

short wave magazine

WEATHER SATELLITE SPECIAL



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European Space Agency

Reviewed

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A Mains PSU for the R1155

November 1995 £2.25 ISSN 0037-4261



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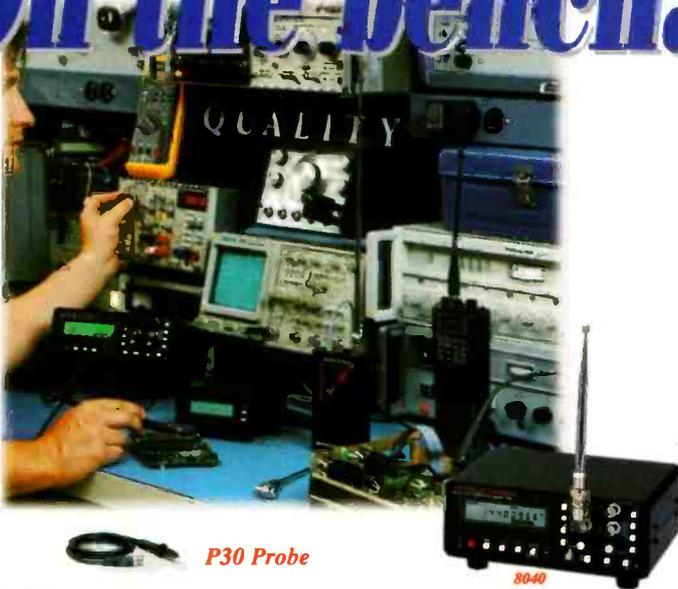
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EDITOR: Dick Ganderton, C. Eng., MIEE, G8V FH
ASSISTANT EDITOR: Kevin Nice, BRS95787, G7TZC
EDITORIAL ASSISTANT: Zoë Shortland
ART EDITOR: Steve Hunt
LAYOUTS: Marcus Hall, Jon Talbot

EDITORIAL

Arrowsmith Court, Station Approach, Broadstone, Dorset
BH18 8PW

Telephone: (01202) 659910

Facsimile: (01202) 659950

If you wish to send E-mail to anyone at SWM then
our Internet domain name is:
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to contact. For example:
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ADVERTISEMENT DEPARTMENT

ADVERTISEMENT MANAGER

Roger Hall G4TNT

Telephone: 0171-731 6222

Facsimile: 0171-384 1031

Mobile: (0585) 851385

ADVERTISEMENT DEPARTMENT (Broadstone)

Lynn Smith (Advertisement Sales)

Ailsa Turbett G7TJC (Advertisement Production)

Telephone: (01202) 659920

Facsimile: (01202) 659950

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Cover Subject

**The Red Sea and Sinai taken from Shuttle
Mission STS-40 using large format
AeroLinhof camera.**

Courtesy NASA

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Subscriptions

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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, Badger Boards, 80 Clarence Road, Erdington, Birmingham B23 6AR. Tel: 0121-384 2473.

Photocopies and Back Issues

We have a selection of back issues, covering the past three years of SWM. If you are looking for an article or review, or whatever that you missed first time around, we can help. If we don't have the whole issue we can always supply a photocopy of the article. Back issues are £2.30 each, photocopies are also £2.30 per article, plus £0.50 for subsequent parts of serial articles.

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

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Technical Help

We regret that due to Editorial time scales, replies to technical queries cannot be given over the telephone. If you require help with problems relating to topics covered by SWM, please write to the Editorial Offices, we will do our best to help and reply by mail.

editorial

This month we have another Weather Satellite Special for you. With a bit of juggling of the budget I have managed to get some editorial four-colour pages to try to do justice to some of the images supplied to Lawrence Harris. For those of you who are already into WXSATs, enjoy the feature; those of you who have yet to dabble, I hope that your appetite has been suitably whetted and that you will consider adding WXSATs to your listening programme.

I have been told that Lawrence's long awaited book on satellite projects will be out around the end of the year. It should be worth waiting for and will, of course, be available from the SWM Book Store.

While on the subject of new books, the very popular *Out Of Thin Air*, which has been out of print for some time, has been revised, updated and added to and is now available as *More Out Of Thin Air*. The original established itself as a compulsory addition to the shack bookshelf - or more likely, bookpile - and I do not doubt that *More OOTA* will join it. Also from the same stable is *Top Secret International Confidential Frequency List* - covering all the utilities up to 30MHz. For those 'Decode' enthusiasts this book, with its 35000 entries, will be an indispensable item alongside the receiver and decoding gear.



Dick Ganderton G8VHF

Dick Ganderton G8VHF

letters

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

Computers & SWM

Sir,

In reply to Harold McIntyre G3FLJ, I am over the moon that someone has written and voiced their objections to computers in radio/radio magazines. I am totally opposed to more articles on computers in SWM.

Now, if I can just tell a story about our hobby.

As a young boy, I remember the nights I spent under the blankets as I listened with glee to my father's short wave radio. I would let my imagination travel around the world with Radio Moscow, BBC World service, etc., and wonder at the distances travelled by some of the weaker stations fighting for signal strength among the megawatt transmitters. Even trying to work out what all those garbled voices were saying to each other - of course, I later discovered they were s.s.b. stations! Now I'll cut to the chase.

When I left school, I joined the Irish Army and after my six months recruit training I joined the Signal Corps. Another six months and I was a Wireless telegrapher - my dreams were all coming true!

When I first went on duty in the COMCEN (communications centre) I thought I was in heaven,

with the sound of c.w., RTTY and all sorts of other interference coming from radios that seemed to be scattered all over the place. This was it now, fighting through interference from Baghdad Radio on our night frequency to bad band conditions on other frequencies, and on other days trying to receive and send c.w. to a new operator who was just dying of 'stage fright' on a ship hundreds of miles from home!

But these days I go on duty and gradually, slowly but surely, it's all going. "What's all going", Darren Bruton (SWM Sept '95) says to his computer - wondering if he should just give up this noisy hobby.

Yes, all these wonderful sounds of c.w., old RTTY machines banging and the whistles and whines of s.s.b. are replaced by a 'PINGGGGGG' from the computer telling me that a station on the net has just activated my ARQ or FEC terminal. I go and type in my reply or send my message, hit the BREAK key and go back to my newspaper, having taken zero pleasure from my moments work.

Now, when we have new operators in the COMCEN, they think I'm just throwing breaks about the days before computers,

when we had real operators! There was time when amateur radio was a much encouraged pastime in the Signal Corps. but now, when the new lads start earning their duty money, the talk is all of the pros and cons of buying a games computer or a PC. Gone are the boasting of being able to operate at 40w.p.m. c.w. or being able to operate c.w., read the newspaper, look at TV and argue with the lads about *Coronation Street*, all at the same time. No more arguments about straight keys being better than bugs, etc. - it's all hard drives and floppies now.

I've read through some computer magazines and have never found one that dealt with radios in computers as a subject. Before being accused of being 'just another old ham', I am only 29 years old, but I love to listen to the sounds of amateur radio and s.w.l.ing - I dread the 'PINGGGGG' of the computer beckoning me to its silent commands.

Let's face it - in what other magazine would you find a reader writing about listening to bat sonar on 45kHz while they are decapitating themselves on his long wire!

To finish, I offer this saying about s.w.l.ing:

"We are given two ears and one mouth, so that we can listen twice as much as we speak."

Thank you for a really great magazine, month after month.

**Martin Leonard EI6IG
Dublin
Eire**

Letters

IF YOU HAVE ANY POINTS OF VIEW THAT YOU WANT TO AIR PLEASE WRITE TO THE EDITOR. IF YOUR LETTER IS PUBLISHED YOU WILL RECEIVE A £5 VOUCHER TO SPEND ON ANY SWM SERVICE

To: dick@pwpub.demon.co.uk

I am writing to actively encourage you to include more computer related articles in *Short Wave Magazine*. Darren Bruton's proposal is very sensible ('Letters' Sept 1995) and I am very disappointed by the opposition expressed by Harold McIntyre ('Letters', October 1995).

Mr McIntyre has entirely missed the point. Like it or not, computers are used by many radio enthusiasts as part of their hobby. I myself am a keen receiver of weather satellite pictures, yet a recent house move into a ground floor flat has stopped my radio reception. My only access to satellite pictures now is now via the (computer) Internet. Pictures this way are generally of much higher quality and from a greater geographical area than is available by receiving direct. The equipment is also cheaper to buy. This, I believe, means that traditional methods of receiving pictures (direct by radio) will gradually become redundant for most amateurs. I do not look forward to that time because I am more interested in the actual radio reception of the pictures, than their actual viewing. The point is, like it or not it will happen. (Look what happened to slide rules after the electronic calculator was invented, LPs after the CD, etc.)

I acknowledge that newsagents are full of computer magazines. Have you ever read one? Well, my advice is don't bother! In my experience they are very difficult to comprehend and assume that the reader is already a computer expert. They fail to explain things well to the 'average person in the street'. This is *Short Wave Magazine's* strength - explaining to radio enthusiasts how the use of computers is enhancing and changing their hobby.

I would not like to see computing feature in a major way, after all it is not actually radio reception, it is merely an ancillary tool - albeit an important one. However we must open our eyes to what is happening around us! I believe that many of your readers would be interested in topics like: What is the Internet? Why on earth should I be interested in it? How could it help me? My friend says that I should access a 'bulletin board' to get up-to-date frequency lists - what is this, how do I do it, how much will it cost, how useful will it be?

You can't stop progress. I am quite happy for Mr McIntyre to ignore anything written about computers, but I want to be kept aware of developments which inevitably affect my hobby.

Yours sincerely
Ben Ramsden....via the 'net

To: dick@pwpub.demon.co.uk

Pleased to get this month's copy. Good as usual. But what a good idea from Darren Bruton, 'Letters' page. We do need a computer page. At least it might put you off publishing articles about contributors' 'Other hobbies'. If I want photos, I'll just buy a mag.

Bye For Now
Robert Grilli....via the 'net

Dear Sir

I am writing to you about the letter from Mr H. McIntyre regarding the inclusion of articles appertaining to personal computer usage in your magazine. I heartily endorse his sentiments in every respect - you can go into any local newsagents and rummage among the myriad of PC mags in an often vain attempt to find one on radio. *Short Wave Magazine* is for short wave listeners, so let's keep it that way, please.

James E. Stone
Bassett
Southampton

SWM is first and foremost a radio listeners' magazine, its remit is to serve the 'listening' community at large. With the advent of many aspects of the hobby that can positively benefit from the use of computers - frequency databases, decoding software, logging programs, beam heading packages d.s.p., etc. - we would not be serving our readers wide range of needs if SWM was to take the 'ostrich' approach.

As far as we know, there are no computer journals that cover any radio-related aspects of the use of computers. We, therefore, feel we have an obligation to cover these aspects of the hobby - and we will! - Dick & Kevin.

Inflight Radios and Other Electronic Gear

To: kevin@pwpub.demon.co.uk

The following may be of interest to SWM readers.

Taken from Southwest Airlines *Inflight Magazine*. (Southwest flies only Boeing 737 jets). It concerns the use by passengers of electronic equipment onboard their aircraft.

1. You obviously can use the AT&T airphones located on the back of every third airline seat.
2. Portable devices that may be operated at all times are: Hearing aids, Electronic watches, Pacemakers.
3. Portable devices that may be operated inflight, but turned off and properly stowed for taxi, take off, and landing are: Portable computers with or without umbilical or mouse, Electronic calculators, Audio recorders or players, Hand-held electronic games, Television receivers, Pagers, Electronic cameras, a.m./f.m. radio receivers.
4. Devices that cannot be operated while inside the aircraft are: Portable telephones, Remote controlled toys, Radio transmitters (amateur, CB, etc.), Any other devices not addressed in this section. Plus, cellular telephones MUST be turned off while on the aircraft."

Could it be that the latest 737s are better shielded?

Colin Goodall....via the 'net

Dear Sir

I ordered a demodulator from Pervisell around 1500 a short time ago and presto, it landed on the hall mat at 0815 the next day. It was up and running by 0900 the same day and its performance is quite remarkable when used in conjunction with Hamcomm/JVFAX/PKTMON12 software also supplied by Phil Perkins of Pervisell. I think the whole package is quite brilliant and the tutorial files subsequently printed out from the program easy to follow.

I would, however, like to decode some of the other weather modes apart from Ship/Synop messages and maybe this will be possible in the De-Luxe JVFX demodulator that is promised from Pervisell in the near future.

Philip C. Mitchell
Newbury
Berkshire

Dear Sir

I wish to make contact with other s.w.l.s in the Chester area, for information exchange. Either via RSGB (my ref. is **RS92837**) or 'phone **(01244) 347189**.

R. G. Chester
Vicars Cross
Chester

Is there something you want to get off your chest? Do you have a problem fellow readers can solve? If so then drop a line to the Editor.

grassroots

rallies

November 3: The Bangor & District Amateur Radio Society are holding their annual surplus equipment sale in Hamilton House, Hamilton Road, Bangor NI. Doors open at 7pm sharp. Talk-in on S23 plus a Bring & Buy stand, etc. Admission price is £1.50 which includes a free draw. Free parking nearby. This is Northern Ireland's premier event - not to be missed! **Norman G13YMY** on (01247) 466557 or **Terry G13USS** on (01247) 473948.

***November 4-5:** The Eighth North Wales Radio & Electronics Show is being held at the Aberconwy Conference & The Bew Theatre, Llandudno. The show opens at 10am, both days. **B. Mee GW7EXH** on (01745)591704.

November 11: The All Micro Computer & Electronics Show is being held at the Bingley Hall, Staffordshire Showground, Weston Road, Stafford (A518 Stafford-Uttoxeter Road), signposted from Jn. 14 on M6. Entrance fee for adults is £2, children under 14 - 50p, Concessions - OAPs, RSGB Members, Student Card, UB40 - £1.50. This year, Beacon Radio Roadshow will be broadcasting live from the show between 10am and 2pm. As usual the AMS will be supporting local charity stalls. There will be masses of free parking, a licenced bar from 11am, refreshments, meals and a cafeteria. Its a great day out! **Ray Gable, Sharward Promotions, Upland Centre, 2 Upland Road, Ipswich IP4 5BT** on (01473) 272002. FAX: (01473) 272008.

November 12: The 5th Great Northern Hamfest (formerly the Barnsley Amateur Radio Rally) will take place at the Metrodome Leisure Complex in Barnsley Town Centre. Doors open at 11am. The venue is all on one level, (2 halls this year) with excellent disabled facilities. The event will feature all the usual trade stands covering amateur radio, computers (hardware and software), electronics, components and kits, clubs, repeater groups, Novice and specialist interest groups plus a large Bring & Buy. This year there will be Morse Tests on demand from 12noon to 3pm (candidates must bring the appropriate documentation). A variety of refreshments are also available. For further details contact **Ernie Bailey G4LUE** on (01226) 716339 (home) or (0836) 748398 (mobile).

November 12: Martlesham Radio Society will be hosting another Microwave Round Table event at BT Laboratories, near Ipswich, Suffolk. The event will commence at 10am and will include round table sessions testing facilities (including 24GHz Noise Figure measurements) and a Bring & Buy. This year the event is expecting participants from several European countries including DB6NT and DC0DA who will augment the lecture programme with a microwave update. For BT Labs security requirements, all access is by advance booking only. **MRS Secretary** on (01473) 644285 or for tickets, send an s.a.s.e. to **Roy Smith G0RRC, Lykkebo, The Street, Burstall, Ipswich, Suffolk IP8 3DN**.

November 12: The 7th Midland Amateur Radio Society, Birmingham, Radio & Computer Rally is being held at the Stockland Green Leisure Centre, Slade Road, Erdington, Birmingham. Doors open 10am to 4pm. Admission is £1, children free. There will be a free Christmas draw, trade stands, local clubs, special interest exhibits, refreshments and a large, free car park. **Peter Haylor G6DRN** on 0121-443 1189.

November 18: Rochdale & District Amateur Radio Society traditional radio rally. Components, ex-forces equipment, 'junk', Bring & Buy. Tables for non-trade also available at £5 - empty your loft! Refreshments available. Admission is £1. Doors open at 11am and close at 4.30pm. **St Aidan's Vicarage, Sudden, Rochdale** (same as QRP Convention). Talk-in on S22. **John G7DAL** on (01706) 376204 or **Dave G0PUD** on (01706) 32502.

November 19: The Bishop Auckland Radio Amateurs' Club will be holding its annual radio rally at the Newton Aycliffe Leisure Centre. Doors open at 10.30am for disabled visitors and 11am for everyone else. Further info. from **Mike Shield** on (01388) 766264.

***November 26:** The Bridgend & District Amateur Radio Club will be holding its 9th Amateur Radio & Computer Rally at the Bridgend Recreation Centre in Bridgend. The rally will have all the usual amateur radio and computer dealers, a Bring & Buy, RSGB Morse Test on demand (two passport size photos must be produced). Doors open at 11am, 10.30am for disabled visitors. Admission is £1. Further details from **Maurice GW0JZN** (01656) 864579 or **Don GW3RVG** (01656) 860434.

If you're travelling a long distance to a rally, it could be worth phoning the contact number to check all is well, before setting off. The Editorial staff of *SWM* cannot be held responsible for information on Rallies, as this is supplied by the organisers and is published in good faith as a service to readers. If you have any queries about a particular event, please contact the organisers direct.

Editor

AVON

Bristol International RC: Tuesdays, 8pm. The Fighting Cocks Public House, Hengrove. All visitors are welcome. The club has been formed so that all radio enthusiasts, whether they be Licensed Amateurs, s.w.l.s or CBers can get together and have a good natter and do things that you do in radio clubs. PO Box 28, Bristol BS99 1GL.

RSGB City of Bristol Group: last Tuesdays, 7pm. New Friends Hall, Purdown, Bell Hill, Stapleton, Bristol BS16 1BG. October 31 - AGM. **Dave Bailey G4NKT**. 0117-967 2124.

South Bristol ARC: Wednesdays, 7.30pm. Whitchurch Folkhouse Assoc., Bridge Farm House, East Dundry Rd, Whitchurch. November 1 - Top Band activity evening/committee meeting, 8th - Club Forum - members suggestions, 15th - AGM, 22nd - Christmas raffle commences. For more information ring (01275) 834282 on a Wednesday evening.

BUCKINGHAMSHIRE

Aylesbury Vale RS: Wednesday evenings, 8pm. Hardwick Village Hall, (Hardwick is situated off the A413 between Aylesbury and Buckingham). November 1 - Discussion evening and c.w. session, 15th - Optimising receiver front-end design by **Ian White G3SEK**. **Ivan Eamus G3KLT**. (01296) 437720.

CLWYD

Conwy Valley ARC: 1st Wednesdays, The Studio, Penrhos Road, Colwyn Bay, Clwyd. November 1 - Effect of lightning on aerial installations by **Ray Pierce Jones GW7CMF**. **R. W. Evans GW6PMC** (01745) 855068.

DEVON

Appledore & DARC: 3rd Mondays, 7.30pm. Appledore Football Clubroom. November 20 - The club radio quiz. **Dave Brierley G3YGJ**. (01237) 476124.

Torbay ARS: Fridays, 7.30pm. ECC Social Club, Highweek, Newton Abbot. November 17 - Monthly meeting - Satellites by **Ernie Hayman G3ABU**. **Peter G4UTO**. (01803) 864528.

EAST SUSSEX

Southdown ARS: First Monday of the month, The Chelsey Home for Disabled Ex-Servicemen, Bolsover Road, Eastbourne, 7.30pm. November 6 - Talk by **Dr Craig G3SGR** (Radiologist) speaking about 100 years of X-Rays and Radiation. **Vic Robins G0THX** on (01323) 846774 or **John Vaughan G3DQY** on (01323) 485704.

GREATER LONDON

Southgate ARC: 2nd & 3rd Thursdays, 7.30pm. The Pavilion, Winchmore Hill Cricket Club, Firs Lane, Winchmore Hill, London N21 3ER. October 26 - Radio on the air, November 9 - Competition and Brains Trust, 23rd - Demo night and radio on the air. **M. E. Viney G0ANN**. (01707) 850146.

HAMPSHIRE

Horndean & DARC: 1st & 4th Tuesdays, 7.30pm. Lovedean Village Hall, Lovedean Lane, Lovedean, Hants. November 7 - Natter night. S.

Club Secretaries:

Send all details of your club's up-and-coming events to: **Lorna Mower, Short Wave Magazine, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW**. Please tell us your County and keep the details as brief as possible.

Swain (01705) 472846.

Southampton ARC: Mondays, 7pm. This club is now up-and-running after some years of inactivity. New members welcome. **Harold McIntyre** on (01703) 737715.

Winchester ARC: 3rd Fridays, Red Cross Centre, Durngate House, North Walls, Winchester. 7.30pm. November 17 - **Gerry Sanderson G2DBT** - home-brew expert. **P. Simpkins G3MCL**. (01962) 865814.

HEREFORD & WORCESTER

Bromsgrove ARS: 2nd & 4th Tuesdays. Lickey End Social Club, Alcester Road, Burcot, Bromsgrove. November 14 - Night on-the-air. **Barry Taylor**. (01527) 542266.

HERTFORDSHIRE

Hoddesdon RC: Alternate Thursdays, 8pm. Conservative Club, Rye Road, Hoddesdon. October 26 - Wine making by the Enfield Society, November 9 - Night on-the-air, 23rd - Talk on RAYNET by **G4KUJ**. **Dave G1CAY** on (01992) 460841.

