Greenock every five weeks to change crew and take on supplies. She has another two years of service in view before being replaced by satellite and other updated systems.

From 1982, The Netherlands operated *OWS Cumulus* alternately with the UK *OWS Starella* at station 'Lima', but in 1985, *Starella* finished her tour of duty and *Cumulus* was officially handed over by The Netherlands to the UK (at a token price of £1) and commenced single manning of station 'Lima'. Her complement of 18 staff usually includes six Hull and Fleetwood trawlermen and six specialists for the meteorological, oceanographical work and radio operation. She also has ample spare accommodation for guest scientists and trainees, having been built to passenger ship standards.

In addition to the weather ships, information is gathered and transmitted by 450 merchant and other ships commissioned by the UK and 7500 throughout the world. The oceans also provide data via lightships, buoys, radiosonde balloons, oil rigs and aircraft. Although there are still a few manned lightships, their weather stations are all automatic nowadays. Visibility and wind direction present problems to automation, and the shipping forecasts sometimes reflect this when odd data are missing from particular locations. Their information reaches Bracknell via Inmarsat and Goonhilly, or by radio and telex.

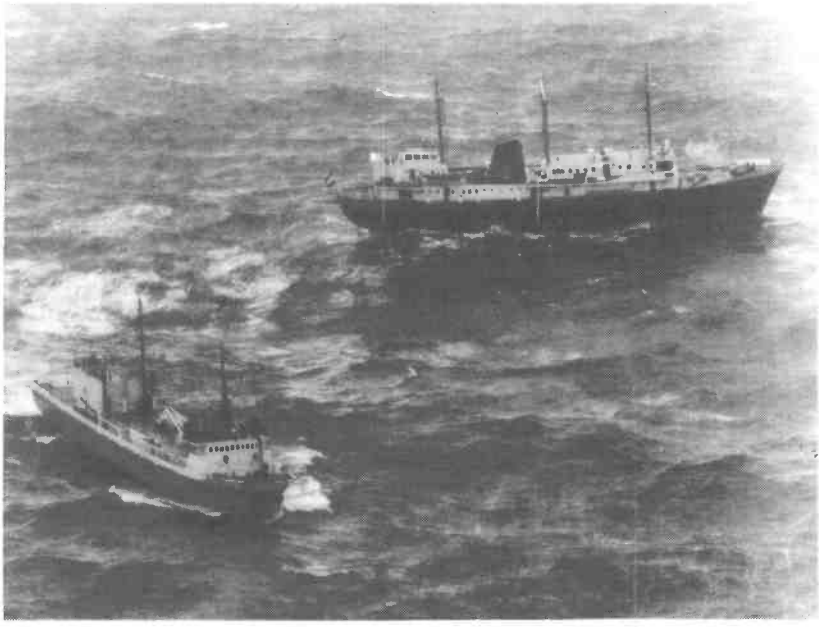


Fig. 2:* OWS Starella *handing over to* OWS Cumulus *at Station Lima, 18 November 1985.

Coastal Stations

The second part of the BBC Shipping Forecast consists of reports from coastal areas and contains interesting detail, reported again as a series of numbers: wind speed, direction and tendency - veering (changing clockwise, i.e. E to SE), backing (changing anticlockwise, i.e. opposite SE to E), weather, visibilty - fog, visibility under 1000 metres; poor, 1000 metres to 2 nautical miles; moderate, 2 - 5 nautical miles; good, above 5 nautical miles: barometric pressure and the trend (rising, falling, quickly, slowly, steady). The trend is what has happened in the three hours preceding the bulletin. Coastal stations reporting observations are, Tiree, Butt of Lewis, Sumburgh, St Abb's Head, *Smith's Knoll Automatic*, Dover, *Royal Sovereign, Channel Light Vessel Automatic*, Land's End, Valentia, Ronaldsway, Malin Head and Jersey.

Many of the Trinity House light vessels are no longer manned, and with automation the weather observing services which they provided ceased. Nearby land stations replaced most of them, but sometimes it is possible to install automatic weather stations on board. *Smith's Knoll Automatic* in the coastal waters E of Cromer and *Channel Light Vessel Automatic* stationed SW of Portland are the most recent light ships to be fitted; others may follow. Their 'belt and braces' arrangements for ensuring that the information reaches its destination at Bracknell via Darmstadt, include two alternative satellite transmission paths and two separate power supplies.

Fig. 4:* Smith's Knoll Automatic *light vessel. The automatic weather station is at the central mast-top above the light, The ship is painted red, masts and all!

Fig. 3:* OWS Cumulus *in North Atlantic. Photo by Geoff Allen, scientific officer on the ship at the time.

The Future

Although satellites provide a great deal of the information, Bracknell still requires surface observations for comparison and verification. The information provided by mariners will always be valued, but the new Global Maritime Distress and Safety System which the World Meteorological Organisation will introduce between 1992 and 1999 ushers in the 21st century with the disappearance of the ship's radio officer as we know him. It will be just under 150 years since the ex-captain of *The Beagle* established the Meteorological Dept. of the Board of Trade, forerunner of the Met. Office. He also invented two kinds of barometer. Admiral FitzRoy's introduction preceded radio by many years, and we are now well on the way to systems of weather reporting and forecasting that he could never have envisaged. **WW**

Acknowledgements

I am most grateful to Capt. John F.T.Houghton FNI, Marine Division of the Meteorological Office, and Deputy Editor *The Marine Observer* who kindly supplied information and photographs and courteously answered all my queries.

Listening to Weather Forecasts

The weather is probably talked about more than any other subject. Knowing the weather conditions at the receiver or transmitter can help in planning a successful DXing session and P.C. Mitchell unravels some of the mysteries of weather forecasts.

Both tropospheric openings and Sporadic-E disturbances are assumed to be weather-related phenomena, but arguments are very much in evidence as to the precise mechanics of this relationship.

In less technical terms, it is known that falling barometric pressure after a prolonged spell of reasonably settled weather (high pressure) is beneficial for good v.h.f. and u.h.f. reception. It is also probable that thunderstorms may trigger Sporadic-E disturbances.

There is likely to be, therefore, particular interest in the reception of voice weather broadcasts in addition to many other sources of weather data, such as that obtained via c.w. FAX, RTTY and satellite transmissions.

Today, with great advances in computer forecasting techniques and satellite communications, weather predictions and observations are, generally speaking, highly accurate. The listener today has a veritable mine of constantly up-dated, high-grade, weather data available for interpretation.

Shipping Forecasts

Of primary concern to ships within UK coastal waters, BBC broadcast shipping weather forecasts on Radio 4, 198kHz (a.m.) at 0555, 1355, 1750 and 0033 (UK time). More details on this service are given in the article 'Here is the Shipping Forecast' by Joan Ham elsewhere in this publication.

The area covered by these reports is divided into named sea areas. The format begins with warnings of any gales in operation or expected within the next 24-hour period and the relative sea areas. Then follows a description of the general weather pattern which could sound like this: 'general synopsis at 0700 hours, low south-east Iceland 978 expected 100 mile north of Fair Isle with little change by 0700 hours tomorrow.'

To the landlubbers amongst you, a 'low', or depression, generally means dirty weather ahead and 978 is the barometric pressure in millibars in the centre of the low. Conversely, a 'high', or anticyclone, usually brings fine and settled conditions. Following this synopsis, a more detailed weather forecast for the following 24 hours is given.

Finally, weather reports from selected stations will give actual weather prevailing Note that all times are quoted in BST and not UTC throughout the forecast. The wind force is given using the Beaufort Scale, which starts at 0 for dead calm to 12 hurricane force. The tendency column relates to barometric pressure, e.g. whether steady, rising or falling. Regular shipping weather forecasts and gale warnings are also broadcast from all marine shore stations and some ports, forewarning on Marine Band Ch. 16 (156.8MHz f.m.), the working channels to be used (remembering this is duplex working with two frequencies quoted). Details of the many marine contact and working frequencies will be found in most v.h.f./u.h.f. frequency lists.

Inshore and Land Forecasts

To compliment shipping weather reports, there is an Inshore Waters Forecast on Radio 3 (a.m.) 1215kHz at 0655BST and 90.2-92.4MHz f.m. and at 0038BST Radio 4 198kHz daily. In addition to numerous land forecasts on most BBC and commercial radio stations (long wave and f.m.), the latter probably being the most widely received of all weather information. The general weather forecasts will also give warnings of severe weather for the on-going 24-hour period and it will be noted that, unlike shipping forecasts, land weather reports will include additional minimum and maximum temperatures expected. Shipping forecasts giving much essential information to seafarers, together with the land forecasts mentioned so far, will present to the more general listeners a fairly accurate general picture of weather conditions in and around the British Isles, with no attendant problems regarding reception. However, for a more in-depth study of the subject, other radio sources must be sought that give more precise data both for the UK and many other world-wide locations.

Aeronautical Weather Reports

Voice broadcast aeronautical reports will, in the main, appear to be more esoteric in nature. The first recorded use of radio communication between aircraft and ground was on 27 August 1910 in New York State, USA. Doubtless, shortly after this, the state of ground weather conditions were relayed to the pilots of those early planes. Likewise, to the pilot of today, a precise picture of meteorological conditions is essential for the safety of aircraft from take-off to landing.

The VOLMET stations in the UK are provided by the Civil Aviation Authority for the broadcasting of comprehensive weather information for both military and civil aircrew

Table 2: Weather Report Abbreviations.

BC	=	Patches (fog)	PE	=	Ice Pellets
BL	=	Blowing (snow)	PO	=	Dust Devils
BR	=	Mist	RA	=	Rain
DZ	=	Drizzle	RE	=	Recent
FG	=	Fog	SA	=	Sand/Dust Storm
FC	=	Funnel Cloud (Tornado)	SG	=	Snowgrains
FU	=	Smoke	SH	=	Showers
FZ	=	Freezing	SN	=	Snow
GR	=	Hail	SQ	=	Squall
HZ	=	Haze (dust)	TS	=	Thunderstorm
MI	=	Shallow (fog)	XX	=	Heavy

Table 1: Sample report London VOLMET (South). Selected locations.

DATE: *22/10/90*

Location	Time	W/D	KT	RVR KM / VIS	WTR	CLOUD OKTAS	°C	DP	QNF	NOSIG	CHANGE G=GRADU T=TEMPO R=RAPID I=INTER
LONDON VOLMET (SOUTH) 128.6MHz AM (offset)											
Birmingham	*1020*	*080*	*7*	*9*		*2 2 8 3*	*9*	*6*	*1018*	✓	
Bournem'th	*0950*	*060*	*8*	*8*	*HZ*	*5 1 8 5*	*12*	*7*	*1015*		
Bristol	*1020*	*090*	*12*	*7*	*HZ*	*7 4*	*10*	*6*	*1016*		
Cardiff											
Jersey											
Luton											
Norwich											
S'thampton											
Southend											

Table 3: Sample report RAF & Shannon VOLMETs. Selected locations.

DATE: *22/10/90*
VOICE WEATHER BROADCASTS ALL TIMES UTC ALL ACTUAL WEATHER REPORTS

Location	Time	W/D	KT	RVR KM / VIS	WTR	CLOUD OKTAS				°C	DP	QNF	NOSIG	CHANGE G=GRADU T=TEMPO R=RAPID I=INTER
1. RAF VOLMET H24 4.722, 11.200MHz														
Belfast	0920	090	15	5		1	6	5		10	8		✓	
Coningsby	0950	110	11	+10		2	1	8	2.5	11	9	1020		G 50 KT
Kinloss	0920	100	9	+10		1	2	8	2.5	11	5	1023	✓	
Heathrow														
Manston														
Odiham														
Prestwick														
St Mawgan														
Shannon														
Bardufoss														
Gutersloh														
Oslo														
Sola														
Keflavik														
Ascension														
2. SHANNON VOLMET 3.413, 5.505, 8.957, 13.264MHz No barometric pressure given.														
Brussels	1030	260	7	COK		1	3	7	5	10	8			G 15 KT
Frankfurt	1030	230	7	6		5	2	8	4	11	4		✓	
Munich	1000	290	4	+10	FU	2	4	5	3	9	6		✓	
Amsterdam														
Copenhagen														
Stockholm														
Helsinki														
Barcelona														
Madrid														
Santa Maria														
Paris CDG														
Lyon														
Rome														
Zurich														
Athens														

and operate throughout the 24-hour period. The following abbreviations will, in general, apply to these and other broadcasts mentioned later on:

H24 - broadcast continuous throughout a 24-hour period.

H+00 - actual timing of broadcast on the hour.

H+05, H+10, H+20, etc. - broadcast as indicated minutes past the hour.

A - actual weather report or aviation weather.

F - landing forecast.

T - forecast trend type.

METAR - routine airfield weather report.

SPECI - special weather report following a significant change from previous report.

UK & European VHF VOLMETs

These are broadcast on v.h.f. for reception by both military and civil aircraft flying within UK airspace and its immediate European vicinity with v.h.f. reception area. Due to v.h.f. line-of-sight reception it may not be possible to receive all of these at any one location due to the different locations of transmitters, but high performance dipoles may bring in the more distant signals.

All major airports in the UK are covered by the London VOLMETs and a single Scottish VOLMET, all of which are H24 continuous, with time of report (in UTC) for airport broadcast and of AT type (actual report and trend) as follows:

London (Main): 126.375MHz covering Amsterdam, Brussels, Dublin, Glasgow, London/Gatwick, London/Heathrow, London/Stansted, Manchester, Paris.

London (South): 128.6MHz covering Birmingham, Bournemouth, Bristol, Cardiff, Jersey, Luton, Norwich, Southampton, Southend.

London (North): 126.6MHz covering Blackpool, East Midlands, Leeds, Liverpool, London/Gatwick, Manchester, Newcastle, Isle of Man, Teeside.

Scottish: 125.725MHz covering Aberdeen, Belfast, Edinburgh, Glasgow, Inverness, London/Heathrow, Prestwick, Stornoway, Sumburgh.

Also **Las Palmas:** 126.2MHz, Lisbon 126.4MHz, Dublin 127MHz all H24. Airports in those vicinities.

It should be noted that these frequencies are offset and are best tuned in 5kHz steps. The format for these reports is shown in **Table 1** and the following interpretations are in addition to those given for the shipping forecasts.

SIGMET information. At any time these can broadcast warnings of severe weather conditions, existing and forecast, that could endanger flight safety, e.g. thunderstorms, line squalls, heavy hail, severe turbulence, aircraft icing, wind shear, etc. Wind direction is given in which wind is blowing from in compass degrees magnetic e.g. 090 = from due east. Wind speed in knots. CAV OK - ceiling and visibility OK, visibility 10km, or more, no rain, fog or snow and no cloud below 5000ft, in other words a decent summer's day! Visibility in metres. RVR - runway visibility range is only given in visibility is less than 1500 metres (due to fog, heavy rain or snow, etc.) and is a localised assessment at the end of airport runway. **Table 2** gives the weather state and standard report abbreviations. Cloud base height is given in oktas or eighths followed by cloud height in thousands of feet. Hence eight oktas indicates sky totally obscured at indicated height, one okta is only one eighth sky obscured by cloud. If CAVOK is given then there is no significant cloud. If a thunderstorm is in the vicinity of the airport then this is stated as 'cumulo-nimbus' cloud - pilots endeavour to fly round this rather than through it! Temperature in degrees Celsius (Centigrade) Dewpoint (also in Celsius) is the temperature to which the air can be cooled without causing condensation. The lower the dewpoint in relation to the air temperature the drier the air. Hence in fog or heavy rain, air temperature and dewpoint will probably be the same (in other words, rather humid). QNH is barometric pressure in millibars and in general terms, the higher this figure the better the weather! Modern barometers usually show pressure in millibars.

After this report of weather conditions, if

Table 4: Sample report New York & Gander VOLMETs. Selected locations.

DATE: *22/10/90*

3. NEW YORK VOLMET H+00 H+30 3.485, 6.604, 10.151, 13.270MHz

Time of report UTC: *0900* UK time of report: *1000*

	Cl. levels 000' C	Vis. km	Wtr.	Temp. °F	D/P	Wind	Kts.	Change
Chicago	*3.9SCT 5 OVC*	*8*	*DZ*	*50*	*49*	*200*	*13*	*I 10KM*
New York	*CLEAR*	*20*		*61*	*50*	*290*	*9*	*G 7KTS*
Bermuda	*2SCT 3SCT 7BKT*	*+6*		*60*	*60*	*060*	*12*	
Miami								
Atlanta								

4. GANDER VOLMET H+20 H+50 Frequencies as for New York (Temp in °C)

Montreal	*1 SCT 2.5 BKN*	*25*		*1*	*0*	*070*	*02*	
Goose	*2 BKN 5 SCT*	*6*		*0*	*- 4*	*000*	*01*	*I 4KM*
Iqaluit	*1.5 OVC 5 C*	*10*	*SN*	*-11*	*-14*	*050*	*04*	
Winnipeg								
Edmonton								
Sondestrom								

Cloud cover (USA & Canadian VOLMETS)
CB = Cumulo-nimbus OVC = Overcast (8 oktas) SCT = Scattered (1 - 4 oktas)
BKN = Broken (5 - 7 oktas) C = Ceiling

no significant trend in the weather is expected in the next two hours, then NOSIG is given, but should a change be anticipated then the following groups are given. GRADU, when a constant rate of change is expected. RAPID, when a change is expected within half an hour or less. TEMPO, when changes are expected of a temporary nature. INTER, when frequent changes are expected within a short period of time throughout a specified period. PROB (followed by 10, 20, 30 or 40), indicates percentage probability of the conditions becoming as given in subsequent groups.

Airfield weather reports will also be given on request from aircraft on both v.h.f. and u.h.f., the latter mainly military aircraft, usually on aerodrome tower frequencies and published in v.h.f. and u.h.f. frequency lists. Also AFIS (airfield information service) and ATIS (automatic terminal information service) continuously broadcast weather and airfield state from numerous civil and military airports on the navigation aid band 108 to 118MHz (a.m.). All the interpretations above will also apply to following weather broadcasts.

UK HF SSB Voice Weather Broadcasts

For aircraft beyond v.h.f./u.h.f. range requesting airfield and general weather states the following VOLMETS will give detailed forecasts and reports, but full lists of stations are not included since these are too numerous to list.

Shannon: 3.414, 5.505, 8.957 & 13.264MHz H24 H+00 and at five minute intervals. Type A, F, S. All principal UK and European civil aerodromes (**Table 3**).

Royal Air Force: 4.722 & 11.200MHz continuous. Type A. All principal UK and European military and some civil airbases plus Ascension Island (**Table 3**).

New York: 3.485, 6.604, 10.051 & 13.270MHz. H24. H+00, 05, 10, 15, 30, 35, 40 & 45. All principal airports in eastern United States. Note that this follows a different format. Temperatures are given in Fahrenheit and no barometric pressure is given. (**Table 4**).

Gander (Newfoundland): Shared frequencies with New York. H24 at H+20, 25, 50 & 55. All principal eastern Canada airports plus Sondrestrom (Greenland). Format as for New York but temperature is in Celsius (**Table 4**)

St. John's: 6.753MHz H24, 15.035MHz 1200-2300 and Trenton 6.753MHz 2300-1200; 15.035MHz 1000-0100. Principal RCAF airbases in Canada.

Oakland: 2.980, 5.519, 8.903 & 13.344MHz H24. Principal western United States aerodromes.

Anchorage: 5.519MHz. Schedules unknown for Western Canadian aerodromes.

Sydney: 11.387MHz H+00. Principal Australian airports.

Hong Kong: 13.282MHz H+45 Hong Kong and Far Eastern airports.

Auckland: Frequency shared with Hong Kong. New Zealand airports.

Croughton (UK): 6.750, 11.176MHz H24 13.214MHz 0800-2100. Some major USAF bases UK and Europe. Weather broadcasts from this and individual stations are referred to as METEOs, following the same format as NY VOLMET but barometric pressure is still quoted in inches and not millibars. Some VOLMETs have more than one quoted frequency for variation in reception conditions.

Tape Recorder

If you have a tape recorder, set it up to record the whole report from, say, Shannon VOLMET. If a careful note is made on the counter at the start, selected reporting points can be picked out when the tape is played back, thus avoiding listening to a whole broadcast. The counter will indicate the same stations at approximately the same point day-by-day.

Times

All times quoted by VOLMETs are UTC (GMT), but to calculate local time at the reporting station an adjustment must be made according to geographical position. Hence 0800UTC, New York -4 hours, Auckland NZ +12 hours. Looking to the future in weather broadcasts, the trends will be for improved accuracy in all forecasts as new and more powerful computers come on stream. Pilot schemes are in operation for the reception of weather maps via FAX machines in aircraft and improved aircraft radar systems will further refine the detection of weather conditions during flight.

It is hoped that this article will make for more interesting listening and if weather reports are compared on a day-to-day basis it is possible to compile one's own forecast relating to the countries mentioned.

Further useful weather information can be obtained from the *RAF En Route Supplement*, obtainable from 1AIDU, Tel: 081-845 2300 ext 209, *Air Traffic Control* by David Adair and *The Met. Office Observer's Handbook* published by HM Stationery Office. **WW**

Further Reading On Weather Satellite Technology

WEATHER SATELLITE HANDBOOK Fourth Edition
by Dr Ralph E. Taggart WB8DQT
Published by ARRL
192 pages, 275 x 210mm. £13.50 plus 85p P&P from *SWM* Book Service
ISBN 0-87259-319-3

This book explains all about weather satellites, how they work and how you can receive and decode their signal to provide the fascinating pictures of the world's weather.

The *Weather Satellite Handbook* has changed considerably since it was first published in 1976, driven by the ever increasing sophistication of the satellites themselves as well as the steady march of technology that has made it easier and easier to watch the elusive images provided by the 'birds'.

The ten chapters cover Operational Satellite Systems, Weather Satellite Antenna Systems, Weather Satellite Receivers, Video Formats and Display Systems, the WSH Microcontroller, Scan-Converter Display Boards, Scan-Converter and Computer Interfacing, Satellite Tracking, Station Operating and Advanced Applications. There is a Glossary of terms and three Appendices cover parts and equipment suppliers, a scan-converter parts list and the WSH1700 BASIC program listing.

There are plenty of circuit diagrams and the chapter on Satellite Tracking has the WSH PREDICT.BAS satellite prediction program listing for IBM PC compatible computers, written in GWBASIC.

It is interesting that in the back of the book is a selection of advertisements for equipment for the WXSAT enthusiast with a couple of well-known British suppliers in there.

This book is well worth putting in your shack if you are into weather satellite watching.

Technical Software Weather Satellite & FAX Receive System

Before the arrival of budget-priced computer systems, there were few ways in which the listening enthusiast could extract meaningful information from the strange sounds that can be heard by tuning the dial on a domestic radio. Lawrence Harris has been looking at a low-cost Spectrum-based decoding system.

When you progress to better quality short wave receivers, you realise that there are many different types of transmissions. You can quickly learn to recognise c.w., FAX and possibly even weather satellite signals.

Several hardware and software manufacturers have recognised the interest that listeners have in decoding these transmissions, producing products that will translate these strange signals into meaningful pictures and charts for a surprisingly low outlay.

This is what Richard Wilmot of Technical Software set out to do for those who already have a certain minimum level of equipment. Several readers of my 'Info in Orbit' column have told me of their results using this equipment, so I was interested in trying it out for myself.

Before contemplating just what this hardware can do, you must appreciate what gear you need to have. The equipment requires a Spectrum computer, dot matrix printer, a television and a suitable h.f. receiver. Spectrum owners will already be aware that this computer does not produce the highest quality screen images, but the idea of this system is to produce hard copy, hence the printer.

Fig. 1: A visible light image from NOAA 11 printed on a dot matrix printer using the APT-1 module.

For the purpose of this review, I was able to borrow the cheapest version of the Spectrum sold. Technical Software provide the software for all Spectrum versions and a fairly comprehensive instruction leaflet explains about the setting-up procedure and gives details on FAX and weather satellite transmissions.

I am reasonably familiar with the weather satellites, having been involved with them and other satellites for many years, but my knowledge of FAX was relatively limited. So I needed to look up fairly basic information on frequencies from columns in *SWM*. I felt that a little bit of information about suitable frequencies would have been helpful. However, the more experienced utility monitoring enthusiasts will know that frequencies vary from season to season and reception varies considerably during the day, so a cheap frequency guide could be useful.

I set up the system to decode the signals from weathersats first, as I have several tapes full of recordings made from various satellites. The instructions correctly tell you to make the connections with the equipment power off.

Hardware

The hardware provided by Technical Software consists of three units. The SIA-2 interface adaptor board is needed for either module and was well constructed on a double-sided glass-fibre p.c.b., though without the interface. One i.c. is the Z80 clock timer and the other is a peripheral interface controller. This unit is connected to the expansion port provided at the back of the Spectrum.

This didn't prove to be a problem - after I had re-read the instructions showing that automatic starts are available for FAX. So I

Fig. 2: A FAX picture of a METEOSAT whole disk infra-red image (DTOT format) taken near midnight.

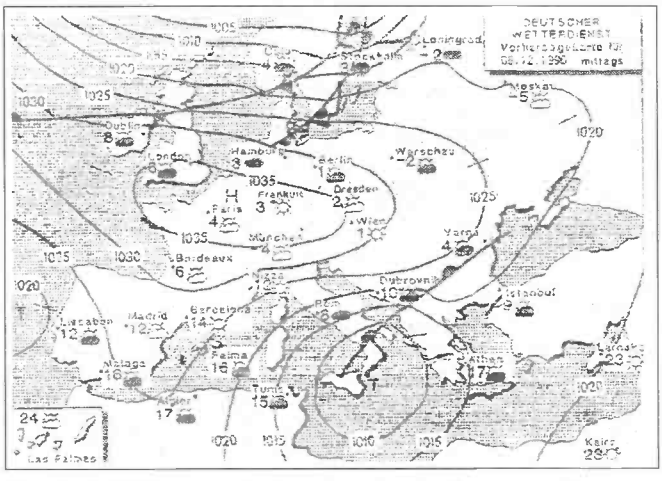


Fig. 3: A FAX transmission showing isobars over Europe.

experimented for a while and quickly got some results. I would recommend beginners to FAX to start with the well-known transmissions such as Bracknell on 3.289MHz or Offenbach on 134.2kHz or DPA on 139kHz, always assuming that they are transmitting when you tune in!

My first attempt at decoding a Bracknell transmission was successful and I got a chart out, though the scaling was wrong. I then tried the automatic start and was impressed by the way that the screen monitor showed the start tone as being recognised and the printer started up. I had worried about r.p.m. and IOC settings, but the automatic start set these up itself. Under noisy reception conditions it is possible for the unit to misinterpret parts of the signal, so that you may get unexpected results, such as the wrong scaling, from time to time.

Favourite Facility

The FAX proved to be my favourite facility. I could see how you can set up the system to run fully automatically in your absence. If you do set it up to run automatically, you will need to use continuous paper and the software caters for this by doing a form feed after the chart is printed.

It is worth mentioning that if you only decode weather charts then you will not suffer greatly from 'burnt-out' ribbons. It is the large dark areas on press and similar pictures that consume ribbons - printing FAX charts is little different from printing text files, just more interesting.

I do feel that here is an excellent school project - a cheap Spectrum and h.f. receiver and these two or three modules and you have revolutionised your geography lessons!

My thanks to Richard Wilmot of **Technical Software, Fron, Upper Llandwrog, Caernarfon LL54 7RF** for supplying the review modules. The units are priced at £40 for the SIA-2 interface, including software on tape (or £42 on disk). The FAX box is £40 and the APT-1 weather satellite modules cost £59 inclusive of VAT. **WW**

Suitable Listening Guides

Air & Meteo Code Manual 10th Edition by Joerg Klingenfuss. £15.00
The Satellite Experimenter's Handbook, £7.50
Guide to Facsimile Stations 10th Edition by Joerg Klingenfuss, £14.00
Guide to Utility Stations 9th Edition by Joerg Klingenfuss, £19.00
The Pocket Guide to RTTY & FAX Stations by Bill Laver, £2.95
Also a frequency list is available from Mike Richards G4WNC, author of 'Decode' column, see Short Wave Magazine for details.

Abbreviations

c.w.	continuous wave (Morse)
FAX	facsimile
h.f.	high frequency
i.c.	integrated circuit
IOC	Index of Co-operation
kHz	kilohertz
MHz	megahertz
p.c.b.	printed circuit board
r.p.m.	revolutions per minute

Further Reading On Weather Satellite Technology

RADIO AURORAS
by Charlie Newton
Published by RSGB
93 pages, 240 x 183mm.
Available from RSGB, £7.65 (non-members) £6.50 (members)
ISBN 1-872309-03-8

Every month the propagation columns include details of auroral, magnetic and solar events that have been reported to me by both astronomical and radio observers. Obviously there is much more behind these complex happenings than the end product which I publish and I feel sure that many of my readers want to know more about the cause, as well as the effect, of such natural disturbances.

Radio Auroras is a book dedicated to these subjects and, in a reader friendly manner, the author explains, with easy to follow diagrams and graphs, the reasons why a disturbance on the sun can upset the earth's magnetic field and/or cause an aurora to manifest within its polar atmosphere.

Apart from his own 30-year study of auroral activity and the innumerable hours he spent analysing the special auroral logs completed by thousands of European amateurs, the author has included valuable data so willingly supplied to his project by famous scientists and scientific institutions around the world.

The adequate introduction to the subject matter is followed by seven chapters explaining how an aurora begins, the changes in the magnetic fields of the earth and the sun, auroral propagation on the 144MHz band, a fascinating analysis of the contribution made by radio amateurs during sunspot cycle 21 and a really detailed report of the great solar storm of March 1989.

The book is well indexed and its pages are thoughtfully laid out providing a sensible balance between informative text and the associated diagrams. From theory to fact this book is a winner, a great credit to the author and a fine example of the international co-operation that exists in the amateur radio movement. In my view the price of £6.95 is modest compared to the valuable research packed within its pages.

Ron Ham

WEATHER SATELLITE RECEPTION
by Chris Hornby
Available from Spacetech,
21 West Wools, Portland,
Dorset DT5 2EA
149 x 209mm, 91 pages.
Price £9.75 plus £1 P&P
ISBN 1 870919 00 9

This book is aimed at two types of readers, those who have a casual interest in satellite imaging processing techniques but who may not wish to go into a great deal of technical detail as well as those who wish to get involved to the extent of starting their own satellite project.

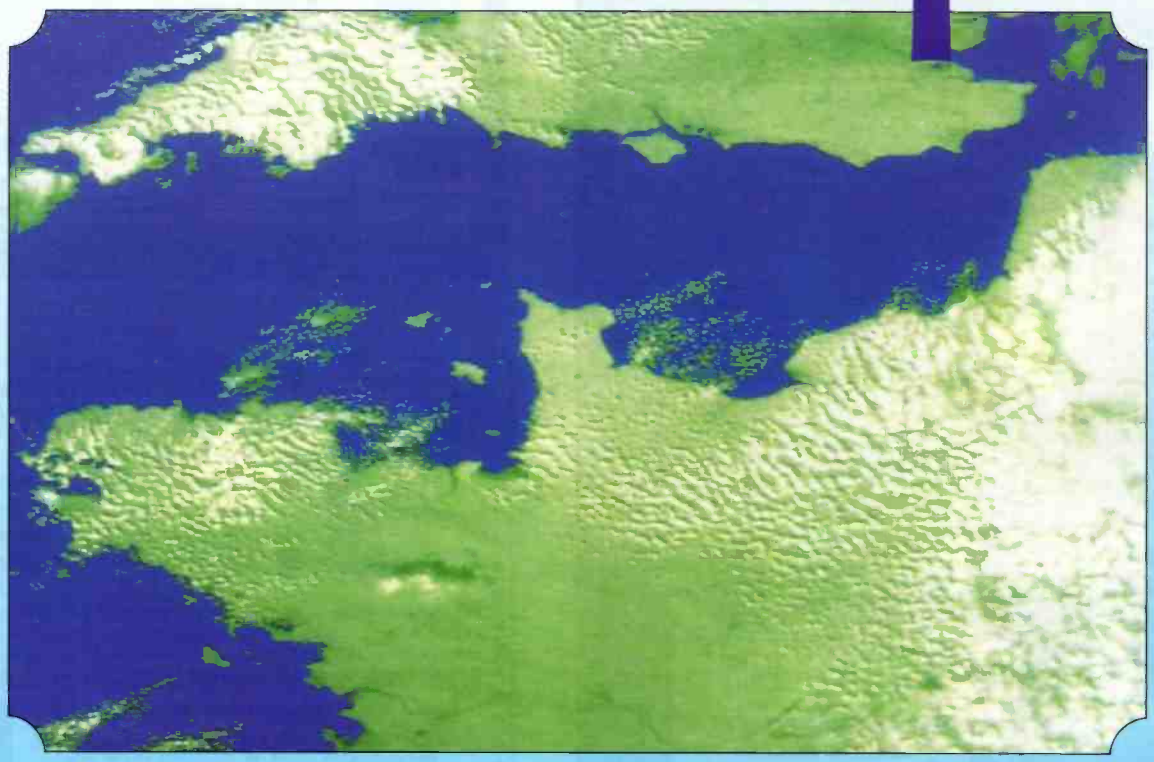
There are four chapters in the book: Satellites in Education; Reception and Antennas; Decoding Signals; Development. There are also ten appendices covering things like useful addresses, licensing notes, satellites, FAX frequencies and hard copy - to name a few.

All kinds of topics are discussed, reception and decoding techniques, frame formats and orbiting types. After working your way through the book, it's hoped that the readers will feel confident enough to have a go at setting up their own station.

There are plenty of illustrations to give the reader an idea of what results you can expect from various systems including a FAX picture from Bracknell. Both printer dump and photographic type results are shown to give a good idea of the different levels of resolution that can be achieved. The best one was on page 62, a photograph of the Isle of Portland, land thematic mapper, 30m resolution.

If you think you would like to get into weather satellite watching, then this book could make the way ahead a little easier for you.

Timestep



Weather Satellite Systems

Timestep produce weather satellite systems that operate from Meteosat, GOES, GMS, NOAA, Meteor, Okean and Feng Yun. Using an IBM PC compatible computer enables the display of up to 1024 pixels, 768 lines and 256 colours or grey scales depending on the graphics card fitted. We support all known VGA and SVGA cards.

The choice is yours of whether you go for a Geostationary or Polar Orbiting system. You can start with either one and add to it later. We can supply complete systems including the PC at very competitive prices or you can buy one part at a time. All the systems and hardware are designed by Dave Cawley and Peter Arnold and manufactured in Britain.

Complete Meteosat systems giving 400 different images a day are available for under £700 including the Meteosat antenna.

Polar orbiting systems, receivers, antennas, pre-amps and tracking programs together with the PROscan receiver are available at modest cost. Instant Track, the definitive polar tracking program, is just £24.05 inclusive.

The image above is taken from the AVHRR sensor of NOAA 11 HRPT using our new HRPT system. It will be available from summer 1991 at a cost of approximately £1200.00 less antennas. The antenna system can be two Timestep Yagis or a 1.2M dish.

Several unique features are available (depending on the software version) such as: NOAA latitude and longitude gridding, NOAA temperature calibration, False Colour with autoshade, Pan and Zoom, Transect, Histogram and variable equalisation, 3D display, 100 frame animation from Meteosat, Live on screen display at up to 1024 x 768 x 256, Mouse interactive operation, Median filter to remove country outlines from Meteosat and a Laser dump facility. New options and features are being added all the time.

Call or write for a full catalogue

Timestep Weather Systems

Wickhambrook Newmarket CB8 8QA England
Tel: (0440) 820040 Fax: (0440) 820281

p

propagation

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

Fig. 1.

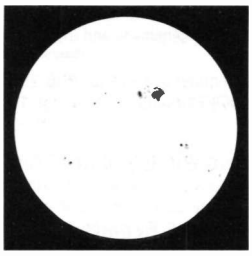


Fig. 2.

Patrick Moore (Selsey), using his special apparatus, made drawings of the large sunspot group which he observed near the sun's east limb, **Fig. 1**, at 1240 on January 9 and its position again, near central meridian, at 1040 on the 13th, **Fig. 2**. **Ted Waring** (Bristol) counted 17 sunspots on the 11th and 8 on the 22nd.

Cmdr. Henry Hatfield (Sevenoaks), using his spectroheliosc ope, located 2 sunspot groups and a small bright pillar prominence at 1123 the 6th; 3gps at 1145 on the 11th; 2gps and a large quiescent prominence at 1445 on the 13th; 3gps at 1202 on the 16th; 2gps at 1212 on the 19th; 3gps at 1205 on the 21st and 3gps at 1437 on February 1. Henry added that one group on the 1st was 'very large', possibly 16 spots, with a small flare. His 136MHz radio telescope recorded individual bursts of solar noise on the 7th, 11th and February 1 and, on 1297MHz, he recorded bursts on the 12th, 17th and February 1.

Ron Livesey (Edinburgh) with his 2.5in reflector and 4in projection screen, identified 4 active areas on the sun's disc on days 6, 9, 19, 23, 24 and 28; 5 on days 10, 13, 25 and 29 and 6 on the 3rd. **Ern Warwick** (Plymouth) heard a 'huge rushing sound' (no doubt solar) and fading, on 28MHz, around 1030 on the 3rd and found the the band 'dead' at 1630 on the 16th and midday on the 21st and heard a long burst of noise at 1340 on February 1.

Auroral

Ron Livsey is the auroral co-ordinator for the British Astronomical Association. He received reports of 'intense aurora' from an observer in Oulu, Finland for the overnight period of January 25 and of auroral 'glow' from observers, mainly in Scotland, on nights 6, 7, 8, 9, 11, 12, 14, 15, 17, 23 and 24. In addition, reports from Kirkwall show that 'rays', 'quiet arc and rays', 'quiet arc' and a 'rayed arc' were seen on the 9th, 12th and 14th, 15th and 23rd respectively. **Doug Smillie** (Wishaw) noted auroral reflected signals from the Orkney (OY6VHF) and Shetland (GB3LER) beacons on the 24th. **Tony Hopwood** (Worcester) noted tone 'A' signals during the afternoon on 25th and mid-morning of the 28th.

'Echos' were reported by Ern Warwick on the 28MHz beacon signals from Germany (DF0AAB) on days 1, 2, 5, 10 and 20; South America (PY2AMI) on the 10th and the USA (WA4DJS) on days 2, 5, 9 and 10. He also heard fast signal-fading on VK2RSY, on December 30 and January 1 and the 14MHz beacon KH60/B on December 31.

Magnetic

The magnetometers used by **Garry Hawkins** (Bristol), **Karl Lewis** (Saltash), Ron Livesey, **David Pettitt** (Carlisle), Tony Hopwood and Doug Smillie, between them, recorded activity from January 23 to the 29th with an 'active storm' on the 24th. The layout and general constructional details (no circuit) of Doug Smillie's 'Hall Effect' magnetometer can be seen on page 91 of Charlie Newton's book *Radio Auroras*, (ISBN 1 872309 03 8), available from the RSGB, price £7.65 to non-members and £6.50 to members.

International Beacons

First, I regret to report the death of Mark Appleby who was a regular contributor to the beacon section of this column and, although he is no longer with us, his consistent work will not be forgotten because it has been recorded in our sister magazine *Practical Wireless* for posterity to use. We all extend our deepest sympathy to Mark's family and his many friends.

Secondly and as usual, my thanks are due to **Chris van den Berg** (The Hague), **Gordon Foote** (Abingdon), Henry Hatfield, **John Levesley** (Bransgore), **Ted Owen** (Maldon), **Fred Pallant G3RNM** (Storrington), Ted Waring and Ern Warwick for their 28MHz beacon logs from which I have compiled a chart, **Fig. 3**. This shows the signal paths that were open and the general condition of the band, on a daily basis, from December 26 to January 25. New beacons, especially in the USA are frequently being tried out and this time Ern Warwick added KB8JYR (St. Louisville - 28.232MHz), KB9DJA (28.222MHz) and NT9S/B (Greencastle - 28.250MHz) to those listed in **Fig. 3**. Ern also logged consistent signals during this period from IK6BAK on 24.915MHz; PY2AMI on 24.931 and 18.100MHz; KH60/B, ZS6DN/B, 4U1UN/B and 4X6TU/B on 14.100MHz and DK0WCY on 10.144MHz.

Tropospheric Band II

The slightly rounded atmospheric pressure readings, recorded at my home in Sussex, for the period December 26 to January 25 can be seen in my 'dx television' column elsewhere in this issue. High pressure changes within the period helped to create a few openings in Band II (87.5 - 106MHz). For instance, at 0810 on January 13, using my elderly, ex-military, R216 receiver, **Fig. 4**, fed by a chimney-mounted dipole, I heard BBC Radios Bristol and Shropshire, at good strength and counted 8 continentals scattered through the band. The R216, although insensitive by todays standards, is ideal for sorting out stations because the frequency range of 87.5 to 103MHz is spread across some 560mm of its film strip scale.

On the 13th, 14th and 15th, **Simon Hamer** (New Radnor) logged BBC Radios Guernsey, Jersey and Suffolk and stations in Belgium, France, Germany - including AFN2 and BFBS1, Holland, Ireland and all of Scandinavia. In the latter he identified Radios 'FYN' and 'SYD' from Denmark, 'NRK' P1 and P2 from Norway and 'SVR3' from Sweden.

George Garden (Edinburgh), operating his car radio around 1600 on the 29th, heard BBC local radio from the north-west with Leicester being mentioned, a weak signal for a short period from BBC Radio York and strong signals from the IBA station Radio Borders.

Francis Hearne (Bristol) tells me that Bristol's incremental station 'FTP' (for the people) is no longer broadcasting and its spot has been taken by Galaxy Radio. "This station came on air on 27.1.91 and is part of the Chiltern Radio group," said Francis.

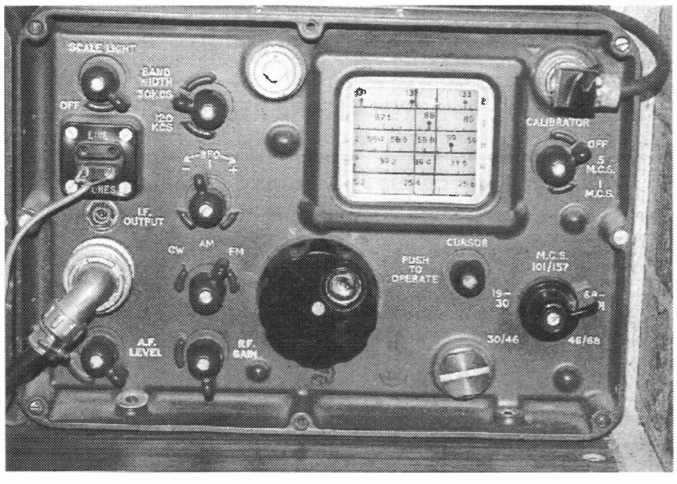


Fig. 4.

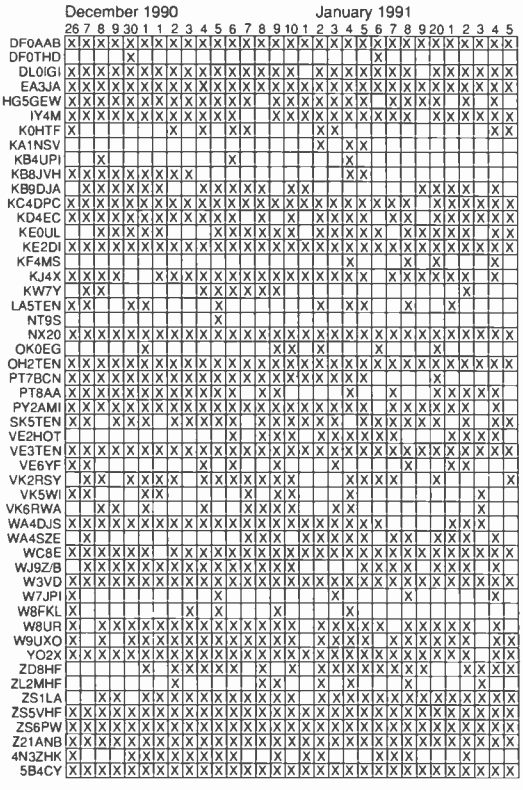


Fig. 3.

ssb utility listening

Peter Rouse GU1DKD
Barcroft, Rohais de Bas, St Andrews, Guernsey, C.I.

This month I am going to briefly return to the frequencies used during the Gulf War. Several readers have said that they have not heard very much on the frequencies listed in the January issue. First, it has to be said, you must be patient. It is no use dialing-up a frequency and expecting to hear a constant flow of communications. The Forces are regularly changing channels and of course it may well be that at any given time of day or night the frequencies being used may not be suitable for propagation into the UK area. Patience is the key.

I am providing a shorter list here which includes some new frequencies. All are upper sideband (u.s.b.).

Airborne Warning & Control System (AWACS):
9.014, 11.215, 13.205 & 15.091MHz.
Allied Ground Forces primaries:
6.632, 9.006, 11.233, 13.231, 13.257MHz.
Allied Ground Forces secondaries:
4.704, 5.690, 6.204, 6.810, 6.906MHz.
US Army Engineers (callsigns Castle 1 to Castle 12):
9.130 & 11.425MHz
US Navy Hicom (High Command):
7.525, 12.215 & 22.126MHz.
Saudi Air Force:
3.095, 5.526, 8.967 & 8.990MHz.
Dharan air base ("Hotel One"):
9.130,11.100 & 18.019MHz
Riyadh air base ("Hotel Two"):
7.300 & 12.112MHz.

If you have a receiver that covers 30 to 35MHz it is also worth tuning around this band as, depending on propagation, quite a lot of activity can be heard at times (narrow f.m. mode). Feeding my Icom R7000 with an old CB base station antenna has at times produced far more interesting transmissions in this segment that has been found below 30MHz. Listen out for the callsign 'Dragon' which appear to be tank groups and their support crews.

Several readers have reported monitoring activity not only in the Gulf area but also from stations handling aircraft *en-route* from Europe to Saudi Arabia. The popular route seems to be down through Italy and on to Egypt and then the Gulf. Several comments have been made about the very poor level of communication discipline at times with stations calling over the top of each other and obviously not listening out on the channel before transmitting. Air crews have at times also given away a surprising amount of information about their home base, tail numbers, passengers and cargo and destinations. If we did not know before, we now know that the colour identifiers for air-to-air refueling tankers are Azure and Blue for those based at Mildenhall in the UK (Eastern Atlantic refueling) and Ebony and Gold for for Pease Air Force Base in New Hampshire (Western Atlantic).

Readers' Letters

Firstly may I thank everyone who has written in not only with logs, lists and tips but also for the encouraging remarks about this new column. It seems it was long overdue and enthusiasts no longer need rely on American publications which were of limited use in Europe.

Mr Coulter of Winchester has asked about a station he regularly hears on 4.410MHz where the operator asks which service is required. Firstly the exact frequency concerned is 4.4101MHz which is marine channel (4)18 and the corresponding reply from the ship will be found on 4.1157MHz. By checking the latter frequency it should be possible to identify the land station by listening to the initial call from the ship. I cannot be more specific as so many stations use this channel it could be one of several. The only point that puzzles me slightly is that Mr Coulter says the ship is then given two working frequencies. This sounds as if the station concerned is only using channel (4)18 for initial contact when in fact the calling channel for this group is channel (4)21 which has shore stations on 4.4194MHz and ships on 4.1250MHz. Perhaps someone can shed more light on this.

A letter from **John Garnett** of Truro lists the two main frequencies for Plymouth and Edinburgh rescue as 5.680MHz (primary) and 3.023MHz (secondary) and he asks if any more search and rescue channels are known. I can add several for Beccles Heliport at Great Yarmouth and they are 2860, 3488, & 5.484MHz. You will also find them on 134.600MHz if you have a v.h.f. scanner and are within range. John also adds 5.696MHz for US coastguards and I can confirm hearing many East coast stations on this channel particularly in the late afternoon and early evening. Just a tweak of the dial below them you will occasionally hear Plymouth rescue on 5.695MHz and they also use 5.683MHz. I have also heard Edinburgh Rescue using 5.420MHz in addition to the two frequencies mentioned by John. According to some sources 5.645MHz is used for helicopter search and rescue in the North Sea but I have yet to hear anything on this channel myself. Some helicopter work in the North Sea is also co-ordinated by Stavanger Radio in Norway on 5.427MHz.

It is worth noting that aircraft-to-ship coordination is often carried out using h.f. and on more than one occasion I have heard rescue ships talking to Nimrods and helicopters on the marine distress frequency of 2.182MHz.

John asks if any frequencies are known for Kinloss (120, 201 & 206 squadrons) and St Mawgan (42 & 38 Squadrons). These are both major fields for search and rescue and coastal patrol operations but I have not seen anything listed. The nearest I can get is a frequency of 4.540MHz for Lossiemouth (home for a number of squadrons including ones using Sea King helicopters and Boeing AWACS). Most of these squadrons seem to rely heavily on their u.h.f. links which provide good range from ground to air but if anyone can shed light on h.f. frequencies then let us know.

Whilst we are on the subject of search and rescue it might be an idea to look at the main marine calling and distress channel. Certainly the most active frequency in waters around Europe is 2.182MHz. You will hear ships calling shore stations and being told the frequency of the working channels that they should move to. If a ship needs to transmit a Mayday call then all other calls on the frequency are supposed to cease. A number of British stations can be heard on this frequency including Land's End, Niton, Humber, Portpatrick and others. Under some conditions you may well hear stations as far afield as the USA.

That's it for this month. Keep the logs coming and if there are any particular topics you would like covered then let me know. If you do not want your name mentioned in the column please say so each time you write as it will be impossible for me to remember who does or does not want to remain anonymous.

Abbreviations

AWACS	Airborne Warning & Control System
CB	Citizens' Band
f.m.	frequency modulation
h.f.	high-frequency
MHz	megahertz
u.h.f.	ultra high frequency
u.s.b.	upper sideband
v.h.f.	very high frequency

bandscan

EUROPE

Peter Shore
c/o SWM, Enefco House,
The Quay, Poole BH15 1PP.

DX programme presenters at the EDXC Conference in Madrid, 1985. (l. to r.) Ian McFarland (R. Canada Int.), Bob Zanotti (Swiss R. Int.), Jonathan Marks (R Nederland). Bob Thomann (Swiss R. Int.), Marianne Marks, George Wood (R. Sweden). This year's EDXC Conference will be in Barcelona, May 17 -20.

The attention of the world has been firmly fixed on the Gulf, and is likely to remain so despite the liberation of Kuwait City on February 27. Radio from Baghdad was rather erratic in the first couple of months of the year, presumably following the destruction of some of Iraq's transmitting sites. Some new stations appeared, including the 'Mother of Battles' Radio, although this was very short lived. It was first noted on January 26 but by February 3 it had disappeared. Radio Baghdad's services started to use some rather odd frequencies and by the end of February, transmissions had settled down on to three channels 3.98, 4.60 and 8.35MHz all of which were on the air for most of the day.

The Allied forces, meanwhile, made extensive use of the radio spectrum in attempts to encourage Iraqi soldiers to desert. During mid-February transmissions were noted around 6.6MHz, a military communications area of the shortwave bands, with a 90-second message transmitted in Arabic. This would then be repeated on a frequency around 10kHz along the band. Presumably this was aimed at signals staff in the Iraqi military who doubtless were tasked with monitoring the Allied military communications frequencies.

BFBS

BFBS, the British Forces Broadcasting Service, has been making use of short wave, with a feeder noted on 6.84MHz from Cyprus to BFBS stations in the Gulf which could not, for one reason or another, be fed by satellite from London. The American equivalent, AFRTS, is fed from the UK on 9.023MHz u.s.b., and VoA Europe is on shortwave, directed to the Gulf, on 21.70, 15.195, 15.160 & 11.735MHz noted from around 0800UTC.

The Red Cross Broadcasting Service doubled its output after the commencement of hostilities. There is now a second Sunday of the month broadcast in addition to the long standing last Sunday of the month transmission. English is heard at 1100 on the second and last Sunday of the month on 7.21MHz, repeated the next day (Monday) at 1700 on the same frequency.

Gulf Links

One programme which has suffered as a result of the Gulf War is Radio Austria's *DX Programme*. This was dropped for a number of weeks to allow extended coverage of events. However, it returned on March 3. It is broadcast to Europe on 6.155 and 13.73 at 1130 and 1430UTC.

Radio Australia has been running a *Gulf Links* programme for the forces in the Middle East. The programme contains messages from friends and relatives at home sent in by telephone or on cassette, and it is similar to the BBC's *Gulf Link* programme which kept the British hostages in touch with home last year. The Radio Australia programme is transmitted at 1430 on 25.75MHz (which is heard clearly in the UK) and on 21.775MHz.

The Baltic

Whilst the news media has been concentrating on the war with Iraq, developments in the Soviet Union have been quite dramatic. On January 13, Soviet Interior Ministry troops were deployed in Lithuania resulting in the death of several people during clashes as the television station was occupied. Relays of Radio Vilnius, carried on short wave by the Soviet radio transmission network, stopped for several days, although Lithuanian transmitters, still in the hands of the independent authorities in Lithuania, continued to broadcast. Negotiations with the Soviet broadcasting authorities proved successful in getting the external service of Radio Vilnius back on the air, and now the 2300UTC North American service can be clearly heard on 9.75MHz. Listeners have been urged to send in reception reports by FAX. The number is 0122 22 15 71 and the station's address is Radio Vilnius, Vilnius, Lithuania.