KENT

Bromley & DARS: 3rd Tuesdays, 7.30pm. The Victory Social Club, Kechill Gardens, Hayes. November 21 - Slide show. **A. Messenger G0TLK**. 0181-777 0420

Maidstone YMCA ARS: Fridays, 8pm. YMCA Sports Centre, Melrose Close, Maidstone, Kent, ME15 6BD. October 27 - RAE reactance by **Paul Austin**, November 3 - Junk sale, (8pm), £1 admission. (01622) 743317.

Medway AR & TS: Fridays, 7.30pm. Tunbury Hall, Catkin Close, Tunbury Avenue, Walderslade, Chatham. Nov. November 10 - Magnetism caused by rotation by **Lars Harstad**. **G3VUN**, 40 Linwood Avenue, Strood, Rochester, Kent ME2 3TR. (01634) 710023.

LANCASHIRE

Rochdale & DARS: Mondays, 8pm. Cemetery Hotel, 470 Bury Road, Rochdale. November 13 - A talk entitled 'From Marconi To Sony' by **Dave G0PUD** with old radios for illustration. Non-members always welcome. **G7DAL** on (01706) 376204.

LINCOLNSHIRE

Lincoln SW Club: Wednesdays, 8pm. City Engineer's Club, Waterside South, Lincoln. November 22 - Construction contest. (01427) 788356.

NORFOLK

Norfolk ARC: Wednesdays, 7.30pm. Formal and informal meetings at The Norman Centre, Bignold Road, Off Drayton Road between 'Asda' and Three Mile Cross Roundabout, Norwich. November 1 - Surplus equipment sale, 8th - Night on the air/construction QRP/Morse practice, 15th - A video of NARC event 1995 by **Jack Simpson G3NJQ**, 22nd - Night on the air/construction QRP/Morse Practice. **Mike G4EOL**. (01603) 789792.

OXFORD

Oxford & DARS: 2nd and 4th Thursdays, 7.30pm. The Grove House Club, Grove Street, off Banbury Road, Summertown, Oxford. D.A. Walker **G3BLS** on (01865) 247311.

Vale of White Horse: 1st Tuesday of each month. 8pm at The Fox, Stevenston. **Ian White**. (01235) 531559.

SOMERSET

Yeovil ARC: Thursdays, 7.30pm. The Red Cross Centre, 72 Grove Avenue, Yeovil. October 26 - Committee meeting and club station on the air. **Cedric White, QTHR**. (01258) 473845.

SUFFOLK

Bury St. Edmunds ARS: 3rd Tuesdays, 7.30 for 8pm. Culford School. November 21 - Weather satellites - an illustrated talk from **Mark Clarke G3CQL**. **Kevin Waterson G1VGI**, 20 Cadogan Road, Bury St. Edmunds, Suffolk IP33 3QJ. (01284) 764804.

TAYSIDE

Dundee ARC: Tuesdays, 7pm. Dundee College, Graham Street, Dundee. October 31 - Lecture, November 7 - Construction evening, 14th - Oscilloscopes and how to use them by **Les GM0TGG**, 21st - Construction evening. **Allan Martin GM70NJ**, 11 Langley Place, Broughty Ferry, Dundee, Tayside DD5 3RP.

WARWICKSHIRE

Stratford-upon-Avon & DRS: 2nd & 4th Mondays, 7.30pm. Home Guard Club, Main Street, Tiddington, Stratford-upon-Avon. October 28/29 - CQ WW DX SSB, November 13 - A DXpedition by **Vincent Denecker G0MLX**. **Martin Rhodes G3XZO**. (01789) 740073.

WEST YORKSHIRE

Denby Dale ARS: Wednesdays, 8.30pm. Pie Hall, Wakefield Road, Denby Dale, West Yorkshire. Denby Dale ARS also provides RAE, Morse and Novice RAE classes and is a registered City & Guilds examinations centre for both the RAE and Novice RAE exams. November 1 - AGM, 15th - Constructor's Trophy. Further details from the examinations secretary **Brenda G4OTE** on (01484) 424776 or secretary **Malcolm McKenzie G8RWN**, 9 Bloomhouse Close, Denby Dale, Huddersfield, W. Yorkshire HD8 8UX or (01484) 861782 for club activities.

North Wakefield RC: East Ardsley Cricket Club, Bradford Road, East Ardsley, Nr. Wakefield, 500 yards from J.41 M1. November 9 - A different opinion on UFOs by **Arthur Tomlinson**. 0113-253 9087.

Keighley ARS: The Ingrow Cricket Club, Ingrow, Keighley. Thursdays, 8pm. October 26 - Junk sale, November 2 - Natter night, 9th - Horse Ratching at the Cricket Club, 16th - Natter night, 23rd - Natter night. **Kathy G0RLO**. (01274) 496222.

Wakefield & DRS: Tuesdays, 8pm. The Ossett Community Centre, Prospect Road, Ossett. October 31 - JVFAX demonstration, November 7 - Pea & pie supper, 14th - Desk Top Dithering by **G4BLT**, 21st - World Scout Jamboree. **Bob 0113-282 5519** or **G3WWF@GB7WRG**.

WILTSHIRE

Trowbridge & DARC: 1st & 3rd Wednesdays, 8pm. The Southwick Village Hall, Southwick, Trowbridge. November 1 - Judging of construction projects. **Ian G0GRI** on (01225) 864698.

Elaine Richards
PO Box 1863,
Ringwood,
Hants BH24 3XD.

junior listener

Calling All Ladies

Wavelengths, A short wave news letter for Women is a publication aimed at ladies who enjoy short wave listening. There are programmes in many schedules that deal with women's issues or that try and enlighten the listeners on the lives of women in different cultures. I've just read Issue No. 2 and was surprised at just how many interesting programmes *Wavelengths* readers have heard. If you're interested in reading or contributing to *Wavelengths*, then Nina Allen (the Editor) would like to know: Why do you listen to short wave radio? What types of programmes do you listen to regularly and why? Are short wave broadcasters addressing the concerns of women? Send a letter or cassette to **Wavelengths, PO Box 381766, Cambridge, MA 02238, USA**. Please include an IRC to cover the postage of your copy of *Wavelengths*.

Dear Santa!

I'm sure that a few letters will be winging their way to Lapland with requests for new receivers. But if you haven't been quite that good this year, what could you ask for. If you have a relation who is asking for bright ideas, how about asking for a clock. A good accurate clock is a must if you are serious about your listening. You could always go for one of the radio synchronised clocks that will always correct themselves even after you have changed the batteries. Unfortunately, these can be more expensive than ordinary clocks. So, perhaps you could ask for a good digital clock or perhaps a clear-faced analogue one. You can then keep this set to UTC, making your report writing easier. Don't forget, international broadcasters give the time in the schedules in UTC and expect any reports to use the same method of time keeping. During the winter months it's not too bad as we go back to using UTC too, but during the summer we have British Summer Time, which always adds to the confusion.

So, you got a clock last year, what else? How

about a new antenna then?

This could range from a simple rubber duck to a lovely discone or dipole. A good antenna can do a lot to improve the reception of your receiver. Make sure you get the right type of antenna for your receiver - and that it has an external antenna socket, too.

An external speaker is another very useful accessory. The speaker in most broadcast sets is somewhat limited by the size of the radio. If you can take the audio and put it into a good quality external speaker, you will be surprised at the difference. Of course, not everyone in the house-hold may appreciate this increase in audio quality! So how about a set of headphones for the late-night DXing sessions.

What else can you include in your Christmas list? Have you got static protection in your station? Even if there isn't any lightning flashing around the house, the amount of static that can build up on the antenna can be immense. A static discharge protector will protect the investment you've made in your radio. You just connect it into the antenna cable, attach a very good protective earth and leave it in-

line to do its stuff.

Alternatively, you could ask for information. I suppose I ought to mention a subscription to *Short Wave Magazine* - because if I don't, the Editor will!!! To be honest, it does save you money (£2 for UK 12 month subscribers).

Of course, *Short Wave Magazine* also have an extensive book service too. If you are a broadcast listener, then there are two books worth putting on the present list. There's the *World Radio TV Handbook* and *Passport to World Band Radio*. I've just got my 1996 copy of 'Passport' and always find the front half of the book as useful as the 'Blue Pages' with their channel-by-channel guide to world band schedules. This year they have reviewed all kinds of new radios from ones that I've never heard of (and they only get a 'One-Star' rating) to Four and Five-Star ratings for the likes of the Lowe HF-150 and the Watkins-Johnson HF-1000. In fact, they tested about 117 different types of radio last year alone. Each one has a brief description, the advantages and disadvantages and their own star rating (from 1 to 5). Other useful features are things like their 'Top Ten Best Radio Programmes'.

Although guides like these are expensive, it is worth getting a good one each year if you can. It can save you a lot of wasted time and effort when you are looking around the bands. Whatever you decide to put on your present list, if you are getting other people to buy them for you, I would recommend they use tried and trusted sources - like the advertisers in *SWM*. If you are not sure about what is wanted, a good advertiser will always help by making sure the right item is purchased and you won't end up with a useless gift.

New Book

The International Short Wave League have brought out another of their good-value booklets. This one is called *Guide to English Language Short Wave Broadcasts to Europe* (Winter Schedules 95/96). They rely on broadcast stations sending the ISWL the winter schedules as soon as possible. Unfortunately, stations are rather reluctant to let anyone know in advance, so the publication is later than the ISWL would have liked. It is in the same format as previous years: Time, country and station names, frequencies and programme details (whether it's news, sport, religious, features, etc.). All the frequencies in the book are given in kHz and so should be easy to use. The A4 guide costs £2 (IRCs or postage stamps to the value of £2) to **ISWL, 10 Clyde Crescent, Wharton, Winsford, Cheshire CW7 3LA**.

Pen Pals

Fancy writing to a fellow Junior Listener? James Stevens, aged 12, is looking to write to fellow short wave listeners between the ages of 10 and 15. James uses a Sangean ATS-803A with a 30m long wire antenna. He enjoys listening to broadcast stations from Asia, Middle East, Europe, South America and North America. He also collects QSL cards and enjoys sending reception reports. To date he has 21 cards from all over the world. If you'd like to write to James, his address is James Stevens, 10 Odlehill Grove, Abbotskerwell, Newton Abbot, Devon TQ12 5NJ. Don't forget to include as many details about yourself as you can and tell him all about your listening interests.



Lowe HF-150

Lifeline Programme

BBC World Service's Rwanda lifeline programme for people affected by last year's civil war marked its first year on the air back in September. Each weekday, the 15 minute programme broadcasts messages from listeners wanting to be reunited with their families together with a summary of regional news from the area.

Called *Gahuzamiryango* (Missing Persons) the

programme was set-up following the civil war in Rwanda. Transmitted from London in the Kinyarwanda language at 1815UTC each evening, it broadcasts the only reliable source of news in the region. It is produced in association with the International Committee of the Red Cross providing data on refugees and unaccompanied children, and non-governmental British aid organisations providing funding.

Open Evening

The **Mid-Warwickshire Amateur Radio Society's** open evening took place at the club meeting rooms back on Tuesday 12 September 1995. A wide range of displays illustrated the varied interests of the membership.

Amateur stations were active on the air throughout the event and packet radio was demonstrated together with satellites, short wave listening and Morse code operation. Home construction and the use of computers in radio circuitry illustrated the technical and practical aspects. The RAYNET display was popular and aroused considerable interest.

Radio literature, magazines, leaflets and posters were freely available to those who wished to take them. The Mayor of Warwick, Councillor Mrs Christine Hodgetts was met by the Chairman, Brian Clulee G0LXG and escorted around the exhibits.



Central view of visitors in one of the rooms (spot the *Short Wave Magazine*).

New Yupiteru

Nevada Communications, the UK distributor for Yupiteru, announce the launch of the new MVT-7200 hand-held scanner. Frequency Range is 0.1 - 1650MHz. Scan and Search speed is a healthy 30 steps per second. Available modes are n.b.f.m., w.b.f.m., a.m. s.s.b. Step size is selectable between 50Hz and 125kHz. The new receiver can be powered by either internal NiCads or via an external mains adapter. Weight of the scanner is 320g. Yupiteru produce this latest offering with a 'rubber duck' flexible antenna instead of the telescopic type used by its predecessor.

The MVT-7200 is available from **Nevada Communications, 189 London Road, North End, Portsmouth PO2 9AE. Tel: (0175) 862145, FAX: (01705) 690626.** Nevada are now on the World Wide Web, details of the MVT-7200 and other products offered are available at URL http://www.ee.port.ac.uk/~arrow_1

The MVT-7200 is also available from **Waters and Stanton Electronics, 22 Main Road, Hockley, Essex SS5 4QS. Tel: (01702) 206835, FAX: (01702) 205843.**



3S-Wick is supplied on handy 1.5m antistatic plastics dispenser reels.

Wickety-Wick

'Wicking' has long been, and will continue to be, a safe and reliable de-soldering method with virtually no capital investment in special tools or equipment, and can easily be performed by any person familiar with soldering operations. For correcting soldering errors, a spool of 3S-Wick is a MUST for any soldering station. Wicking simply sucks up excess solder by capillary action into the wick mesh. The copper wick does not allow excessive rates of temperature increases and

temperature levels that could influence reliability of a solder joint.

Wicking has gained popularity especially since the cost is very low per desoldered joint. Cobonic Limited, a Guildford based distributor, now offers prime quality Swiss made desolder braid at 44p per 1.5m antistatic spool. 3S-Wick uses state-of-the-art (no-clean) flux coating. The Swiss wick manufacturer has produced wick for 25 years, but marketed it till now mostly under various private labels through UK OEM companies in the soldering business.

WorldTel Appoints NatWest Markets

WorldTel announced recently that it has appointed NatWest Markets as lead financial advisor and global co-ordinator of its fund raising activities. WorldTel, as a commercial undertaking, aims to help close the widening global communication gap between the developed world and low income countries.

WorldTel was officially launched by the International Telecommunication Union (ITU) back in January 1995. In June, the governing body of the ITU, the Council, resolved to encourage all interested parties to collaborate in a mutually beneficial commercial undertaking with the aim of closing the gap. The ITU may also provide available expertise and services to WorldTel on the basis of commercial arrangements.



Centenary Celebrations

As part of their celebrations of a hundred years of radio, the Institute of Electrical Engineers in London received a lecture on the Alexanderson generator. The Alexanderson is a high speed generator that produces electricity at a frequency of 17.2kHz, broadcasting the signal produced from an antenna, around 1.6km long.

The Alexanderson generator at Grimeton (near Gothenburg) in Southern Sweden is the only one in the world that can still be put into full operation. It was last used a few months ago to celebrate its 70th birthday and again during the celebration.

National Transmitter News

New BBC FM Transmitters

July 13, Kingswear, Dartmouth now brings good stereo f.m. radio reception to an additional 3400 people in the Dartmouth and Kingswear areas. The transmitter is located just above Kingswear along Mount Ridley Road.

The stations on the following frequencies are:

Radio 1	99.4MHz
Radio 2	89.8MHz
Radio 3	92.0MHz
Radio 4	94.2MHz

On some radios, the f.m. band may be marked as v.h.f. This transmitter broadcasts with vertical polarisation. External or loft-mounted antennas must be mounted vertically - not horizontally as would be the case with most other f.m. stations.

Further information on f.m. reception in the Kingswear area - including advice on fitting an external f.m. antenna - is available from:

BBC Engineering Information

**Villiers House
The Broadway
Ealing
London
W5 2PA**

Tel: (0345) 010313 (local call rate)

June 30, Whitehaven, Cumbria, now brings good stereo f.m. reception to an additional 12,400 people in the Whitehaven area of West Cumbria. Coverage of the new transmitter stretches from Beckermeth in the south to Whitehaven in the north and includes Arlecdon, Frizington, Cleator Moor, Egremont and St. Bees.

The transmitter is located about 2km north east of St. Bees and has now entered service following a period of test transmissions which began on 30 June 1995. The transmission frequencies are:

Radio 1	99.3MHz
Radio 2	89.7MHz
Radio 3	91.9MHz
Radio 4	94.1MHz

This transmitter is vertically polarised. External or loft-mounted antennas must be mounted vertically - not horizontally as would be the case with most other f.m. stations.

Further information on f.m. reception in the Whitehaven area - including advice on fitting an external f.m. antenna - is available from:

BBC Engineering Information or **Engineering Information**
Villiers House or **BBC Broadcasting Centre**
The Broadway or **Barrack Road**
Ealing or **Newcastle-upon-Tyne**
London or **NE99 2NE**
W5 2PA or **Tel: 0191-232 1313**
Tel: (0345) 010313 (local call rate)

Walnut Creek Winner

Public Domain Shareware Library (PDSL) of Crowbrough have taken on yet another Walnut Creek CD-ROM winner. New Power DOS, provides 1909 of the world's best and freshest DOS programs in simple categories, this CD-ROM provides an easy-to-use viewer that makes finding the file you want a breeze. This CD-ROM saves hours of wading through the Internet to find the application or file/s you need.

The CD-ROM contains anti-virus programs, a must for every PC user, games and game cheats, network programs and TCP/IP programs, patches to upgrade commercial software packages, utilities for disks, keyboards, memory, printers and tape drives. There are graphics/video drivers, ray-tracers, viewers and painters. Add to this the programming utilities and source for assemblers, C and Modula, and you have a versatile, well named CD-ROM in Power DOS. At £10, you cannot go wrong with this CD-ROM. **PDSL, Winscombe House, Beacon Road, Crowborough, TN6 IUL. Tel: (01892)**



**Paul Wood - BBC
Belgrade
Correspondent.**

Newsroom from August 1993 going on to Northern Ireland at the beginning of the year. Other BBC appointments held include political reporter for BBC Westminster regional TV and radio programmes and a sub-editor for Ceefax. With a degree in Government from the London School of Economics and early training with Shropshire Newspapers, Paul moved from being Deputy-Chief reporter at the newsdesk of the *Shropshire Star* onto freelance work for national newspapers before joining the BBC in 1992.

Discount For ITU Members

The International Telecommunication Union (ITU) is pleased to announce that 'small-m' members (participating in the work of the Sectors) will benefit from the same discount as Member Administrations when ordering ITU publications as from 1 August 1995. At the same time a 40% discount on catalogue prices will be granted to the Administrations from Least Developed Countries (LDCs). For further information contact: **International telecommunication Union, Sales Service, Place des Nations, CH-1211 Geneva 20 (Switzerland), FAX: +41 22 730 5194 or E-mail: sales@iti.ch**

Activity On Air

The **Club of Friendship** are holding an activity day on the air on 5 November 1995 from 00.01 to 23.59UTC between UK and Russian radio amateurs. During this period, radio amateurs in the US and CIS are invited to participate in bringing the two countries closer together and the two club stations G4BAS (GX4BAS/P) and RK3AWP will be operating.

An award will be available to radio amateurs (and s.w.l.s) who make (or hear) ten contacts with radio amateurs

in Russia and either a club station or a member of the COF (UK of Russian). QSOs made be made in any mode on any frequency, but duplicate contacts are not permitted.

The cost of the certificate is £5 and applications in the form of a copy of your log, witnessed by another radio amateur should be sent to: **Howard Ketley, UK Co-ordinator, Club of Friendship Between UK and Russian Radio Amateurs, 1 Tewkesbury Avenue, Mansfield Woodhouse, Notts NG19 8LA** prior to the end of November.

New Catalogue

Copies of the latest 40-page MFJ catalogue (and latest price list) can be obtained from **Waters & Stanton Electronics, 22 Main Road, Hockley, Essex SS5 4QS** upon receipt of a large s.a.e.

Stop Press

AOR have just announced the production of two new receivers and the move to a new location in Belper, Derbyshire. The first is a UK manufactured HF receiver the AR7030, which has been developed by the ubiquitous John Thorpe formally of Lowe Short Wave Magazine, November 1995

Electronics Production. John is internationally known and a recognised expert in the field of receiver design. The new AOR receiver will be John's **best ever** it is claimed that it will easily surpass all other models - being jam packed with features - on the market in the medium priced sector

Second is the AR5000 which is a high performance wide range base receiver with a frequency coverage of 30kHz - 2.5GHz. Strong signal handling is particularly good as the receiver incorporates a pre-selector. The AR5000 is not intended to replace the popular AR300A, it is pitched at the commercial and serious

listener market. The receiver is housed in a metal case. It offers many new features including many, standard i.f. bandwidths, full computer control to name but two.

Both these new receivers should be available from dealers before the end of 1995.

news

New BBC Belgrade Correspondent

Paul Wood has been appointed as the BBC's new correspondent in Belgrade. He took up his post on 7 August 1995. Currently on secondment to BBC Northern Ireland as a reporter for news and current affairs, Paul Wood has had previous experience in both Bosnia and the Former Soviet Union where he reported for BBC outlets in both 1993 and 1994.

He worked as a broadcast journalist for the World Service

LISTENING TO

When you ask us for help or advice, you get the benefit of many man years of experience in all aspects of short wave listening, scanning and airband monitoring. Here at Lowe, we have radio amateurs, medium wave DXers, scanning enthusiasts, pilots and data comms experts, all of whom are only too pleased to help you. Also, one of our fundamental policies is that we will not try to sell you something which we feel is not suitable for your needs. If we recommend it – we mean it! Our own SW receivers out-sell in the UK all other brands put together, and we have built up a wealth of experience as a result.