Neighbouring Baltic state Latvia has started a somewhat sporadic English language service. Radio Riga can be heard on 5.935 at 0530, 1230 and 2130 on some days.

Down south in Kazakhstan, there is a new English service from Kazakh Radio on Monday, Wednesday and Friday at 0130, noted on 5.915MHz. Other frequencies which may be worth watching at this time are 7.23, 6.135 and 5.035MHz.

Albania

Further south, that last bastion of Marxism, Albania, seems to be going through something of a revolution, with demonstrations on the streets, and the toppling of a giant statue of the former Head of State, Enver Hoxha. English from Radio Tirana is heard at 1830UTC on 9.48 and 7.21MHz, and at 2230 on 9.76, 9.66, 7.215 and 1.395MHz. Radio Tirana has certainly become more liberal in recent weeks. A New Year message from the station admitted that in the past not all heard from the station has been the exact truth, but in future the staff would endeavour to report the news more objectively. The Albanian domestic service is on the air on 5.057MHz

In Hungary, there is speculation that up to 50% of Radio Budapest's output is to be cut from the end of June. It is likely that Italian, Spanish and Turkish will cease, and other services will be curtailed. It is probable that the station's twice weekly DX programme, which has a total of 18 airings during the week, will be cut. If listeners feel strongly enough, it might be worth dropping a note of protest to the Director of Programmes, Radio Budapest, Budapest, Hungary.

Radio Canada International

At the end of February there was still no news about the future of Radio Canada International. The Canadian Broadcasting Corporation, RCI's parent organisation, announced late last year that it could no longer support the international service which costs some Can$20 million to run. It is probable that the Department of External Affairs will find most of the cash to run RCI, but it may be that the station will be reduced to only French and English, with all other language services axed.

Relays

The BBC World Service is benefitting from an increased number of rebroadcasting agreements. World Service is now heard in Auckland and Hamilton in New Zealand on f.m., and on medium wave in Wellington, while in Czechoslovakia, f.m. transmitters in Prague, Brno and Bratislava are now carrying World Service. The BBC is also investigating the possibilities of using Soviet transmitters to improve its audibility in the Sub-Continent. It is examining the potential coverage from senders in Tashkent, Alma Ata and Frunze, although no final agreement has been reached with the Soviet authorities. This would indeed be a remarkable achievement, considering that jamming of the BBC's Russian Service is not that distant a memory. The facilities may be available because of the reduction in many of the foreign language and regional services of Radio Moscow. There has been a reduction in the overall hours broadcast by the station, although frequency usage has stayed constant in terms of number of hours per week.

Possibilities

Other possible relays which the Corporation is considering include facilities within Mongolia and a joint relay station to be constructed in Thailand with the Dutch. This is becoming less likely, with the Dutch government having vetoed the expenditure for the time being. The military coup in February may also make things less easy for the BBC. The World Service programme line up undergoes major changes in April, with a second ***News Hour*** introduced at 1300UTC to complement the existing programme which is now advanced to 2100UTC. The weekly *Waveguide* programme will be heard on Saturday at 0905, Monday at 0530, Tuesday at 1115 and Thursday at 0130.

Sounds Interesting

Radio Netherlands is reintroducing a listener contact programme from Friday April 5. Called *Sounds Interesting*, it will be open to suggestions from listeners. Send your suggestions to the station at Radio Netherlands, PO Box 222, 1200 JG Hilversum, Holland. Radio Netherlands in English is heard at 1130UTC on 9.715 and 5.955 and at 1430 on 5.955MHz. The evening transmission at 2030 beamed to West Africa has also been well heard lately on 13.70 and 15.56MHz.

Adventist World Radio has announced plans to build a transmitting station in Italy near Argenta which will have two 100kW and two 250kW transmitters. There will be curtain antennas to service much of Europe, as well as the Soviet Union, the Sub-Continent, North Africa and the Middle East. AWR currently uses transmitters in Sines, Portugal and its own facilities in Forli, Italy.

RadioSat

Finally news of a new venture which aims to supplement, if not to replace, short wave broadcasting. The International Radio Satellite Corporation, known as RadioSat for short, plans to launch three geo-stationary satellites each with 200 stereo audio channels that will be leased to international broadcasters. The problem at the present is that there are no receivers available to pick up such satellites (which have yet to be commissioned), but the RadioSat organisation is already talking with receiver manufacturers, aiming to have sets costing around £50.00 or less throughout the world. We'll have more details next time Bandscan covers Europe. In the meantime you can get the latest news by listening to RadioLine on (0898) 654676. This is updated every Sunday and will give you the latest developments in the listening scene ahead of the magazine.

satellite tv news

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

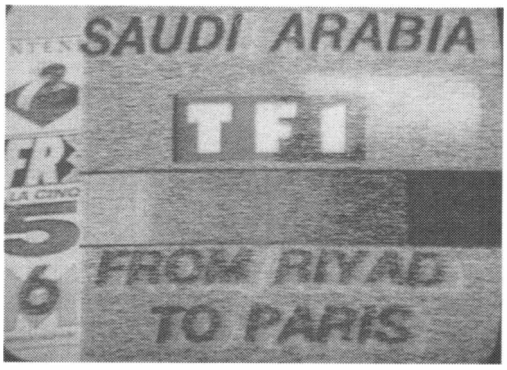


Fig. 1: The French Saudi-Paris news circuit on Eutelsat I F4 4°E at 11.05GHz horizontal.

Fig. 2: The VisEurope news service with menu of daily feeds, taken from Eutelsat II F1 13°E 12.52GHz vertical.

Another month on and the Gulf War still dominates the headlines and the satellite news feeds. Last month, I mentioned the Intelsat VA F11 at 57°E to provide easy access to the broadcast media for uplinking reports back to the UK in the Ku band - Ku output on this bird has been spotted into London. The UK news pool downlink into the UK at 11.498GHz. Additional feeds have been brought into service for other media reports, mainly for North American TV networks. CNN out of Riyadh are on 10.980; CBS Tel-Aviv on 11.015; ABC Tel-Aviv 11.600 and CNN from Baghdad on 11.167GHz. Unfortunately, I am badly sited and unable to see much past 23°E, but those more fortunate with a clear look to the south-east report fair quality signals from 57°E down to a 1m dish.

Another Gulf news feed source that appeared on January 22, was the ex-13°E. Eutelsat I F4 that has been re-positioned for Euteltracs service to 4°E. This bird has been pressed into news feed services with the French TF1 circuit uplinking out of Riyadh into Paris at 11.05GHz horizontal, active at times throughout the day into late evening. This Saudi feed in SECAM is a dedicated French link and carries material for other French networks as indicated by their identification logo. UK satellite uplink trucks (Starbirds) are known to be sited in Amman (11.67GHz hor Eutelsat I F4 7E) and at least one in Saudi. Amman is usually seen via the semi permanent EBU link over Eutelsat I F1 using sound in sync at 16°E 11.17GHz. The Jerusalem Capital Studios are often seen signing as JCS and indicating client on 7°E horizontal 11.20GHz and 10°E horizontal 11.56GHz + 10.970GHz vertical. Finally, on both 7°E 11.64 (strong) and 10°E 11.57GHz (very weak). Another SNG feed was seen on Jan 26, but the identification was scribbled on a shorthand pad 'Estacion Reyota Amman, Agencia Efe-Telefonica', can anyone identify this one?

Despite the Gulf War, the world continues. The funeral of Kong Olav V in Norway was seen live January 30 over the TVN and TV4 transponders on Intelsat VA F12 1°W. The Nor-Net/TV Ruta transponder on this bird 10.969GHz has been testing in the clear with D2MAC ('in the clear' means with no encryption). Meanwhile, TV10, a new Norwegian cable channel, is using the Nor-Net transponder at weekends (Fri-Sun) for 6 hours from 2000 - mainly films and bought-in material, though 15% or so will be of Norwegian production.

Eutelsat II F2 successfully launched. During February, prior to the 21st, it was testing its transponder load from a temporary position at 21.5°E. **David Thorpe** at Crewe noted them at 11.65GHz with strong signals, the bird had to fly away from the test slot prior to Feb 21 to clear for the Astra 1B launch on that day, II F2 will move to its designated slot at 10°E over the next few weeks.

Intelsat VI F4 27°W has established a permanent US-Europe pair of news feeds over the last few weeks from RAI-New York 11.12 vertical and Worldwide Television News/PVHS #1 11.07GHz vertical - the latter in 525 lines NTSC.

Finally, one disturbing development - though not unexpected - was VISNEWS seen on their VisEurope 13°E downlink at 12.52GHz with encryption suggesting a variation on Nagra-vision. It's suspected that broadcasters have been 'lifting' news material from satellite downlinks and not paying for their use, recently the BBC lost a High Court case when certain of their sports material was recorded off-air by a rival broadcaster and then transmitted in the rival's news.

Orbital Slot News

Speculation continues over the future of the MAC format-which had been promoted as the way forward to improved picture and sound quality plus High Definition TV (HDTV). Heavy politics are now seeking an alternative to the MAC system of transmission following the demise of BSB. Both the West German PAL-PLUS and an Italian video compression technique are under discussion though the former German system is most favoured. Thomson Broadcast together with the Dutch Philips group were heavily into MAC research, but rumour suggests that Thomson may pull out-this coupled with the problems of the French TDF satellites that are failing-all were using D2 MAC and with nominal viewing figures-is further evidence of a likely fall from grace of MAC.

The new Eutelsat II F2 will take up its 10°E station mid March carrying TV, radio and digital business traffic. It carries 16 Ku band transponders (50W t.w.t. amplifiers), 12 of which will be in TV service and the others with business traffic. There are six series II birds, II F3 will launch mid-July 91. The EBU have confirmed the use of four series II transponders and options on a further two, all on the 'wide-beam' footprint to ensure adequate coverage for its 39 European members. Luxembourg based SES, owners of the Astra satellites has not yet confirmed all of the lease holders for their new IB craft now orbital, apart from two new BSkyB channels ex-BSB Marco Polo and several German channels, speculation continues about the Discovery Channel, CNN and Children's Channel. SES is planning for the IC and ID satellites with thoughts of 18 transponders for these craft-IC will provide additional channels plus the important back-up for IA and IB, meanwhile ID will carry four higher powered transponders for future HDTV options. All the Astra satellites will be co-located at 19.2°E.

Meanwhile overseas, the Hong Kong based ASIASAT is proving a financial success with 12 of its 24 transponders giving a dual 6-channel service over most of the Far East, and several other countries - amongst them Korea, Burma and Nepal - likely to take out options for transponder leasing. The bird is solely C Band (4GHz) and earlier in its career had been rescued by a Shuttle flight after failing to reach orbit. China launched the satellite earlier in 1990. Also in the Far East, PacStar is a new projected satellite communication system to be operational late 1993, recently Taiwan signed as a co-partner.

CNN coverage of the Gulf War has gained that channel much publicity and, it's interesting to note that Hanoi, Vietnam now has a CNN receive terminal for the THVN network in the capital for accessing news material and for transmitting various news programmes dubbed into Vietnamese-the US Government were initially against the move but eventually permitted CNN to install the system. CNN meanwhile has gained access to MATV systems in Hong Kong, and in Ghana the GBC have installed their own dish at the Accra Broadcasting house to receive and re-transmit parts of CNN programmes over the GBC.

Fred Pilkington, one of our experienced enthusiasts from Newmarket is fortunate to occasionally stay in Southern Spain and relates the story of his neighbour receiving both Sky Movies and Sky News on their terrestrial TV! Further investigation revealed that Eurosport was also being received at u.h.f. A directional antenna and portable TV was assembled by Fred and careful pointing of the Yagi suggested the satellite signals were radiating from an apartment block 200m away, the result of a leaking distribution system.

Fred now intends to take a high gain Yagi on his next visit so that he can watch the Astra programmes, in addition to the local Spanish terrestrial offerings!

Fig. 3: News feed for the UK from Israel over Eutelsat I F5 10°E at 11.56GHz horizontal using the author's 1.5m dish.

amateur bands round-up

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

QSL card from UA0AI in Ilansky, USSR sent to BRS-26053, otherwise James Kavanagh in Swindon, 1966.

First a letter from **Kevin Walton**; who is ex-9M2ZZ, but has now returned to USA and is operating as N4RMF. If anyone still needs a QSL for the 9M2ZZ operation, he can be reached at PO Box 316, Culpeper, Virginia 22701-0316, USA.

Ian Hamilton is in Riyadh, Saudi Arabia, where he takes a copy of *SWM* and a Philips D2999 into the air-raid shelter with him when necessary. Ian notes the antics of what he describes as a 'radio hooligan' who is audible from there on around 14.175MHz, and seemingly operated by a woman in Lebanon.

Daniel Peake from Burnage is still using his AR88D to a 30m antenna; he has now added an AOR AR800E but not a lot to report since he is using it on the inbuilt helical antenna. On 14MHz JX7DFA, JW1QCA, LX150L, A71CD, C31PA, ZL0AAD/ZL7 (Chatham Is), FK8GA, 3B8FU, VK6HA, ZD8DX, 5Z4BI, VK3SWM, YV6BXN and T5RR; 21MHz yielded YV5DTA, VK6NEB, CN2AQ, VK4CC, A92T, TA1AR, VP2EY, HI8RED, HK5JPS, N7DF/P/NH2 and V29A. When 7MHz was tried, JA6FKY, JA1OYY, JA4EYK, JR2KDN and HL1UA were all logged; compare that with 24MHz where Daniel noted FP/P/VE1KM, C53GH, 9H1IP, KP2A, PJ6/KV4AD, PJ9MR, VK8OL, CU3LF, AP2JZB, OD5QX and C31UA. These pale to insignificance when we look at what is obviously Daniel's favourite 28MHz; KC4OQB/MM, C53GH, KP4DQ, ZS6BBY, FM5DN, 9X5SW, ZM2RR (Niue), OD5RH, KE0YG/TF, CE2AK, HZ4ZZ/MM (somewhere near Libya), 3DA0BK, ZC4DG, CN8NY, PZ1DY, KP5SS, T77V, OD5SK, CN8NK, 7X5VBK, TA3PB, 4X6RL, VP2V/N2BAT, YQ3R, CO4/CO3JA, VS6VO, J6LVI, OX3W, plus lots of W6, W7, VE6 and VE7 stations.

On 3.5MHz, **Ron Pearce** (Bungay) uses his home-brew one-valver, which uses a PM2HL from about 1938; this picked up K3FLY, JA8EOP, VO1EM, OZ8BV, WB2NC, 3A2LU, VE1PS and WB2CLN.

Now to **Bill Williams** of Gloucester, who started off with an Eddystone Two, pre WWII; On 3.5MHz we see KO1F, K2JMY, K4JLD, VO1XC, VS6BX, YV5AAX; on 7MHz he found JA1UTS, and JA6XMM, while 21MHz presented him with 7J5EJL, H44AP (Solomons), JX7DFA (Jan Mayen), T23YL, T77T and ZK2XB. On 28MHz the log includes 8P9GC, PJ2HB, PT2TF, TG9GI, ZS6AOO and FY5EM.

Eric Pickering (Blackburn) voices interesting thoughts on antennas; being somewhat of a 7MHz dab. He put up a Delta Loop and tried feeding it at a lower corner for omnidirectional low-angle radiation. The plot worked in part, in that it proved very potent out to the USA and S. America, but poor to the SE. Eric reasons that as the loop was on the NW side of the earthed metal supporting mast, the mast was the culprit.

I'm not quite convinced, though he agrees the way to prove the point is to rebuild the Delta on the basis of an insulated mast.

Angie Sitton (Stevenage) reckons that for her, 7MHz was 'flavour of the month', JA as early as 1600, and as late as 1000, Ws about the same but peaking in Stevenage at about 0100 on the 18m wire which she has for this band.

Those of you who suffered in the snows of early February can blame it all on **Don Robertson**, who wrote that in the far north of GM-land they had only had a couple of showers of snow, no wind - most unusual that - blue skies and dry weather. Such writing must have annoyed the Clerk of the Weather who promptly sent plenty of the white stuff! On the radio side, there hasn't been a lot of activity owing to a severe 'bug' which prevented him going to his outside shack.

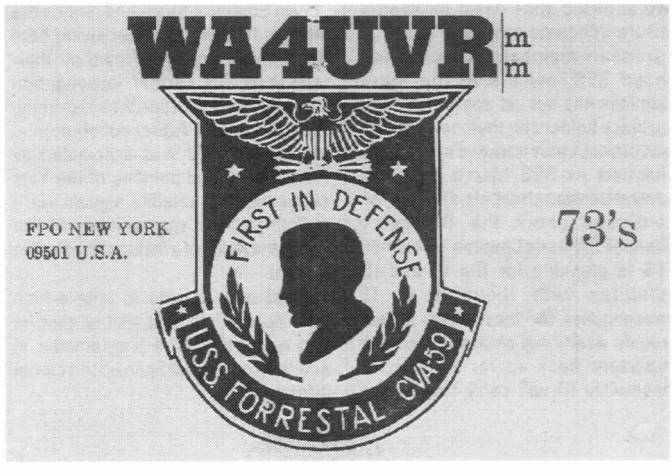
Charles Wells (Mansfield) was also in problems. First the XYL was laid up for three weeks, then the blizzards pulled down the 33kV lines and left them without power and water for five days. However, Charles did log PY2IBS, RA9LL, UA9JH, VE3NXB, VU2KB, UA9MHN, UZ9WWR, LU1IXC, CO8RL, KP4YD and, of course, UAs Ws and Europeans all on 28MHz, not to mention 18MHz sigs from J6LNJ, C31LBB, VE7SR, 4K2/UV3CC, Europe, USSR and Ws. Charles noted all these on c.w.

Now to Wrexham, where we find **Mike Drew.** He used 3.5MHz to log 6W1QC, A92BE, W4QCU, and loads of Europeans and UK signals. On 24MHz the tally was: VK8HN, 6W1QJ, YQ3R, KA2CYN, G4TYV/M, KE8FG, EA7ABW, WA4BWB, KF2X, KZ4V, N0OH, N5FA, N4UCK, N8AYC, N4LUF, V51KC, W1OW, EA9UA, K1ZSE. As for 28MHz, here the log said 3OA0AY, ZL3CQ, W2FV/0, K9EIC, N3BAW, WB3EML, WA7HRR, VK6ME, YQ3R, KA1CNG, N7NHV, KA0WTA, K6GCF, W7LTH, K0REF, N4YAM, K1CSB, CT1DL and ZS5ADB.

Ted Trowell comes from Minster and manages to work all the h.f. Bands. Top Band s.s.b. gave ON7BW, while c.w. showed up OK1DWJ and W4QM/MM off Tunis. 3.5MHz yielded various Europeans, while 7MHz found T77GM, W4PLL, K4FU, UA9MJA, UL7VB and U3DR all on c.w. as were ZP6XDW, W8EGB, KP2A, W1FZY, W2BA; on 14MHz there were ZL3FV (s.s.b.), UA0QHN, UT0/UB4MM; as for 28MHz it was also c.w. all the way, with XE2MX, YV1NX, UV0BB, K7UOT, W6OV, LU1ICX, K1RH, RB5FQ, N3GMA, K4KQ, K1HZ, KM4WL, WA7CWM, KE2WY, WT7F/8, W6DU, W5TCX, W1HMD, K8CIT, YN1CC, N2IF and 3W4DK.

Vince Cutajar (M'Scala, Malta) sticks to s.s.b. and WARC bands; loggings on 18MHz included VK3CEW, ZL2BRS, ZL2MAX, ZS5BH, 9X5NH, PT9FH, and YS1YS, while 24MHz was cropped to the tune of LY2BBZ, HE7ASJ, TI2KD, 9L1US, HK5LEX, PZ1EL, RF0FWW, AP2JZB, UG1700GWG, CT3FT, 4S7/ON4IPA, RC2CR, RC2CO, 9Q5TE, KE6FW, VK8HN, ZD8DX, ZK2XB, ZC4MK, RD7DZZ, UF7FWR, K7SP (Arizona) VP2VE and GJ3RAX.

Brian Lucas looks after third year students in a training school in Kent; part of the course-work includes radio listening on our bands to give some 'feel' for what can be done. They have various receivers: valved jobs such as RA17 Mark 2, BRT400K, B40L, an HRO and solid-state boxes such as R2000, R5000, FRG-7, FRG-8800 + active antenna, and Eddystone 990R and 990S for higher frequencies. Listening is mainly on 14/21/28MHz with dipoles, with the odd foray on to 1.8, 3.5 and 7MHz using a long wire; plus Yagis giving coverage up to 144MHz all of which are designed built tested and erected by students. Listening times are mainly 0800-0830 and 1300-1330 with each student having a band assigned to him. The cream from the large log that results include PT7BZ, 8P6BE, OD4AYR, ZL1OK, 9H1BE, VK8HN, C31UA, 9J2EG, VU2OO, A22GH, AP2JZB, A61AD, VE3ICR, JA6GGD, JH1RFR, VK2APV, PT7OO, HZ1TA, YB3CEV, VU2GPD, VK5QW, TA1AR, ZS6ASW, 7X2VZK, 9H4M, JA4UQI, JA3REK, WG20G/MM, 9J2WS, VE1CAW, VK8HN again, JJ5AVM, JK1UNZ, JA4KFA, ZL1AD, VK7GK, C30EOA, and 'specials' GB0CDQ, OH1AA, HE7IQB and YV6A.



James Kavanagh received this QSL from the nuclear-powered aircraft carrier USS *Forrestal* in July '67.

Snow!

Finally, a moral tale from **Eric Masters G0KRT** in Welling. Eric uses the Lake DTR3 on the transmit side plus a Howes receiver into 25m of wire and a counterpoise earth. Without the counterpoise, replies are not forthcoming; when the snow came down it was noted that the a.t.u. tuning had changed and replies were again not in evidence. When the snow stopped, Eric went into the garden where he found about 10m of the counterpoise buried in snow. Hoisting it out and tying it up well clear of the stuff and lo! normal service was resumed.

Again, I had several v.h.f. contacts which were only possible by reflection off snow on the hills surrounding the home QTH.

I need to receive your material by April 12 and May 15, addressed as shown above, to give me time to 'put it together.'

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dxtv round-up

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Toward the end of 1990, **Lt. Col. Rana Roy** (Meerut, India) received many unidentifed television pictures, in Band I, from stations in South-East Asia, via 'F2' and/or TEP (trans-equatorial propagation) openings, almost daily, from October 30 to December 26 when "the DX seemed to taper off". A typical example of the unidentified pictures came at 1656 on November 13 when, on Ch. E2 (48.25MHz), he saw a news reader, **Fig. 1**, from a SE Asian News programme which finished at 1700. "A clock at 1705 showed the time at 7.30 pm," said Rana, adding, "This was followed by another programme of world news, **Fig. 2**." His fascinating log for that day continued, "At 1725 saw Ads. At 1730 another station came up on E2 as a floating picture. At 2000 Bangkok ('Ch3'), came up with clear sound. Pics faded away at 2200." He often saw Bangkok's '3' caption, **Fig. 3**, on Ch. E2 and positively identified signals from Dubai and Thailand TV and, in the early evenings of October 30, November 18 and December 9, he received 525-line pictures, probably from Burma, on Ch. A2 (55.25MHz). Among the bits of programmes he saw, while these events, with their sometimes smeary and distorted pictures, ebbed and flowed, were American films, various adverts, kick boxing, news and teletext. At 1855 on October 30 he made out an advert for 'PONDS COLD CREAM' from a 525-line signal.

Back home now and although **John Woodcock** (Basingstoke) found no DXTV in Band I during the month prior to February 8, he did hear, at the lower end of the band , official mobile traffic from the USA in the afternoons of January 30 and 31 and February 3, 5 and 6. On the 5th, John reports hearing utilities from Europe and North America at the same time. **Simon Hamer** (New Radnor) had a super haul of DX via an 'F2' opening between 0900 and 0930 on January 16 when he received "strong but smeary" pictures from Australia (ABC and DDQ) on Ch. A0 (46.25MHz), China (CCTV1) on Ch. C1 (49.75MHz), weak and fading video from New Zealand (BCNZ) on Ch. NZ1 (45.25MHz), Thailand, with '3' logo on Ch. E2 (48.25MHz) and the USSR (TSS) on Ch. R1 (49.75MHz). Later at 1100 he identified Dubai and Iran and at 1300 Zimbabwe on Ch. E2. Simon logged Australia (DDQ), China, Thailand and the USSR again on February 2 and 4 but with the addition of New Zealand on the 4th. He found some winter Sporadic-E in the shape of test-cards from Czechoslovakia (CST IS RP) and Norway (NRK Televerket) at midday on January 21 and 22 respectively and Czechoslovakia (CST) and the USSR (TSS) on Ch. R2 (59.25MHz), Denmark (DR) on Ch. E3 (55.25MHz) and Finland (YLE) and Iceland (RUV) on Ch. E4 (62.25MHz) on the 7th.

Simon has now received verification for his television reports from both Australia (ABC) and New Zealand. **David Glenday** (Arbroath) caught a brief glimpse of Italy's 'RAI UNO' and Spain's 'TVE 1' on the 16th. It is possible that the 'F2' disturbance on the 16th was caused by the large sunspot group, observed and drawn by **Patrick Moore** at his observatory in Selsey, which can be seen in my 'Propagation' column elsewhere in this issue.

Picture Archives

George Garden caught his first glimpse of the 'Sports' and 'Movie' channels on a satellite TV system installed at a hotel in Edinburgh and, down south near Guildford, **Les Jenkins**, using a 1m 'dish' antenna to feed his satellite TV converters, logged a couple of interesting pictures, **Figs. 4 & 5**, from Eutelsat 2 on January 14. Les is not sure about the origin of the 'Usingen' test card, **Fig. 5**, but he knows that its frequency is 1161MHz and he has noticed that the wording sometimes changes to 'Tonprogram' and 'Deutsche Welle'. "Perhaps it's marking a space for things to come," said Les, any ideas readers?

Tropospheric (Weather)

The slightly rounded atmospheric pressure readings for the period December 26 to January 25, **Fig. 12**, were taken, at noon and midnight each day, from the Short and Mason barograph installed at my home in Sussex.

The already high pressure increased rapidly from 30.2in (1022mb) at midnight on the 18th to 30.55in (1034mb) at 2300 on the 19th and varied a little around this figure until the 28th when a slow decline began. The sky remained consistently overcast from the 22nd to the 31st with, no frost, but with overnight temperatures around 28/30°F and daytime between 32 and 34°F. Although a bad period for the visual astronomers, the weather buffs among you may like to know that I recorded 2.13in of rain in December and 4.02in in January, but what about the following report from Rana Roy? "We have had a severe cold wave here from 31 Dec. 90 to 07 Jan. 91. There was heavy snowfall and icy gales in Kashmir, Himachal Pradesh and Hills of Western Uttar Pradesh. Temperatures went down -10.8°C in Srinagar, -6° in Shimla, -39° in Spiti in Himachal Pradesh and -41° in Drass in Ladhak. In the plains of Rajasthan the lowest temperature recorded was at Churu (-2°). In Meerut temperature came down to 1° at night at 11° in the day". In his letter on January 12, Rana said that the night and day temperatures were 5° and 19° respectively. "Early January was dominated by low pressure and there was no DX then, but the second half of the month has had several high pressure areas moving over the British Isles so there has been a little tropospheric DX, but it has been weak signals," wrote **David Glenday**.

Most of us experienced some form of the arctic conditions between February 4 and 11 during which period I recorded an overnight temperatures of 18°F down to 10°F and up a little to 13°F on the 6th, 7th and 8th respectively and watched the pressure gradually fall from 30.5in (1032mb) at midnight on the 5th to 29.7in (1005mb) at 1800 on the 8th as various snow storms crossed the country.

Tropospheric (Openings)

David Glenday received pictures in the u.h.f. band from Denmark (TV2) and Holland (NED1,2,&3) on January 14 and added the sound transmissions from Germany (NDR3 & ZDF) on the 15th. He logged Denmark (TV2) and Ireland

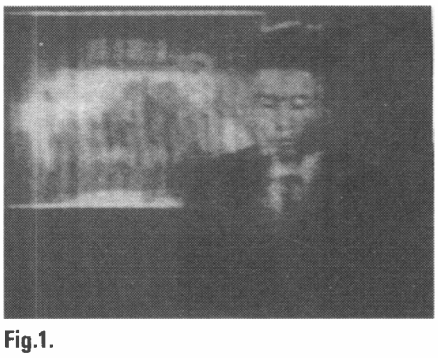

Fig.1.

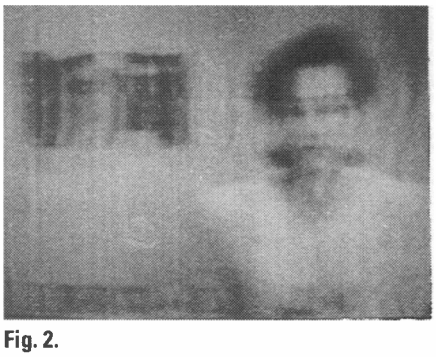

Fig. 2.

Fig. 3: Bangkok.

Fig.4: Eutelsat 2.

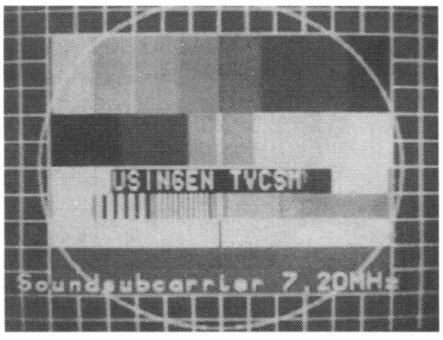

Fig. 5: Eutelsat 2.

Fig. 6: France Antenne 2.

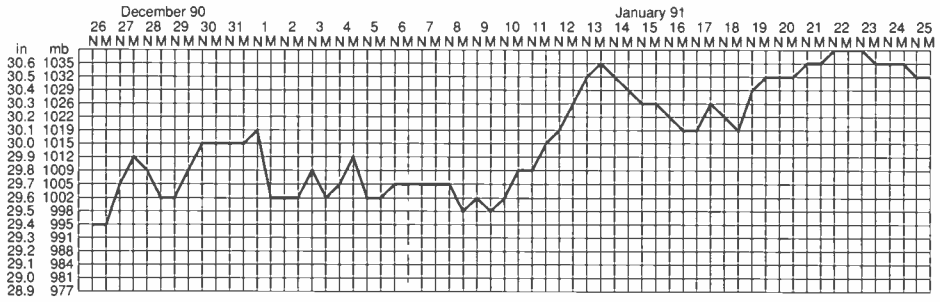

Fig. 12.

(RTE1&2) on the 22nd, Denmark on the 23rd, Germany (ARD1, SAT1 & ZDF) on the 24th and the sound channels only from Belgium (BRT1&2 and RTBF) on the 28th, Belgium, Holland and Germany on the 29th and Denmark on the 31st. He again saw weak pictures from Holland and Belgium on February 2 and 4 respectively. In Swindon, **R.T. Gale** found u.h.f. reception good from France (TDF) and Germany (ZDF) between 1130 on January 25 and 1500 on the 26th when he logged pictures from the French 'Antenne 2', **Fig. 6**, on Ch.21 and TF1, **Fig. 7**, (note the TF1 ident bottom left) on Ch. 27 and a test card from Germany's 'HR3', **Fig. 8**, on Ch. 37. During the period he also identified programmes from Belgium (BRT TV1&2), Germany (Frankfurt and SW3 Bagn) and Holland (NED1,2&3). RTG's equipment sounds good, he uses a Grundig mulit-system colour receiver with a quad bow-tie stacked antenna and Labgear amplifiers.

Mobile DXing

Our keen mobile DXer, **George Garden**, took advantage of the falling pressure on the 28th and took his carborne JVC receiver, log-periodic antenna and head amplifier to the summit of the road from Fettercairn to Banchory in Kincardineshire. From this point he logged a weak signal, "coming in waves" from the Caldbeck (nr. Carlisle) transmitter on Ch. 34 and, while the signal was at it strongest, around 1540, he saw a cartoon and a snippet of sound. He also received reasonable colour pictures from the ITV stations 'TYNE TEES' (Ch.49) and 'BORDERS' (Ch.59) from Chatton and Selkirk respectively. "The weather was perishingly cold with a slight amount of fog on the horizon and a dense layer of complete cloud cover," said George. On January 14/15, Simon Hamer received pictures from Austria (ORF1), Czechoslovakia (CST1), Denmark (DR), Finland (YLE1&2), Germany (ARD), Poland (TV1) Norway (NRK), Sweden (SVT1) and the USSR (TSS) in Band III and Austria (ORF2), Denmark (TV2 DANMARK), Finland (YLE), Germany (ARD, DFF, NDR3, RTL+, SWF3, WEST3 and ZDF), Poland (TVP2), Norway, Sweden (STV2) and the USSR in the u.h.f. band. Simon watched the Scandinavian stations in Band III and the German station in the u.h.f. band again on February 4.

Band III in India

From his home in Meerut, Rana Roy received pictures in Band III during tropospheric openings from Agra (Ch. E9), Kasauli (E6) and Lahore TV (E5) at 2250 on November 16; Agra, Amritsar (E7), Bahatinda (E12), Delhi TV with Lahore TV overlapping on Ch. E5 and Kasauli at 0750 on the 29th; news from Jaipur (E5) and programmes from Kasauli at 1930 on December 8; Agra ("fighting for predominance on the screen" with Jalandhar), Amritsar, Bhatinda, Kasauli at 0730 on the 24th and later at 2040 Lahore TV was overlapping Delhi TV. Next morning at 0700 Lahore's test-card was again riding up on Delhi's signal and another tune through Band III found signals from Amritsar, Bhatinda, Jalandhar and Kasauli. Rana's trop-DX for 1990 ended at 1630 on the 26th with Education TV for children from Lahore.

Slow Scan Television

During the Christmas holidays, **P. de Jong** (Leiden, Holland) received 32 seconds slow scan television captions, around 14.228MHz, from Finland, **Fig. 9** and Southern Germany, **Fig. 10**. Pd., is a member of the Benelux DX-Club and uses a Grundig International 650 receiver, 50m long-wire antenna, DSH Electronics decoder and a Philips monitor. On the same band around 1600 on January 27, Philip Lock (Aldershot), equipped with a Lowe HF-225 receiver, long wire antenna in the loft, a Dragon 32 computer with G4BMK software and an Epson printer, copied captions from OE1ZO in Austria, **Fig. 11** and SM0PPE in Sweden. Toward the end of January, John Scott (Glasgow) copied 'CQ' or 'K' captions, on 14.288 or 14.235MHz, from Belgium (ON4ABP), France (F6GIO), Germany (DF3IF & DL9SBL), Holland (PA3AII), Spain (EA2JO) and Wales (GW4WFM).

Abbreviations

Ch.	channel
DX	long distance
in	inches
m	metres
mb	millibars
MHz	megahertz
u.h.f.	ultra high frequency
v.h.f.	very high frequency
°C	degrees Celcius
°F	degrees Fahrenheit

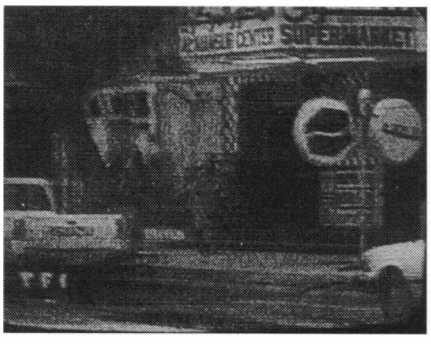

Fig.7: France TF1.

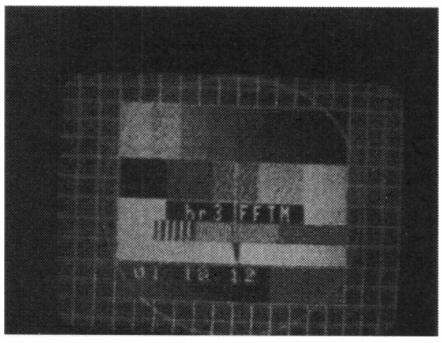

Fig. 8: Germany HR3.

Fig. 9: Finland.

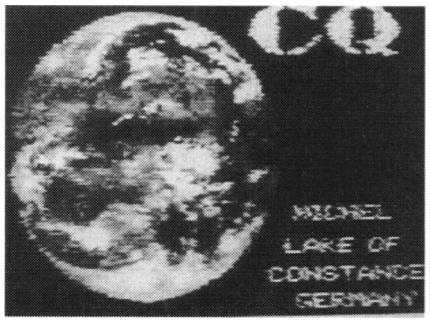

Fig.10: Germany.

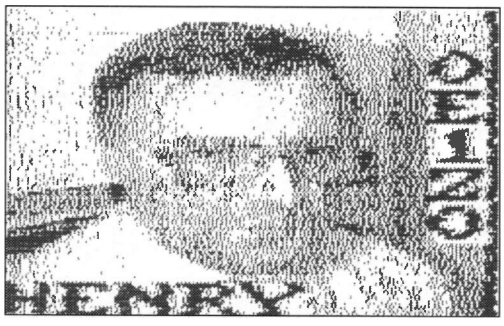

Fig. 11: Austria Slow Scan.

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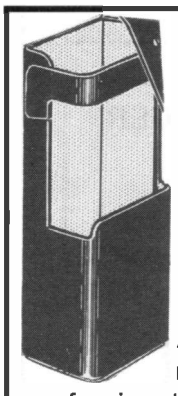

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Our VHF & UHF Frequency Listings are both updated to late November and must be the most comprehensive available. Our VHF list includes ICAO 3-letter designators, callsigns, squawk codes and much more, while the UHF lists include stud numbers, range and other frequencies. Both lists have LATCC transmitter site/frequency tie ups.

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airband

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No further need to be in suspense! The Christmas Quiz (January issue) only produced four entries, all correct. **J. Pumfrey G8SNH** (Shoeburyness) has a PPL and works professionally in aviation. **P. Grimmitt** (Evesham) even identified the part of the aircraft in question to be the hydraulic system ground servicing connectors. **Nicholas Winter** (Hull) also provided captions for the other, non-competition, photos - beyond the call of duty! The other entry was from **D. Andrew** (Torrington). The answer was a SEPECAT (Anglo/French) Jaguar fighter, since made famous by daylight sorties in the Gulf War. There can only be one winner and using random selection the prize of a Victor Tanker (again, topical) jet pipe temperature gauge goes to P. Grimmitt. Here's another question (no prizes this time) for the military buffs. Why don't Jaguars operate at night, even though equipped with FLIR?

Now a 'Stop Press'. I have discovered where the annual PFA International Rally has moved to this year. The previous venue, Cranfield, was an essential source of parts for my Museum. This year Wroughton, Wiltshire (home of the Science Museum's main transport collection) will host the Rally on July 5-7. I hope to be there on the Saturday if anyone wants to arrange to meet up.

Runway Braking Action

As noted by **Peter Wade** (Sevenoaks), the recent weather has brought chaos with the need to close runways at intervals for snow clearance. No wonder Delivery Controllers are losing their cool if up to 80 flights are already awaiting slots due to weather delays! Braking action is usually measured by the Mu-Meter on a 0-1 scale. The instrument is a three-wheeled trailer towed behind a vehicle; two wheels on one axle are to enable it to travel, the third wheel is behind the axle and in the midline (like a tricycle in reverse). This latter wheel senses the surface friction at 3m intervals. Sometimes a subjective-sounding reading is given (good, medium or poor) but these groups should correspond to ≥0.5, 0.49-0.35, and ≤0.34 on the Mu-Meter. For compacted snow, a Tapley meter can be installed inside a vehicle. This is a decelerometer which gives a 0-100% reading according to how briskly the vehicle in which it is carried can skid to a halt! Any volunteers to try this one?

Follow-Ups

Michael Farrier (Hatfield) responded to the request by Mr. & Mrs. Hasman & Son (Leicester) in the February issue and some historical radio navigation charts are on their way. Thanks for your generosity, Michael.

The new North Atlantic h.f. circuits have been mentioned several times in recent issues so I'll just thank **Sean Carvin EI2CR** (Dublin) and **Geoff Halligey** (Bridgend) who both sent official charts showing that NAT-A, B, C, D and E are now all in use. Despite what I said in November 1990, the 8.906MHz frequency is part of NAT-E (not NAT-A). NAT-B is still in use, but not at Santa Maria and New York where NAT-E has taken over.

In January **John Harrowing** (S. Humberside) had his questions about reporting points answered. Various Alconbury, Bentwaters, Upper Heyford and Woodbridge military procedure reporting points were described. In an explanation regrettably far too long to print here, **Mike Tighe** (London) adds more detail on this subject. Apparently one military procedure (which requires specific pilot training) that uses these reporting points is the Aircraft Surge Launch And Recovery (ASLAR) which enables instrument approaches at busy times such as exercises and tactical evaluations.

The stages in an ASLAR approach are:
Initial Approach Fix, often co-located with an existing holding pattern;
The two aircraft in formation take up line-astern to achieve separation for landing;
Deceleration point (reached by the leader first, of course);
Final Approach Fix;
Final Approach Speed Point (speed depends on aircraft type and, presumably, weight).
There is also, inevitably, a missed approach point.

Private pilots don't use these procedures - they don't fly formation sorties! But they're worth knowing about as it is possible to encounter military aircraft on instruments in the open f.i.r. Although these aircraft should keep a look-out, it's all too easy to become engrossed in the instruments and with 'head inside the cockpit' not notice another aircraft as quickly as usual.

When writing to me about any 'follow-up' it helps to state in which issue the subject was last mentioned.

To Russia - By Balloon

In February, I mentioned the Cameron/Oparin flight and the details are filled in for us by **Roy Merrall** (Dunstable). You can plot the progress on a chart:
2/10/90 1200Z 54°57'N 09°19'E
2/10/90 1615Z 55°35'N 11°32'E FL50 track 064° 15kt
3/10/90 0815Z 51°52'N 20°04'E FL55
3/10/90 0915Z 57°58'N 20°39'E FL60
3/10/90 1030Z 58°42'N 21°24'E FL60
3/10/90 1147Z 57°44'N 22°35'E
3/10/90 1315Z 57°15'N 24°04'E FL40
3/10/90 1345Z Coasting in at Riga
3/10/90 1743Z Landed Sigulda, 15km SE Riga.

Hardware

Michael Farrier asks an important question where receiving any small signal is concerned (all the more important on v.h.f. and u.h.f.). Does the coaxial feeder cable between the antenna and the receiver matter?

Yes it does, the better the quality, the stronger will be the received signal. Without boring everybody with the maths involved, look for the attenuation figures in the specification when buying coaxial cable. There will be a number of dB (decibels) per metre at 100MHz. The smaller this figure, the better the cable.

What about antenna pre-amplifiers? Rule 1 is: don't do it (but **do** install good quality coaxial cable). Rule 2: if you must have one, be careful as it might also amplify all manner of interfering transmissions and it might also increase the noise as much as the wanted signal! But put it at the mast-head, where it can boost the wanted signal before the coaxial cable gets a chance to attenuate it again. Warning to my transmitting amateur colleagues: make a fool-proof arrangement whereby you can't transmit through your pre-amp or the result could be expensive.

An a.t.u. is always a good idea for an h.f. receiver and **Graham Tanner** (Harlington) reports good results with the CM Howes kit that he built. With a G5RV antenna feeding a Sony ICF-2001D through the a.t.u., interference from a nearby computer is almost cured. Shame the kit doesn't include a template to help with drilling the front panel of whatever metal box you decide to enclose it in.

Software

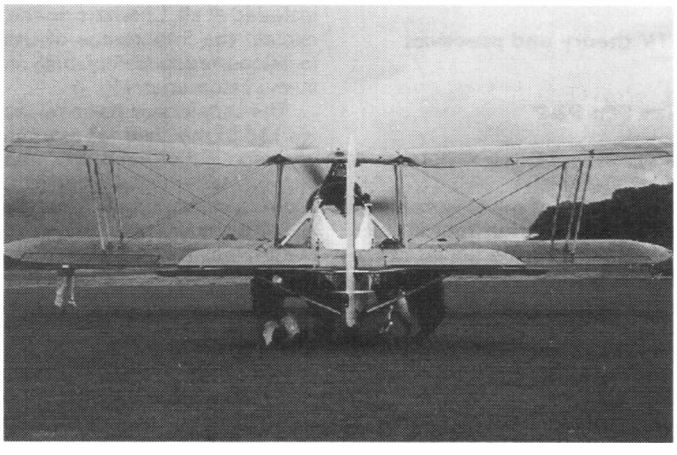
Computers continue to work wonders in various ways for aviation enthusiasts. **David I Shaw** (93 Quarry Moor Park, Harrogate Road, Ripon, N. Yorks HG4 3AQ) has been collecting and listing callsigns for 30 years. I'll bet you didn't have a computer when you started, David! He invites anyone to send him callsigns to add to his 120-page computerised list and will exchange information with other enthusiasts. ICAO publishes *Designators for Aircraft Operating Agencies, Aeronautical Authorities and Services* which is an official callsign list. It will set you back a surprising sum and is available from CAA Printing and Publication Services, Greville House, 37 Gratton Road, Cheltenham, Glos GL50 2BN. Tel: (0242) 235151.

Another database enthusiast is **Chris Kirby** (Aynho). Your village, if memory serves, looks like a good v.h.f. site but whenever I've driven over your spectacular hill, calling CQ on 144MHz, no-one ever answers! The information is integrated from many official sources including NOTAMs and in this case, Chris, although you feel that you'd rather not release the 84-page list generally I can see no problems if you were to do so. Perhaps the airline operations departments would be glad of it? Listings by frequency are very unusual so you might be filling a niche.

Disaster!

Although **Paul Hilton** now lives in Thatcham, Berkshire, he was brought up in Colorado Springs, USA and his first flight was in a TWA 707 from Stapleton, near Denver. He was interested in a newspaper report of a fire at Stapleton's fuel farm. Flights were affected not so much by the smoke pall but more by lack of fuel availability. Although the larger tanks were spared, some firemen were injured. Despite the commercial value of the fuel it took two days to call out a specialist oil fire-fighting company who, once on scene, extinguished the blaze in 17 minutes!

Let's hope it doesn't happen here. Closer to home, Paul can't work out why Concorde pilots prefer landing on 09L/27R at Heathrow, unless it's to cut



Holding down the tail of the display example Fairey Swordfish during an engine run-up at Old Warden. *Godfrey Manning.*

The Experimental Aircraft Project of British Aerospace.
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down taxiing time to Terminal 4. I can't find a better explanation in the Heathrow let-down plates, so can anyone else (such as a Concorde pilot) supply the answer?

Frequency News

Graham Tanner enjoys the h.f. details in this column but reminds me that I have 'only scratched the surface'. True - but this magazine could never replace the full-size *En Route Supplements* which I often mention from the usual suppliers. One of these, the Africa and Southern Asia section from the RAF FLIPs, was found by Graham to include the Falklands. Source: 1 AIDU, RAF Northolt, West End Road, Ruislip, Middlesex, HA4 6NG, Tel: 081-845 2300 ext 209. For details of all the h.f. aeronautical circuits I recommend *World HF Aeronautical-Mobile R/T Frequency Allocations* by Tim Christian (£6.99 UK post paid from Isoplethics, 157 Mundesley Road, North Walsham, Norfolk NR28 0DD). Graham also produces an h.f. listing; is this to be made available to readers and if so, how much will each copy cost?

Another 'surface scratch', this time from **Alan Gentry** (Cirencester). Frequencies in MHz as primary, main secondary, alternative secondary (where appropriate). Propagation prediction to the UK is 0700-0930Z in each case.
Auckland & Sydney 8.867 5.643 13.261
Abidjan, Canaries, Dakar, Recife 8.861
Manjus, Piarco, Porto Velho, Paramaribo 8.855 5.526

The next three deadlines (for topical information) are April 12, May 17 & June 14. All correspondence to 'Airband,' c/o The Godfrey Manning Aircraft Museum, 63 The Drive, Edgware, Middlesex HA8 8PS.

Circuit

A rectangular flight path commencing with take-off from a runway, circling the aerodrome and landing back on the same runway. The sides of the rectangle are called legs. All turns in any particular circuit are made the same way, most commonly to the left (this would be a left-hand circuit).

Crosswind leg

After take-off in a circuit, the aircraft climbs ahead to a safe speed and height (typically 800ft above aerodrome for a light, single-engine aircraft). At this point a 90° turn is made on to the crosswind leg.

Downwind leg

The crosswind leg of a circuit is flown until, typically, the end of the runway disappears under the tail of the aircraft. A 90° turn is made so as to fly the aircraft parallel to the runway but in the opposite direction to that used for take-off. Hence the aircraft is now flying downwind. On passing abeam the threshold, a downwind radio call is made.

Base leg

In a circuit, the aircraft turns onto base leg after the downwind leg and commences to descend. The runway comes in to view at right-angles to the aircraft's track.

Final leg

In a circuit, the final descent path prior to touch-down. Achieved by making a 90° turn at the end of the base leg. A finals radio call is made. The end result is a landing or a touch-and-go or a go-around without touching the runway. If the runway is obstructed, it is occasionally necessary to perform a tight circular orbit on finals whilst awaiting further clearance.

Abbreviations

a.t.u.	antenna tuning unit
CAA	Civil Aviation Authority
f.i.r.	flight information region
FL	Flight Level
FLIP	FLight Information Publication
FLIR	Forward Looking Infra-Red
ft	feet
h.f.	high frequency
ICAO	International Civil Aviation Organisation
kHz	kilohertz
kt	knots
MHz	megahertz
NOTAM	NOTice to AirMen
PFA	Popular Flying Association
PPL	Private Pilot's Licence
R/T	radiotelephone
u.h.f.	ultra high frequency
UTC	Universal Co-ordinated Time (=GMT)
v.h.f	very high frequency
Z	time UTC
°	degrees

FOR YOUR BOOKSHELF

The Satellite Book
(A complete guide to satellite TV theory and practice)
by John Breeds
published by Swift Television
280 pages, A4. Price £27.00 plus 85p P&P
ISBN 1 872567 01 0
Available from the *Short Wave Magazine* Book Service

This book deals almost exclusively with television broadcast satellites and is a comprehensive collection of chapters on topics, each written by an expert in that field. It appears to be aimed at the professional satellite system installer for whom it is invaluable, but it will be appreciated by a much wider audience - anyone interested in satellite technology. The theory of geostationary satellites and the concepts of satellite 'footprints' related to the size of dish are covered without ommision and in a very pleasing style.

A little mathematics is included to explain orbits and other concepts without leaving the reader feeling overwhelmed. It is inevitable that a book dealing with TV satellites will be overtaken by events and the recent merger of BSB and SKY illustrates how quickly this can happen. However, this does not affect the information included at all. Chapters on the installation of receiving equipment explain the importance of using the correct tools, suitable dish locations, ladder safety, dish mounting, cables and connectors and even customer care!

The chapters on basic microwave theory are also well-written - I worked in this field for several years doing research linked to this very application, and was impressed with the writer's efforts to explain matters clearly and concisely. Antenna theory, the potential problems using small dishes that could receive signals from adjacent satellites, and the solutions to these problems - all are covered comprehensively. With this book the topic of TV broadcast satellites is completely de-mystified. Background material, such as a description of British Telecom's Teleport terminal and its various antennas, the EUTELSAT fleet and all the 'footprints', together with ASTRA 1 and 2 are covered in detail as one would expect in a book of this nature. Finally, technical topics such as MAC and signal encryption are explained in an interesting manner, leaving the reader feeling that the wonders of electronics are that bit more easy to understand. To summarise: an excellent book, not just for the dish installer but for anyone who wants to know more about satellite television in all its aspects. John Waite.

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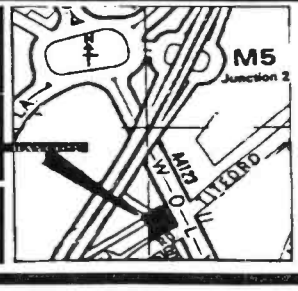

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scanning

Alan Gardener
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Once again I begin the column with details of yet another new scanner. This time it is YUPITERU announcing the MVT-7000 as a successor to their popular MVT-5000/Jupiter II handheld. The new model incorporates several additional features including continuous frequency coverage from 100kHz to 1300MHz, w.b.f.m. so that you can listen to f.m. broadcast stations and TV sound, 200 memory channels, manual tuning control, selectable tuning steps and all the other features standard on the MVT-5000. The case has also been redesigned to remove the sharp corners although the overall size remains about the same. The price is expected to be in line with that of its main competitors, so expect to see it advertised in the £249-£289 price range.

Following on from last month's comments regarding Mk II versions of scanners if you would like to extend the frequency coverage of your AOR AR1000/HP100E handheld or have problems with f.m. broadcast band interference then RGW Electronics may have the solution. They are offering a range of inexpensive add-ons for use with many different models of scanning receiver. You can write to them for further details at: 5 Braunston Place, Rugby, Warwickshire CV22 5JZ.