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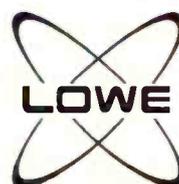
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THE WORLD

THE NEW LOWE HF-250



**As reviewed in September issue
See back cover for full colour picture*

The Lowe HF-250 is set to become the new world standard for mid-priced receivers. Building on from the world-wide success of our HF-225 and HF-150 models, the new HF-250 combines Lowe's traditional high standards of performance and quality of construction together with the advanced facilities and control features required by today's discerning listener.

** Call or write for a brochure, or pop into your local Lowe shop for a demo **

FEATURES

- * Frequency range from 30kHz to 30MHz
- * Tuning step size 8Hz
- * Back-lit display
- * Display resolution now 100Hz
- * 255 memory channels
- * Memory channels also store frequency, mode, filter selection and attenuator setting.
- * Computer control is standard via built-in RS232 port.
- * RS-232 reads to and from the radio for upload-download of memory data. Free software included.
- * Clock with two independent timers.

- * Fixed level output for decoding and tape recording.
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- * Fast tuning in 10kHz steps.
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Electronics

Derbyshire DE4 5LE Tel: (01629) 580800 Fax: (01629) 580020

MVT-7200 Review

Yupiteru has established a deservedly popular position in the portable scanner market and the new MVT-7200 reviewed here by Mike Richards looks set to continue the line.

The MVT-7200 is the latest in a line of very successful hand-held scanners from Yupiteru. This new model features continuous coverage from 530kHz right through to 1650MHz with f.m., a.m. and s.s.b. reception modes. There are 12 different frequency steps available and 1000 memories to store your collection of hot frequencies. All this is supplemented by a wide range of powerful scanning and search tools developed to make life easy for the listener.

What's New

If you already have, or are thinking of buying, the earlier MVT-7100 you are probably wondering what's changed. According to the supplied data sheet, these are the main changes. The antenna has been changed to an encapsulated helical type instead of the old telescopic rod. This is a very worthwhile improvement as the new antenna is extremely robust and much better suited to a portable environment. Another useful antenna change is the inclusion of a built-in ferrite bar antenna for medium wave reception.

The MVT-7200's excellent a.m. reception has been supplemented by a new narrow a.m. mode that uses a very narrow-band filter to reduce adjacent channel interference - more on this later. The display illumination has been improved with a backlight that can be set to light for around 5 seconds or, if pressed for more than a second, switch the light on permanently. To help with the reception of broadcast f.m. signal, a new 125kHz tuning step has been added. For s.s.b. enthusiasts the i.f. filtering has been improved to give a narrower bandwidth and improved selectivity.

Finally the '7200 includes a built-in charger for the NiCads that will trickle charge the batteries in around 15 hours. All the changes appear to represent a very logical development of a well established receiver.

First Impressions

With many manufacturers striving to produce a new look every year, it's quite refreshing to see Yupiteru sticking to a well established formula for the layout. Although lacking in one-up-man-ship, the MVT-7200's layout is extremely practical and easy to use. The display digit size is large enough for most to see without reverting to spectacles and the new back lighting system works very well. A particularly good point here was the illumination of the keys as well as the display.

The only rotary controls were the volume, squelch and main tuning - all mounted on the top panel. Although the knobs were mounted quite close together, there was enough clearance to ensure that, at least my fingers, didn't interfere with the other controls. The manual tuning control followed standard practice and featured approximately 20 click stops per turn, with each of the clicks increasing or decreasing the frequency by the selected steps.

To make portable use as easy as possible, the MVT-7200 was supplied with a wrist strap and a metal belt clip that attached to the back of the receiver. There was even a car cigar lighter adapter supplied so you could also use the MVT-7200 in the car.

Ins and Outs

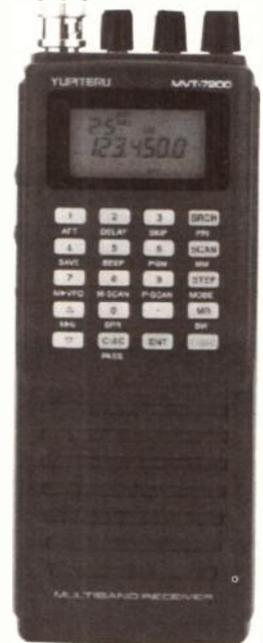
Although the MVT-7200 is pretty much self-contained, as any portable should be, there were the usual range of

external connections to increase its flexibility. Headphones or an earpiece (not supplied) could be connected to the 3.5mm jack on the top panel. The maximum output from the side mounted jack was around 100mW in to 8Ω that should prove adequate for all types of headset. If you intend using the MVT-7200 for any form of utility listening or maybe want to make recordings, you will have to use the external speaker jack as there's no line-output. This is not a major problem as you can use a readily available Y-adaptor to facilitate the simultaneous use of an external speaker and any auxiliary equipment.

The antenna connection was via a good quality 50Ω BNC socket that provided a low-loss connection for any external antenna system. The final connection point was a coaxial power socket on the side panel. This served the dual role of supplying external power for base station or mobile operation plus a charging point for the internal NiCad batteries. The change-over between the two functions was fully automatic with the charging role being activated whenever the MVT-7200 is switched off. I was surprised to find that NiCads were supplied as standard - they're usually an optional extra. The four NiCads were conventional AA size and fitted in a battery compartment at the rear of the MVT-7200.

Getting Around

When first switched-on, the MVT-7200 is set to manual tuning mode. In this state the tuned frequency can be set by the rotary tuning knob, up/down buttons or by direct entry. This latter method is by far the best way to move smartly to the required frequency and is supported by some sensible input logic. You



don't have to enter the complete frequency with trailing zeros, so to get to the 14MHz amateur band, all you do is type 14. followed by Enter and the MVT-7200 switches to that frequency.

A particularly helpful feature was the provision of an entry cancel key. With this you could correct any mistakes you may have made, without having to completely re-type the whole frequency. At first, the process felt rather long winded but, once committed to memory, it was useful for correcting detailed spot frequency entries.

The rotary control and up/down buttons operated in parallel and changed frequency using steps that could be selected by the operator. The MVT-7200 features fifteen pre-set steps, most of which are available for all receive modes. Of particular importance was the choice of 50 or 100Hz steps for s.s.b. reception. For many years it has been common practice to only offer 100Hz steps on everything other than a full blown communications receiver. Whilst 100Hz steps

are just about OK for s.s.b. reception the use of 50Hz gives a significant improvement in audio quality. The smaller frequency step is also very important for anyone thinking of using the MVT-7200 for occasional utility reception. The new fine steps should just about make it possible to receive 170Hz shift signals, as a 50Hz step enables tuning to within 25Hz of the required signal.

During the review I noticed that using the rotary tuning control with the steps set at anything other than 50 or 100Hz caused the receiver to silence momentarily during each change. This happens on many receivers and makes it very difficult to tune around with this control. I suspect the effect is caused by the automatic muting used whenever the phase locked loop loses synchronisation. However, I noticed that, if you tuned using the up and down buttons, there was no silencing between steps. The trick, therefore, is to use these buttons when tuning around with larger frequency steps. The new 125kHz steps for broadcast f.m. are not very relevant for UK listeners as local frequencies are allocated in 100kHz increments - I suspect the change is primarily to bring the MVT-7200 in-line with the channel spacing used in other parts of the world.

Versatility

The wide range of receive modes provided on the MVT-7200 makes it very flexible and potentially able to handle a wide range of signals. From a look at the specification, you could expect the MVT-7200 to replace your medium wave, h.f. and scanning receivers in one go! However, before you get carried away, you need to appreciate the limits as well as the benefits of such a receiver. Despite its very wide frequency coverage, like many other receivers in its class, it is primarily a v.h.f./u.h.f. scanning receiver. This is certainly what it does best, with the other functions taking second place. Having said that, it's pleasing to see that Yupiteru are making significant steps to improve the other areas of the receiver's performance. A classic example of this is the excellent

Specification

Frequency Range:	530kHz to 1650MHz
Receive Mode:	w.b.f.m., n.b.f.m., a.m., n.a.m., l.s.b., u.s.b.
Step Frequency:	50, 100Hz, 1, 5, 6.25, 9, 10, 12.5, 20, 25, 100 & 125kHz
Sensitivity:	f.m. = 12dB SINAD, a.m. = 10dB S:N 0.5 3-2.0MHz 2.5µV a.m. 2.0-30MHz 1.5µV a.m., 1.0µV s.s.b., 1.5µV n.b.f.m. 30-1000MHz 0.5µV a.m., s.s.b. & n.b.f.m., 0.75µV w.b.f.m. 1000-1300MHz 1.0µV n.b.f.m.
Memories:	1000 channels, 500 search pass, 10 band memories, 1 priority
Scan/Search Speed:	30 channels/steps per second
Antenna:	50Ω BNC
Power Supply:	4 x AA size NiCad (4.8V) 12V d.c. external power source AC Adaptor 12V 200mA
Speaker Output:	100mW or more (4.8V 8Ω)
Current Consumption:	140mA at rated output 100mA standby 10mA during Save
Operating Temperature:	0-50°C

improvements to the s.s.b. performance. The use of 50Hz tuning steps combined with some fairly tight i.f. filtering result in a creditable performance with most s.s.b. signals.

Although there was no circuit diagram supplied, the quality of the recovered audio leads me to suspect the MVT-7200 uses a product detector. The reception of broadcast signals was remarkably good right across from medium wave through short wave to v.h.f. The wide frequency coverage of the MVT-7200 meant that you could also receive TV sound - this can be useful for commentary at sports events. The new ferrite bar antenna worked well for general purpose reception of local/national stations. On v.h.f. broadcast, I thought the audio quality was particularly good, especially considering the very small internal speaker.

As I have a personal interest in utility listening with readers often asking if receivers such as the MVT-7200 are suitable for this type of listening, this is an ideal opportunity to put it through its paces. One of the first obstacles is interference from the computer used to decode the utility signal! This makes it impractical to rely on the MVT-7200's helical antenna. The solution is to use an external h.f. antenna connected via the BNC socket. At this point you need to appreciate one of the weaknesses of this type of wide range receiver. The extensive frequency range

inevitably means that the receiver's front-end circuitry is wide open, with only limited filtering. The end result is a receiver that can be very easily overloaded by the strong signals often presented by an efficient external h.f. antenna. There are a number of ways around this, the most common being to insert some attenuation in the antenna lead.

The MVT-7200 has a built-in 10-15dB attenuator that's controlled from a button on the front panel. Unfortunately, you often need rather more than 10dB to achieve a noticeable improvement. The easiest way to achieve this is with one of the in-line attenuators that are available from most good radio suppliers. An alternative, if you really want to get serious, is to use a pre-selector to filter-out the strong out-of-band signals. With the antenna and overload problems sorted, I tried the MVT-7200 with RTTY and SITOR signals using HAMCOMM software running on a PC. As expected, the 50Hz tuning steps were a great help to accurate tuning and I was able to receive clean copy from most of the stronger press and weather stations such as Tanjug and Bracknell Met.

Although the receiver had the sensitivity to receive the more difficult and weaker signals, the attenuation required to control the overload often made the wanted signals too weak. This is fairly typical of the h.f. performance of most wide band receivers. The exceptions generally demand

price tags that start around the £1000 mark! I also tried FAX reception using JVFAX software again running on a PC. Here the main limiting factor is the frequency stability of the receiver as it's required to remain within a few tens of hertz for at least 15 minutes at a time. If there is any significant drift the black/white balance of the chart or image will be adversely effected. The MVT-7200 did extremely well in this test and, by using the autotune facility of JVFAX, the receiver could be left monitoring a good strong signal for several hours. This is credit to both its long and short term stability. The overall quality of the FAX image was limited primarily by the noise from the front-end. Moving on to the v.h.f. and u.h.f. utilities the main interest is on paging and the aeronautical ACARS systems.

The MVT-7200 will be fine for ACARS, but the successful reception of most paging systems demands modification to the receiver to boost the low frequency audio performance. When it comes handling voice communications the MVT-7200 is on home ground and performs very well. For h.f. s.s.b. operation there were the same limitations as for utility work in terms of overload susceptibility, but the audio quality was very clear and punchy. One of the most popular listening areas on v.h.f. is always the air band and for this you need a receiver with

CONTINUED ON PAGE 17

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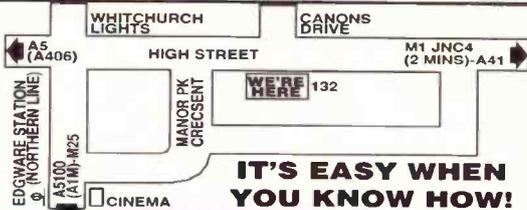
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R1155

External Power Pack & Output Stage

Although it is possible to build-in a power supply, it is far easier and makes more sense to construct a simple external unit, adding an audio amplifier at the same time. G.F. Clarke offers this design.

Following the series of articles by Chas Miller in the December 1993 to February 1994 issues of *Short Wave Magazine*, there may be those who have checked through the R1155 and now wish to power up the receiver. Whilst it is possible to make major modifications to construct an on-board power supply, an external unit, complete with output stage, is easily built.

The first step is to identify the power plug located at the bottom right corner of the front panel. This is marked 'from the transmitter'. The identifying numbers can be seen from the back of the socket and are shown in Fig. 1.

When used in an aircraft, the 1155 could be operated from any one of three different antennas, the switches selecting the appropriate antenna for the operational requirement. A short fixed antenna was used for ranges 1 and 2 and a long trailing wire, which was let out when the

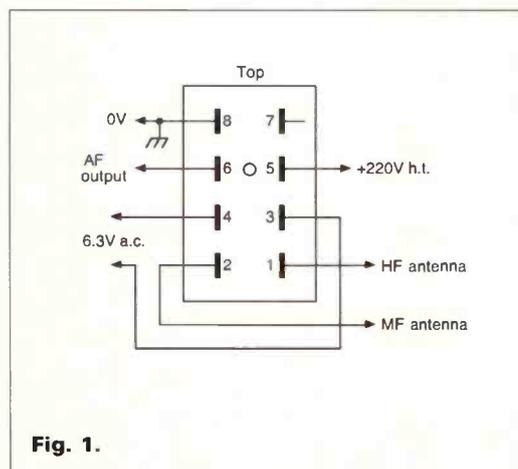
aircraft was airborne, for ranges, 3, 4 and 5. For fixed station reception, pins 1 and 2 should be joined together and taken to the antenna.

In aircraft use, the 1155 obtained its supplies from a motor generator running off the aircraft accumulators, but for fixed station, use a mains supply is more useful. The power requirements are 6.3V at 4A and 230V at 70mA. A saving of nearly 2A in the heater supply can be made if the d.f. valves are removed.

A circuit of a power unit and output stage suitable for the 1155 is shown in Fig. 2 and the valve bases shown in Fig. 3. If headphone reception only is required, then C2 should be increased to 16µF and the components from this point are omitted. The headphones are connected between pins 6 and 4. The unit allows the use of both headphones and a speaker as required.

Certain precautions have to be taken in the construction of the supply unit. In the 1155, the

h.t. negative is not taken directly to the chassis but has a bias resistor of 2kΩ between h.t. negative and chassis. Therefore, if a metal chassis is used for the power supply and the h.t. negative taken to the



You Will Need

Capacitors

High Voltage Disc Ceramic 500V
10nF 1 C4

Electrolytic 450V

8µF 2 C1, 2
16µF 1 C3

Electrolytic 25V

25µF 1 C5

Resistors

Metal Film, 0.6W, 1%

5.1kΩ 1 R3
27kΩ 1 R4

Metal Film, 2W, 1%

410Ω 1 R2

Note: R2 can be made up of two 820Ω 1W resistors in parallel.

Potentiometers

Rotary, linear

22kΩ 1 R1

Valves

5Z4 V1

6F6 V2

Miscellaneous

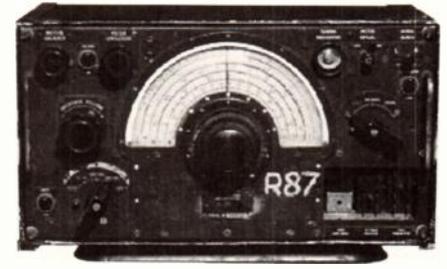
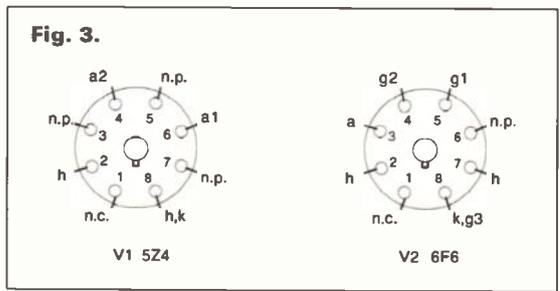
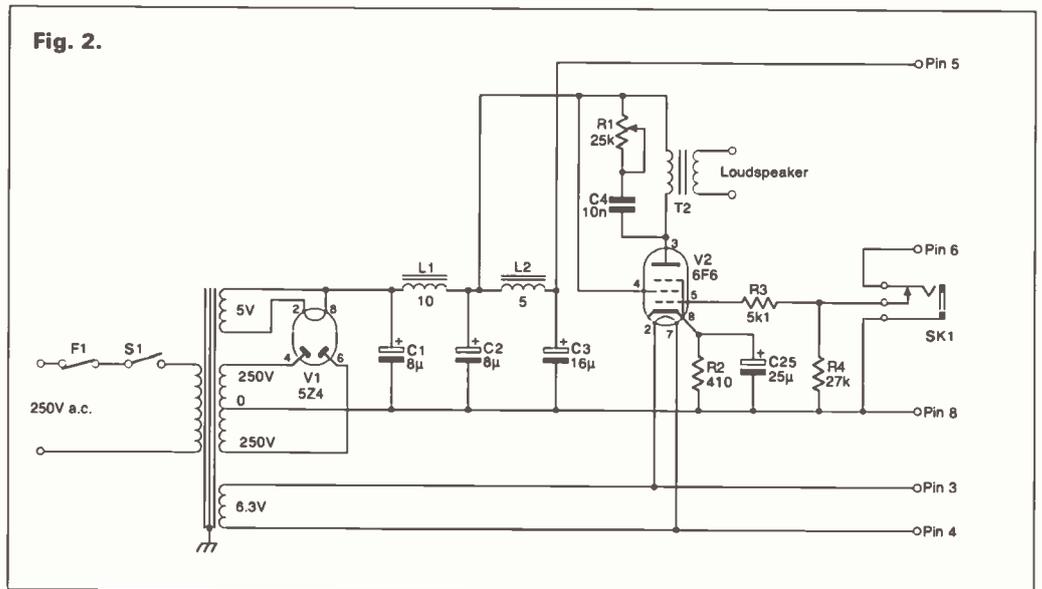
Mains transformer 250-0-250V @ 100mA, 6.3V @ 4A, 5V @ 2A (T1); Choke 10H, 100mA (L1); Choke 5H, 50mA (L2); Output transformer 50:1 (T2) see text; International Octal valve base (2); Jack socket.

Maplin Electronics, PO Box 3, Rayleigh, Essex SS6 8LR. Tel: (01702) 554161 can supply most of the components. **Colomor (Electronics) Ltd., 170 Goldhawk Road, London W12 8HJ. Tel: 0181-743 0899** can supply the valves.

A telephone call to **J. Birket, 25 The Strait, Lincoln LN2 1JF. Tel: (01522) 520767** will bring help with chokes L1 and L2 and the mains transformer.

chassis, the 1155 bias resistor will be shorted if the two chassis touch. The smoothing capacitors should be of the type where the case is not connected to the negative. The amplifier components should, of course, be connected to this h.t. negative line.

Pin 6 on the power plug on the 1155 chassis is taken to the secondary of the headphone transformer, which can be found on the back of the front panel between the wavechange switch spindle and the b.f.o. switch. The reference number of this transformer, which has a ratio of approximately 1:1, is 10K 12139. Whilst this is not the ideal way of connecting an output stage, the obvious advantage is that no modifications to the 1155 are required. Resistor R4 is included to prevent the grid of the output stage floating when headphones are plugged into SK1. Potentiometer R1 and capacitor C4 form a basic tone control circuit.



MVT-7200 Review

CONTINUED FROM PAGE 13

good a.m. performance. In this application I found the MVT-7200's narrow a.m. filter to be rather too narrow and the best results were obtained using the standard a.m. setting.

Searching

The MVT-7200 featured a comprehensive range of searching and scanning facilities to help you find and store interesting frequencies. The main tool for finding new stations is the Search Mode that was well implemented on the MVT-7200. You could either search from the current frequency or use up to ten stored search bands. These stored search bands came pre-programmed with standard favourites such as the air and marine bands. However, if you have a specialist interest area, you can amend the stored search bands to whatever you like.

I found the simple searching from the current frequency to be particularly

quick and easy to use. All you had to do was hit the search button to start the process. If necessary, you can instantly reverse the search direction by pressing the up or down arrows. When checking-out v.h.f. and u.h.f. bands, I quickly realised the search facility was the quickest way to tune around. I suppose the only other search facility that I would have liked to have seen would be an automatic storage of active frequencies into a scratchpad memory bank.