New Allocations

Several people have reported that p.m.r. base stations are now operating in the London area in what was previously an exclusive Home Office allocation at 80-84MHz. Most of these are either Trunked Systems or Community Repeaters with base transmit frequencies centred on 82MHz. The paired receive frequencies are at present unknown. It is assumed that this band will become more active as users of the current 87.5-88MHz p.m.r. allocation are moved in order to make way for further expansion of the v.h.f. f.m. broadcast band.

Activity also seems to have increased in the old Band III TV allocation where the lower of the three sub-bands reallocated to p.m.r. base stations is now showing signs of activity. This uses frequencies in the range 176.5-183.5MHz for the base station transmitter paired with frequencies 8MHz higher between 184.5-191.5MHz for mobile stations. Most transmissions in this band are likely to be from 'Trunked' Systems with many users sharing the same channels, the distinctive buzzing of the 1200baud data channels being the most characteristic feature.

Fellow *SWM* columnist Roger Bunney dropped me a line to say that the BBC have been carrying out test transmissions on 47.645MHz in the London area. These consisted of an announcement which repeatedly stated "This is a test from the East tower". The aim was apparently to find a cure for a problem resulting from a new Outside Broadcast allocation which was interfering with a v.h.f. cable distribution system in TV Centre - the transmit frequency corresponds to cable TV Channel E2. The transmissions were from BBC TV centre and used 25W from a 3-element vertical Yagi pointing north. The transmissions, which have now ceased were clearly audible at Roger's home in Romsey, Hants, at a distance of around 112km, which demonstrates the potential of this band providing that good antennas are used.

Digital Traffic

Observant readers stuck in traffic on the M25 may have gazed towards the heavens and noticed strange pods with helical antennae sprouting from the many bridges and gantries which cross the motorway. These are part of a new traffic information system which uses digital packet transmissions in the old 158 - 163MHz Post Office System 4 radiophone band.

The system operates by the downward facing pods detecting the rate of traffic movement at certain key points. The information is then transmitted back to a central control point where the raw data is processed. This allows the position of any hold-up to be determined, the details of which are then transmitted back to any motorist with a special receiver fitted to their car. This is designed to give an alarm signal if problems are anticipated on the road ahead. The unit also incorporates a large liquid crystal display which presents a stylised map of the motorway and junctions along with useful directions to help avoid the jams. If the scheme is successful you can expect to see an expansion of the scheme to other routes in the near future.

Illegal Listening

My thanks to the anonymous reader who sent me a news clipping from the *Southampton Evening Echo* regarding a Citizens Band enthusiast who was operating from his car whilst parked on a local spot of high ground. The police noticed that he had a scanning receiver in the back of his car, which was seized and taken back to headquarters for examination. The receiver was found to be tuned to police frequencies, aircraft stations and a Home Office channel. The case later came to court and he was found guilty of 'obtaining information which he was not authorised to receive'. The end result being a 6-month conditional discharge.

Reading the article it is not clear if the scanner was actually switched on at the time or if it was being re-broadcast over the CB radio. It is also not apparent if the scanner was returned after the court case.

However, as I have said before in this column it is illegal to listen to anything other than Broadcast, Amateur and CB stations in the UK unless permission is given to monitor frequencies for a specific purpose. It should be noted that this is normally not granted to private individuals.

It's still not that common for cases of illegal listening to come to court, most cases that do are usually in connection with other offences. You only have to go to an airport, airshow or yacht race these days to see a whole range of scanning receivers in public use. Technically, of course, all of these people are committing an offence, but it is unlikely that any prosecution would result unless someone did something really stupid. However, from comments I have heard several bodies are now concerned about the number of scanning receivers in circulation and their possible use by criminals. As a result it is likely that much more attention may be paid to the use of scanners in public places.

I hope that readers of this column will take note of these comments and use their receivers responsibly.

Talk-through Operation

Regular reader **A. Sheldon** has been picking my brain again, this time with a question regarding what is commonly refered to as 'Talk-through' operation. This is often used to allow mobile stations to pass messages directly to each other via a fixed base station. The idea being that the range of the base station is much greater than that which could be expected from the mobile station alone.

The question is how do these systems work and how are they controlled? A basic talk-through system consists of a receiver tuned to one frequency connected to a separate transmitter and antenna operating on another frequency. If the transmitter is fed with the audio signal from the receiver and is arranged to switch to transmit each time the receiver squelch opens, then any signals that are received will be re-transmitted on the second frequency. If such a system is placed on a hill or high building then any mobile stations operating on the correct frequencies and within range will be able to communicate with each other via the base station. Because the base station is well sited it can provide a much greater communication range than would be possible if the mobiles transmitted directly to each other because of the surrounding terrain or screening effects of nearby buildings.

One good example of such systems are the Amateur Radio Repeater stations operating in the 2m band between 145.6-145.8MHz and the 70cm band between 433.0-433.4MHz. These have transmit receive frequency spacings of -600kHz and +1.6MHz respectively and require a short tone burst of 1750Hz to initially activate the automatic control circuits.

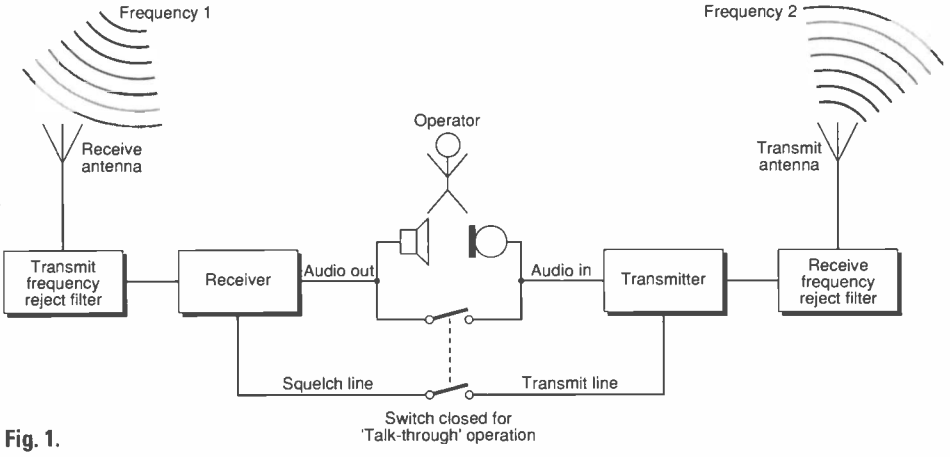


Fig. 1.

It may seem easy to construct such a system but there are one or two problems which have to be overcome first. The main one being how to prevent the the base transmitter from overloading or 'blocking' the receiver it is connected to. When a base station can simultaneously transmit and receive signals in this way it is said to be capable of duplex operation. Several techniques can be used to provide sufficient isolation between the transmitter and receiver, the easiest one being to put them in different locations. This has the advantage of being cheap but you still have to interconnect the two sites, and you end up with areas where mobiles can hear the base transmitter but the base receiver can't hear them. The more usual method is to have the transmitter and receiver at the same site but use special filters to separate the incoming and outgoing signals. Such a unit is referred to as a duplexer and often provides enough isolation to make it possible to use the same antenna for both transmission and reception.

In order to make the construction of such filters practical it is necessary to have a reasonable frequency separation between the transmit and receive frequencies. These tend to be in the order of 5-10MHz at v.h.f. and 10-14MHz at u.h.f.. As we go higher in frequency the spacings get larger in order to maintain the ease of construction.

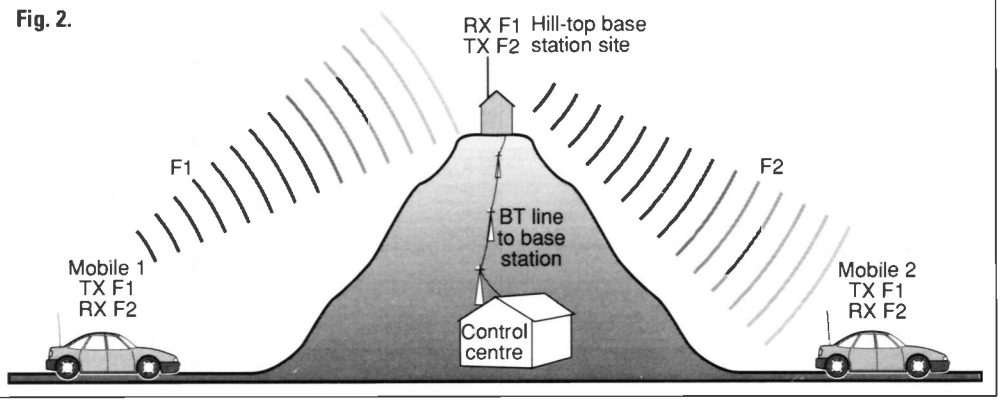
The use of 'Talk-through' operation is restricted in commercial systems by the DTI Radiocommunications Division, as it tends to encourage idle chat between mobile stations. As most channels used by p.m.r. stations are shared it is important that each user gets a fair share of the 'airtime' so any talk-through operation generally has to be under the control of an operator.

Most commercial base stations are connected by BT lines back to the control centre. This allows the operator to receive and transmit messages as if they were actually located at the base station. If a mobile station requests talk-through operation the operator can flick a switch to connect the transmitter to the receiver via the BT lines, permitting the re-transmission of any incoming signals. When a large area has to be served several different sites may be used to to give the required coverage. In this situation an automatic control system may be used to determine which site is receiving the best signal and route it to all the transmitters simultaneously. It is for this reason that you usually can't hear mobile stations directly, as they use a much lower transmit power than that of the base station and are often just too far away.

If the sites are very remote the control station may use radio links in the u.h.f. and s.h.f. bands to remotely control the base station. Different audio frequency tones are then used to select the required functions.

Most commercial traffic heard using talk-through operation is in fact likely to be using either a Community Repeater or Trunked System. In both these cases the base station is automatic in operation with several different users sharing the same system. Each user has their own electronic callsign which allows them to only hear calls addressed to themselves. Each user also has a transceiver back at their control centre and this is used to link to the base station in exactly the same way as the other mobiles, again a special control circuit in the transceiver only allows them to hear calls specifically directed to them. Anyone monitoring such a base station without a special decoder will hear the different conversations of users juxtaposed.

Fig. 2.



Abbreviations

CB	Citizens' Band	MHz	megahertz
cm	centimetres	p.m.r.	private mobile radio
DTI	Department of Trade & Industry	s.h.f.	super high frequency
		u.h.f.	ultra high frequency
f.m.	frequency modulation	v.h.f.	very high frequency
kHz	kilohertz	W	watts
km	kilometres	w.b.f.m.	wideband f.m.
m	metres		

And Finally

My thanks to all those readers who have sent me letters regarding their favourite scanning receivers - I have been analysing your comments and hope to be able to print the results soon. After recently monitoring some low-power transmissions in the 174MHz band I am currently trying to find out more about animal tracking and bio-medical transmissions. I wonder if any one out there has any information they would like to share? Until next month - Good listening.

ERRATA

Reception of Low & Very Low Frequencies. Pages 31 to 33, December 1990.

The capacitors listed in the 'You Will Need' table do not tie up with the Circuit Diagram, Fig. 1. The values and numbers given to the components in Fig. 1 and their positions on the p.c.b. in Fig. 2 are correct. The values and numbers of the capacitors in the 'You Will Need' table should be as shown here:

Capacitors

Polystyrene 160V

47pF	1	C1
100pF	1	C10
470pF	1	C9
1nF	1	C8

Ceramic Plate 100V

1nF	2	C2,4

Sub-miniature Electrolytic

1µF (63V)	1	C3
100µF (16V)	2	C6,7

Using an ERA Microreader Mk 11 Pages 19 & 20, February 1991.

Richard L. King of St. Ives, Cambs sent us the following information regarding the connections to the 9-pin serial ports on IBM compatibles and the AMIGA.

Fig. 4, which purports to show the connections to the 9-pin Serial port, is not correct. The usual IBM and compatibles use the following pin-out (as confirmed by ERA).

Pin	Description	
1	Carrier Detect	(DCD)
2	Received Data	(RXD)
3	Transmitted Data	(TXD)
4	Data Terminal Ready	(DTR)
5	Signal Ground	(SG)
6	Data Set Ready	(DSR)
7	Request To Send	(RTS)
8	Clear To Send	(CTS)
9	Ring Indicator	(RI)

The 'tip' of the jack plug goes to pin 2 as stated in the article, but the 'ring' of the jack plug should be connected to pin 5 (Signal Ground). Pins 7 & 8 (RTS & CTS) should be joined together on the 9-pin D-type connector.

From the AMIGA manual it appears that the serial port is a 25-pin D-type connector. The important connections are:

Pin	Description
1	Frame Ground
3	Received Data
4	Request To Dend
5	Clear To Send
7	System Ground

From this it is deduced that the 'tip' of the jack plug is connected to pin 3 and the 'ring' to pin 7 rather than pin 1. It is also possible that the AMIGA requires pins 4 & 5 to be connected together.

As it is possible that there could be variations in different makes of computer it is recommended that the Operator's Manual is **always** consulted before making any connections.

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VT-TU7E Svc Man	VCR	2.25
VT-TU70E Svc Man	Port VCR	1.50
VT5000E Svc Man	VCR	2.00
Invicta CT7050 Svc Man	C TV	2.50
ITT		
CP9210 Svc Man	C TV	1.50
CVC1 Svc Man	C TV	2.00
CVC2 Svc Man	C TV	2.00
CVC5 Svc Man	C TV	1.50
CVC20 Svc Man	CTV	1.75
GMC CB9000 Svc Man	CTV	1.75
GMC CD651 Svc Man	remt/cont	1.75
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Wk/end 350 Svc Man	mus/cent	0.50
Wk/end Stereo 107 Svc Man	mus/cent	0.50
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HS300B Svc Man	VCR	1.50
MURPHY		
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N1515 Svc Man	VCR	4.00
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VR2005 Svc Man	VCR	3.50
VR2010 Svc Man	VCR	3.50
VR2020 Svc Man	VCR	3.50
VR2073 Svc Man	VCR	3.50
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VR6462/00F Svc Man	VCR	3.00
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Abbreviations:

Svc	Service
Man	Manual
Port.	Portable
CTV	Colour TV
T/T	Teletext
Dir/drv	Direct Drive
Sys	System

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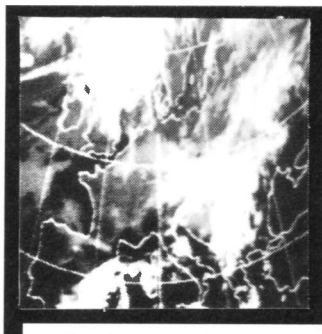

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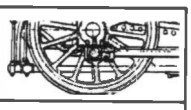

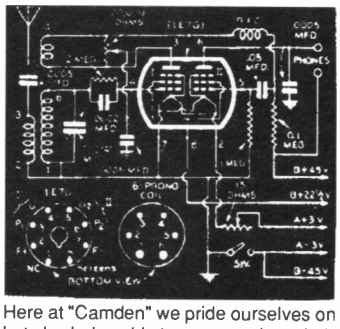

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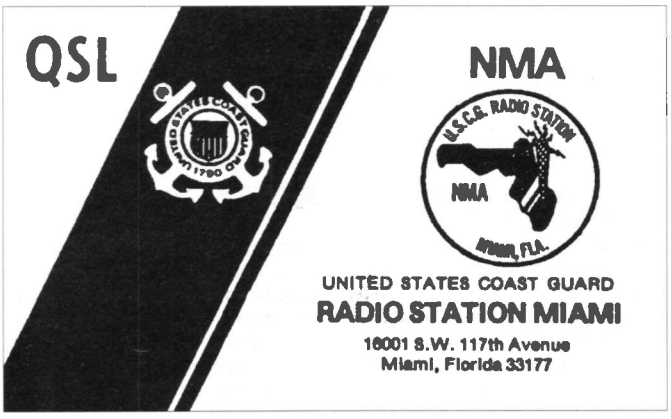

Robert Fulford of Exeter has recently purchased an ICS Electronics FAX-1 decoder to operate with his Lowe HF-225 receiver. The antenna in use is a simple 15m long wire. Robert's favourite FAX station is Offenbach Meteo on 134.2kHz. This has in the past been a favourite with many but sadly suffers from severe adjacent channel interference from a radio location system. The fact that Robert can receive the station well is testament to the excellent filtering of the HF-225 receiver. Robert's only complaint so far is that he hasn't received any re-broadcast Meteosat images. According to my schedules these images should be sent at the following times: 0103, 0144UTC, 0315, 0643, 0852, 1225, 1539, 1843 and 2143UTC. If this has changed, perhaps someone would like to drop me a line with the details.

Mr G. Dobson of Bradford runs an ERA Microreader with his Icom R-71 receiver and 30m long wire antenna. He reports very good results over the past two years and is about to expand his station to include a printer. Once question he has concerns the number of 850Hz stations that are not decodeable. I'm afraid this is just a fact of life. There are a wide range of signals that sound for all the world like RTTY but are other forms of data transmission. To receive many of these systems would require a system upgrade to a more comprehensive decoding systems. But even that would not make all signals resolvable as many are encrypted or in foreign alphbets.

Mr C Vasili of London has a question about the operation of his Icom R-71 receiver. He uses his receiver with an ERA Microreader for utility reception and questions the receive mode he should be using. If he selects c.w. or s.s.b. all is OK, but if he sets the R-71 to RTTY the Microreader doesn't work. The reason is simple and is due to there being two standard tones for RTTY. In Europe most RTTY decoders use what is known as 'low tones', these are 1275Hz and 1445Hz for 170Hz shift signals. the "other" standard is called 'high tones' and is used mainly in the USA and Japan. This standard uses tones of 2125Hz and 2295Hz - quite a difference from the 'low tones'. In its standard form the R-71 is set-up for 'high tones' when switched to RTTY. As some receivers can be converted to 'low tones', it may be worth contacting Icom UK to see if they can help. The answer for most people is to decode RTTY signals with the receiver set to u.s.b.

This month I have received several letters from readers asking some pretty basic questions about how to get started with utility decoding. Rather than write lots on individual replies I thought it would be more useful to cover the main issues in the column.

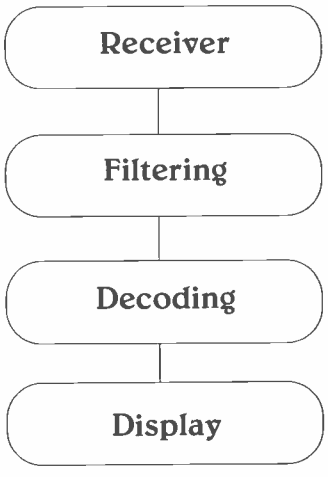

Fig. 1: Decoding Process.

Decoding Systems

There are basically two ways to decode utility stations hardware and software, unfortunately the division between the two is not always that simple. In **Fig.1** I have shown the decoding process using block diagrams. Let's start with the receiver, This has to process the radio transmission and convert it into a pair of tones representing the two possible states of the signal. The frequency or pitch of these tones will depend on the shift in use by the transmitting station.

The next stage in the process is the filtering. The purpose of this is simply to remove all but the wanted signals. In practice the filtering stages are normally only capable of removing interfering signals that are above the highest wanted tone or below the lowest. This means that if there is interference within the signal, the filter has little effect. Although I have shown the filtering as a separate function, there are often several stages of filtering from the receiver through to the decoder. In fact some more sophisticated receivers, such as the Lowe HF-225, can provide most of the filtering required for utility decoding.

Moving on to the decoder, this is where most of the work is done. This stage has to convert the incoming tones from the receiver and filter into a format suitable for display and subsequent viewing by a human! The most basic form of decoder for RTTY would be a device called a terminal unit. This simply takes the two tones and converts them into two d.c. voltages. The problem with this very basic type of decoder is that the display process is left with much work to do. The display would have to provide extensive processing of the two d.c. voltages before a plain text display could be produced. Perhaps the simplest way to do this would be to use a Teleprinter. This is an electromechanical device, like a typewriter that converts this simple d.c. voltage into printed text. You may remember seeing these being used a few years ago to display the football results during the Saturday afternoon *Grandstand*. The main restriction with using a Teleprinter is that you can only receive RTTY and only one speed at that. The next simplest way of processing the output from a terminal unit is to use a computer. You can buy a special program for some computers to make it behave just like a Teleprinter. The subtle difference is that the decoded signal u sually appears on the screen. Another important difference is that the computer program can usually be set to handle many different modes and speeds, instead of being stuck with single speed RTTY. Until recently this type of decoding system was by far the most common.

However, developments in computer programming, i.e. software, have resulted in a comparitively new system that gives the simplest of all decoding systems. In this system all that is required is a receiver and a computer. The receiver provides the basic audio signal and the computer program handles the filtering, decoding and display functions. Another great advantage of this type of system is that it is generally very cost effective. Although there is not normally an external filter stage with these decoding systems the addition of such a filter usually provides a worthwhile improvement. This is particularly true when trying to receive very weak or noisy signals. An example of this type of decoding system is the RX-4 from Technical Software.

Besides the basic decoding and display systems I have described so far, there are other systems available. The first of these are commonly known as intelligent terminal units or data controllers. Examples of this type of unit are the AEA PK-232 and the Kantronics KAM, both of which have been primarily designed for the amateur radio market. These units contain extensive filtering and decoding for many different modes. The reason for calling them intelligent decoders is that they contain their own microprocessor and program that adjusts the filtering and decoding routine to many different modes. Another great advantage with these units is that they usually included some form of tuning indicator. The most common form of tuning display being a l.e.d. bargraph. The decoders can handle many modes i.e. Packet, RTTY, c.w., ARQ, FEC and FAX. You will however, still need to provide a display for the decoded output. The output from these intelligent decoders is designed to be connected to what is known as a dumb terminal. This odd name in fact means a simple visual display terminal. This is a device rather like a computer with limited processing power. What happens is that the screen displays any information sent to it via the RS-232 port and the keyboard is used to send signals from the RS-232 port. The coding used for this information exchange is simple ASCII and the speed or baud rate can usually be altered over a range of standard values. You don't have to use a dedicated dumb terminal, as most computers can be easiliy set-up to behave like a dumb terminal. In addition, there are a few specialised programs available to provide very sophisticated control of these intelligent terminal units with most common home computers.

One of the big advantages of these units is that the latest development can be incorporated by a simple change of internal software. This software is usually contained in a plug-in ROM chip. If you are interested in transmitting data (via amateur radio) this is very clearly the way to go.

The final type of decoder, and perhaps the most desired, is the self contained type. Examples of these are the ERA Microreader, Wavecom 4010, etc. Prices for these vary widely ranging from about £150.00 through to over £1000.00. This type of decoder is very clearly the neatest way into decoding as all you need for a basic system is a receiver and the decoder. Although I have called these self contained, most do need a display device. This is usually either a standard TV or a simple video monitor. As with the intelligent terminal unit, the modes covered by these units are controlled by plug-in software. In the advanced units such as the W-4010, you can add receive modes by buying optional plug-in software modules. Regular readers of this column will no doubt be aware that the Microreader is probably the most popular stand-alone decoding system among short wave listeners. This popularity is due to its ease of use combined with a very reasonable price.

The fact that it is completely self-contained with its own display adds to its popularity.

The final type of decoding system that is worthy of note is the latest computer-based systems. The reasons for the success of this approach is that they utilise the best points of the other systems I have described. They have the flexibility afforded by a software-based system and the filtering and signal processing that is best carried out with traditional electronics. Examples of these systems are the RX-8 from Technical Software and the IBM-based Code-3 from Hoka Electronic. This latter incorporates an extremely wide range of decoding modes. One special feauture of this package is that raw data can be stored for analysis at a later date. This is great when trying to analyse transmissions with a short duration.

So there we are a quick run through the range of decoding systems that are currently available. To get a full view of the range of equipment take a close look at the advertisments in the magazine.

Amstrad PCW

I seem to receive a fairly steady stream of letters from readers who would like to use the PCW8256 and 8512 computers for utility reception. One such letter came from **W. Batho** of Chipping Norton. He has seen a PCW8256 at a good price and asks if it's suitable for radio use. Unfortunately there is currently no dedicated radio software available and it seems likely to stay that way. The only solution for users of these computers is to use an intelligent terminal unit. The snag with this is the additional cost.

To use the PCW with an intelligent terminal unit it needs to be configured to act as a dumb terminal. This can be done by using the MAIL232 program that's provided on the system disk. A more powerful alternative would be to use the MEX public domain communications program. This gives some very useful file handling facilities. These can be very useful for storing decoded information or when issuing commands to the terminal unit. It also gives you access to the printer, so you can get a print-out of interesting data. **Mike Bradbury** of Stoke-on-Trent has been using this system for some time and reports great success. The decoder in use with his station is the PK-232. Another great advantage of being able to store decoded data to disk is that some of the inevitable decoding errors can be edited out using a standard text editor. The place to go for your copy of the MEX program is the Public Domain Software Library, Winscombe House, Beacon Road, Crowborough, East Sussex TN6 1UL. Thanks to Mike for supplying this information.

BARTG R-5 Filter

From my earlier dissitation you will have noticed that filtering is an important part of any decoding system. No matter what decoding system you use, you will normally find that some additional external filtering will improve performance. The performance improvement is most noticable when receiving signals suffering inteference from adjacent stations. Although there are many ready built filters on the market I thought it would be interesting to feature something for the constructors. This filter is known as the R-5 and is an adaptation of a manufacturer's application notes. The filter centres around the use of the switched capacitor filter technology. The type of filter required for decoding is a bandpass unit, i.e. it only passes a pre-set band of frequencies. In this design, the bandpass feature is created by combining two filters - a low pass and a high pass. The advantage with this technique is that by altering the cut-off frequencies of the two filters the effective bandwith of the bandpass is also varied. In this design each filter can be varied between about 50Hz and 3.5kHz giving an extremely wide adjustment range.

The heart of the filter is the two switched capacitor filter integrated circuits, AMI S3528 and S3529. These are seventh order elliptical type and provide a very steep cut-off with an attenuation of 51dB at 1.3 fo.

To make the R-5 filter as versatile as possible, there are several switching options to set the bandwidth of the filter. The most popular methods are the 40-way CB switches or 10-way rotary switches. However, the constructor is left with a free choice to suit his or her particular need. In my situation, with my Hoka Code-3 decoding system, I need a filter with a fixed centre frequency of 1750Hz but a bandwidth variable from 800Hz down to 100Hz. This can be achieved with some simple diode matrix switching.

The R-5 is really only suitable for the keen constructor as it is supplied as a printed circuit board and circuit diagram only. The constructor is left to find the components and a suitable enclosure. Despite the effort, there is a much satisfaction in this type of home construction and considerable savings to be made. The R-5 can typically be built for approximately £30.00, which compares very favourably with commercial units.

The acid test is - how does the R-5 shape up on the air? For this test I was able to borrow a complete unit from **Ted Hatch G3ISD**. This was connected between the low-level audio output of my Icom IC-720 and the Code-3 decoder. As expected, the R-5 made little difference to strong clean signals, but when working under noisy conditions the improvement was considerable. By careful adjustment of the high and low pass filters, most adjacent channel noise could be eliminated. The result was a significant reduction in the number of received errors. Although I have concentrated on the use of the filter for utility reception, its wide adjustment range means that it is equally effective on speech transmissions.

So, to conclude, the R-5 is certainly a very effective filter that is likely to be of use to most listeners. If you are interested, I must stress that you need to have enough constructional skill to build a project from just the p.c.b. and circuit diagram. Non-members of BARTG can obtain p.c.b.s at a cost of £5.25 inclusive of post and packing. The address to send your order to is: BARTG Components Manager, Ted Hatch, 147 Borden Lane, Sittingbourne, Kent ME10 1BY. My thanks to Ted for the loan of the review model.

Frequency List

Only a few selections for you this month, as the tutorials have taken quite a bit of column space. If you want a more complete list drop me a line including three stamps and I'll post one to you. The format for the list is the usual frequency, mode, speed, shift, callsign, time and notes.

6.92MHz, RTTY, 50, -, RGC70, 0840UTC, Kiev Meteo SYNOP
11.141MHz, ARQ, 100, 170, -, 1716UTC, MFA Rome
12.108MHz, RTTY, 50, R, IRJ21, 1005UTC, ANSA Romes
12.718MHz, CW, -, -, NMN, 2146UTC, USCG Portsmouth
12.750MHz, CW, -, -, CWA, 2143UTC, Cerrito
12.801MHz, CW, -, -, TAH, 2033UTC, Istanbul
12.857MHz, CW, -, -, 6WW, 2031UTC, FN Dakar
14.912MHz, RTTY, 75, -, DFZG, 1540UTC, MFA Belgrade
14.932MHz, RTTY, 50, -, -, 1544UTC, El Djaza'ir
15.935MHz, RTTY, 50, 400, SUA291, 1546UTC, MENA Cairo

Abbreviations

ARQ	Automatic ReQuest repeat
ASCII	American Standards for Computer Information Interchange
BARTG	British Amateur Radio Teledata Group
c.w.	continuous wave (Morse)
d.c.	direct current
dB	decibels
FAX	facsimile
FEC	Forward Error Correction
fo	fundamental frequency
Hz	hertz
kHz	kilohertz
l.e.d.	light emitting diode
MHz	megahertz
ROM	Read Only Memory
RTTY	Radio TeleTYpe
s.s.b.	single sideband
u.s.b.	upper sideband
UTC	Universal Co-ordinated Time (=GMT)

info in orbit

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

Within a day or two of the start of the Gulf war, only one Russian weather satellite was left operating at v.h.f. METEOR 2/19 has remained transmitting on 137.85MHz throughout the period, while METEOR 3/3 was switched off. It is possible that other METEORS are transmitting higher resolution data. There should shortly be a change-over, possibly to METEOR 2/17, because 2/19 will run along the terminator. During mid-February NOAA 9 pass times coincided with NOAA 11 and so it hasn't provided a.p.t. during this time.

FENGYUN 1-2 stopped transmitting a.p.t. data in early January though **Dave Cawley** tells me that he is still receiving the high resolution data (h.r.p.t.). The Russian oceanographic satellite OKEAN 2 transmits the occasional picture and, on February 10 at 1633UTC, I saw a live pass running along the terminator. Similar ones have occurred since. A screen dump from an OKEAN 2 pass last summer, showing south eastern Sweden can be seen in **Fig. 2**.

SALYUT 7/COSMOS 1686

This re-entered in early February over the South American Andes and, fortunately, there appear to have been no casualties. I plotted the satellite's Mean Motion (its number of revolutions per day), which increases prior to re-entry. The data from January 1 onwards was entered on a spread-sheet and the graph is shown in **Fig. 1**. The height was calculated every few days using Kepler elements sent to me for this project by **Geoffrey Falworth** of Penwortham. A rather less dramatic re-entry was that of METEOR 8 which was launched in 1971 and burnt up on January 10.

Future Launches

From the list of future satellite launches kindly provided for me by Geoffrey Falworth, the geostationary Chinese weather satellite FENGYUN 2A is due to be launched in April but unfortunately it will be out of our range at its intended orbital position. METEOSAT 5 was due for a February launch, together with ASTRA 1B and we can check occasionally for test transmissions. Several COSMOS launches are also planned, as is another METEOR possibly METEOR 3/4 transmitting on one of the usual frequencies, and scheduled for March.

INFORMATOR 1

This may be the first column to give details of the launch on January 29 of a new Soviet spacecraft series called INFORMATOR 1. Its orbit is similar to those of the polar navigation satellites, and the series is for communications with natural disaster areas, geological survey parties and other work. I've no information yet on transmission frequencies.

Letters

I received a request from **Dr E G Duncan** of Fife who has asked me to forward a letter to **Chris Spray** of Cheltenham, whose address I no longer have. Perhaps Chris would drop me a line so that I can forward the letter?

D H Whittle of Lytham enquired about the frequencies used by the LANDSAT and SPOT satellites. These spacecraft use a number of frequencies for their telemetry but they are not really accessible to amateurs because they operate in the region of 22GHz. Note that G means gigahertz, or 1000MHz! You have to track the satellite accurately as well! The reason for the very high frequency is, of course, that the amount of data being transmitted is phenomenal - being very high resolution imagery. For the record SPOT-2, the French Earth resources satellite also uses this band, 22.05GHz and even higher.

Using old Kepler elements and finding that they can give inaccurate predictions was a problem for **Peter Staunton** who is an electronics engineer at University College, Dublin. He had problems trying to record live passes and finding that they didn't appear at the predicted times. I despatched a set to Peter but ,in fact, good recordings could be obtained by just leaving the frequency set to which ever (NOAA) satellite is wanted, and adjusting the SQUELCH control on the receiver to a reasonably high level to eliminate the lower elevation passes. I do this occasionally with NOAA 11 for the midday pass if there is an interesting weather system that I want to look at later.

Spectrum Computer

There have been more queries about satellite software for this computer.

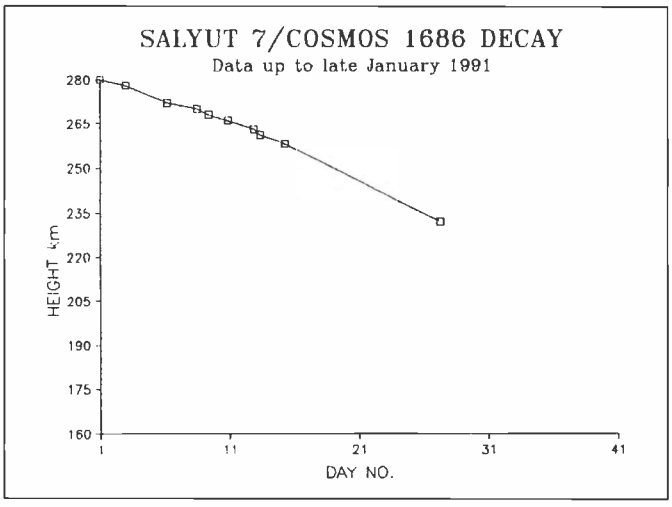

Fig. 1: The decay of SALYUT 7/COSMOS 1686 during January 1991. Height (km) v day.

Alistair Harley asks whether I know of decoding hardware and predictions software for his Spectrum. As it happens Technical Software recently loaned me their modules to review for *SWM* which is published in *Weather Watching* - free with this issue! For those readers who have asked me about prediction programs here is the good news!

Victor Suller has written to me about his program which gives good results using standard Kepler elements. He has generously offered to make the program available if a suitable pre-paid cassette is sent. His address is 104 Grove Park, Knutsford, Cheshire WA16 8QB. My thanks to Victor for responding to my request.

Amiga

A letter from **James Patton** of Perth asked for recordings of a.p.t. data to try out his decoding system made for the Commodore Amiga 500, called Amigasat. He is the chairman of the local computer club and comments that his Philips monitor uses high persistence phosphors to overcome the dreaded Amiga flicker!

PC Clones

Tony Pattinson of Reading uses a Maplin receiver and decoder to feed his PC clone (this term is used to describe a computer which is built like the IBM PC computer and runs the same software) but says that he had to build a parallel-serial converter to get the data in. I would be very interested to hear from anybody who is using Maplin hardware because I have not located any specifications for their kits. Some readers say they work, others appear less fortunate!

B Martin of Bournemouth wrote to ask about bulletin boards that could provide Kepler elements for the weather satellites. I believe that this is being considered by the Remote Imaging Group (RIG) and I will publish details as soon as they are available. He also asks whether I could do a review of the VGASAT software produced by Timestep Weather Systems because, like an increasing number of people, he also has a PC clone computer and currently uses software from California. Timestep have told me that they will be bringing out a new version of VGASAT shortly for PCs with hard drives and from what I have heard about the software it sounds worth waiting for. Peter Cotton of Comar Electronics has also told me that they are releasing a new version of PC GOES soon and has offered to let me have a review sample.

Another reader wanting advice on software for PC clones is **Philip Morris** who has a fast PC compatible with super VGA. With that machine it is essential to buy a quality receiving system and so some study of the available hardware/software is required. *Weather Watching* should prove useful! There are a number of PC clones and one of the early ones was the Amstrad PC1640 which has the ECD (enhanced colour display) which has better screen clarity than the earlier standard. **Ray McCreith** wants to use his Amstrad for decoding purposes including weather satellite pictures. It will be necessary to buy suitable receiving equipment as well of course but *Weather Watching* should help you to work out a cost.

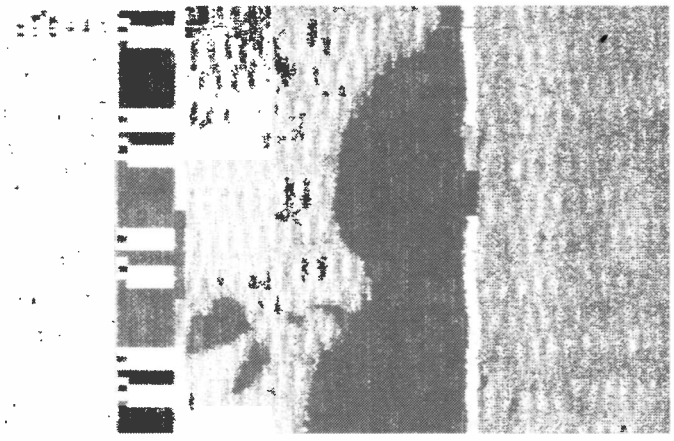

Fig. 2: OKEAN 2. June 1990. Image showing 'piano key' telemetry, microwave and radar image, with contrast optimised for the microwave picture. Area shown is Sweden near Stockholm.

General

Some readers may have seen the piece

in the *Daily Telegraph* on January 23 which has led to some correspondence. **A C Gabanski** of Huddersfield wrote to ask where to begin in the field of satellite monitoring. This month's special supplement should help! Letters arrive asking for Kepler elements and mentioning other radio work, as did **John Lundy** who is the chairman of Andover Radio Club. They have been decoding WEFAX and have just completed building a satellite receiver, and he promises to let me know how they get on. **Bob Warriner** operates the Proscan scanner and Prosat 3 (I think that this is a version of VGASAT) software from Timestep Weather Systems and says that it all works very well except for OKEAN 2 data, which, he says, refuses to synchronise.

I use this software and on rare occasions there is a problem with OKEAN because it transmits various picture formats one of which might not be recognised by the software. If anyone finds this to be a problem Timestep have offered to make the necessary modifications. Most of my OKEAN data is recorded to allow me to analyse it later and I find that a trial run or two gives superb results - see **Fig. 2** for a screen dump print.

Keplers

This is proving to be a popular offer! I receive several requests each week for copies of recent Kepler elements for the weathersats. Please remember to enclose an s.a.e. if you write for a set. I always annotate the list with the latest operating frequencies.

Out of Sight

A letter from **Pat Gowen**, asks whether anyone else has noticed the sub-horizon satellite signals during periods of high solar flux, particularly last November? Pat comments that he has been receiving signals from UoSAT-3 on 435MHz about six minutes before it was due above the horizon! I have noticed some evidence of this with METEOR 3/3 when I followed it well below my western horizon in December. I have also heard NOAA 11 while still a degree or two below my western horizon.

Frequencies

The American NOAA satellites transmit on:

NOAAs 9 and 11 - 137.62MHz; NOAA 10 - 137.50MHz.

OKEAN 2 - 137.40MHz occasional transmissions.

The Russian METEORS 2/16 to 2/20 and 3/2 or 3/3 use 137.30, 137.40 or 137.85MHz when switched on. The Chinese FENGYUN 1-2 uses 137.80MHz, but has been off recently.

Reports and queries

Some letters have been held over until next month - correspondence on any satellite matter is welcome but please enclose an s.a.e. if you want a personal reply. I was recently made redundant from my full-time computing job so I shall unexpectedly have more time to respond!

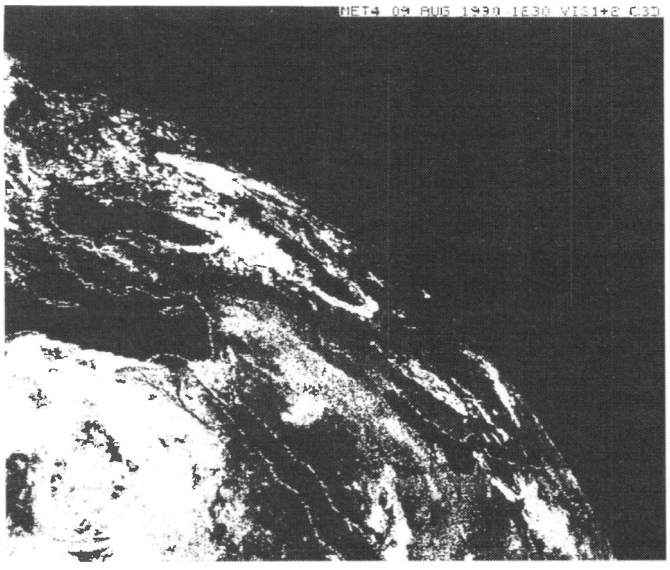

Fig. 3: METEOSAT-4 C3D visible light image of the eastern Mediterranean and Gulf regions - not the 'smoke cloud' one! This scan is dated August 9 at 1230UTC. The signal was recorded, played back into my computer running VGSAT, stored on disk, sent to Dave Cawley of Timestep, who kindly dumped it to a laser printer.

Abbreviations

a.p.t.	automatic picture transmission
GHz	gigahertz
MHz	megahertz
s.a.e.	stamped addressed envelope
UTC	Universal Co-ordinated Time (=GMT)
WEFAX	weather facsimile

long medium & short

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

In order to compensate for seasonal changes in propagation the s.w. broadcasters are permitted, by international agreement, to change their operating frequencies and schedules up to four times a year, namely in March, May, September and November. Some changes to the information contained in this article can therefore be expected soon after this issue arrives on the bookstalls.

Unfortunately some s.w. broadcasters do not comply with the agreement and make changes without warning. Most listeners find that it is almost impossible to keep up with these stations' activities.

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 7/2/91.

Encouraged by his transatlantic l.w. reception last month, **Alan Roberts** (Quebec) checked the band most nights. Due to the high level of interference from local TV receivers, his search for European signals often had to be delayed until after midnight (0500UTC). At sunrise in Europe, it was not continued beyond 0200 (0700UTC).

On January 9, he picked up a news bulletin in French on 216kHz at 0600UTC. The station confirmed Radio Monte Carlo, Monaco at 0630. He rated their signal via Roumoules (1400kW) as SINPO 33333. On the 16th, three signals were heard, but definite idents could not be obtained. Classical music and announcements in German were noted on 177kHz at 0430. A woman speaking in Russian was heard on 171 at 0450, both rated 22222. Music and unrecognisable speech was heard on 207 at 0550, which rated 12222.

On the 24th, he heard a news bulletin, weather report and commercials in French on 183, 32232 at 0615. A signal was evident on 198 at 0625, rated 12222, but the low depth of modulation made it impossible to confirm that it was the BBC. In an attempt to improve reception, Alan is now constructing the l.w. preselector designed by Ray Howgego in *SWM* Dec'90.

Further to l.w. station identification (LM&S Feb'91 SWM), **Kenneth Buck** (Edinburgh) offers the following suggestions. First, ascertain the direction of the incoming signal with a loop and compass, then refer to the maps in *Dial Search*, see Book Service. Record what sounds like a news bulletin, which may contain local news. Find someone who knows a foreign student at a University or College and ask him/her to translate the recording.

MW Transatlantic DX

The thrill of hearing m.w. transatlantic signals for the first time was experienced by **Jamie Tullett** in Co.Londonderry. At 2244 he picked up signals from CJYQ in St.John's, NF on 930. He heard two more signals before midnight: WFAN in New York, NY on 660 at 2315 and CKLM in Lavel, Quebec 1570 at 2341. Much to his surprise, the broadcasts from VOCM in St.John's on 590 were still audible at 0810.

The Caribbean Beacon, Anguilla on 1610 was heard for the first time by **Bart O'Brien** in Co.Wexford. Although their signal was weak it was quite clear. He says, "No doubt the fact that it is very isolated at the end of the m.w. spectrum helps in this respect."

Generally poor conditions were noted by **Jim Willett** in Grimsby, with an absence of signals from the Caribbean and S.America. Nevertheless SIO333 signals were noted from CJYQ 930 at 2345 and CKCW in Moncton, NB 1220 at 0120.

Good reception of WINS in New York, NY on 1010 was noted by **Tim Shirley** in Bristol. On January 1, he rated their signal as SIO344 at 2330. Eight east coast US stations and seven in eastern Canada were logged by **Simon Hamer** while searching the band in New Radnor from 0000 until 0115UTC.

Other MW DX

While checking the band at 2300, Simon Hamer picked up the sky wave component of the 1000kW transmission from Nagpur, India on 1566. At 0300 he heard the BBC via Masirah Island, Oman on 1413 (Eng 0300-0400). Sky wave signals from Qurayyat, Saudi Arabia on 900 (1000kW) were received by Tim Shirley at 2030.

Some stations in Algeria were noted in the logs. Ain Beida 531 (600/300kW) was rated 33333 at 0020 by **Sheila Hughes** in Morden; Les Trembles 549 (600kW) as SIO434 at dusk by **George Millmore** in Wootton, IOW; Algiers 891 as 24352 at 2310 by **Ciaran Fitzsimons** in Co.Laoise; Alger 981 (600/300kW) as 35454 at 2045 by **Ron Galliers** in N.London.

MW Local Radio DX

Surprisingly, the 250W transmission from BBC R.Kent via Rustall on 1602kHz has been received during daylight by **John Stevens** in Largs! He can also receive BBC R.Solent via Fareham 999 (1kW) during the day, but there is no trace of IOW Radio via Wootton on 1242 until after 0200. Airport Information Radio, Heathrow 1584 also becomes audible via sky wave paths after 0200, but so far the co-channel broadcast from Gatwick has not been heard.

David Porter (Ludlow) tells me that ILR Beacon Radio (WABC) now operates on 1017kHz from the BBC site at Shrewsbury, so no doubt they will be interested in reception reports from places near and far. That goes for LM&S too! Good reception of their transmission during daylight has been noted by Simon Hamer.

Local Radio DX

Freq kHz	Station	BBC/IBA	kW	DXer
558	Spectrum R.	I	7.50	F,G*,H,K*
585	R.Solway	B	2.00	B,G,H,K
603	Invicta Snd (Coast)	I	0.10	D*,H
603	R Gloucester	B	0.10	H
630	R.Bedfordshire	B	0.20	A,D*,F,H,N
630	R.Cornwall	B	2.00	H,I*,K
657	R.Clwyd	B	2.00	F,N
657	R.Cornwall	B	0.50	I*
666	DevonAir R	I	0.34	H,I,J*
666	R.York	B	0.80	N
729	BBC Essex	B	0.20	A,H,N
738	Hereford/Worcester	B	0.037	H*,I
756	R.Cumbria	B	1.00	H,I
756	R.Shropshire	B	0.63	H,I*
774	R.Kent	B	0.70	F,H
774	R.Leeds	B	0.50	N
774	Severn Sound (3CR)	I	0.14	H
792	Chiltern R.	I	0.27	A,N
801	R.Devon	B	2.00	C,G,H,I*
819	Hereford/Worcester	B	0.037	H,I
828	Chiltern Radio	I	0.20	M*,N
828	2CR	I	0.27	H
837	R.Cumbria	B	1.50	I
837	R.Furness	B	1.00	G*
837	R.Leicester	B	0.45	A,D*,F,H,I,N
855	R.Devon	B	1.00	I
855	R.Lancashire	B	1.50	G,I
855	R.Norfolk	B	1.50	A,D*,F,N
873	R.Norfolk	B	0.30	F,H
936	GWR (Brunel R.)	I	0.18	H
945	R.Trent (GEM-AM)	I	0.20	N
954	DevonAir R.	I	0.32	H,I
954	R.Wyvern	I	0.16	I
990	R Aberdeen	B	1.00	G
990	R.Devon	B	1.00	H,I
990	Hallam R.(C.Gold)	I	0.25	N
990	Spectrum	I	?	D*,F,N
999	R.Solent	B	1.00	F,H,I*,L
999	Red Rose R.	I	0.80	I
1017	Beacon R (WABC)	I	?	E
1026	Downtown R.	I	1.70	N
1026	R.Cambridgeshire	B	0.50	A,D*,F,M*,N
1026	R.Jersey	B	1.00	F,H,I,K
1035	Northsound Radio	I	0.78	I,N
1035	R.Kent	B	0.50	A,F,H,M*,N
1035	R.Sheffield	B	1.00	A,N
1035	West Sound	I	0.32	G
1107	Moray Firth R	I	1.50	I*
1107	R.Northampton	B	0.50	A,G,H,N
1116	R.Derby	B	1.20	G*,I*,N
1116	R.Guernsey	B	0.50	G*,H,I
1152	LBC (L.Talkback R)	I	23.50	H
1152	Metro R. (GNR)	I	1.80	G*,N
1152	Piccadilly R.	I	1.50	I
1152	Plymouth Sound	I	0.32	I
1152	R.Broadland	I	0.83	A,G*,N
1161	R.Bedfordshire	B	0.10	N
1161	R Sussex	B	1.00	F,H
1161	R.Tay	I	1.40	G*,I*,L
1161	Viking R.(C Gold)	I	0.35	N
1170	Ocean Sd.(C.Gold)	I	0.12	F,H
1170	R Orwell	I	0.28	A,N
1170	Swansea Sound	I	0.58	I
1242	Invicta Snd(Coast)	I	0.32	D*,M*
1242	Isle of Wight R	I	0.50	G*,H,L*
1251	Saxon R.	I	0.76	A
1260	GWR (Brunel R.)	I	1.60	G*,H,I
1260	Marcher Sound	I	0.64	I
1278	Pennine R (C.Gold)	I	0.43	D*,H
1305	R.Hallam (C.Gold)	I	0.15	G*
1305	Red Dragon (Touch)	I	0.20	G*,H
1323	R.Bristol	B	0.63	G*,I
1323	Southern Sound	I	0.50	D*,F,H
1332	Hereward R.	I	0.60	A,C*,F,G*,N
1332	Wiltshire Sound	B	0.30	F,G*,H,I*
1359	Essex R (Breeze)	I	0.28	A,N
1359	Mercia Snd(Xtra-AM)	I	0.27	G*
1359	R Solent	B	0.85	G*,H
1368	R.Lincolnshire	B	2.00	A,N
1368	R Sussex	B	0.50	F,H
1368	Wiltshire Sound	B	0.10	G*,H
1413	Sunrise R.	I	?	B*,F,H
1431	Essex R.(Breeze)	I	0.35	G*,N
1431	Radio 210	I	0.14	H
1449	R.Cambridgeshire	B	0.15	G*,N
1458	GLR	B	50.00	C*,F,H,N*
1458	GMR	B	5.00	G
1458	R.Cumbria	B	0.50	G*,I*
1458	R.Devon	B	2.00	H,I
1458	R.Newcastle	B	2.00	N
1475	C'ty Snd(1st Gold)	I	0.50	G*,H,I*
1485	R.Humberside	B	1.00	A
1485	R.Merseyside	B	1.20	G,I
1485	R.Oxford	B	0.50	H,N
1485	R.Sussex	B	1.00	F,H
1503	R.Stoke-on-Trent	B	1.00	G,H,I*
1521	R.Mercury	I	0.64	G,H
1521	R.Nottingham	B	0.50	N
1530	Pennine R.(C.Gold)	I	0.74	C*,G*,H
1530	R.Essex	B	0.15	N
1530	R Wyvern	I	0.52	H,I*
1548	Capital R. (Gold)	I	97.50	H,I*,N
1548	R.Bristol	B	5.00	G,I*,N
1548	R.City (City Talk)	I	4.40	I
1548	R.Cleveland	B	1.00	N
1557	Chiltern R.	I	0.76	G*,I*,N
1557	Ocean Sound(C.Gold)	I	0.50	H
1557	R.Lancashire	B	0.25	I*
1584	Gatwick	I	?	F,H
1584	Heathrow	I	?	F,L*
1584	R.Tay	I	0.21	L
1602	R.Kent	B	0.25	F,G*,H,I*,L,N

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

DXers:
A: Ted Agombar, Norwich
B: Leo Barr, Sunderland.
C: Ciaran Fitzsimons, Co.Laoise.
D: Ron Galliers, N.London.
E: Simon Hamer, New Radnor.
F: Sheila Hughes, Morden.
G: Eddie McKeown, Co.Down.
H: George Millmore, Wootton.
I: Bart O'Brien, Co.Wexford.
J: John O'Halloran, Harrogate.
K: Tim Shirley, Bristol.
L: John Stevens, Largs.
M: Phil Townsend, E.London.
N: Ted Walden-Vincent, Gt.Yarmouth.

Short Wave Reports

Occassionally, propagation conditions prevailing in the h.f. bands have been disturbed by solar events and reception from some areas has been rendered poor or even non-existent. Other times, strong signals have reached the UK from many areas. Further disturbances can be expected.

Generally good reception of R.Australia's **25MHz (11m)** broadcasts to the Gulf area has been noted here. Transmissions via Carnarvon on 25.750 (Eng 0800-0955, 1430-1530) were rated SINPO 32333 at 0840 by **Donald Blashill** in Cheltenham and 44444 at 1500 by **Eddie McKeown** in Co.Down. Their signal in Oman was rated 55555 at 0817 by **Rhoderick Illman** in Thumrait.