Scanning

With a thousand memories available for storage the main problem is likely to be finding the one you want. The MVT-7200 tackles the problem by grouping the memories into ten banks of 100 memories each. You can then use these banks to hold similar categories of transmission, so reducing the search problem by a factor of ten. Once you have collected all those hot

frequencies, you can then call on the MVT-7200's scanning modes to check for activity.

The MVT-7200 features a total of four scanning modes which are scan, bank scan, program scan and mode scan. Each of these scanning modes runs at a very healthy 30 memories per second. Whilst the simple scan works its way through all 1000 channels, the bank scan can be set to scan through up to four banks of memories. Perhaps the most versatile of the scans is the program scan where you can literally individually select up to 100 memories for inclusion in the scan. These memories can be from any of the MVT-7200's 1000 memories. Finally, there is the mode scan that will work its way through all the memories that have the selected mode stored. So, if you wanted to check out all the v.h.f./u.h.f. broadcast memories you would just have to select a mode scan based on w.b.f.m.

Summary

The MVT-7200 certainly proved itself to be a worthy successor to the earlier '7100 model. All the changes were for the better and I was particularly pleased with the results on s.s.b. My experiments with utilities showed that it could be used successfully at least with the stronger signals. The only weakness was the new narrow a.m. mode. I thought it was just a touch too narrow - another 500Hz or so would probably make all the difference. Despite this I'm sure the MVT-7200 will justifiably enjoy as much success as its predecessor.

The MVT-7200 costs £449 and is available from **Waters & Stanton Electronics 22 Main Road, Hockley, Essex SS5 4QS**. My thanks to Waters & Stanton for the loan of the review model.

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Active wideband antenna

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A high performance wide band antenna offering gain over a conventional discone.

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The EFW is a complete 20mtr long short wave receive end fed wire ant. Balun fed, uses high quality "Flex Weave" copper wire. 1 - 30 MHz...£59.95

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Matches end fed long wires to 50 ohm coaxial cable, helps on receive to reduce noise and interference & allows transmit up to 100Watts. Fully moulded for full weather protection...£39.95

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AR8000 + Opto Scout



Let the Scout tune your AR 8000 to the captured frequency instantly! The Scout will capture & memorise up to 400 frequencies.

Special Offer

AR8000 + Modification + Scout
RRP £923.....Our Price £795

AR 8000



- 500 kHz - 1900 MHz
- Computer control
- Data clone
- 1000 memories
- c/w Nicads & charger

Price £449 ~~£389~~

AR 2700



- 500 kHz - 1300 MHz
- Voice recording option
- Computer control
- Data clone
- c/w Nicads & charger

Price £299 ~~£269~~

MVT 7200



Limited Edition

See our colour advert on the inside front cover

Price £449

MVT 7100



This is still the Number 1 handheld scanning receiver.

- 530 kHz - 1650 MHz
- AM/FM/WFM/SSB/CW
- 1000 memories
- c/w Nicads & charger

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The best slimline Base/Mobile scanner on the market.

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- 200 memories
- Supplied with 240V mains power supply.

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Unidens best model hand

- 66 - 956 MHz with
- 200 memories
- Easy to use
- c/w Nicads & charger

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- 66 - 512 MHz with
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- 10 memories
- c/w Nicads & charger

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Boost reception of your Base/Handheld scanner with this state of the art pre-amplifier.

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From Timewave USA

Hear weak signals, reduce noise, eliminate heterodynes & interference with these new Digital Audio filters from Timewave.



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Accessories

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A fully adjustable desktop stand for use with all handhelds, fitted BNC and aerial filter lead.



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Complete ready to go with BNC.....£49

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SWL ATU with Q Selector to prevent interference. (100 kHz - 30 MHz)

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Active antenna and pre selector (300 kHz - 30 MHz)

Ideal indoor antenna/tuner.....£79.95



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Fibreglass 1.1 mtrs long.....£3

Scanmaster Discane.....25 - 1300

Stainless steel high quality.....£4

Scanmaster Mobile.....100 - 1000

Complete magnetic mount w/BNC.....£2

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Scanmaster Airband Base. 108-136

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- 12dB gain
- 20 elements
- 1.4 mtr boom

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browser at:-

http://www.ee.port.ac.uk/~arrow_1

E Mail us at:-

info@nevada.co.uk



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- 100 kHz - 2036 MHz
 - Features include computer control
- Special offer £999 **£899**

Lowe HF 250



- Lowe's latest model
- New super receiver now in stock!
 - 30 kHz - 30 MHz
- Price **£799**

SDU 5000



- Spectrum display unit
For use with AR3000A, Icom R7100 & Icom R7000.
- Price **£799**

Sangean ATS 818



- Excellent new Short wave RX with SSB
- 150 kHz - 30 MHz plus VHF
 - Supplied c/w Mains adaptor
- Price **£159.95** + £4.75 p&p

Opto 3300



- 1 MHz - 2.8 GHz
- 10 digit LCD disp.
- Supplied c/w ant, Nicads & charger

Price **£139.95**

Sangean ATS 803A



- Our most popular Short wave portable with SSB reception.
- 150 kHz - 30 MHz plus LW/MW
- Price **£119.95**

Full after sales service

Kenwood R5000



- 100 kHz - 30 MHz + optional VHF
 - Competition class receiver
 - All mode with optional filters
- Price **£995**

Drake SW8



- 500kHz - 30MHz + 87-108, 118-137 MHz
 - AM/FM/SSB
 - 240V AC adaptor included
- Price **£599**

Yaesu FRG 100



- Special Deal FRG 100 plus:-
Free Short wave antenna worth £59.95
Free 240V AC mains adaptor worth £12.95
- Price **£549.95**

Drake R8A



- New World class receiver
- 100 kHz - 30 MHz wide coverage
 - AM, LSB, USB, CW, RTTY & FM
- Price **£1295**

ERA Microreader



- Decodes RTTY/AMTOR/CW/SITOR/FEC
 - Includes CW tutor mode
 - Complete stand alone unit
- Price £199 **£189**

UK Scanning Dir



- Our most popular selling book, it lists everything!
- Over 325 pages
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 - Includes location listing
 - A must for enthusiasts.

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Receive the very latest news & weather Fax's from around the globe. PC based package with on screen help & manuals **£139.95**

Skycall Callbook

Complete UK Amateur call book on disk including BBS Callsign with full Sysop details and QRA. Runs within Windows. **£19.95**

Skyview ICRX

Control your Icom via your PC with this software package. Requires minimum 286 + Colour monitor **£44.95**

OPTO Scan 456

Computer controlled Interface for Realistic Pro 2005/6 series scanner **£249.95**

OPTO Scan 535

Computer controlled interface for Realistic Pro 2035 **£249.95**

CX12AR

Computer controlled interface for Aor & Icom radios & Opto. ie Scout/M1 **£79.95**

OPTO Interceptors

These clever units instantly lock on to any close strong signal, allowing instant monitoring. Ideal for use anywhere two way communicators are in use!

R10 - FM

- Receives FM from 30 - 2000 MHz in less than 1 second!
 - Deviation check facility
 - Fully automatic
 - Earphone supplied
 - Signal strength bargraph display
 - c/w antenno, NiCads & Charger
- Price £369.95 **£299.95**



R20 - AM

- Interceptor/Bug detector
- 500 kHz - 3000 MHz
- AM monitoring w/earphone
- FM detection
- Field strength indicator
- 9V battery operation..... **£129.95**



DC440 Decoder

A new decoder that displays DTMF, CTCSS + DCS tone frequencies. Computer port for logging/control **£269.95**

Quality Used Equipment

Scanning Receivers

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AOR AR3000Super W/Band.....£695
Bearcat 580XLTMobile/base.....£120
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Realistic Pro-32Handie.....£110
Realistic Pro 39Average Cond.....£150
Realistic Pro-50Clean.....£75
Trident TR-2400£275
Yupiteru MVT3100H/held.....£185
Yupiteru MVT7100£265
Yupiteru VT-225Boxed.....£195

Shortwave Receivers

- Drake R8EBoxed.....£725
Drake SW8Portable RX.....£549
Kenwood R1000£325
Kenwood R2000Gen.Cov.....£375
Sangean ATS 803Portable RX.....£95
Sony SW1SPocket Receiver.....£130
Steplestone MBR7£45
Yaesu FRA7700Active antenna.....£45
Yaesu FRG7700Gen Cov+VHF.....£450

SHOWROOMS:- 1A MUNSTER ROAD, PORTSMOUTH PO2 9BS

MAIL ORDER:- 189 LONDON ROAD, PORTSMOUTH PO2 9AE

Radio Austria International

In the first part of our series profiling the world's short wave broadcast stations, Philip Mitchell takes a look into the goings on at RAI.

It is true to say that Austria counts as one of the pioneer countries in international broadcasting communication. As early as 1929, experimental broadcasts were being transmitted, but it was not until 1955 that an international short wave service was planned and four years later, 1959, that transmissions commenced from Moosbrunn in Lower Austria, 25km south west of Vienna.

Thus Radio Austria International (RAI) came into being from its parent State broadcasting organisation, Osterreichischer Rundfunk (ORF) and today reaches most parts of the world by short wave, satellite and cable. Funding for RAI is from public funds and the estimated

budget for 1995 is approximately 157 million schillings (approximately £10m), a modest figure compared with similar international radio stations and not in any way at the expense of a reduction in quality of its broadcasting output.

RAI's present director is Prof. Paul Lendvai and Dr. Edgar Sterbenz is its present head of programmes.

Well Balanced

So, to the commencement of today's operations at the time of 0730UTC and with an opening jingle of a rather jazzy version of Johann Strauss's *Blue Danube Waltz*. Radio Austria International commences its daily 30 minute European English broadcast with a news magazine *Report From Austria*, forming part of a daily output of 80 hours of transmissions in seven languages from RAI.

This well balanced and informative report, by a rotation of presenters, David Ward (Head of English Section), Patricia Maadi, Ann Dubski, Karen Engel, Joanna King, Murray Hall, Elizabeth



The Broadcasting Studio at Radio Austria International, Vienna, part of Osterreichischer Rundfunk (Austrian Radio) ORF.

Mortimer and Leigh Bailey, starts with a summary of World News with location interviews as and when necessary. The interviews are straightforward and objective, do not appear to be abrasive or politically biased (unlike some criticisms levelled at our own homespun BBC these days) and as with news reporting, the RAI point out in their schedule, their editorial is guaranteed by law.

After the *World News* round-up and occasionally a brief weather forecast for Austria, Austria's national news follows and it is always interesting to note that as in the UK, Austria has its fair share of scandals in high places too! But this, like the *World news*, is also a well balanced and factual presentation. A topical feature of the day concludes its 30 minute programme and on Saturday at 1330UTC for example this will include a musical programme.

No need, of course, to mention that the works of the Strauss family is often heard at this time as

music and the arts have a fairly high profile in current schedules, not surprising since most of the World's greatest composers and musicians have at one time lived in or resided in Vienna and other parts of Austria. From amongst a total of some 20 000 items of mail received in a year, selected listeners letters, including those from the more serious DXers, provide amongst various topics mentioned, a clue to Worldwide reception conditions of RAI's transmissions.

Serious Note

It is nice to know that broadcasters do take serious note of adjacent channel interference and related problems and endeavour to minimise this with positive action taken from time to time. As an example, listeners to RAI broadcasts in SE Asia (13.730MHz) were complaining of heavy interference from All India Radio (13.732MHz). A firm request to the latter station was made by RAI's frequency planning department to cease using this particular frequency and confirmation is awaited that this request is met.

In this respect, it should be mentioned that a High Frequency Co-ordination Committee of 35 participants meets twice yearly (in February for summer schedules and in August for winter schedules) to agree on frequency



The English Section personnel of Radio Austria International. (L to R) Joanna King, Ann Dubsky, Merlin Koene, Patricia Maadi, Karen Engel and David Ward, head of English Section.

policy. However, it is pointed out that this system will only work if all the participants respect the resultant agreement.

Listening in on today's crowded wavebands, one is sometimes inclined to wonder if co-ordination and agreement ever exists at all! On the organisational side, output from ORF Vienna headquarters is distributed from six production studios and thence to RAI centre at Moosbrunn.

Transmission from there, on more than ten frequencies, is via two 330/500kW and two 100kW transmitters. Erected in the mid-eighties, a high gain, turntable curtain antenna completes the transmitter site facilities.

Ongoing Improvements

With regular listeners much in mind, ongoing technical improvements and innovations are planned by RAI in programme production and distribution. New digital systems will be installed to improve existing equipment and by developing existing satellite technology, better sound quality and an expanded reception area can be expected.

Currently in Europe and North America, an estimated 45 million households with satellite or cable access could receive *Report from Austria*. A well presented programme schedule is available free of charge from : Radio Austria International, Wurzburggasse 30, A1136 Vienna, Austria. Tel: +431 87878 3636 (Listeners' Service) 2130 (Management). FAX: +431 87878 4404 (Listeners' Service) 2792 (Management). E-mail: info@rai.ping.at



ORF

RADIO ÖSTERREICH INTERNATIONAL
A-1136 Wien Wurzburggasse 30. Tel: +431/87878 3636 Fax: +431/87878 4404

DVR: 0066915 ROI

QSL-Verification

We confirm your reception
REPORT:

Date: 27.03.1995
 Time: 0730 - 0800 UTC
 Frequency: 6155 kHz

Vienna, 01.04.1995
bo

Dear Listener!

We appreciate your letter and your interest in our programmes.

Please feel free to comment or criticize or provide suggestions about our programming. These informations are very helpful in making sure we meet listeners needs and interests.

We hope to hear from you again soon and remain

Yours sincerely,

RADIO AUSTRIA INTERNATIONAL
Listeners' Service



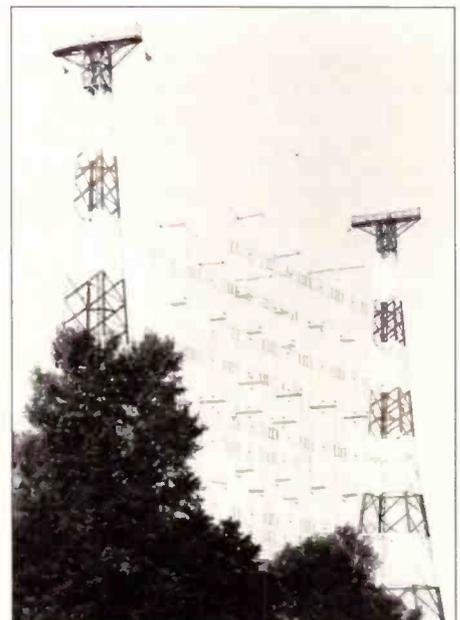
QSL-verification from ORF.

Acknowledgement with thanks to David Ward, Head of English Section, RAI, for help in compiling this article.



Radio Austria International Schedule cover.

High-gain, turntable curtain antenna array, Moosbrunn transmitter site for Radio Austria International, Vienna, Austria.



English Transmissions (half hour duration)

Target Area	UTC	Frequencies (MHz)
Europe	0730	0930* 1330
	1030	6.155 13.730 6.155 5.945
North America	0130	9.655
	0530	6.015
	1130	13.730
Australasia	0930*	1030 17.870

* except Sundays

Satellite & Selected Cable Networks

Europe	0430	via Astra 1B (World Radio Network) Channel 22 VH1 11.538GHz. Audio 7.38MHz
North America	2230	via Galaxy 5, 125°W Channel 6 WTBS 3.820MHz vertical. Audio 6.8MHz on World Radio Network (also via Telstar 33 satellite and national US cable radio C-span network via Satcom C3).

Transmissions also available on Internet Talk Radio at URL <http://town.hall.org./radio/wm.html>



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Prices correct at time of going to press E&OE
e-mail: info@aor.co.uk

IMPORTANT ANNOUNCEMENT

NEW MANUFACTURING COMPANY ★ NEW LOCATION ★ TWO NEW MODELS

NEW COMPANY: A new manufacturing division has been set up "AOR MANUFACTURING LTD" and will be producing the new UK designed & built AR7030 short wave receiver.

NEW LOCATION: We have relocated to Belper (from Wirksworth) so that everything can be under one roof... AOR (UK) LTD, AOR Manufacturing Ltd and the retail division "World Radio Centre". All will be re-sited and operational from the new address, same people but different location, phone and fax numbers. If you are planning to call we suggest that you phone before hand for directions etc. The next advert will carry a map.

NEW RECEIVERS: Those who visited the Leicester show on 20 / 21 October will have seen two new AOR models on display, if you would like to phone or send a SAE, we will be happy to forward preliminary leaflets. Both models should arrive with dealers before the end of 1995, just in time for Christmas. Prices £ T.B.A.

New

AOR AR5000 - "The new horizon"

All new wide band all mode base receiver 10kHz - 2600 MHz

AOR have been synonymous with pioneering design of high quality wide band receivers for many years building on the strength of the AR2001, AR2002, AR3000 and AR3000A. The tradition continues and we are proud to announce the arrival the very latest receiver... the AR5000. The new receiver is not based upon any specific earlier model but draws on the best points and combines this experience with the latest circuit design. The result of this clever RF design is a **very sensitive** receiver with **excellent strong signal handling** capabilities over a very wide receive range. The AR5000 is housed in a newly designed **solid metal cabinet** and provides a very wide receive frequency coverage from **10kHz to 2600MHz, all mode reception** FM, AM, USB, LSB & CW and MANY microprocessor facilities aimed toward professional monitoring and the dedicated listener.

Receive circuit details: The AR5000 features a **NCO (Numeric Controlled Oscillator)** providing **tuning rates right down to 1Hz**. A **TCXO** is fitted as standard and used in conjunction with the WWV signal reference to ensure a very high degree of stability. The receive circuitry is based around a triple superheterodyne with I.F.s' of 622MHz, 10.7MHz & 455kHz. Multiple switchable I.F. bandwidths are available in both the 10.7MHz and 455kHz I.F. stages: 3kHz, 6kHz, 15kHz, 40kHz, 110kHz & 220kHz with provision for a 500Hz option. This great advancement in wide band front end design has been made partly due to the introduction of **automatic electronic preselection** between 500kHz - 999.999999MHz with low pass, band pass and high pass filters covering other bands. This is a real achievement for a receiver with such a wide frequency coverage and scan / search speeds of up to 50 channels per second.

Microprocessor control: To compliment such receive excellence, the microprocessor facilities are right up to date and full featured. There are a total of **1000 memory channels** provided in 10 banks of 100 channels with a large EEPROM memory store. **10 search banks** are provided with a total of **1100 PASS frequencies**. Scanning and search speed is a very respectable maximum of **50 channels or increments per second**. Auto-memory may be switched On/Off and a special Frequency Offset facility has been provided to simplify DUPLEX frequency monitoring.

A large rear illuminated segmented liquid crystal display provides a wide range of operating detail including frequency, mode, AGC, etc but also displays up to **7 alpha-numeric text characters** so that comments may be entered to accompany memory channels & search banks to aid easy identification and retrieval of data. An **analogue S-meter** provides easy to see relative signal strengths. A wide variety of search and scan types are available including memory scan, select scan (your temporary favourite frequency notepad!), mode scan, bank scan, search bank link etc. The squelch too may be configured for noise, signal level, audio level, CTCSS. A **DTMF decoder** is provided to display DTMF characters in use and **CTCSS search** to display the CTCSS frequency in use. **Audio low pass and high pass filters** may be configured and are switchable around the following frequencies: LPF 3kHz, 4kHz, 6kHz & 12kHz, HPF 0.05kHz, 0.2kHz, 0.3kHz & 0.4kHz. De-emphasis is also selectable: THRU, 25uS, 50uS, 75uS & 750uS.

TIP OF THE MONTH *Setting the time on the AR3000 (not AR3000A)*

When setting the time on the AR3000 a potential exists for the microprocessor to CRASH. This is a nuisance, you may loose the memory contents and have to internally reset the microprocessor using the RESET switch on the reverse of the keypad. To ensure this does not happen, simply press the [DIAL] key after completing the time input terminating in [ENT]. The problem arises when you attempt to change mode before pressing [DIAL]. This is simple but effective and may save hours of reprogramming!

 01773 880788

New

AOR AR7030 - "Superior by design" New high dynamic range short wave receiver 0 - 32 MHz

For many years short wave receiver manufacturers throughout the world have pressed forward the frontiers of performance and design bringing a handful of notable advancements and setting new industry benchmarks for receiver specification. With the introduction of the all new AOR AR7030 short wave receiver, a new measure of performance, indeed a new benchmark is offered to the discerning and dedicated listener.

The new AR7030 is the result of a combined project between AOR and internationally acclaimed UK designer **John Thorpe**. The AR7030 represents the very latest and best ever "JT" design concentrating on exceptional strong signal handling and bristling with enhanced features and facilities. The AR7030 is being manufactured by AOR MANUFACTURING LTD based at the new Belper locale in Derbyshire UK.

Technical excellence – top of the class: No matter how many new features and facilities are offered, ultimately a receiver will be judged on how well it receives! It is for this reason that we can feel so confident of the receiver's success and notability.

In Europe, especially at night strong signal handling is of prime concern and this is where the AR7030 stands ahead of the field offering an **IP3 greater than +35dBm** (preamp off - around +25dBm preamp on), dynamic range greater than 100dB in AM mode with a 7 kHz filter and greater than 105dB in SSB modes with a 2.2 kHz filter. This fantastic strong signal handling is aided by the innovative configuration of a lateral DMOS FET QUAD first mixer running at 15V, relay switching in the front end (not diodes) and the use of shielded inductors throughout the signal path. All this and GREAT SENSITIVITY better than 0.5uV for 10dB S/N in AM mode and better than 0.3uV for 10dB S/N in SSB. Selectivity too is razor sharp offering greater than 90dB @ 10kHz SSB and greater than 100dB @ 20kHz. No other receiver "in the class" nor indeed at considerably higher price can match the sheer performance excellence of the AR7030.