Good reception has also been noted in the UK from the Voice of the UAE in Abu Dhabi on 25.690. Their broadcasts in Arabic were rated SIO544 at 0930 by **Thomas Barnett** in Slough. They have also been reaching Quebec, where Alan Roberts logged them as 55455 at 1240.

R.Australia's broadcasts have also been reaching the UK in the **21MHz (13m)** band. Their transmission via Darwin 21.525 (Eng to C/S.E.Asia 0100-0900) was rated 25323 at 0744 in N.London; via Carnarvon 21.775 (Eng to Asia 0100-0958) as SIO222 at 0938 by **Philip Rambaut** in Macclesfield.

11m European Signals

Among the broadcasts to Europe noted were R.Japan via Moyabi, Gabon 21.690 (Eng 0700-0800) rated 24433 at 0722 by **Kenneth Reece** in Prenton; Voice of the UAE in Abu Dhabi 21.735 (Ar 0200-1300) 45554 at 0820 by **David Edwardson** in Wallsend; UAE R.Dubai 21.605 (Ar, Eng 0615-1640, also to

N.Africa) 44544 at 1030 by **John Robertson** in Alnwick; also 21.675 (Ar, Eng 1000-1400) SIO455 at 1330 in Edinburgh; Voice of Israel, Jerusalem 21.790 (Eng 1100-1130, also to USA) SIO433 at 1108 by **Ron Pearce** in Bungay; R.Romania Int, Bucharest 21.665 (Eng 1300-1400) 54444 at 1340 by **Chris Shorten** in Norwich; WCSN Scotts Corner, MN 21.780 (Eng 1400-1600) 55444 at 1400 by **John Nash** in Brighton; R.Japan via Moyabi 21.700 (Eng 1500-1600) 34333 at 1500 by **Cliff Stapleton** in Torquay; RCI via Sackville 21.545 (Eng 1515-1530) 44444 at 1520 by **Ken Willis** in Scarborough; WYFR via Okeechobee 21.525 (Eng 1600-1700, also to Africa) 23122 at 1620 in Co.Down; WHRI Noblesville 21.840 (Eng 1500-1700, Sat/Sun only) SIO453 at 1650 by **Bill Clark** in Rotherham; R.HCJB Quito, Ecuador 21.480 (Eng 1900-2000) 44333 at 1905 by **Ted Agombar** in Norwich; also on 21.455 (u.s.b. + p.c.) 44444 at 1920 by **Darran Taplin** in Brenchley.

Other 11m Signals

Those to other areas included R.Austria Int via Moosbrunn 21.490 (Eng to Australia, NZ) logged as 44454 at 0852 by **Jim Cash** in Swanwick; BFBS via Daventry 21.735 (Eng to Gulf 0930-1000) 23332 at 0945 by **Robin Clark** in Plymouth; BBC via Limassol 21.470 (Eng to E.Africa 0900-1745) SIO 433 at 1000 in Oman; Vatican R. Rome 21.515 (Eng to Asia 1200-1230) 44444 at 1200 in Morden; SRI via Schwarzenburg 21.630 (Eng, Fr, Ger to Middle East, Africa 1515-1700) SIO434 at 1515 by **Cyril Kellam** in Sheffield; BBC via Ascension Island 21.660 (Eng to S.Africa 0700-2115) SIO444 at 1500 by **John Coulter** in Winchester; BSKSA Riyadh, S.Arabia 21.505 (Ar to N.Africa 1100-1700) 54554 at 1605 by **Darren Beasley** in Bridgwater; WCSN Scotts Corner 21.640 (Eng to E.Africa 1600-1800) SIO544 at 1630 by **John O'Halloran** in Harrogate; R.Denmark via RNI 21.730 (Da to E.Africa 1630-1700) 32222 at 1645 by **Robin Harvey** in Bourne; VOA via Tangier 21.625 (Eng, Ar to Africa 1600-2200) SIO444 at 1800 by **Neil Wheatley** in Lytham St.Annes.

The 17MHz Band

The **17MHz (16m)** signals from R.New Zealand Int. have been clearly heard in the UK some mornings. Their 100kW signal from Rangataiki, N.Island on 17.770 (Eng to Pacific areas 2111-0630 Mon-Sat, 0000-0630 Sun) was rated 33433 at 0530 by **Ron Damp** in Worthing. Some R.Australia's broadcasts have also reached the UK. Their signals via Shepparton 17.715 (Eng to SE Asia 0900-1030) was noted as 43443 at 0925 in Bridgwater; via Carnarvon 17.630 (Eng to Gulf 1300-1500, S.Asia 1500-1800) as 34543 at 1503 in Wallsend.

Among the broadcasts for outside Europe noted, were Africa No.1, Gabon 17.630 (Fr, Eng to W.Africa 0700-1600), rated 44554 at 0730 by **John Parry** in Northwich; R.Prague, Czechoslovakia 17.840 (Eng, Cz to Asia, Pacific 0730-0830) 43343 at 0745 in Norwich; R.Japan via Yamata 17.890 (Eng, Jap to Oceania 0700-0900) 34433 at 0826 in Prenton; KHBI Saipan, N.Mariana Islands 17.555 (Eng to Oceania 0800-1000) 44333 at 0900 in Morden; R.Cairo, Egypt 17.595 (Eng, Ben to S.Asia 1215-1430) 43333 at 1225 in Brenchley; R.Sweden via Karlsborg 17.740 (Eng to Asia, Australia 1230-1300) 44344 at 1236 in Plymouth; Mother of Battles, Iraq or Kuwait 17.940 (Ar to ?), heard at 1440 by **Paul Hilton** in Newbury; Voice of Greece, Kavala 17.525 (Gr, Eng to USA 1500-1550) 54554 at 1525 in Swanwick; RTVM Tanger, Morocco 17.595 (Eng, Fr to Middle East, N.Africa 1500-1800) 31321 at 1535 in Co.Down; BBC via Ascension Island 17.860 (Eng to C/E.Africa 1515-1745) SIO333 at 1700 in Oman; R.RSA Johannesburg 17.790 (Eng to W.Africa 1700-1800) 53434 at 1720 by **Alan Smith** in Northampton; R.Nederlands via Bonaire, Ned.Antilles 17.605 (Eng to C/S.America 1830-1925) SIO444 at 1900 in Sheffield; Vatican R., Rome 17.730 (Eng to Africa 2100-2130) 35322 at 2120 in Alnwick.

The 16m signals to Europe include R.Sophia, Bulgaria 17.825 (Eng 0730-0800), rated SIO333 at 0745 by **Francis Hearne** in Bristol; R.Pakistan, Islamabad 17.565 (Eng 1100-1120) 54444 at 1100 by **Mark Hayward** in Basildon; Voice of the UAE in Abu Dhabi 17.855

Medium Wave DX

Freq kHz	TX Location	Country	Power kW	DXer
531	Ain Beida	Algeria	600	H*,I*,K*,N*
531	Torshavn	Faroe Is	5	M*
531	Leipzig	Germany	100	A,J*,K,L*,N*
531	Oviedo	Spain	10	N*
540	Wavre	Belgium	150/50	A I J* K L*
540	Solt	Hungary	2000	C*,K*
549	Les Trembles	Algeria	600	K*,N*
549	Bayreuth	Germany	200	A*,I*,J*,K
558	Espoo	Finland	100	H*
558	Valencia	Spain	20	N
558	Cima di Dentro	Switzerl'd	300	J*
567	Berlin	Germany	100	A*,K,N*
567	Tullamore	Ireland (S)	500	C*,D,I,K,L*,N,O*
576	Stuttgart	Germany	500	C*,D*,H*,J*,K, L*,N
585	Orf Wien	Austria	600	K*
585	Paris	France	8	K
585	Madrid	UK	2	C*
594	Pleven	Bulgaria	250	N*
594	Frankfurt	Germany	400	C*,I*,J*,K,L*,N
594	Oujda-1	Morocco	100	D*
594	Muge	Portugal	100	K*
603	Lyon	France	300	C*,J*
603	Sevilla	Spain	20	E*
603	Newcastle	UK	2	J*,L*
612	Athlone	Ireland (S)	100	A,C*,D,E*,J*,K*
621	Wavre	Belgium	80	E*,I,J*,K,O*
621	Barcelona	Spain	10	J*
630	Vigra	Norway	100	E*,J*,L*
630	Timisoara	Romania	400	C*
639	Liblice	Czech	1500	J*,K*
639	La Coruna	Spain	100	E*,N*
648	Palma de M'orca	Spain	10	J*
648	Orfordness	UK	500	A,E*,I*,J*,K, L*,N*
657	Burg	Germany	250	J*,K
657	Napoli	Italy	120	K*
657	Madrid	Spain	20	E*
657	Wrexham	Wales	2	H,J*
666	Bodenseesender	Germany	300/180	E*,J*
675	Marseille	France	600	C*,D*
675	Lopic	Holland	120	A,E*,I,J*,K,L*,O*
684	Sevilla	Spain	250	C*,D*,E*,J*,N
684	Beograd	Yugoslavia	2000	E*,K*,N*
693	Droitwich	UK	150	D,N*
702	Aachen/Flensb'g	Germany	5	J*
702	Zamora	Spain	5	J,N*
711	Rennes 1	France	300	D*,J*,K,N,O*
720	BBC via Zakaki	Cyprus	500	F*
720	Lisnagarvey	Ireland (N)	10	C*,N
720	Norte	Portugal	100	D*
720	Lots Rd London	UK	0.5	A,D,K
729	Cork	Ireland (S)	10	D,J,K,N
729	Alicante	Spain	10	D*,E*,K*
729	Oviedo	Spain	50	J*,N
738	Poznan	Poland	300	J*,K*
738	Barcelona	Spain	250	C*,E*,K*
747	Flevo	Holland	400	D*,E*,I,J*,K,O*
756	Brunswick	Germany	800/200	C*,D*,E*,J*,K*
765	Sottens	Switzerl'd	500	D*,H*,J*,K*
774	Enniskillen	Ireland (N)	1	J*
774	San Sebastian	Spain	60	D*,K*
783	Burg	Germany	1000	C*,D*,E*,J*, K*,D*
792	Limoges	France	300	J*,K*
792	Sevilla	Spain	20	K*
792	Ulster	UK	1	B*
801	Munich	Germany	420	O*,K*,O*
810	Westerglen	UK	100	A*,D*,E*,J*,K,O*
819	Warsaw	Poland	300	A*,J*
828	Hanover	Germany	100/5	J*
837	Nancy	France	200	A*,J*,K*
846	Rome	Italy	540	E*,J*,K*,O*
855	Murcia	Spain	125	C*,D*,J*,K*,O*
855	Santander	Spain	20	A*
864	Paris	France	300	C*,J*,K,O*
873	AFN Frankfurt	Germany	150	C*,D*,E*,I*, J*,O*
873	Enniskillen	UK	1	J*
882	Washford	UK	70	A,C*,D,I,J*,K,O*
891	Algiers	Algeria	600/300	A*,D*,J*,K*
900	Milan	Italy	600	D*,J*
900	Qurayyat	Saudi	1000	M*
909	Westerglen	UK	50	D*
927	Wolvertem	Belgium	300	C*,D*,E*,I,J*, K,O*
936	Bremen	Germany	100	C*,E*,J*
945	Toulouse	France	300	J*,K
963	Pori	Finland	600	C*,D*,E*,H*,J*, K,O*
972	Hamburg	Germany	300	A*,D*,E*,I*,J*, K,O*
981	Alger	Algeria	600/300	E*,K*,O*
990	Berlin	Germany	300	J*
990	Bilbao	Spain	10	D*,J*
999	Hoyerswerda	Germany	20	J*
999	Madrid	Spain	20	D*,E*,O*
1008	Flevo	Holland	400	C*,E*,I*,J*,K
1017	Wolfsheim	Germany	600	D*,E*,J*,K,O*
1026	Graz-Oobl	Austria	100	D,E*
1035	Milan	Italy	50	J*
1035	Lisbon	Portugal	120	O*
1044	Burg	Germany	250	C*,D*,E*,J*
1053	Droitwich	UK	150	D
1062	Kalundborg	Denmark	250	C*,D,E*,J*
1071	Brest	France	20	E*,H
1089	Brookmans Pk	UK	150	D*
1098	Bratislava	Czech	750	E*,J*
1107	AFN Munich	Germany	40	E*,J*
1107	Barcelona	Spain	20	J*
1116	Bari	Italy	150	D*
1125	La Louviere	Belgium	20	E*,K
1134	Valencia	Spain	10	D*,J*,K*
1134	Zadar	Yugoslavia	1200	E*,J*,K
1143	AFN Stuttgart	Germany	10	E*,J*
1143	Dublin	Ireland (S)	?	J,N
1143	Kaliningrad	USSR	150	E*,J*
1161	Stara Zagora	Bulgaria	500	J*
1161	Strasb'g (F Int)	France	200	D*,E*,J*
1179	Santiago	Spain	10	K
1179	Solvesborg	Sweden	600	C*,D*,E*,I,J*, K*,O*
1188	Kuurne	Belgium	5	K*
1197	VOA Munich	Germany	300	E*,I
1197	Enniskillen	Ireland (N)	1	D,J*
1197	Bournemouth	UK	0.5	K
1206	Bordeaux	France	100	D*,J*
1206	Wroclaw	Poland	200	E*,H*,J*
1215	Moorside Edge	UK	100	D*
1233	Melnik	Czech	400	D,J*
1251	Marcali	Hungary	500	J*
1251	Huisberg	Netherl'ds	10	J*
1260	Valencia	Spain	20	J*
1269	Neuminster	Germany	600	C*,D*,E*,J*, K,O*
1269	Reus	Spain	2	D*
1278	Strasbourg	France	300	J*
1278	Dublin/Cork	Ireland (S)	10	D,G*,H,J*
1287	Litomysl/Liblice	Czech	300/200	O,E*,O*
1296	San Sebastian	Spain	5	D*,J*
1296	Orfordness	UK	500	K,O*
1305	Rzeszow	Poland	100	J*
1314	Kvitsoy	Norway	1200	C*,D*,E*,J*, K,O*
1323	Zyyi	Cyprus	50	F*
1323	R.M'cow Leipzig	Germany	150	D,J*
1332	Rome	Italy	300	E*,O*
1341	Lisnagarvey	Ireland (N)	100	C*,D*,K,O*
1350	Nancy/Nice	France	100	E*,I*,J*,K*
1359	Berlin	Germany	250/100	J*
1368	Foxdale	IOM	20	C*,D*,J*,N
1377	Lille	France	300	C*,D,K
1386	Kaliningrad	USSR	500	C*,D*,G*, I*,K*
1395	R.Tirana Lushnje	Albania	1000	D*,J*
1404	Brest	France	20	J*,K
1413	BBC Masirah Is.	Oman	1500	F*
1413	Zaragoza	Spain	20	D*,K*
1413	Pristina	Yugoslavia	1000	H*
1422	Heusweiler	Germany	1200/600	C*,D*,J*,K
1431	Dresden	Germany	250	J*
1440	Marnach	Luxemb'g	1200	C*,D,J*,K
1467	Monte Carlo	Monaco	1000/400	D*
1476	Wien-Bisamberg	Austria	600	J*
1485	Carlisle	UK	1	N
1494	Clermont-Ferr'd	France	20	J*,K*
1494	Leningrad	USSR	1000	D*,H*
1503	Stargard	Poland	300	C*,D*,I*, J*,K
1512	Wolvertem	Belgium	600	O*,G*,H*, I*,K
1521	Kosice	Czech	600	M*
1530	Rome	Italy	150/450	D*
1539	Mainflingen	Germany	700	H*,J*,K
1557	Nice	France	300	J*
1557	Kaunas	USSR	75	B*
1566	Nagpur	India	1000	F*
1566	Sarnen	Switzerl'd	300	J*
1575	Burg	Germany	250	C*,J*,K*
1575	Genoa	Italy	50	D*
1584	Gandia	Spain	2	D*
1584	Pamplona	Spain	2	H*,N*
1593	Langenberg	Germany	400/800	C*,D*,J*,K
1593	M.Cluc	Romania	14	M*
1602	Cartagena	Spain	2	D*
1602	R Ontemiente	Spain	2	J*,N*
1611	Rome	Italy	5	N*

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

DXers:
A: Ted Agombar, Norwich
B: Leo Barr, Sunderland.
C: Peter Easton, Edinburgh
D: Ciaran Fitzsimons, Co.Laoise.
E: Ron Galliers, London.
F: Simon Hamer, New Radnor.
G: Robin Harvey, Bourne
H: Simon Holland, Douglas
I: Sheila Hughes, Morden
J: Eddie McKeown, Co Down
K: George Millmore, Wootton.
L: John O'Halloran, Harrogate.
M: Tim Shirley, Bristol.
N: John Stevens, Largs.
O: Phil Townsend, London.

long medium & short

Jim Cash's listening post in Swanwick.

(Ar 0600-1600) 44444 at 1107 in N.London; Voice of Israel, Jerusalem 17.545 (Heb 0615-1900, also to USA) 43434 at 1235 in Torquay; HCJB Quito, Ecuador 17.790 (Eng 1900-2000) 44434 at 1919 in Norwich; RCI via Sackville 17.820 (Fr, Eng 1700-1730) SIO555 at 1716 in Edinburgh; also 17.875 (Fr 1900-2000 Sat/Sun) 44444 at 1925 by **Denis Bosher** in Dolgellau.

The 15MHz Band

Although the **15MHz (19m)** signals from R.New Zealand Int. are for listeners in Pacific areas they have reached the UK some evenings. Their 100kW signal on 15.130 (Eng 1800-2111 Sun-Fri) was rated 33433 at 1830 in Scarborough and as 'fair with some fading' at 1930 by **Roy Patrick** in Derby. Later, the broadcasts to C.Asia from R. Australia via Darwin 15.170 (Chin, Eng 2300-0000) have been received here. In Sunderland, **Leo Barr** rated their signal 34333 at 2337. Good reception of their transmission to S.Pacific areas via Shepparton 15.240 (Eng 2200-1030) has been noted in the early morning. It was logged in N.London as 33333 at 0845.

Some broadcasts to areas outside Europe were logged: R.Japan via Yamata 15.325 (Eng to Middle East 0700-0800) 34433 at 0726 in Prenton; VOA via Munich 15.195 (Eng to Middle East 0800-1000) 23432 at 0859 in Plymouth; R.Finland via Pori 15.245 (Eng, Fin, Sw to E.Asia, Pacific areas 0930-1100) 45554 at 0935 in Wallsend; R.Budapest, Hungary 15.220 (Eng to Asia 1000-1015 Mon-Fri) 43333 at 1010 in Morden; R.DW via Antigua, W.Indies 15.205 (Port to S.America 1000-1050) SIO544 at 1030 in Harrogate; R.Beijing, China 15.440 (Eng to S.Pacific 0900-1100) 43343 at 1035 in Norwich; VOA via Kavala 15.205 (Eng to N.Africa, Middle East 1400-1500) 33433 at 1400 in Brighton; TWR Swaziland 15.120 (Ur to Pakistan 1530-1545) 44333 at 1544 in Oman; VOIRI Tehran 15.084 (Per to Asia 1430-1630) 45554 at 1600 in Northwich; UAE R.Dubai 15.320 (Ar, Eng to N.Africa 1030-2050) 43444 at 1600 in Dolgellau; R.Norway Int. via Sveio 15.230 (Norw to Middle East 1600-1630) 43433 at 1615 in Brenchley; R.RSA Johannesburg 15.270 (Eng to E.Africa, Middle East 1700-1800) SIO434 at 1700 in Rotherham; R.Cairo, Egypt 15.375 (Eng to W.Africa 2030-2200) 44333 at 2100 in Bridgwater; WCSN Scotts Corner 15.300 (Eng to W.Africa 2200-0000) 55455 at 2200 in Co.Laoise; R.Beijing via Mali 15.100 (Eng to USA 0000-0100) 54444 at 0100 in Basildon.

19m to Europe

Many broadcasters use 19m to reach Europe. Among those noted were R.Sophia, Bulgaria 15.160 (Eng 0730-0800) SIO444 at 0730 in Bristol; RCI via Sackville 15.325 (Fr, Eng 1700-1730) SIO 555 at 1716 in Edinburgh; R.Algiers via Bouchaoui 15.160 (Fr 0700-1800) SIO222 at 1730 in Winchester; RNB Brasilia, Brazil 15.265 (Eng, Ger 1800-1950) 34343 at 1900 in Torquay; R.Korea, Seoul 15.575 (Eng 2030-2130) 42333 at 2046 in Swanwick; RAE Buenos Aires, Argentina 15.345 (Ar, Eng, Ger, Fr, It, Sp 1800-0000, also to Africa) 42233 at 2055 in Northampton; WWCR Nashville 15.690 (Eng, Ger, 1200-0100) SIO333 at 2100 by **Alf Gray** in Birmingham; LJB Tripoli, Libya 15.415 (Ar 1745-0430) 44444 at 2130 in Worthing; WINB Red Lion 15.185 (Eng 2002-2245) 24322 at 2210 in Co.Down.

The 13MHz Band

The **13MHz (22m)** broadcasts to Europe include R.Austria Int. via Moosbrunn 13.730 (Ger, Fr, Eng, Sp, Ar 0400-1700), rated 54434 at 0845 in Swanwick; BRT Brussels, Belgium 13.675 (Eng 1000-1025) 55555 at 1000 by **Harold Wood** in Manchester; R.Jordan, Al Karanah 13.655 (Ar 1100-1315) SIO544 at 1222 in Bungay; UAE R.Dubai 13.675 (Ar, Eng 1600-2100) 54444 at 1635 in Norwich; WCSN Scotts Corner 13.770 (Eng 2000-2200) SIO433 at 2045 in Birmingham; WHRI Noblesville 13.760 (Eng, Sp, Port, Yu 1700-0000) 54444 at 2310 in Basildon.

Some of those to other areas stem from R.Australia via Carnarvon 13.745 (Eng to S.Asia 1530-2100) noted as SIO323 at 1603 in Macclesfield; KSDA Agat, Guam 13.720 (Bur, Ta, Mal, Hi, Tel to S.E.Asia 1400-1700) SIO343 at 1615 in Harrogate; R.Nederlands via Flevo 13.770 (Ar to Middle East 1530-1625) 55455 at 1615 in Worthing; R.Pakistan, Islamabad 13.665 (Eng to N.Africa, Middle East 1600-1630) 24322 at 1626 in Co.Laoise; KHBI Saipan, N.Mariana Islands 13.625 (Eng to S.E.Asia 1200-1800) SIO344 at 1700 in Edinburgh; RCI via Sackville 13.670 (Eng to Africa 1900-1930) 34333 at 1924 in N.London; R.Australia via Shepparton 13.705 (Eng to Pacific areas 1900-2130) 44233 at 1850 in Oman and 23423 at 1900 in Prenton; WCSN Scotts Corner 13.700 (Eng to W.Africa 2030-2125) 33433 at 2040 in Co.Down.

Among the broadcasts noted in the **11MHz (25m)** band were the Voice of Mediterranean, Malta 11.925 (Eng to N.Africa, S.Europe 1400-1600), rated SIO323 at 1400 in Rotherham; R.Cairo, Egypt 12.050 (Ar to E.Africa 0700-1530) SIO444 at 1500 in Slough; KTWR Guam 11.650 (Eng to S.Asia 1445-1700) 45534 at 1510 in Brighton; RCI via Sackville 11.945 (Fr, Eng to Europe 1900-2000) 34333 at 1934 in Plymouth; R. Australia via Carnarvon 12.000 (Eng to ? 1800-2100) 43433 at 2027 in Brenchley; AIR via R.Globo Rio 11.805 (Port to S.America 0900-0400) SIO444 at 2100 in Largs; Aligarh, India 11.620 (Eng, Hi to Europe 1845-2230) SIO444 at 2125 in Lytham St. Annes; R.Damascus, Syria 12.085 (Eng to USA 2110-2210) SIO544 at 2137 in Bungay; RCI via Yamata 11.705 (Eng to SE.Asia 2200-2230), noted as poor in Derby; VOFC Taiwan via Okeechobee 11.915 (Eng to Europe 2200-2300) 35443 at 2210 in Alnwick; R.Japan via Moyabi 11.835 (Jap, Eng to Europe, N.Africa 2200-0000) SIO444 at 2315 in Bristol; R.Finland via Pori 11.755 (Eng, Fr, Fin, Sw to USA, S.America 0000-0125) 35543 at 0015 in Wallsend.

Potent signals from R.New Zealand Int. have reached the UK in the **9MHz (31m)** band some mornings. At best, their signal on 9.700 (Eng to Pacific areas 0630-1110) was 44444 at 0810 in Dolgellau and 34343 at 1045 in Torquay.

Afternoons on 31m

Some of the 31m broadcasts noted during the afternoon stemmed from WRNO New Orleans, USA 9.715 (Eng to USA, C.America 1200-1400 Sun only), rated 22322 at 1246 in Plymouth; AIR via Aligarh 9.565 (Eng to SE.Asia 1330-1500) 34343 at 1420 in Brighton; BBC via Limassol 9.660 (Eng to S.Europe 0900-1515) SIO555 at 1445 in Slough; R.Pyongyang, N.Korea 9.325 (Eng, Fr, Russ, Kor, Sp, Ger to Europe 1300-2150) SIO444 at 1500 by **Phil Cooper** in Guernsey; BBC via Kranji 9.740 (Eng to S.Asia 1515-1830) 43343 at 1530 in Northampton; Voice of Vietnam, Hanoi 9.840 (Eng to Africa 1600-1630) SIO333 at 1614 in Macclesfield.

Later, VOIRI Tehran, Iran 9.022 (Eng to Europe 1930-2020) was SIO544 at 1950 in Lytham St. Annes; R.Cairo, Egypt 9.900 (It, Fr, Ger, Eng to Europe 1800-2245) 44444 at 2116 in Brenchley; R.Vilnius, Lithuania 9.750 (Eng to USA 2300-2330) 44333 at 2313 in Sunderland; R.Tirana, Albania 9.760 (Eng to USA 2330-0000) 55545 at 2330 in Bourne; Voice of Israel, Jerusalem 9.435 (Eng to W.Europe, USA 0000-0030) 45554 at 0005 in Wallsend.