High Tech: The receiver is built around a TCXO frequency standard which provides the reference for all circuitry ensuring the ultimate in stability and optimum alignment. Single loop DDS provides the clean local oscillator reference essential for low reciprocal mixing levels and seamless tuning in approximately 2.7Hz steps (no tuning "plops" at regular intervals). The receiver is double conversion superheterodyne with intermediate frequencies of 45MHz and 455kHz.

The I.F. filters are self-aligned by the receiver using advanced microprocessor control ensuring "spot on" alignment and symmetry of passband characteristics essential for serious ECSS listening. The main PCB will accept a number of different filters including Murata and Collins, all will be self-aligned! The on-screen displayed filter bandwidth is not hard written into the microprocessor code but is actually "measured" by the receiver under microprocessor control permitting various displays such as 2.2kHz, 2.3kHz, 2.4kHz, 2.5kHz etc depending upon the particular filter fitted. In fact the remote facilities are so powerful that standard dealer service kit will contain a PC disk for alignment, testing and diagnosis.

Virtually every aspect of the AR7030 will be controllable with the standard REMOTE port, even the twin line outputs may be configured as hi/low etc. The tape recorder slave relay may be configured to operate from the built-in clock timer or from the squelch control. Mute input is also available in order to mute the AR7030 for use with transmitters.

All modes are fitted as standard: USB, LSB, CW, AM, Synchronous AM, NFM, DATA. The receive coverage is 0 - 32 MHz, the AR7030 has NOT been disabled below 150 or 30 kHz. The standard fitted I.F. filters include: 2.2kHz, 4.5kHz, 7kHz & 10kHz with two optional positions available for CW or other filters. Enhanced features include pass band tuning ± 5 kHz, variable audio pitch tune on CW & data modes and a new "variable bandwidth synchronous detector" for AM listening to eliminate the effects of transmitter / receiver drift as well as reducing distortion with selective fading. The pass band tuning may be used in synchronous AM mode to select synchronous USB, LSB, DSB or anything in between. A specially developed AGC release characteristic has been developed to ensure SSB quality never before heard.

Infra-red & microprocessor control: A 48 character DOT MATRIX alphanumeric rear illuminated display enables a huge amount of detail to be displayed. Microprocessor facilities include on screen 70 segment S-meter, twin VFOs, frequency readout to 10Hz, 100 memories which hold frequency, mode, filter, passband shift or squelch status, memory scan facility, clock & timer, filter information, memory review, menus etc. An assignable control enables you to place the functions YOU want at your fingertips, these include a press button and a spin-wheel. A full featured 32 button infra-red remote control is provided as standard and provides access to virtually all the facilities (except aerial switching) including: Tuning, volume, tone, numeric keypad, memory functions, pass band shift, filter selection.

Stylish strong cabinet: The AR7030 features a custom CNC machined solid aluminium front panel with extruded aluminium shaped sides, metal top, bottom & rear panels. The front panel finish is brushed & anodised with the sides and other surfaces toned in a matching textured paint. Smooth curved lines, detailed front panel, custom domed top mounted speaker grille and ergonomically placed controls spell out the attention to detail of the robust, solid cabinet.





ANNOUNCING THE NEW LOWE HF-250



The Lowe HF-250 is set to become the new world standard for mid-priced receivers. Building on from the world-wide success of our HF-225 and HF-150 models, the new HF-250 combines Lowe's traditional high standards of performance and quality of construction together with the advanced facilities and control features required by today's discerning listener.

Deposit: £103. 12 x £58.00

Features

- Frequency range from 30kHz to 30MHz
- Tuning step size 8Hz
- Back-lit display
- Display resolution now 100Hz
- 255 memory channels
- Memory channels also store frequency, mode, filter selection and attenuator setting
- Computer control is standard via built-in RS232 port
- RS232 reads to and from the radio for upload/down load of memory data
- Clock with two independent timers

- Fixed level output for decoding and tape recording
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International Short Wave Broadcasting - Monologue or Dialogue?

Well-known short wave broadcaster Ian McFarland, reckons that broadcasting is a two-way activity, needing input from the listener as well as output from the broadcaster.

It's probably safe to assume that for most short wave listeners their activity is a simple matter: the broadcaster talks, and the listener listens. Well, speaking as one who has done a lot of talking, and much listening to a lot of listeners over the past few decades, I can say, without any doubt at all that I look upon this broadcasting business as a two way activity. What turns this exercise from a monologue into a dialogue is a very important element called listener feedback. This is one of the main reasons why so many stations include a mailbag programme in their schedule. Quite simply it enhances the possibility of turning the broadcaster's monologue into a dialogue with listeners, and gives the station a chance to publicly answer any criticisms, constructive or otherwise, which listeners send in.

It's fairly easy to tell which stations are serious about inviting criticism from listeners just by tuning in to their mailbag programmes. I guess we've all heard the kind of letterbox programme that reads out only glowing comments from listeners, and answers only those questions that show the country in a good light. Thankfully, with all the political changes which have



taken place in Europe and elsewhere in recent years, there's a little more realism on short wave these days.

Be Specific

Just as we all enjoy receiving compliments for a job well done, the majority of those who prepare and present the programmes heard around the world on short wave appreciate hearing what listeners liked or didn't like about their own particular programmes.

There's certainly no need to get gushy with the comments, but there should be something more than just a simple - I liked, or didn't like, the programme. A comment about what item or aspect of a programme you liked best, and why, is always the best approach. Or, if you didn't like a

programme, also say exactly why. It's very important to be specific in one's comments. So many times I've seen comments from listeners who make some general remarks about a one hour broadcast, when there were actually two or three separate and distinct programmes broadcast in that hour. No clear thinking broadcaster expects listeners to send write reams of comments on a weekly or even monthly basis. For one thing, overseas postage costs a lot these days, especially in Third World countries, and many listeners who can afford to listen cannot afford to write all that often. However, if even ten percent of the listeners to a very popular short wave programme wrote to the programme's host once a year with some good solid comments, that would amount to quite a pile

of letters.

Personally, I've always operated on the premise that the ideal programme should comprise three elements: the kind of material or information that the station wants the listeners to hear; material that I think the listeners might want to hear; and finally, the sorts of things I know the listeners want to hear. This final element is where the broadcaster has to depend on feedback from listeners, and that's where the monologue turns into a dialogue. In my experience short wave broadcasting is far more enjoyable when the listeners play an active part in the dialogue, and keep in touch with their favourite broadcasters. For one thing, listeners who write regularly often become good friends.

Talking into a void is never ▶

much fun, especially in the field of broadcasting. During the Cold War years I always felt very sorry for my colleagues who were broadcasting to various highly controlled countries in Eastern Europe, whose citizens were prohibited from sending mail abroad, particularly to foreign radio stations. They were always working in a void as it were, largely cut off from the pleasure of receiving comments from listeners.

The Truth

The majority of those short wave listeners who've been listening for many years probably started out as I did, sending out hordes of reception reports in an effort to amass as many of those nice, attractive QSL cards as possible. To increase the odds of adding to their QSL card collection many listeners tend to tell a station what they think the station wants to hear in their programme comments, and even in their reception reports, because they think it will improve the chances of getting a QSL. It doesn't usually make one iota of difference to one's chances.

Normally the reception report section of letters from listeners is what gets processed first, and the QSLs are sent out. Then the letters are passed on to the programme production people, and so by the time a programme host or producer finds out you didn't like the programme the QSL card has already been sent out. In any case, I think most broadcasters are not so sensitive as to be petty enough to withhold a QSL in retaliation for a critical comment.

Don't Waste Time

Over the years I've seen more than a few reception reports that consisted of one or more typewritten pages of transcript of what was said in a programme. But, when it came to comments on what was heard in the programme or broadcast, there were none. That's a good example of putting too much of the wrong kind of effort into a reception report.

Don't forget, the broadcaster already knows what was said, so these word for word transcripts are totally unnecessary, and serve no useful purpose. It wastes time and paper, and really only proves that the listener in question owns a tape recorder and can type.

Stations usually only require a few details such as the topics covered in a newscast or magazine programme, or titles of music played, as proof that the programme was actually heard. They just want to know that the details didn't come from a programme schedule or other publication.

Souvenirs

I can recall seeing one listener's letter some years ago which went into raptures about how much he liked a number of different programmes on Radio Canada

a reception report in order to get those souvenirs.

Stations will usually make allowances for DXers who don't speak the language of the broadcast being reported on. However, it's advisable, whenever possible, to avoid the sort of programme details that read - "man spoke, woman spoke, music played, woman spoke, programme ended".

Different short wave stations have different mandates as far as programming is concerned, and there can be a wide variety of reasons why a particular programme is done in a particular



International. It was very nice to get all the compliments, but all of the programmes he was commenting on had gone off the air two years previously! The letter closed off with a request for any souvenirs the station had to offer. Stations that have souvenirs such as stickers, pennants, pens, calendars, etc., to give out to listeners, are obviously glad to send them out upon request, so there's no need for listeners to gild the lily in the comments section of

way. Programming at some stations can be very tightly controlled by management, and this is especially true at stations which are really the voice of a country's government. At other stations the people who produce and host the programmes are fortunate to have a great deal more latitude, and are able to put pretty well whatever they want into a programme as long as the station's mandate and policies are followed.

Any broadcaster who is proud of what he or she puts on the air, is more than likely going to welcome and appreciate constructive feedback from listeners, because this feedback is more or less the only indication of a programme's popularity. Short wave broadcasters aren't fortunate enough - or in some cases unfortunate - to have the sorts of ratings systems that can be found in domestic broadcasting. Taking listener surveys in a single country is costly enough these days. Imagine if those surveys had to be taken in several dozen countries. The cost factor is why listener surveys in the short wave broadcasting business can only be afforded by the very biggest of the broadcasting organisations, such as the BBC World Service and The Voice of America, and to some extent Deutsche Welle in Germany.

Useful Balance

Well thought out comments on a particular programme also serve another very useful purpose, besides possibly massaging the ego of programme hosts and producers. At any given short wave station management people more often than not have their own ideas and biases about what constitutes interesting programming, and how long the average listener is able to concentrate on a given item or topic before his or her mind starts to wander. The life of a programme producer can often be a constant battle of wills with management. With a good and constant supply of feedback from faithful listeners a programmer soon finds out whether or not his or her ideas on what listeners are interested in hearing are valid and on the right track, and serves as a useful balance to internal critiques.

If you are including substantial programme comments in a reception report, addressing your letter to the host of a particular programme goes a long way towards ensuring that the person in question actually sees the comments right away. In some cases, if a letter is simply sent to a station's general mailing address, it can sometimes get lost in the shuffle, and the production people are often the last to see the letter, after it has been processed through a variety of other departments.

One Single Letter

It can sometimes take just one single letter, with a constructive comment, to improve things for untold numbers of listeners. I recall a number of years ago now, getting a letter from a listener in Africa who was lamenting his constant problems in trying to determine which of the two frequencies for a particular broadcast was giving the better reception. There was only one minute of identification signal on each of the two frequencies before the start of the broadcast. On many occasions, by the time he'd found the best of the two frequencies being used, the listener said, the news would have already started and he had missed some of it. Couldn't we leave the ident signal on longer, he asked. Well, the listener obviously had a valid point. A check with the engineering department determined that while one of the two transmitters was in use until one minute before the broadcast to Africa, the second transmitter was in fact idle during the half hour preceding the broadcast. All it took to solve the listener's dilemma was to schedule five minutes of identification signal on that idle transmitter instead of the usual one minute.

Despite such tales of listeners' comments really having an effect, the degree of success will certainly vary from station to station. There's undoubtedly a good deal of cynicism amongst short wave listeners as to how much attention is paid to listeners' comments, and what sort of impact they have, but after a few years of active listening it's usually pretty obvious which stations really care about what their listeners think.

Protest Now

Just as with domestic radio and television, programmes on short wave tend to change from time to time for various reasons. If it's announced that one of your favourite programmes or hosts is going off the air, without any kind of explanation by the station in question, don't be shy. Send off your protest right away. Don't just sit back and let the other listeners write. That might very well be what they're doing too. It's possible that a programme is going off because the host is retiring, or moving away to another job. Perhaps the station had to drop the programme for budgetary reasons. However,



it's also possible that the station is just sending up a trial balloon to determine how popular a programme actually is.

The fate of a number of short wave broadcasting stations, and not just programmes, has been altered in past years by masses of letters of support from listeners all over the world. I remember sending up one of those trial balloons myself years ago. I'd been running a monthly stamp corner feature in a magazine programme that I was the host of. I figured that, since stamp collecting was arguably the world's most popular hobby, my stamp corner must obviously have a good audience, although strangely, I seldom noted any comments on it in listeners' letters.

My particular trial balloon took the form of a contest, with First Day covers and sheets of stamps as prizes. The contest ran for some three months, and I had visions of hundreds and hundreds of entries pouring in. One of the entries was from an American friend of mine, another broadcaster, who jokingly said that at least I'd have one entry in the contest. My friend didn't

realise just how prophetic he was. As it turned out his entry was the ONLY entry in the contest, so the stamp corner went off the air at the end of the contest, with no fanfare I might add. Not a single listener protested the cancellation. That sort of experience tends to make one wonder if they'd perhaps forgotten to turn the transmitters on during my programme. Just in case you're wondering, yes, I did send my broadcaster friend his prize.

Open Invitation

With the rapid proliferation of domestic facsimile, or FAX, machines these days, for those who can afford the extra expense it has become possible to send comments off to a programme within minutes of the programme going off the air, or even while it's still on the air for that matter. This can be extremely useful in the case of a programme that's aired live, since it then becomes possible for the broadcaster in question to take a comment into consideration in time for the next edition of the programme, and that's about as

close to a two-way conversation as it gets on short wave, except of course in the case of a 'phone-in programme.

Despite the importance of listener feedback to the broadcasters, it just isn't possible for a station to put every listener's suggestions into effect, no matter how useful they may happen to be. There are myriad reasons, not the least of which are hard pressed budgets and staff, why it's not possible to make all of the listeners (and management people) happy all of the time. But it's important that today's world band radio listeners take full advantage of the open invitation to make their comments and opinions known to the broadcasters they tune in to on the short wave bands. Your favourite broadcaster is eagerly looking forward to hearing from you.

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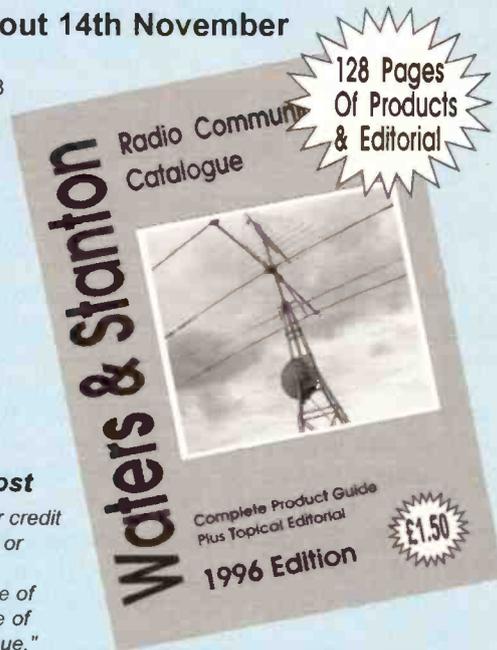
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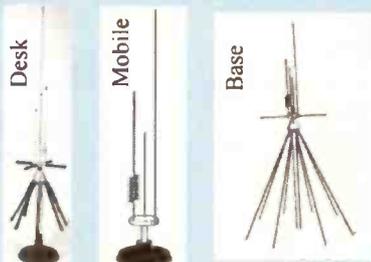
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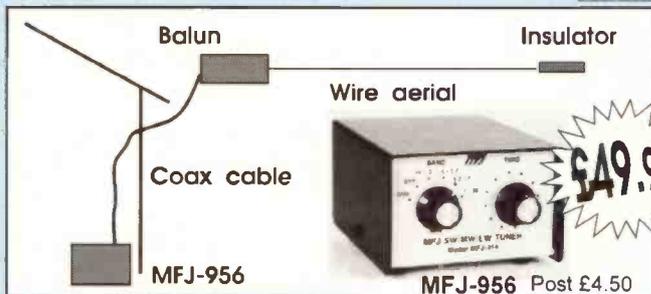
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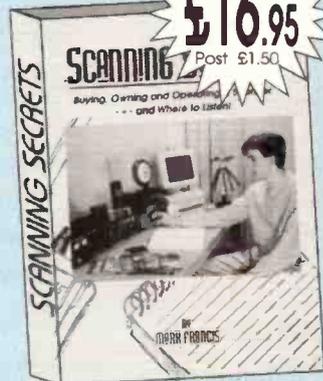
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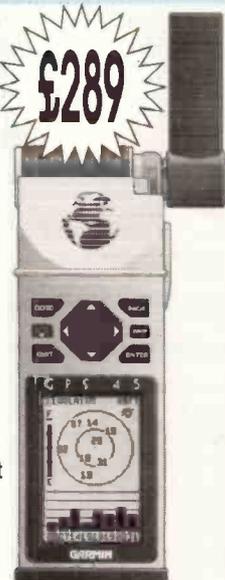
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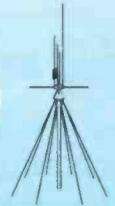
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Timewave DSP-59+

...An Owner's View of the Digital Audio Processor

If, like many of our readers, you've wondered whether a d.s.p. filter is a solution to your reception difficulties then read on. Dave Miller NZ9E has had a DSP-59+ for some time and he's formed some interesting conclusions.

I've always really disliked noise. White noise, pink noise, whatever the colour, it really grates on me after a while. Perhaps it's my many years in the broadcasting industry, noise was always something to chase down and eliminate, perhaps its a quirk in my ear-to-brain interface, whatever the reason, I'll do almost anything to eliminate noise in my listening environment.

I've generally been first in line to try new noise limiters, noise blankers, low noise pre-amps, etc. as they've popped up over the years, but nothing up 'till now has really cut eliminated random (or even not-so-random) noise, not until the introduction of true digital noise reducers.

They've made a real dent in noise elimination - the type of noise our h.f. bands are famous for.

I bought the W9GR kit d.s.p. (digital signal processor) not long after it went through a re-design and the new, multi-program units became readily available. What a difference!

Not To Be Sneezed At

Here was finally something that made real in-roads in noise elimination! Mind you, the new breed of digital signal processors won't eliminate all of the noise on your h.f. receiver, but 20dB or so is nothing to sneeze at, and that's



approximately what they'll do today.

Perhaps in the future someone will develop a total noise eliminator, but for now, I've been very pleased with that ten-times or so reduction in my most dreaded Nemesis, noise!

I was very pleased with the W9GR d.s.p., but we now seem to be entering stage 2 in the digital signal processing arena and it looked like it might be time for a change. Timewave Technology of St. Paul, Minnesota, recently introduced their DSP-59+ which not only offers up to 20dB of noise reduction and 50dB of tuner-upper-hetrodyne reduction, but a full-blown variable passband customiser (they call it a filter) so that you can select exactly how much of the normal 300 to 3000Hz s.s.b. signal you want to let through to your speaker!

For c.w. and other data modes, you can select how wide a chunk of spectrum you'll allow through from as much as 600Hz, down to 25Hz. You can also select

the centre frequency that you prefer to listen to for c.w. or the centre frequency standard for the data modes.

On the data mode issue, you've covered from h.f. Packet up through G-TOR (the newest mode from Kantronics) and probably into the future with selectable centre frequencies and adjustable bandwidth options galore.

Perhaps the easiest way to visualise how the Timewave DSP-59+'s variable passband 'customiser' works is with an analogy. Picture two horizontally sliding windows, that meet in the centre, allowing more or less the total window surface area available to be more exposed to the room. This is kind of how the DSP-59+ works.

With both sliding windows fully open, air comes through the entire window surface. If the left sliding window is partially closed - relating back now to our receiver's passband - less of the low audio frequencies come through - unfortunately, this is known as a

high-pass filter, but just remember that you're cutting-off the lower audio frequencies.

Now, if we also close part of the right sliding window (again going back to electronics), less of the high frequencies come through - and, of course, they had to call this a low-pass filter, but again, think of it as cutting down on the high audio frequencies.

The high-pass, low-pass business is technically correct, of course, but it messes up my mind when I'm trying to picture exactly what I'm doing, so I try to ignore it and just think about cutting back on the low frequencies with the left knob on the DSP-59+ or the high with the right knob - at least the location of the knobs makes sense with the sliding window example and with the way we normally visualise the audio spectrum.

The DSP-59+ is also clearly labelled so you shouldn't have any real trouble with this. It's another of those things that's harder to explain than it is to do. So, in

essence, with the DSP-59+'s high pass and low pass filtering, you can customise exactly how much of the 300 to 3000Hz normal s.s.b. bandwidth you will allow to reach your speaker!

If QRM creeps up from below, cut off more low with the left knob. If it sneaks in from above, cut off more high. You can only go so far with this before you start cutting off too much 'intelligibility', but how much is too much is largely a matter of personal judgement and will vary from one situation and once voice to another.

The important point is that the DSP-59+ puts you in charge of that, it lets you judge how much audio passband you want to cut, on either end, eliminating at least some of the adjacent channel QRM in the process.

By the way, this high frequency/low frequency cutting isn't exactly continuous as I've made it sound so far, but rather in steps of 50Hz, which is just fine, your ear doesn't really require any finer steps than that.

This same analogy, the sliding window concept, holds more or less true for the c.w. and data 'customising' (OK, filtering!) scheme as well. In the c.w. and data mode case, the centre of the window is selectable, ie. where the two windows meet, and the two sliding windows themselves move the same amount (opening or closing more) with just one switch. The right switch selects this band of audio frequencies that's passed through, called the bandpass mode.

There are three actions, noise reduction, heterodyne elimination and passband customising can all be going at the same time or they can be selected individually in any combination on the DSP-59+. That's quite a bit going on in terms of computing, and it's an important feature.

Timewave decided to add a few more items to their new model. The DSP-59+ sports an internal a.g.c. amplifier, something that I added to my W9GR d.s.p. after not very long in use at my QTH. Here's the problem: d.s.p.s tend to be pretty level sensitive, ie. they like to have a fairly consistent audio level going into them to perform properly.

Built-in AGC

They particularly object to too much audio from the receiver, they start to destroy quite a bit (break up is probably a better

description). An amplifier with a.g.c. action ahead of the analogue-to-digital converter helps in many cases, most noticeably when the feed receiver's a.g.c. may not be quite up to par.

Even on some of the newer transceivers, the internal a.g.c. isn't all that great. On the amateur h.f. bands, with signals fading and variations in audio levels - one blasting another almost undetectable, the built-in a.g.c. action in the DSP-59+ can be very handy indeed.

On the down side, some loss of noise reduction can be noticed on pauses during s.s.b. speech, this due to the a.g.c. amplifier increasing the gain and amplifying the noise floor. This feature requires a judgement call on the part of the operator, you can switch it in when it helps, switch it out when it doesn't. It was a great feature for Time wave to have included and I for one am glad they have.

The DSP-59+ also has a switch-selectable true bypass feature built-in. The bypass function is accomplished with a relay, so even if you lose power to the DSP-59+ (accidentally or for whatever reason), the relay will put the unit into the bypass mode and things are just as they were before you had the d.s.p. in-line. That was thoughtful design planning. It also allows them to do one of the neat things on the DSP-59+'s final feature, bypass the unit during c.w. key-down in a transceive set-up.

Here is the final main feature of the DSP-59+, when you're operating c.w., you can hear your transceiver's sidetone oscillator, even though the DSP-59+ may be tuned to a somewhat different c.w. tone. This is because the d.s.p. will go into true bypass mode everytime you key your transceiver, as long as the p.t.t. (push-to-talk) input on the DSP-59+ is wired to your transceiver's p.t.t. line output (not usually too difficult to accomplish).

On s.s.b., that same p.t.t. line from your transceiver will mute the

DSP-59+ so that no spurious audio comes from the speaker during your own transmission times - not an uncommon even with most d.s.p. units.

There you have it, there's a 3.5mm headphone jack on the DSP-59+'s front panel as well as a couple of l.e.d.s to show you when the audio level out of your receiver is correctly set, but other than that, we've pretty much covered features of this nice looking, well made unit.

You'll need to supply your own source of 12 to 16V d.c. for powering the DSP-59+, but Timewave does include the correct plug to mate with their unit. Any well filtered 12V source is adequate, just as long as it will deliver about 1A on audio peaks.

Different Speakers

One thing I did notice, Timewave forgot to add a 'power on/off' l.e.d., but then a number of manufacturers seem to think that's an unnecessary item these days in amateur equipment. Perhaps they're right, but I still like to see one, even though there may be other ways to tell if a device is actually one or off!

I'd also suggest that you try several different speakers with any digital signal processor you might buy, it can often make quite a difference in the way a particular unit sounds. It isn't always how much a speaker costs, either that determines how well it sounds with a d.s.p., so its difficult to predict which will sound the best ahead of time. Just try several and judge for yourself on this.

One other thing I would like to see the manufacturers add in their d.s.p. line ups is an audio input source selector switch. To be sure, a digital signal processor (like the DSP-59+) works amazingly well on the h.f. bands, but if you ever operate on 6 or 2m on higher v.h.f./u.h.f., s.s.b. or c.w., give it a try on these bands too. I've found it to be a big help on the v.h.f.'s and up, especially in the area of

noise reduction - you already know how I feel about noise!

That's where the input selector switch would be a real help, using one d.s.p. unit fed by multiple transceivers. Another worthwhile addition would be the inclusion of a 'speaker 1/speaker 2' switch for those times when a choice of a couple of different 'speaker sounds' or reproduction characteristics would be advantageous.

I've added these switches externally myself, but it would be neater to have them already in the DSP-59+ unit. Manufacturers please take note.

Timewave came up with a very nice looking and well shielded cabinet for their d.s.p. and have also taken the time to add r.f.i. filtering to the input/output leads. Being digital devices, with lots of steep, harmonic filled waveforms inside, d.s.p.s can radiate some radio frequency interference.

The DSP-59+ should be less of a problem on that score than perhaps some others, but don't be too surprised if you find some r.f. leakage on some bands. It's almost inevitable.

I found the DSP-59+'s switches fairly easy to remember as to what does what (as long as I think about the sliding window analogy) as well as smooth in operation (the rotary switches for bandwidth selection rotate very easily and quietly).

The unit, from my stand point at least, is very logically laid out and I wouldn't really change anything if I had the choice - I can't say that about many things these days!

Default's Best

The inside of the DSP-59+ looks starkly simple, belying its tremendous complexity within those few 'master' chips! There are a series of eight jumpers that the owner can change to further 'customise' the DSP-59+, but I found that the default selections made by Timewave before the top cover was put on at the factory were quite satisfactory for my operating - and they probably will also for yours - but they're there if you ever need to change things, and that's nice too.

**Mike Devereux of
Nevada Communications,
189 London Road,
Portsmouth PO2 9AE.**

Tel : (01705) 662145

kindly supplied the photograph of the
Timewave DSP-59 + filter.

Nevada can supply the unit for £299.

WMO and ESA

A look at the organisations behind the satellites with Lawrence Harris.

WORLD METEOROLOGICAL ORGANISATION

Some readers of 'Info' may have been a little startled when, a year or two back, they received official-looking documents with the header 'World Meteorological Organisation'. On closer inspection the letter turned out to be part of a census being made to identify people who have satellite monitoring equipment. It was not a 'big brother' exercise, so what exactly is the WMO?

In a nutshell, it is an offshoot of the United Nations, based in Geneva. The UN has several, better-known agencies, each dealing with specialised areas of concern, and the World Meteorological Organisation was set up to provide the focus for international co-operation in meteorology. Its predecessor was the International Meteorological Organisation (IMO), from which the WMO emerged. Co-operation in meteorology has ensured the free and quick exchange of meteorological data, and information amongst the member countries.

In effect, the WMO ensures the provision of authoritative, international scientific information on the state and behaviour of the global atmosphere, the climate it produces, its interaction with the oceans, and the resulting distribution of water resources on earth. It is also responsible for assisting member countries in applying weather, climate, ocean and hydrological information, thus allowing them to make more efficient use of their resources. This is crucial for achieving the sustainable development of nations.

WORLD WEATHER WATCH

To predict the weather, modern meteorology depends upon near instantaneous exchange of weather information across the entire globe. The World Weather Watch (WWW) is responsible for the world-wide collection, analysis and distribution of this vital information.

It is a unique achievement in international co-operation. In few other fields of human endeavour, particularly in science and technology, is there such a truly world-wide operational system to which virtually every country in the world contributes, every day of every year, for the common benefit of mankind.

The WMO Basic Systems consists of three main components:

- 1 Global Observing System - comprising facilities on land, at sea, in the air and from satellites;
- 2 Global Telecommunications System - a world-wide system for the rapid exchange of observations, as well as of processed information, including forecasts;
- 3 Global Data Processing System - a network of world and regional computerised data processing centres. A data management component ensures the effective integration and inter-operation of the others.

The implementation of the World Weather Watch requires careful attention to the standardisation of measuring methods and techniques, adoption of common telecommunication procedures, and the presentation of observed data and processed information, in a manner understood by all, regardless of language. These arrangements, as well as the operation of the WWW facilities, are organised and co-ordinated by the WMO with a view to ensuring that every country has available all of the information it needs to provide weather services on a day-to-day basis as well as for longer-term planning and research.

WORLD CLIMATE PROGRAMME

The WMO, as the lead agency, provides for the overall co-ordination of the World Climate Programme (WCP) as well as for the World Climate Data and Monitoring Programme and the World Climate

Applications and Services Programme. These functions are provided by the WCP Department, which is also responsible for the overall co-ordination of the Agricultural Meteorology Programme of the WMO. The purpose of the WCP is to provide an authoritative, international scientific



WMO logo.

voice on climate change, and to assist countries to apply climate information and knowledge to sustainable development.

WMO SATELLITE ACTIVITIES

This is the organisation which sent out the census request referred to earlier. The main purpose of WMOSA is to co-ordinate

environmental satellite matters and activities throughout all the WMO programmes. It also gives guidance to the WMO Secretariat, technical commissions and multi-sponsored programmes on the potentialities of remote-sensing techniques in meteorology, hydrology, related disciplines and their applications. Phew!

The long-term objectives of the WMO Satellite Activities include:

- (i) To collaborate with satellite operators to permit clear definition of Members' needs and to maintain the dialogue with international and national space programmes and actively contribute to their co-ordination;
- (ii) To prepare for and assist Members in the transition of low-resolution imagery satellite service from analogue to digital;
- (iii) To foster Members' capabilities in using satellite data through increased education and training and through assistance in procurement of satellite ground receiving equipment.

Note item (ii) above, in which the transition to digital imagery is being encouraged. The effects of this, and the proposed time scales will be published in my 'Info in Orbit' column as they become known.

PROGRAMME ORGANISATION

The broad utilisation of satellite data within all WMO programmes requires that the Satellite Activities group co-ordinates with others. The Satellite Office is part of the World Weather Watch Department. The responsible body for Satellite Activities is the Commission for Basic Systems (CBS) Working Group on Satellites. Co-ordination between the Satellite Activities and the other WMO Programmes is facilitated through expert representation of these Programmes in the working group as appropriate. This group makes recommendations to CBS and reports annually through the president of CBS.

Within the World Weather Watch, the Global Observing System (GOS) includes a space-based sub-system which is involved with satellite data observations, collection and dissemination. The Commission for Basic Systems makes recommendations for the operational use of satellite data. Outside WMO, Satellite Activities are co-ordinated with various United Nations organisations such as FAO, UNDP, UNEP, UNESCO, (COPUOS) the Committee on Peaceful Uses

of Outer Space, space agency organisations such as the Co-ordination Group for Meteorological Satellites (CGMS), and the Committee for Earth Observations Satellites (CEOS).

All of these organisations and committees are involved in the development of meteorological systems and compatibility. Some decisions, such as the encryption of METEOSAT Primary Data, seem to indicate that some important matters are outside their jurisdiction.

FINALLY

I am grateful to the WMO for providing much of the material used for this article.

Address for correspondence: WMO, 41 Avenue Giuseppe-Motta, Case postale No 2300, CH-1211 Geneve 2. D E Hinsman, Senior Scientific Officer - Satellite Activities. WWW URL: <http://www.wmo.ch>

Please note, I have tried to describe WMO activities concisely, using original, somewhat detailed material. I believe this article to be accurate, but I apologise for any inadvertent oversights. 'Info in Orbit' will carry further WMO developments from time-to-time.

EUROPEAN SPACE AGENCY

The aim of the European Space Agency is "to provide for and to promote, for exclusively

peaceful purposes, co-operation among European States in space research and technology, and their space applications, with a view to their being used for scientific purposes and operational space applications systems."

The idea of creating an independent space power in Europe goes back to the early 1960s. Six European countries (Belgium, France, Germany, Italy, the Netherlands and the United Kingdom), associated with Australia, joined in 1962 in ELDO, the European Launcher Development Organisation, to develop and build a launcher system. In 1962, the same countries, plus Denmark, Spain, Sweden and Switzerland formed ESRO, the European Space Research Organisation, to undertake satellite programmes. Ten years later they decided to merge the activities of the two organisations into a single body, and in July 1973 an inter-ministerial conference of the ten European countries met in Brussels and laid down the principle of creating the

The aim of the European Space Agency is to "provide for and to promote, for exclusively peaceful purposes, cooperation among European States in space research and technology and their space applications, with a view to their being used for scientific purposes and operational space applications systems."

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European Space Agency (ESA). Ireland then joined, becoming a member of ESA in 1975. On 30 October 1980, the final signature ratifying the Convention gave legal existence to ESA.

Since then, ESA members have been joined by Austria, Norway and, later, by Finland. Co-operation agreements have been signed to allow Canada to participate in certain ESA programmes.

Current ESA programmes include METEOSAT, IUE, Space Telescope, Ulysses, ERS and MSG-1, among many other projects.

The new Frankfurt/Oder transmitter will be located at Treptin-Booben and running ch.E43 70kW e.r.p. horizontal (ORB) using an omni-directional antenna, and ch.E50 vertical for the ZDF on a directional antenna. An unused ch.E44 allocation for Kiel is now being re-allocated for Hamburg.

In the next tropospheric opening towards the East check out the following main transmitter channels for the POLSAT terrestrial outputs - each are running +1kW horizontal: Szczecin ch.E48; Krakow 53; Zakopane 51; Przemysl 56; Leborg 57; Poznan 50; Wroclaw 59; Opole 57; Skrzyczne 58; Tarnow 60; Bydgoszcz 53; Konin 58; Warszawa 35.

Two new local TV Danish stations have been seen: 'TSV KANAL-1' chs. E51, E58 and 'V MOJN' has been received on ch.E35. 'NTV' a local TV transmitter in Norway has been seen ch.E38. In Holland all Nederland 2 transmitters now transmit a modified PM5544 test card in 16:9 format with identification 'NOZEMA NED 2' top and 'PALplus 16:9' below.

Belgium transmissions for the BRTN TV1 and TV2 are now transmitting wide screen

Radio and TV DX News Extra

programming and the classic PM5544 4:3 test card is no longer transmitted.

The BBC began Digital Audio Broadcasting (DAB) across London in late September and have announced DAB expansion to other areas as follows: West Midlands - July '96; Central South UK up to Oxford - August '96; Liverpool/Manchester, Yorkshire, North Wales - March '97; North East UK - August '97; South Wales and Bristol Channel - November '97; Central Scotland - January '98 and Ireland - February '98.

Hope for increasing m.u.f.s and better higher frequency reception revolves around the report of a sunspot cluster, sighted in an area of the sun, which suggests that the next sunspot Cycle no.23 may be starting earlier than anticipated. Earlier predictions gave Cycle no.23 a peak in activity around the turn of the century.

The average Sunspot cycle runs 11.1 years. **NOTE: DO NOT**

attempt to observe sunspots by direct viewing or by telescope of the sun's surface. DO NOT use smoked glass filters over a telescope and then view directly. Always project the sun's image onto a card for observation.

The South African Broadcasting Corporation (SABC) will be instructed by the IBA to hand over the 3rd TV channel - NNTV - to the commercial TV sector to encourage growth in the market. This follows a review of present and future broadcasting across South Africa, the recommendations of which will be passed into law by the government.

Plans have been announced for the UK's TV terrestrial broadcasting system using ch.E35 and other unused u.h.f channels in each region. The main points for the introduction of digital TV are: Six u.h.f. channels will be used in a given region, each channel carrying at least three digital TV

services and seven radio channels - each channel having up to six DAB stereo services. Each multi-service TV/radio channel (or multiplex) will be administered by a government appointed company who will negotiate terms and conditions for any UK/EU company for coming on-board the multiplex.

All current analogue terrestrial TV services i.e. BBC1, 2, ITV and Channel 4 will be guaranteed digital carriage in each region and free to air. Other TV channels may operate as **Pay-Per-View/Pay-TV** using encryption but that scrambling standard must be common across all channels, so that only a single digital decoder 'box' will be required.

It's hoped that the first digital transmissions will start late '97/early '98. Multiplex operators will pay nothing to the government for their franchise until they're into profit. MPEG-2/CODFM compression or a variant there of will be used. It's expected that the UK's transmitter manufacturers will enjoy a boost to their now rather quiet production line, as will antenna makers for wide-band replacement antennas.

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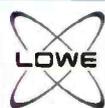
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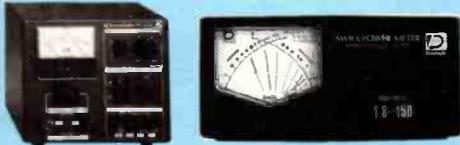
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REVIEWED:

- The Yaesu FT-10R Hand-held transceiver.
- The Yaesu FT-8500 Mobile transceiver.

FEATURES:

- Leicester Amateur Radio Show Guide.
- DXperts With Devereux - Mike G3SED shares his world wide travels with the Camel Trophy DXpeditions.
- Breaking The 100 Barrier. - Chris Page G4BUE describes how to get your name on to the coveted 'Honor Roll'.

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- The Alinco DJ-191 144MHz Hand-Held Transceiver

FEATURES:

- Elaine Richards G4LFM helps you to set-up your first workshop.
- Mike Rowe G8JVE has some further ideas on the PW Robin Frequency Counter.
- Ben Nock G4BXD has some advice to encourage you to get busy on the workshop bench.

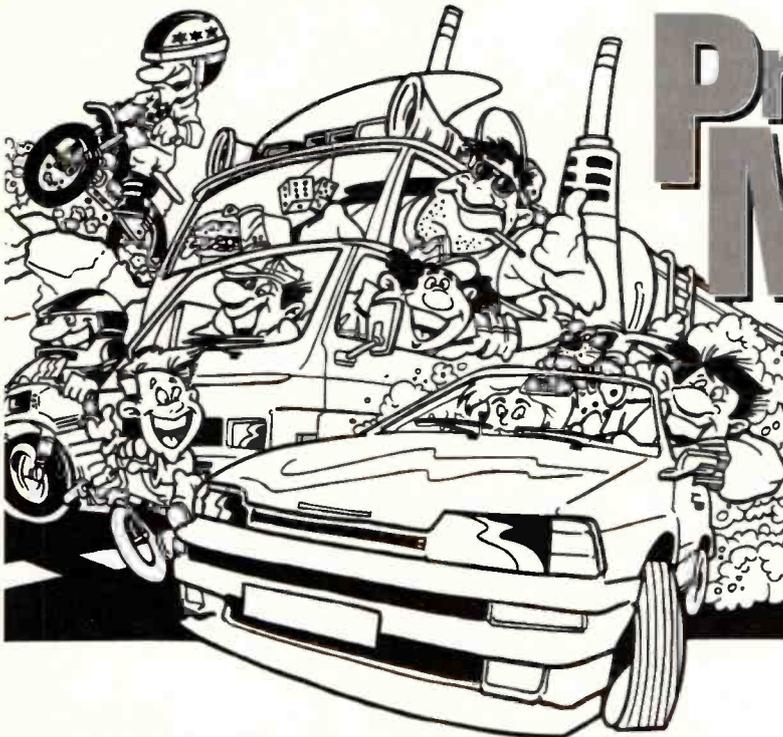
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Info in Orbit Readers' Pictures

Most pictures received for 'Info in Orbit' are sent by readers resident in Britain, but happily there have been several exceptions. **Antonio Frattesi** sent two images on disk from Manziiana, Italy. **Fig. 1.** shows the eastern end of the Mediterranean Sea, which those living on the east of Britain may be able to 'reach', but I certainly can't! This is a METEOR image, apparently taken during summer, but Antonio did not mention what receiving equipment he uses. Looking closely at the image, the Nile Delta is clearly seen and the individual hills shown on my Atlas were identifiable. The Nile can be followed through Lake Nasser and into the Sudan. Some of this detail can be seen on some visible-light METEOSAT images, but the resolution of this METEOR image appears higher.

Cedric Robert of Halesowen retired from teaching some years ago and since 1986 has been an avid satellite enthusiast, monitoring both polar orbiting and geostationary WXSATs. Cedric sent a selection of images from which **Fig. 2.** a METEOSAT-5 image of the D2 format is shown. Cedric used artificial colour to enhance the image, enabling more detail to be seen in the desert sands of north Africa.

Steven Rake of Gwent sent a collection of images received from OKEAN-4 during July. They were all good ones, so I selected **Fig. 3.** because it clearly shows the number sequence which normally accompanies multi-spectral images from OKEAN. The visible-light portion of the image can be seen to show most of Britain, as well as the more usual coverage of the Scandinavian countries. Only during the last year or so have we seen consistent coverage of regions farther west than Denmark.

Several high quality prints, some with added artificial colour, were sent by **George Newport** of Canterbury.



Fig. 1.

He uses the TH2 imaging program and an HP550C printer. I admit to having recently bought the HP660C model! George

Lawrence Harris takes the opportunity provided by this Special Edition to feature some of the wonderful images supplied by 'Info in Orbit' Readers over the months.

produced a set of images from NOAA and METEOR WXSATs, from which I thought his picture of Iceland was particularly dramatic. However (!), I have chosen his July picture from NOAA-14, which shows the large land mass of Europe under sunny skies - **Fig. 4.** George has used high quality gloss paper on which to print an artificially enhanced colour image, and the effect is extremely impressive.