The 7MHz Band

Good reception has been noted in the **7MHz (41m)** band from BBC via Tsang, Tsui, Hong Kong 7.180 (Eng to C.Asia 1500-1615) 42343 at 1504 in Northampton; AIR via Delhi, India 7.412 (Hi, Eng to S.Asia 1515-1741) 45243 at 1530 in Brighton; R.Korea, Seoul 7.550 (It, Fr, Kor, Ar, Ger, Eng, Sp, Port 1545-2345)

Long Wave DX

Freq kHz	TX Location	Country	Power kW	DXer
153	Donebach	Germany	500	B,C,D,E,F,G*,H,K*
153	Brasov	Romania	1200	B
162	Allouis	France	2000	C,D,E,F,G*,H,K*
171	Kaliningrad	USSR	1000	B,C*,F*,H,I*,J,K*
171	Moscow	USSR	500	J
177	Oranienburg	Germany	750	B,D*,F,G*,H,I*,K*
183	Saarlouis	Germany	2000	B,C,E,F,G*,H,I*,K*
189	Motala	Sweden	300	B,D,F
198	Droitwich	UK	500	A*,C,E,F,G*,J,K*
198	Westerglen	UK	50	B,D
207	Munich	Germany	500	A,B,E,F,G*,H*,K*
216	Roumoules	Monaco	1400	B,C,D,E,F,G*,H,I*,K*
216	Oslo	Norway	200	A,B,D,E*,F*,H*
216	Baku	USSR	500	H*
225	Konstantinow	Poland	2000	A,B,C*,E,F,G*,H,K*
234	Junglinster	Luxemb'g	2000	A,B,F,G*,H,K*
243	Kalundborg	Denmark	300	B,C*,D,E,F,G*,H,K*
252	Tipaza	Algeria	1500	D*,E*,F*,G*,H*
252	Atlantic 252	S.Ireland	500	A,B,C,D,E,F,G*,H,K*
261	Burg	Germany	200	F*,G*,H*,K*
261	Moscow	USSR	2000	B,D*,H
270	Topolna	Czech	1500	A,B,D*,E*,F*, G*,H*,K*
279	Minsk	USSR	500	B,D*,F*,G*,H*,J*

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

DXers:
A: Ted Agombar, Norwich.
B: Kenneth Buck, Edinburgh.
C: Ciaran Fitzsimons, Co.Laoise.
D: Simon Holland, Douglas.
E: Sheila Hughes, Morden.
F: Eddie McKeown, Co.Down.
G: George Millmore, Wootton.
H: Fred Pallant, Storrington.
I: Alan Roberts, Quebec, Canada.
J: Tim Shirley, Bristol.
K: Phil Townsend, E.London.

DXers:
A: Simon Hamer, New Radnor.
B: Bart O'Brien, Co Wexford.
C: Tim Shirley, Bristol.
D: Jamie Tullett, Co.Londonderry.
E: Jim Willett, Grimsby.

Transatlantic DX

Freq kHz	Station	Location	UTC	DXer
USA				
660	WFAN	New York	2315	A,D
710	WOR	New York	0135	E
850	WHDH	Boston	0100	A,E
1010	WINS	New York	2330	A,C
1050	WEVD	New York	0130	C
1130	WNEW	New York	0020	A
1210	WOGL	Philadelphia	0030	A,C,D,E
1500	WTOP	Washington	0008	A,D
1510	WKKU	Boston	0115	A,C,E
1560	WQXR	New York	0030	A
Canada				
590	VOCM	St.John's	0100	A,C,D,E
650	CKGA	Gander	0150	E
680	CIYQ	Grandfalls	?	C
930	CJYQ	St John's	2244	A,D,E
940	CBM	Montreal	0010	A
1050	CHUM	Toronto	0100	A,E
1200	CFGO	Ottawa	0015	A
1220	CKCW	Moncton	0105	A,D,E
1570	CKLM	Lavel	2341	A,D,E
C.America & Caribbean				
1610	Caribbean Beacon	Anguilla	2252	B

SIO 433 at 1546 in Winchester; R.Beijing, China 7.800 (Chin, Fr to Europe, N.Africa 1730-2225) 44554 at 2120 in Northwich; Voice of Israel, Jerusalem 7.465 (Eng to Europe, USA 2230-2300) 34323 at 2235 in Sunderland; R.Vilnius, Lithuania 7.400 (Eng to Europe? 2300-2330) SIO555 at 2300 in Rotherham.

The 6MHz Band

The **6MHz (49m)** broadcasts to Europe include RTL Luxembourg 6.090 (Ger, Eng 0600-0300) 44544 at 1023 in Plymouth; R.Nederlands via Flevo 5.955 (Eng 1430-1525), heard by **Julian Wood** in Elgin; VOA via Tangier 6.095 (Eng 0600-0700, also to N.Africa, Middle East) SIO333 at 0645 in Bristol; RCI Montreal via Daventry 5.995 (Eng 1715-1730) 44444 at 1719 in Sunderland; R.Prague, Czechoslovakia 5.930 (Eng 2100-2130), heard by **Phil Townsend** in London; R.Pyongyang, N.Korea 6.576 (Russ, Fr, Kor, Eng 1500-2150) 44554 at 2115 in Northwich; SRI via Schwarzenburg 6.190 (Eng 2230-2300) SIO433 at 2230 in Brimingham; R.Yugoslavia, Bucharest 5.955 (Eng 2200-2245) noted as fair at 2240 in Alnwick.

Abbreviations

Ar	Arabic
a.t.u.	antenna tuning unit
Ben	Bengali
Bur	Burmese
Chin	Chinese
Cz	Czechoslovak
Da	Danish
Eng	English
Fin	Finnish
Fr	French
Ger	German
Gr	Greek
Heb	Hebrew
Hi	Hindi
It	Italian
Jap	Japanese
kHz	kilohertz
Kor	Korean
Mal	Malay
MHz	megahertz
m.w.	medium wave
NF	Newfoundland
Norw	Norwegian
Per	Persian
Port	Portuguese
Russ	Russian
r.w.	randon wire
Sp	Spanish
Sw	Swedish
s.w.	short wave
Ta	Tamil
Tel	Telugu
Ur	Urdu
UTC	Universal Co-ordinated Time
Yu	Yugoslavian

Equipment Used

Ted Agombar, Norwich: Grundig Satellit 400 + r.w.
Thomas Barnett, Slough: Kenwood R-2000 + r.w.
Leo Barr, Sunderland: Matsui MR4099 + r.w. in loft.
Darren Beasley, Bridgwater: Philips D2935 + a.t.u. + 10m wire.
Donald Blashill, Cheltenham: Grundig Satellit 500 + built-in whip.
Denis Bosher, Dolgellau: Matsui MR 4099 + r.w.
Kenneth Buck, Edinburgh: Lowe HF-225 + r.w. in loft or loop.
Jim Cash, Sanwick: Kenwood R-5000 + trap dipole.
Bill Clark, Rotherham: Sony ICF-SW7600 + r.w.
Robin Clark, Plymouth: Saisho SW5000 + 16m wire.
Phil Cooper, Guernsey: Sony ICF-7600DS + r.w.
John Coulter, Winchester: Yaesu FRG-7 + r.w.
Ron Damp, Worthing: Racal RA17 + chimney mounted whip.
Peter Easton, Edinburgh: Kenwood R-5000 + trap dipole.
David Edwardson, Wallsend: Trio R-600 + inverted V trap dipole.
Ciaran Fitzsimonds, Co.Laoise: Goodsman ATS-801.
Ron Galliers, London: Philips D2935 or Fairmate HP-100E + built-in whip.
Alf Gray, Birmingham: Codar CR70 + PR30 + a.t.u. + Ex-Army whip.
Simon Hamer, New Radnor: Lafayette HE30 or Grundig S1400 + loop.
Robin Harvey, Bourne: Matsui MR-4099 + s.w. loop.
Mark Hayward, Basildon: Yaesu FRG-7 + AT1000 a.t.u. + 33m wire.
Francis Hearne, Bristol: Sharp GFA3 cassette radio + r.w.
Paul Hilton, Newbury: Sony ICF-2001 + Datong AD270.
Simon Holland, Douglas, IOM: Sangean ATS-803A + built-in whip.
Sheila Hughes, Morden: Sony ICF-7600DS, Vega 206, or Panasonic DR48.
Rhoderick Illman, Thumrait, Oman: Sony ICF-7600DS + 23m wire
Cyril Kellam, Sheffield: Realistic DX360 or Sony ICF-7600DS + 5m wire.
Eddie McKeown, Co.Down: Tatung TMR 7602.
George Millmore, Wootton, IOW: Tatung TMR 7602 + l/w./m.w. loops.
John Nash, Brighton: Kenwood R-5000 + Datong AD370.
Bart O'Brien, Co.Wexford: Sony ICF-2001D + hexagon loop.
John O'Halloran, Harrogate: Racal RA17 + r.w.
Fred Pallant, Storrington: Trio R-2000 + r.w. in loft.
John Parry, Northwich: Realistic DX-400 + 33m wire.
Roy Patrick, Derby: Lowe HF-125 + 44m wire.
Ron Pearce, Bungay: Home built 1 valve (PM2HL) straight RX.
Philip Rambaut, Macclesfield: Int.Marine Radio R-700M + r.w.
Kenneth Reece, Prenton: Icom R9000, Kenwood R-5000 or JVC NRD 525 + r.w.
Alan Roberts, Quebec, Canada: Lowe HF-225 + r.w.
John Robertson, Alnwick: Lowe HF-225 + E/W r.w.
Tim Shirley, Bristol: Trio R-600 + loop or r.w..
Chris Shorten, Norwich: Matsui MR-4099 + 10m wire.
Alan Smith, Northampton: Matsui MR-4099 + Mizuho KX-3 a.t.u. + r.w.
Cliff Stapleton, Torquay: Trio R-1000 + dipole or 25m wire.
John Stevens, Largs: Hammarlund HQ 180 + loop or r.w.
Darran Taplin, Brenchley: Yaesu FRG-7700 + FRA-7700 active antenna.
Phil Townsend, London: Lowe SRX-30 + LW convertor + r.w.
Jamie Tullett, Co.Londonderry: Realistic DX-440 + a.t.u. + 100m wire.
Ted Walden-Vincent, Gt.Yarmouth: Grundig Satellit 1400L + r.w.
Neil Wheatley, Lytham St.Annes: Sangean ATS-803 + built-in whip.
Jim Willett, Grimsby: RCA AR77 + Diawa CL-22 a.t.u. + 4m square fixed loop.
Ken Willis, Scarborough: Kenwood R-2000 + r.w.
Julian Wood, Elgin: Kenwood R-2000 + Yaesu FRT-7700 a.t.u. + 5m wire.

Tropical Bands

Freq MHz	Station	Country	UTC	DXer	Freq MHz	Station	Country	UTC	DXer
2.310	ABC Alice Springs	Australia	2030	H	4.835	R.Tezulutlan, Coban	Guatemala	0145	R
2.325	ABC Tennant Creek	Australia	2018	H	4 835	RTM Bamako	Mali	1945	F,G,L,O,Q,R
2.435	R.West, New Britain	New Guinea	2150	R	4 845	ORTM Nouakchott	Mauritania	1946	G,O
2.485	ABC Katherine	Australia	2018	H	4 850	R Yaounde	Cameroon	1950	G,L,O
2.560	Xinjiang	China	0025	F	4.855	RRI Palembang	Indonesia	1600	R
3 200	Vos 1, Fuzhou	China	2145	R	4 860	AIR New Delhi	India	0040	F
3 225	RRI Tanjung Pinang	Indonesia	2250	R	4 860	R.Moskva 2 (Chita)	USSR	1943	G,N
3.255	BBC via Maseru	Lesotho	0330	P	4 865	PBS Lanzhou	China	0020	F
3.270	SWABC 1, Namibia	SW.Africa	1950	M,O,R	4.870	R Cotonou	Benin	1821	G,O,R
3.300	R.Cultural	Guatemala	0100	P	4.875	R.Tbilisi	USSR	0509	L
3.320	Pyongyang	N.Korea	1630	R	4 885	Voice of Kenya	Kenya	1843	O
3.355	R.Botswana	Gabarone	1910	M	4 B95	R Moscow (Kalinin)	USSR	1945	G,L,O
3.365	GBC Radio 2	Ghana	1946	L,O,P	4 905	R Nat.N'djamena	Chad	1945	F,L,M,O
3.915	BBC Kranji	Singapore	2010	K,O,Q,R	4 910	R.Zambia, Lusaka	Zambia	1911	O
3.925	NSB Tokyo	Japan	2145	M	4 915	R Ghana, Accra	Ghana	2100	O,O,Q,R
3.955	BBC Daventry	England	2000	A,G,L,N,O	4.915	Voice of Kenya	Kenya	1911	O
3.960	RFE/RL Munich	W Germany	2030	G,N,O	4 920	ABC Brisbane	Australia	1900	H,O
3.965	RFI Paris	France	2010	G,J,L,N,O	4 925	R Nacional, Bata	Eq Guinea	0514	L
3.975	BBC Skelton	England	1933	G	4 930	R Moscow	USSR	1950	C,G,L,O
3.980	VOA Munich	W.Germany	2010	B,G,L,O,P	4.935	Voice of Kenya	Kenya	1920	O,P
3.985	R.Beijing, China	via SRI Berne	2120	G,L,N,O	4 940	R Kiev 2	USSR	1950	C,G,L,O
3.985	SRI Berne	Switzerland	2000	G,J,K,L	4 960	R Baku	USSR	1950	C,M,O
3.995	DW Cologne (Julich)	W Germany	2010	G,O	4 970	PBS Xinjiang	China	0032	F
4.220	PBS Xinjiang	China	0030	F	4 970	R.Rumbos, Caracas	Venezuela	0449	L
4.330	PBS Xinjiang	China	0025	F	4 975	PBS Fuzhou	China	2144	O
4.500	Xinjiang	China	0025	F	4.975	R.Uganda, Kampala	Uganda	1950	L,O
4.719	RRI Ujung Padang	Indonesia	1600	R	4.980	Ecos del Torbes	Venezuela	0446	L
4.735	Xinjiang	China	0025	F,G	4 985	R Brazil Central	Brazil	0532	Q
4.740	R.Afghanistan	via USSR	1905	G,L,O	4 990	AIR via Madras	India	1920	C,L,O
4.750	R.Bertoura	Cameroon	2115	R	4 990	VOIRI Tehran	Iran	2020	J
4 760	R Moscow (Dushanbe)	USSR	1943	G,L,O	4 990	FRCN Lagos	Nigeria	0517	F,L
4.765	Brazzaville	PR.Congo	2017	C,J,L,O,P,R	5.005	R Nacional, Bata	Eq Guinea	1928	C,J,O,P
4.765	R.Moscow	via Cuba	0745	G	5 005	R.Nepal, Kathmandu	Nepal	1615	R
4.770	FRCN Kaduna	Nigeria	1942	M,O,Q,R	5.020	ORTN Niamey	Niger	1915	M,R
4.775	RRI Jakarta	Indonesia	1556	M	5 025	ABC Katherine	Australia	2135	O
4.785	RTM Bamako	Mali	2016	O	5.025	R Parakou	Benin	2027	O
4.785	R.Baku	USSR	2016	C,M,O	5.025	R Uganda, Kampala	Uganda	1958	O
4 795	R Douala	Cameroon	1910	O	5.035	R Bangui	C Africa	1952	O
4.795	R Moscow (Kharkov)	USSR	2020	E,J,L,N	5 035	R.Alma Ata	USSR	0238	L
4.795	R Ulan Ude	USSR	1939	G	5.040	Vos del Upano, Macas	Ecuador	0520	L
4.795	R.Peace & Progress	USSR	2215	I	5.047	R.Togo, Lome	Togo	2030	M,O,R
4 B00	LNBS Lesotho	Maseru	1930	M	5.050	SBC Singapore	Singapore	1500	R
4.B00	R.Moscow Yakutsk	USSR	2137	L	5 065	R Candip, Bunia	Zaire	1928	O
4.810	R.Yerevan 2	USSR	2006	D	5 075	Caracol Bogata	Colombia	0523	L
4.815	R.diff TV Burkina	Ouagadougou	1910	O,R	5 256	RRI Sibolga, Sumatra	Indonesia	1530	R
4.820	E.Prov.Huila	Angola	0440	P	5.260	R Alma Ata 2	USSR	2215	L,N
4 820	R Moskva 4 (Khanty-M)	USSR	2006	G,O	5 290	R Moskva 1Krasnoyarsk	USSR	2335	G
4 825	R Moscow	USSR	1945	L,O					

DXers
A Ted Agombar, Norwich
B Leo Barr, Sunderland.
C Darren Beasley, Bridgwater
D Bill Clark, Rotherham.
E John Coulter, Winchester
F David Edwardson, Wallsend
G Ron Galliers, London
H Simon Hamer, New Radnor
I Robin Harvey, Bourne
J Sheila Hughes, Morden
K Cyril Kellam, Sheffield
L Eddie McKeown, Co Down
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FOR SALE Kenwood R5000 receiver, mint condition, a.m. filter, boxed with manual, computer interface and software available for Amstrad 6128 £700 o.n.o. (0253) 713518 (Lancs).

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FOR SALE/EXCHANGE Eddystone 680X 659/670A receivers, both require attention. Yamaha 500cc single cylinder motorcycle, approximate value £500. **WANTED** good general coverage receiver or AOR2002 or AOR3003 scanners. J.P. Wright. 54 Queen Mary Avenue, Basingstoke, Hants RG21 2PG. (0256) 468649.

FOR SALE PK-232 decoder, as new, £180. Also suitable laptop computer for use with above, £60. Tel: (0730) 816798 after 7pm (West Sussex).

WANTED Icom 9000, Icom 7000, Icom R100 or AOR 3000, cash waiting, can collect. Tel: (0602) 870222 (Nottingham).

FOR SALE Yaesu FRG-7700 receiver, FRT-7700 tuner, PRV-7700 mint condition, £350. Sony 320 world zone, 32 bands, s.s.b., £350. Sony 230 world zone 23 bands l.s.b., u.s.b., £230. Yaesu FRG-7 excellent receiver, £125. Racal 17L with l.f. converter RA137A table model, £200. 081-571 5759.

WANTED Ekco radio model A182 (export model) wood cabinet plus Marconi Marine (Mimco) broadcast receiver (type 2235A) in very large metal cabinet, Cash waiting, non workers considered. Write to Mr Chris F Buckhurst, 66 Corringham Road, Stanford-le-Hope, Essex SS17 0AE.

FOR SALE Alinco 144MHz TX/RX hand-held DJ-120E charger, cigar charger lead, antenna as new, £150. **WANTED** Uniden 200 - HP100Ew.h.y. mint? Cash adjustment. Ray. Tel: (0476) 66047 (Grantham).

FOR SALE Realistic PRO2022 base scanner, four months old, mint 3150. Sangean ATS803A World Band Receiver with p.s.u. £50, postage extra on both items. Tel: (0383) 735967 (Dunfermline).

WANTED Lowe HF-225 receiver, must be in good condition. Tel: (0472) 813430 (Grimsby) evenings/weekends.

FOR SALE ERA Mk2 Microreader, new model used once only, £120. Also Sony Active Antenna, £30 plus post. Exchange lot for FRG-7. Steele. 22 The Green, Radway, Warwick.

FOR SALE Sony 2001O receiver plus AN 1 active antenna, excellent condition, £200. Also realistic PRO34 hand-held scanner, also excellent, £150. A. Allsop. Tel: (0603) 502287 (Norwich).

WANTED Dynatron Pathfinder model TRV14 (valved radio) or Philips RL798 transistorised radio or Pye Piccadilly model 6000 transistor. Hugh McCallion. 8 Strathard Close, Coleraine, Co. Londonderry BY51 3ES. Tel: (0265) 43793.

FOR SALE or EXCHANGE Labgear Colour Bar generator mint condition, £45. Labgear cross hatch, £18. Heath 'scope 5in 10MHz mint condition, £45. Old type h.f. receiver wanted part exchange.. 124 Green Lane, Eastwood, Essex SS9 5QJ. Tel: (0702) 522929.

FOR SALE Icom ICR-700 ultimate scanning receiver, 25-2000MHz a.m., f.m., s.s.b., speech board d.c. conversion, £675. Fairmate HP100 hand-held scanner 1000 memories, 25-1399MHz a.m., f.m., £185. Both mint condition. Tel: (0993) 775337.

WANTED Icom R7000 and BBC B computer disk drive. Tel: (0505) 613570.

FOR SALE Racal RA17 receiver 0-30MHz, good working order, £150 o.n.o. Tel: (0827) 68754 (Tamworth).

FOR SALE Yaesu FRG-7700 with FRT-7700, FRA-7700, FRV-7700 mint, £350. Realistic PRO-2004 scanner, £200, Bearcat DX1000, 30MHz communications receiver, £285. Grundig Satellit 650 International, £325 mint. Tel: (0484) 537838 (Huddersfield) evenings.

FOR SALE Sony CRF320 communications receiver, excellent condition, £400. Tel: (0784) 436688 (Egham).

FOR SALE Lowe SRX30 general coverage h.f. receiver, v.g.c., including manual. Will deliver reasonable distance, £100. Nick. Tel: (0527) 24493 (Redditch).

FOR SALE Trio R1000 with instruction book. Also Mizuho KX2 Sky Coupler. Excellent condition, £200. Tel: 081-590 5275 (Romford). Prefer buyer collects.

WANTED Computer interface for AR2002 scanner scan/master, AOR remote control, etc. **FOR SALE** Active s.w.l. antenna by Heathkit, covers 300kHz-30MHz, cost £65 accept £40 o.n.o. Tel: (0642) 827914 (Marlborough).

EXCHANGE Gold Omega gents wrist watch, unwanted gift, value £750 for FRG-8800, FRG-9600 or h.f. transceiver FT-101Z, TS-130 or similar. G4JGT, QTHR. Tel: (0326) 313688.

EXCHANGE or FOR SALE ERA Microreader MkII, £100 or swap for h.f. receiver, FRG-7 or similar. Daiwa Search 9, 2m receiver, £40 or swap, w.h.y? Ron Sealey. Tel: (0443) 492973 (Pontypridd).

FOR SALE Icom R70 receiver, 150kHz-30MHz, 2-speed a.g.c., pre-amplifier, pass band tuning, notch filter, excellent condition. Will deliver up to 100 miles, £375. Striplin. Tel: (0684) 568317 (Malvern).

FOR SALE RX-8 (BBC version) inc satellite decoding module. Total cost as new £320, immaculate condition quick sale £160. Tel: 091-548 5586.

FOR SALE Realistic PRO34 hand-held scanner with NiCads and charger, £150. PRO2005, 400 channel scanner and discone, £250. JIM100 pre-amp, £50. Sony AN1 active antenna, £30. Dave. Tel: (0543) 472579 evenings.

FOR SALE Sony Air7 hand-held receiver, £130 o.n.o. Sony ICF-2001D portable communications receiver, £220 o.n.o. Both mint condition, boxed with accessories and manuals. Also selection of TVDX antennas. Tel: (0493) 844370 (Norfolk).

FOR SALE Sony AIR7, £140. Sony ICF-SW20 pocket multi-band, £40 or £170 the pair. Both in excellent condition. Tel: 081-391 2879.

FOR SALE Realistic PRO-32w scanner v.h.f./u.h.f. 200 memories plus Signal R537 turn table 118-136MHz, £135 or will sell separate. Clive. 11 Chilpark, Fremington, North Devon. Tel: (0271) 76403.

FOR SALE Yaesu 7700 receiver, FRT-7700 a.t.u., FRV converter 80-150MHz, Oatong notch filter, discone, G5RV, all new condition, £400 the lot. OAP packing up. Tel: Ashdon 223 (Cambs).

FOR SALE Trio/Kenwood R600 communications receiver, complete with instruction manual, £200. Tel: 081-505 1424 (NE London).

EXCHANGE Realistic 2006 scanner, 2 months old, boxed and Panasonic RX-FW39L stereo radio twin cassette recorder, boxed as new for modern short wave communications receiver. Tel: (0582) 606170 (Dunstable).

FOR SALE/EXCHANGE AOR AR-2002 scanner, excellent order, for Lowe HF-225 or £365. Also WIN108 airband scanner, £125. Robin. Tel: 061-799 6652.

FOR SALE Realistic PRO2022 scanner modified for switchable a.m./f.m. in any band, 4 months old with manual and antenna. Spectrum ZX48K computer in good condition, £35. Tel: 021-353 9072.

FOR SALE Icom R7000 HF communications receiver covers 200kHz-2GHz in all modes, with scanning, searching, priority, etc., 200 memories, mint condition, £725 o.v.n.o. Signal R532 airband, £125. Jupiter MVT5000 hand-held, £155. Tel: (0923) 672346 (Watford).

FOR SALE Icom IC-R1 as new boxed complete with leather case, BP90 battery case AD14 charger adaptor, six NiCad batteries, leather case for ICR1 + BP90, £350. Tel: 021-378 1791.

FOR SALE Pye PCR3 needs attention, £20. 267 Hollydown Way, Leytonstone, London E11.

FOR SALE Grundig Yacht Boy Radio 1970 vintage complete with kit-built power unit. Offers for or exchange for active antenna or a.t.u. Tel: (0727) 860631 (St Albans) after 6pm.

WANTED Up to £500 for near mint vintage communications recevier, makes in order of preference, Eddystrone, Hallicrafter, HRO, Racal, Marconi 'services' other considered. Taylor, 27 Christopher Way, Emsworth, Hants.

WANTED *Practical Wireless* 1943-1947, July, Sept & Dec 1948, Jan to Oct 1949, All 1950, all 1951, March & Dec 1952, Feb to Nov 1953, Feb to Oct 1954, Feb & March 1955, April & May 1956, June to Dec 1958, Jan & Aug 1959, Sept & Dec 1966, June 1967, Jan - April 1969 all 1970, Jan to March 1971, All 1982-85. **FOR SALE** 'Over spill' of *PWs* s.a.e. for list, buy/sell 15p each. Mike Evans, 120 Loughton Way, Buckhurst Hill, Essex IG9 6AR.

FOR SALE Kenwood R-5000 working perfectly, 1 year old, 800Irish Pds o.n.o. 'Tarren' British regulated p.s.u. 14.3V 70VA as new, 30Irish Pds o.n.o. Also HRO receiver. N. Cameron EI4DZ, 16 Sy Mary's Crescent, Westport, Co. Mayo, Eire.

FOR SALE WIN108 airband portable complete with carrying case, boxed, instructions, as new, 12 months old, £110. Peter. Tel: 071-274 9221 after 6pm.

FOR SALE Realistic DX400 receiver, a.m. 150kHz-30MHz, f.m. 87.4MHz-108MHz. Modified antenna input to accept 3.5mm jack, instructions, good condition, £65. John Fryatt. Tel: 081-553 2028.

WANTED Instruction manual for Grundig Satellit 2000 international. Good price paid. Tel: (0823) 253306 anytime (Taunton).

FOR SALE Collector's piece. National HRO Type MX communications receiver (ex-WW2) complete with full coil-set in cabinet plus extra coils, instruction manual and accessories. Buyer collects. Offers please to John. Tel: (0844) 339211 (Bucks).

FOR SALE Fairmate HP100E hand-held scanner, mint condition, boxed complete with NiCads and charger, £210. 27 Dalsetter Wynd, Dunrossness, Shetland Is. Tel: (0950) 60312.

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