Kurt Feller lives in Switzerland and sent a number of images showing slightly unusual aspects of Europe. **Fig. 5.** is a METEOR image in which the Canary Islands are highlighted by solar reflection, against the Atlantic Ocean. We generally get clearer pictures of the northern and southern limits of reception from the METEOR WXSATs, compared with the NOAAs, for two reasons. METEORs provide only one image content - visible or infra-red - in their transmissions, so they have better resolution than the NOAAs which always transmit two. Secondly, their orbits are a few hundred km higher, which means that we can receive clearer signals from them, longer (up to 20 minutes) than from the lower orbiting NOAAs (up to 15).

Lester Jones of West Kirby has been monitoring WXSATs for some time, but, like many enthusiasts, has not had easy access to a printer, so had not sent any images for many months. As recently mentioned in 'Info in Orbit', we can now accept images on disk. He sent a selection from which I have used his E2 format image from METEOSAT-5 - **Fig. 6.** This is the water vapour channel - 5.7 to 7.1µm - which is particularly useful for identifying those areas of the troposphere of low water content. These images can be compared with their infra-red equivalents, which of course show thermal differences, regardless of whether the subject is desert or

cloud. By enhancing the image with artificial colour, small differences can be monitored.

Roger Ray of Telford provided a number of examples of the types of images seen from the UK. I have mentioned the meteorological phenomenon of cloud 'hugging' the coastlines, and this picture - **Fig. 7.** - shows a part of the C03 format from METEOSAT-4, where clouds can be seen within the coastline of Italy, and within the land mass of the former Yugoslavia. This phenomenon is seen in many coastal regions.

Jim Gahan of Sligo in Ireland, tells me that he is a newcomer to the hobby of WXSAT reception and has had the usual types of problems encountered when starting off from scratch. Despite this, he sent me a disk containing several good quality images, from which I have selected **Fig. 8.** which shows a feature on the coast of Greenland which several people have referred to as 'fingers'. These are probably ice-bridges of some sort, formed as ice is melting irregularly between Greenland and Baffin Island. On my atlas, the

Davis Strait - the waterway between Greenland and Baffin Island - which is just south of Baffin Bay, is shown as having permanent icebergs in the Bay

Graeme Caie of Aberdeen also sent me a selection of clear images on disk. Graeme, like many other WXSAT monitors, saw the OKEAN-4 (also known as



Fig. 3.

1-7) passes during summer, and recorded **Fig. 9.** This is another of those tantalising, almost complete coverage of Britain, transmissions that has characterised Summer '95. Graeme has been receiving WXSAT transmissions for some years, using a modified Cirkut receiver and a Maplin decoder, feeding serial data to his 486PC running JV FAX. Graeme is interested in contacting any other WXSAT enthusiasts in the Aberdeen area. I can act as 'address-exchanger' as necessary.

From their Strathkinness home, **Jim and Hilda Richardson** have regularly monitored OKEAN and other polar satellites, and sent **Fig. 10.** The image shows piano-key telemetry (its unofficial name) on the left, and the microwave sounder and radar images in this close-up portion. St. Petersburg shows up particularly well, as does Lake Ladoga.

When the postman knocks on the door

rather than squeeze a large letter package through the letterbox, I wonder what delights await me upon opening! One of SWM's American readers, **Rolf Mathison** of Dumont, NJ, captured an image of hurricane Felix on 18 August from NOAA-14, using a quadrifilar antenna, Quorum Communications Explorer capture board and QFAX software - **Fig. 11**. He printed the image on high quality paper, after annotating it.

Another welcome contribution from abroad came from **Peter Schoen** of Helmbrechts, Germany who operates both a.p.t. and h.r.p.t. systems! His a.p.t. system uses a crossed-dipole antenna to feed a crystal receiver; the image is then decoded and enhanced with the JVFAX program. I shall show more of Peter's pictures in future editions of 'Info', but meanwhile I have selected his METEOR 3-5 image - **Fig. 12** - of the eastern Mediterranean Sea, which shows the land to the east not usually seen from the UK.

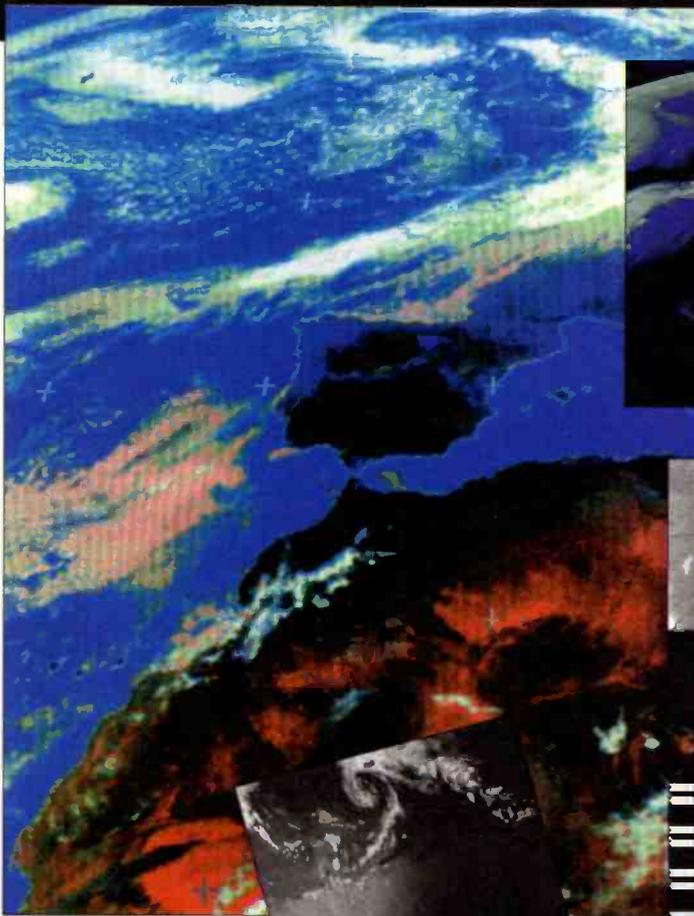


Fig. 2.

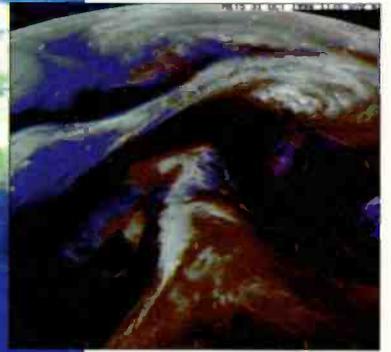


Fig. 6.

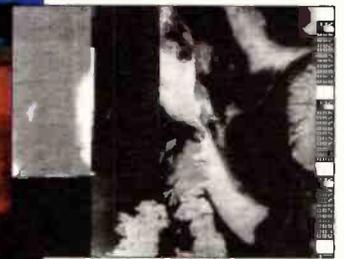


Fig. 9.



Fig. 10.



Fig. 4.

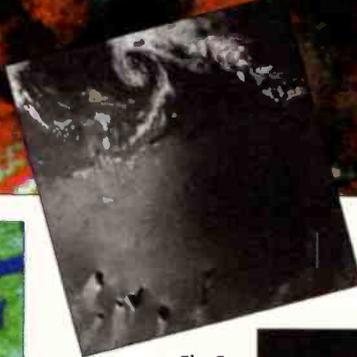


Fig. 5.



Fig. 8.



Fig. 11.

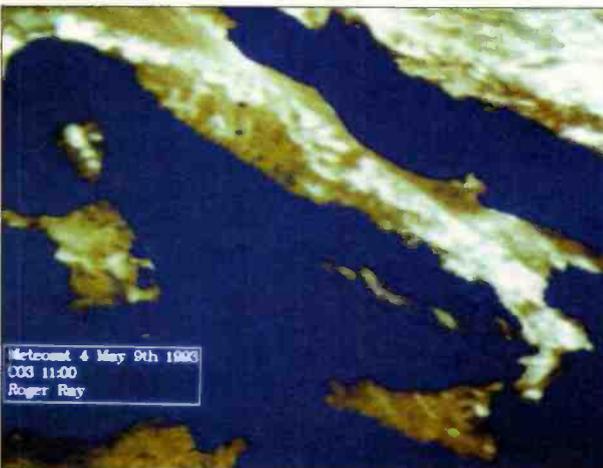


Fig. 7.

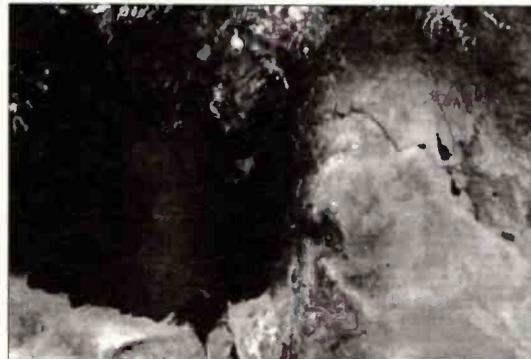


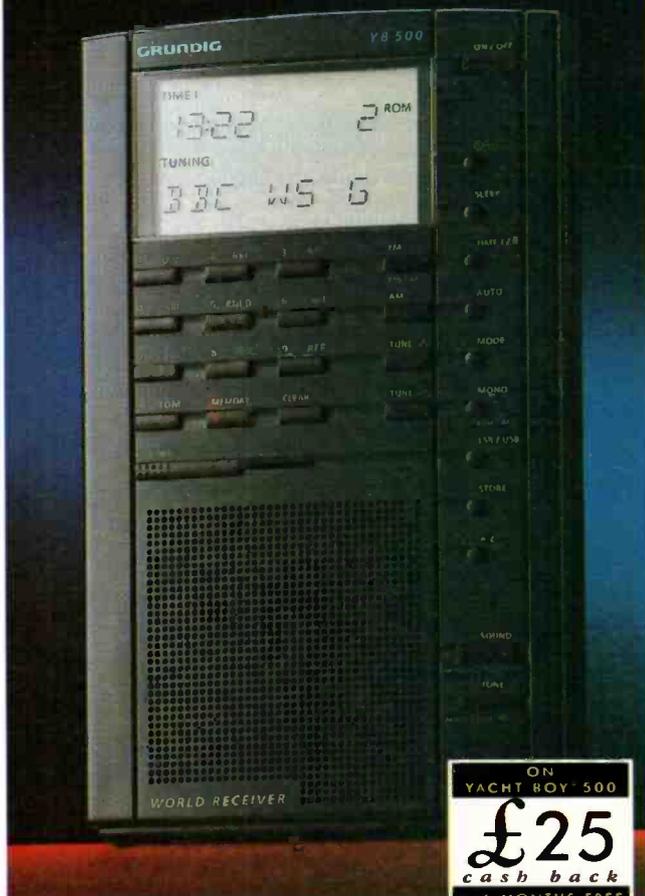
Fig. 12.

My sincere thanks to everyone who has sent images for consideration - they are all welcome. I have kept some for future editions of 'Info in Orbit', and deciding which to include for this edition was not easy. Perhaps a further opportunity for a special 'Readers Images' may occur in the not too distant future.

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NIMBUS

The Nimbus Technology satellite programme was initiated by NASA and NOAA in the early 1960s to develop an observational system capable of meeting the research and development needs of Earth scientists.

The objectives of the programme were:

- 1 to develop advanced passive, radiometric, and spectrometric sensors for surveillance of the atmosphere and oceans;
- 2 develop and evaluate new active and passive sensors for sounding the atmosphere and mapping surface characteristics;
- 3 develop advanced space technology and ground data processing techniques for meteorological and scientific research;
- 4 participate in global observation programmes such as the World Weather Watch (WWW).

Eight spacecraft were built, of which seven were launched between 1964 and 1978, with one failure. Nimbus satellites were placed in polar orbits and acquired global data twice every 24 hours. NIMBUS-7 was still providing data as recently as 1992.

The series carried the following packages:

- Coastal Zone Colour Scanner - CZCS.
- Earth Radiation Budget Experiment - ERBE.
- Limb infra-red monitor of the stratosphere - LIMS.
- Stratospheric Aerosol Measurement 2 - SAMII.
- Stratospheric and Mesospheric Sounder - SAMS.
- Solar Backscatter Ultra-Violet/Total Ozone Mapping Spectrometer SBUV/TOMS.
- Scanning Multi-channel Microwave Radiometer - SMMR.
- Temperature Humidity Infra-red Radiometer - THIR.

NIMBUS 7

Nimbus-7 provided the first daily mapping of the concentration of ozone, and the first global ocean colour measurements. Launched in October 1978, it was a research-and-development satellite, serving as a stabilised, earth-oriented platform for the testing of advanced systems for sensing, and collecting data in the fields of pollution, oceanography and meteorology.

The NIMBUS And DMSP Satellites

The familiar NOAA, METEOR and METEOSAT weather satellites provide images which are probably the easiest for amateurs to decode. Several other satellite constellations - OKEAN, LANDSAT, SPOT, JERS and DMSP - also image planet earth at various wavelengths, with different resolutions and varying ultimate goals. Lawrence Harris looks at both the NIMBUS and DMSP satellite programmes and believes that 'Info in Orbit' readers might find it interesting to get up-to-date with these constellations.

The polar-orbiting spacecraft consisted of three major structures:

- (1) a hollow torus-shaped sensor mount,
- (2) solar paddles,
- (3) a control housing unit connected to the sensor mount by a tripod truss structure.

Configured somewhat like an ocean buoy, Nimbus-7 was nearly 3.04m tall, 1.52m in diameter at the base, and about 3.96m wide with solar paddles extended. The sensor mount forming the base, housed the electronics equipment and battery modules. The lower surface of the torus provided mounting space for sensors and antennas. A box-beam structure mounted within the centre of the torus, provided support for the larger sensor experiments. Mounted on the control housing unit, on top of the spacecraft, were sun sensors, horizon scanners, and a command antenna. The spacecraft spin axis

was pointed at the earth, and an advanced attitude-control system permitted the spacecraft's orientation to be controlled to within $\pm 1^\circ$ in all three axes (pitch, roll, and yaw). Some further operations are anticipated.

CREDITS FOR NIMBUS INFORMATION

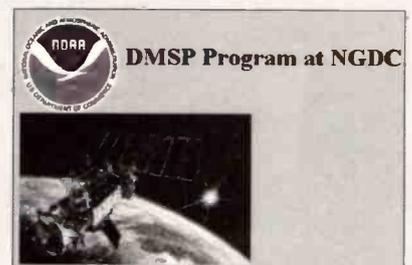
Some information given here was taken from:

- (a) NSSDC System for Information Retrieval and Storage (SIRS). For more information contact the NSSDC Co-ordinated Request and User Support Office, NASA Goddard Space Flight Centre, Code 933.4, Greenbelt, Maryland 20771, USA.
- (b) The Matra Marconi Space Earth Observation Directory.

DMSP - DEFENSE METEOROLOGICAL SATELLITE PROGRAMME

The nearest group to our long-monitored WXSATs is possibly the DMSP - Defense Meteorological Satellite Programme - constellation, consisting of two low altitude, polar orbiting satellites, operated by America's Department of Defense. For many years, data from these satellites remained unavailable for routine use. Then, as described in the July 1994 edition of 'Info In Orbit', US President Clinton announced a future merging of the civilian and military polar-orbiting environmental satellite systems.

A look at the DMSP satellites and their images now seems timely. Being a two satellite constellation and having the orbital characteristics described, complete global coverage of clouds is achieved every six hours. High resolution data are averaged, recorded and sent to ground receiving stations on each orbit - every 101 minutes. The



This is the logo of the DMSP Data Archive at the National Geophysical Data Center at Boulder, Colorado (NGDC). Down loaded from DMSP web site - permission granted

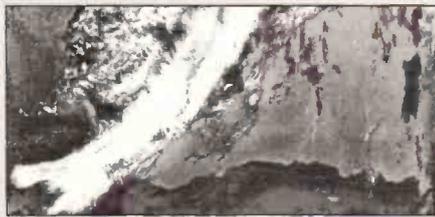


Fig. 1. A typical NIMBUS Image

National Geophysical Data Center at Boulder, Colorado (NGDC) receives DMSP data on 8mm tapes, on a daily basis. Local processing prepares orbital data sets organised as a time-series, restores instrumental data that was adversely affected by the ionosphere during transmission, accurately computes and checks the satellite position, and provides sub-pixel geolocation information and/or software.

Both satellites monitor the atmospheric, oceanographic and solar-geophysical environment of the Earth on a twice-daily basis, and Table 1 shows the type of on-board equipment they carry.

Table 1. On-board instrumentation includes a number of sensors:

OLS	Operational Linescan System; visible (0.4 to 1.1 micrometres) and thermal infra-red (10.5 to 12.5 micrometres) imagery with resolution of 0.55km (regional coverage), or 2.7km (global coverage), along a 3,000km-wide path.
SSM/I	Special Sensor Microwave Imager. Instrument that records vertically and horizontally polarised microwave data from four frequencies - 19, 22, 37 and 85GHz (seven channels), across a 1400km-wide swath.
SSM/T	Microwave Temperature Sounder. This records radiation at seven thermally sensitive wavelengths

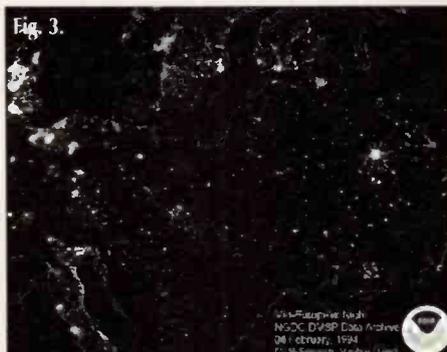


The logo of the Air Force Global Weather Central DMSP Imagery, at Offutt AFB. Down loaded from DMSP web site - permission granted

and seven scene stations across a 1400km-wide swath.
 SSM/T2 Microwave Water Vapour Profiler.
 SSJ/4 Precipitating Plasma Monitor. Records electron and ion fluxes which cause auroras, in 40 energy channels, every 7km.
 SSIES Plasma Monitors. Four instruments measuring ionospheric parameters.



Fig. 2. Courtesy of the NOAA/NGDC DMSP Digital Archive



daily basis. The space environmental sensors record along track plasma densities, velocities, composition and drifts.

To bring the first DMSP images to 'Info in Orbit', I got in touch with Rob Bauer at the NSIDC (National Snow & Ice Data Center), at the University of Colorado, which houses World Data Center A for Glaciology. I looked at several DMSP images and selected the six-image composite Fig. 2.

Section one shows city lights over north America, as seen from a DMSP satellite; section two shows an aurora; section three is a thermal image showing biomass burning; section four records snow and ice cover; five records natural lightning, and six shows a hurricane.

The DMSP image, Fig 3. is courtesy of the NOAA/NGDC DMSP Digital Archive, dated 4 February 1994 and shows the OLS visible image of Europe at night.



Fig. 4. Courtesy of the NOAA/NGDC DMSP Digital Archive

I also asked whether an image of Britain might be available from the archive and was delighted when Rob made four such images available specifically for my collection from his site. These are Fig. 4. Britain at night and Fig. 5. Britain under cloud.

These images are the from the visible band at night (with coastal boundary overlays) and thermal i.r. band (with coastal boundary overlays). They are dated 11 March 1993.

DMSP data is made available via the Shared Processing Network, and archived at the National Geophysical Data Center, in Boulder. For those with access to the internet, you can browse the images and other information available at this web URL <http://web.ngdc.noaa.gov/dmsp/dmsp.html>

CURRENTLY ACTIVE DMSP SATELLITES

If you have a satellite tracking program and want to include the active DMSP satellites in the display, they are object numbers 23233 and 23533, also known as DMSP B5D2-7 and 2-8. I can provide the latest Kepler elements if required. 'Info in Orbit' will keep readers up-to-date with new developments in the DMSP program as the merger process continues.

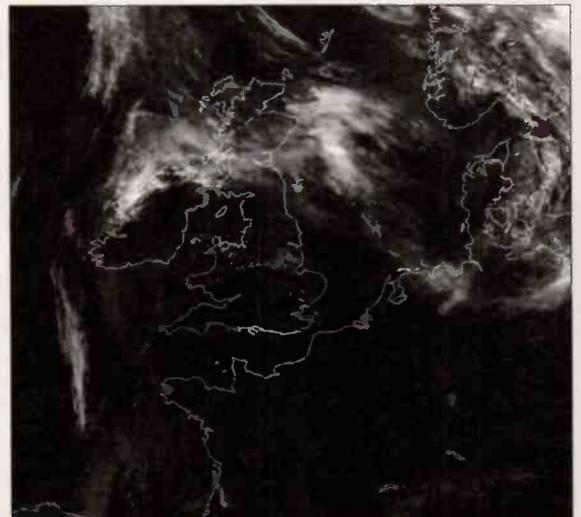


Fig. 5. Courtesy of the NOAA/NGDC DMSP Digital Archive

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Martin Lynch Open Day - 5

Now in it's FIFTH YEAR, our yearly event is can we top last year for the most people at NORTHFIELDS AVENUE? Nearly a thousand people came through the door and grabbed tens of thousands of pounds worth of goods at virtually trade price.

Kenwood UK are 'Co-Hosting' this year and will be on hand all day Saturday. Top of the line Alinco will also be in attendance, including their excellent range of books. The event of 1995 - MARTIN LYNCH will be held for all the FREE food and drink available.

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The only dedicated military scanner worth considering. See our special offer for a FREE set of spare Nicads. Held at £189.95 +

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The best selling "unmodified" scanner. Easy to use has 200 memories (with a few gaps), clear display and including accessories.

NEW PRODUCT NEWS

New AR-5000

Due end '95, the AOR 5000 is a base/mobile high performance all mode scanner covering 30kHz to 2.6GHz. Aimed at the professional user, the new receiver has all modes, full computer control and will cause a real riot when stocks arrive during December. Price around £1975. Watch the next Martin Lynch Advert for more details.

New AOR Shortwave Receiver

A joint venture between AOR UK and Japan, the new receiver is aimed at the middle price band market, competing with the HF-150 and FRG-100. 30KHZ thru to 30MHZ, strong signal handling and easy to use, this is the first time AOR have presented their buyers with a receiver designed and built in the UK. Watch this space!

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travaganza is upon us again, thing people ever seen at one time in usand people poured through the pounds worth of equipment at

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LANDSAT CD-ROM Image Sampler

I spend more time on the internet during weekends because of the lower telephone charges, and exploration to find satellite info for 'Info in Orbit' is my main aim. One such 'surfing' expedition led to the company Intermountain Digital Imaging (IDI), which, in co-operation with CORE Software Technology and the Earth Observation Satellite Company, released the *Satellite Image Sampler* CD-ROM. I should say that I have previously approached a number of UK companies with requests for the loan for review of image sampler CDs. None of the companies replied. Contrastingly, my E-mail to Doug Munn of IDI brought an immediate response, and at the prices discussed, I decided to buy rather than negotiate a loan!

My Internet search was for a source of LANDSAT images. New readers often ask whether it is possible to tune into satellites such as LANDSAT. Of course it could be theoretically possible to do so if you have sufficient funds to assemble the hardware needed to monitor multi-GHz transmissions, but it would probably be less costly to buy the images produced from LANDSAT data, rather than attempt to assemble a receiving station. LANDSAT is an American series of remote sensing satellites, the latest being LANDSAT-6. The programme was commercialised in September 1985, with EOSAT (Earth Observation Satellite Company) then becoming responsible for data acquisition and dissemination.

LAND MONITORING - THE SPECTRUM

Everyone familiar with the electromagnetic spectrum knows the continuous spectrum of radiation ranges from extremely short wavelength gamma rays to very long wavelength radio waves. The spectrum naturally divides into regions having similar characteristics, such as the visible portion, to which our eyes are sensitive. Every body in the universe radiates energy, and by measuring the energy radiated by the earth at a selection of different wavelengths, scientists can monitor a variety of land features.

LANDSATS-4 AND -5

These satellites have sensors centred on seven carefully selected frequency bands in the infra-red spectrum, called thematic mapper (TM) bands, ranging from band one (operating between 0.45 and 0.52µm), to band six, using

After spending hours surfing the Internet looking for interesting images for his regular column, Lawrence Harris looks at an interesting alternative in the form of a CD-ROM.

10.4 to 12.5µm; sensor seven uses a band between these extremes.

Band 1	0.45 to 0.52µm	visible
Band 2	0.52 to 0.60µm	visible
Band 3	0.63 to 0.69µm	visible
Band 4	0.76 to 0.90µm	near-i.r.
Band 5	1.55 to 1.75µm	i.r.
Band 6	10.4 to 12.5µm	thermal i.r.
Band 7	2.08 to 2.35µm	i.r.

Different bands provide different types of information. When applied to land masses, soil content (moisture, organic matter and metals) is seen using TM bands 5 and 7. Vegetation is best monitored using bands 1, 2 and 3, which respond particularly well to chlorophyll. Water is monitored well in the visible wavelengths, and its content at different depths can be identified. Algae can therefore be monitored using TM data. The energy sensed with Band 6 is emitted, not reflected radiation from the Earth's surface, so its imagery can be monitored at night. The Multi-spectral Scanner System (MSS) provides four channels (green, red, red to near i.r., and near i.r.), having resolution to 80m and a swath width of 185km. This permits the mapping of coastal features in sedimented water, the mapping of roads and urban areas, and vegetation studies.

LANDSAT ORBITS

Using an almost circular, sun-synchronous, near polar orbit, the LANDSATs provide repetitive coverage of the earth. Their minimum altitude always occurs over the equator, and crosses it going from north-to-south at 0937 local mean solar time. The orbital period is 98.9 minutes, at an average altitude of 705km, and after 16 days, the orbits repeat - crossing the same area. Image overlap between consecutive orbits is 7.6 percent, increasing towards the poles. The 16-day cycle forms the basis of LANDSAT's

Worldwide Reference System (WRS), in which the globe is segmented into 233 paths running from pole to pole, numbered 001 (at an equator crossing of longitude 64.6°) to 233, and each path is divided into 248 rows.

SAMPLER CONTENTS:

The Image Sampler CD-ROM contains images from Landsats 4 and 5, and also a complete Landsat Thematic Mapper image of the Grand Canyon, along with a variety of image processing, utility and educational programs. This forms an excellent introduction to Landsat satellites and how they work.

1. Grand Canyon TM Image 6967x5965 7-band TM and reduced size colour images.
2. 'Around the World in Eighty Scenes' - a collection of 80 satellite 'browse' images of locations around the world downloaded from CORE Software's interactive ImageNet Web site. There is understandably a distinct bias towards the USA - even images in this section exclude Britain. An interactive, educational guide to these scenes is included.
3. LANDSAT Image Tutorial; you can learn how colour satellite images are generated, and create your own false colour images of the Grand Canyon.
4. Browse images from *The Best of the US*, an economical archive of recent Landsat images covering the entire US - coast to coast and border to border. Search software is included so that you can find the satellite scene for any location on Earth.
5. "State Capitals" - a game using satellite images. Learn the names and see the locations of the capitals for the 50 states of the USA. Fine for Americans!

A number of utility programs are included on the CD, so even if you have no image processing or display software, you should find plenty here. I must add that the software includes freeware, shareware and professional software. Documentation explains the process of registration, should you wish to continue to use some of the software.

All images on the CD are in standard formats - JPEG, TIFF and GIF, and text files are included for all images for non DOS/Windows

CONTINUED ON PAGE 54

Geostationary Weather Satellites and a few extra images

Before we take a look at the usual imagery available from WXSATs, have a look at the mystery picture. Can you guess what it is or the circumstances under which it was taken? You will find the answer elsewhere in this magazine!

One of the most common questions from those who have recently taken up an interest in monitoring, concerns the difference between imagery from polar and geostationary satellites, and the nature of their different - yet often similar! - transmissions.

I have assembled a series of images from almost all the geostationary WXSATs, (at least those where images are released,) in order to appreciate the variety and nature of imagery available. Several of these images I collected by direct reception, using a 1.7GHz Yagi and WEFAX receiver for METEOSAT and GOES images; some were downloaded from sites on the Internet - during a period of several days searching! Some new readers asked about other imaging satellites so an image from LANDSAT is shown, which readers can obtain. Credits for help received are given at the end.

The diagram Fig. 1. shows the arrangement of WXSATs from different constellations around the globe. The term 'constellation' is used to describe a group of associated satellites eg., the METEOR constellation. Illustrated are two principal types of orbit in which WXSATs are placed - geostationary (usually known as the Clarke Belt, after its principal discoverer Arthur C Clarke), and polar orbits.

GEOSTATIONARY WXSATS

In Fig. 1. a wide circle is used to illustrate the position of the Clarke Belt - which has a radius of 35800km. This distance is the height at which an Earth satellite has an orbital period of about 24 hours. Because this belt covers different countries there are different geostationary constellations - one or more for each country operating them.

The main WXSATs in this group are GOES, METEOSAT, INSAT, GOMS and GMS - with one or more (such as FENG-YUN) planned for the future. Each group is looked at in turn.

Lawrence Harris' 'Info in Orbit' column has a large postbag reflecting the interest in weather satellites by correspondents around the world. Many letters come from beginners. Fortunately, most stay with the hobby, writing to describe their stations, after several months monitoring.

GOES CONSTELLATION

This group includes several WXSATs; some are 'back-ups' and others are 'under test' craft. The main operational GOES WXSATs are those in two official positions, known as GOES-east and GOES-west. At any particular time, one of the satellites in the GOES constellation can be temporarily moved to either of the official positions. Currently, GOES-9 is the latest WXSAT in this constellation, and a decision was recently taken to move it to the GOES-west position, in due course.

The movement of a geostationary satellite from one location to another is called a 'drift', and it involves briefly firing a thruster to impart extra velocity. This slight orbital change causes the satellite to drift, either eastwards or westwards, depending on the direction of thrust. There is a limit on the amount of manoeuvring fuel available, and, by convention, a residual amount is always retained to permit the craft to be 'de-orbited' (removed from geostationary orbit) after the end of its operational life.

The following summarises the status of all the GOES WXSATs as of summer 1995, taken from an official list of such satellites issued in July:

GOES-2: Launched 16 June 1977; orbital inclination 11.79°; longitude position 176° west; Operation: PEACESAT Transponder.

GOES-2 was manoeuvred to replace GOES-3 for PEACESAT operations. All communication links were terminated after gathering as much attitude data for navigation as possible.

GOES-3 Launched 16 June 1978; inclination 10.76°; longitude position 170° west; Operation: None. GOES-3 was drifted after GOES-2 assumed PEACESAT functions, and in the most fuel conserving mode possible. It had to be within both Malabar and South Pole station fields of view by November 1995. GOES-3 needs to be as far east as 130° west to avoid communications conflict with GOES-7.

GOES-5 is at 67° west.

GOES-6 was being drifted near 107° west.

GOES-7 Launched 26 February 1987; inclination 2.27°; longitude position 134.73° west; Operation: West WEFAX

GOES-7 is still operating well after 8 years in orbit. In 1992, it ran out of north-south (station-keeping) fuel. Since then, tidal forces (the earth and moon's varying gravitational attraction) have perturbed the orbit to a 2° inclination, making raw animation of the earth bob and wobble. GOES-7 was drifted to 135° west in January 1995, and resumed operation at the GOES-WEST slot.

Being positioned over longitude 134° west, GOES-7 has a commanding view of the Pacific Ocean, as seen in the picture, taken on 5 September at 1800UTC. This WXSAT can therefore monitor all severe weather coming from the Pacific to the USA. It is an old satellite and is scheduled to be replaced by GOES-9 following the satisfactory completion of tests. From this longitude, GOES-7 cannot be directly received from the UK.

Launched 13 April 1994; Inclination: 0.05°; longitude position 74.72° west; Sensor Status: Operational East WEFAX.

In January 1995, NOAA moved GOES-8 to the GOES-EAST slot at 75° west. Formal operations began on 1 June this year, when it replaced METEOSAT-3. A transmission schedule is broadcast daily, but a few of the slots have been changed. This avoids some duplication (some image areas overlap significantly) and gives us the benefit of global (whole disc) images every few hours.

Hurricane Allison is shown in Fig. 3., and

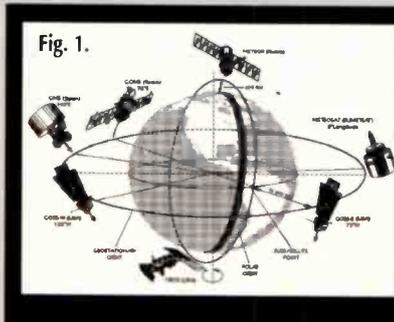


Fig. 1.

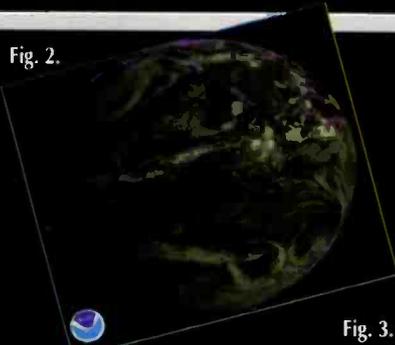


Fig. 2.



Fig. 3.



Fig. 4.

is dated 5 June at 1445UTC. At 1445UTC the sun is not yet illuminating the whole globe, as seen from GOES-8, so a pronounced phase effect is seen. GOES-8 telemetry on 1691.0MHz can be received from some western areas of Britain, including Plymouth, where it is about 3° above my horizon. I have been able to receive good pictures from GOES-8, though I am using this 'official' picture to show the features described.

GOES-9: Launched 23 May 1995; Longitude Position 90° west (for the remainder of check-out).

GOES-9 is the latest addition to the constellation and, as mentioned, is under continuing tests. It is already producing excellent imagery, as shown in the first full disc image taken on 12 June at 1745UTC. Fig. 4. is an image from the Primary Data stream - not a WEFAX image, and shows the crescent earth as seen from GOES-9 at 0800UTC on 12 September. In due course, GOES-9 will be moved to the nominal GOES-east position, from where it will replace GOES-7.

THE METEOSAT CONSTELLATION

The European organisation for the exploitation of METeorological SAtellites (Eumetsat) operates the constellation of METEOSAT geostationary WXSATs, which are positioned near nominal 0° longitude, as in the first illustration. There is normally one operational WXSAT, though from time to time, one or more of the others may be activated for tests. For proper (interference-free) reception, a dish size of 1.8m or more is recommended for WEFAX operations. In common with most users, I have a 1m dish for WEFAX, so some interference is occasionally seen. METEOSAT scans the earth every 30 minutes and produces two main data streams - one containing Primary digital Data (PDUS) at the highest resolution available, and a Secondary Data stream (SDUS) containing a reduced form of the primary data. The picture shown

in Fig. 5. was obtained from the University of Edinburgh, mainly because my own PDUS dish remains waiting for some essential carpentry!

Edinburgh has a 2m dish on the roof, pointing at METEOSAT-5. A downlink from this connects into a Primary Data receiver made by the Electronics Department at Dundee University, Scotland. This in turn sends data to a host PC by a fast IEEE-488 bus. In between slots, the PC copies the received data to a Sun computer on their LAN (local area networked computers) by PC-NFS, where all the data processing is done. All the software is home grown. Fig. 5. was collected via this set-up.

METEOSAT STATUS

The following information is summarised from ESOC's operations report as at July 1995:

METEOSAT-3 is in Standby mission support at 69° west from 1 June 1995, with regular ranging and orbit determination, and one monthly image. It remains an emergency backup for NOAA. Eumetsat conduct battery reconditioning, and the satellite is expected to be de-orbited (moved out of geostationary orbit) no later than 23 November. The METEOSAT-3 lease with NOAA runs out in November 1995, but it went off-line operationally on 1 June 1995.

METEOSAT-4 (MOP-1) is at 9° east and also in Standby mode.

METEOSAT-5 (MOP-2) is at 0° longitude (over Greenwich) supporting the ESA Mission. It is operated by Eumetsat which began encrypting image data and selling commercial licenses in the summer of 1995, greatly

restricting the free flow of weather images to the peoples of Europe and Africa.

METEOSAT-6 (MOP-3) is at 10° west. It was launched 20 November 1993, and is being commissioned, while available as an in-orbit spare, though its calibration is irregular. Radiometric calibration of the first-generation METEOSATs is indirect, through calculations and secondary earth-targets.

GMS

The Japanese Meteorological Agency operate their Geostationary Meteorological Satellite (GMS-5) over 140° east longitude. It appears that GMS-5 is a copy of GOES-7. Their high resolution data is made continuously available on the Internet, from which I collected Fig. 6. As seen from the picture, GMS-5, launched in Spring, views the western Pacific Ocean and east China, as well as Japan.

I was extremely impressed with the amount of data made available from GMS operations, of which this picture is only a small sample. Unfortunately most of the images approach 1Mb in size, so I won't be downloading too many images just yet!

GMS-4 is now non-operational, drifting towards a backup position at 120°E. For the future, MTSAT is now being constructed by Space Systems/Loral, to replace GMS-5 around 2000 AD. MTSAT is nearly a copy of the GOES-1/M series.

GOMS (ELEKTRO)

On 31 October 1994 the first Russian Geostationary Operational Meteorological Satellite (GOMS), was launched from Baikonur Cosmodrome by a Proton launch vehicle. This launch was part of the Federal Service's development programme for the space-based meteorological observing system. An hour and a half after the lift-off of the Proton rocket, the satellite was placed in an interim orbit at an altitude of 200km. A special booster then lifted it to geostationary orbit

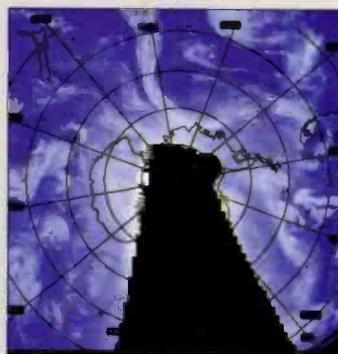


Fig. 11.

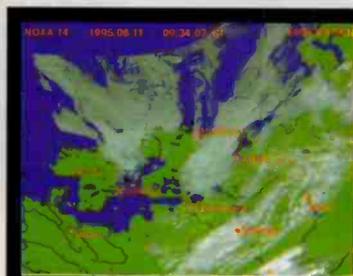


Fig. 9.



Fig. 10.

Fig. 5.

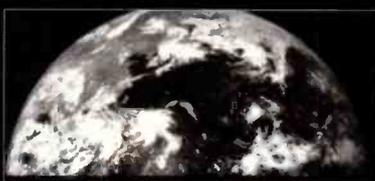
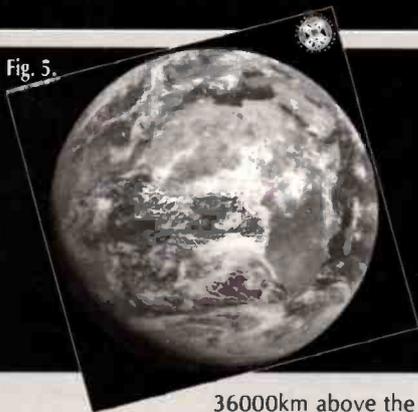


Fig. 6.



Fig. 8.



Fig. 7.

36000km above the earth.

After orbit manoeuvres on 1 November 1994, the satellite was moved to a satellite sub point of 76° east longitude. Telemetric tests of onboard housekeeping and information systems were carried out, apparently revealing normal performance. The only image which appears to have been released is Fig. 7., dated 28 February.

At present, the GOMS attitude control system is being tested using onboard computers. I plan to provide more information about GOMS in future editions of 'Info in Orbit'.

FENG-YUN-2

This is under construction by the Chinese government, with launch expected some time late in 1996. The first model of FY-2 was lost early in 1994 during a fuelling accident that destroyed the rocket and satellite. FY-2 should be placed near 105°E.

FY-2 is not expected to encrypt its imagery, and therefore it will be available on the global networks. "Feng-Yun" is pronounced "Phone-Wheen?" ("?" indicates rising pitch, like a question, OK?).

INSAT

INSAT-3 is operated by the Indian government at approximately 90° east. INSAT is mainly a military communications satellite, and its imagery is encrypted to prevent viewing by surrounding nations. Apparently the imagery is not particularly good, since calibration and pointing are secondary on a comsat. The encrypted imagery represents a major gap in world coverage for cloud estimates. NOAA is negotiating to get more access to INSAT imagery. INSAT-5 is under construction for launch in the late 1990s.

POLAR ORBITING WXSATS:

As regularly published in 'Info in Orbit', and as illustrated by the vertical orbit shown in the diagram, several WXSATS are operated from polar orbit, that is, orbits having an inclination (to the equator) of nearly 90°, which ensures they pass over every point on the earth's surface.

METEOR and NOAA a.p.t. images form a

regular part of 'Info in Orbit', so I am including an h.r.p.t. image, together with one or two of the more unusual images, in this article.

The NOAA WXSATS (currently NOAAs 12 and 14) collect high resolution data from the onboard AVHRR (advanced very high resolution radiometer) sensors and transmit it in two forms - h.r.p.t. (high resolution picture telemetry) and a.p.t. (automatic picture transmission). To receive h.r.p.t. you require a drivable dish to track the satellites and receive the telemetry in the 1.7GHz band. The rewards for operating such equipment include the acquisition of high quality images which few spacecraft surpass.

Scientists at the Space Monitoring Information Support (SMIS) laboratory operate a NOAA h.r.p.t. station. SMIS is one of the Space Research Institute (IKI) laboratories, previously known as the Analytical Research Centre. It is also one of the newest laboratories in IKI, and staffed by highly qualified scientists. They provide a selection of images, and I have chosen one which they have processed to reveal a fire in Israel on 2 July.

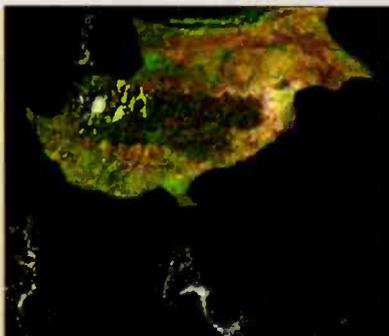


Fig. 12.

The image is published by kind permission of Dr Michael Zacharov.

I must point out that there are dozens of high resolution images available from SMIS, so an occasional picture is likely to find its way into 'Info in Orbit'!

Two other images from IKI are shown as Figs. 9. and Fig. 10.

These show cloud cover over the region of Moscow and central northern and central southern Europe respectively, as at 0943UTC on 11 August.

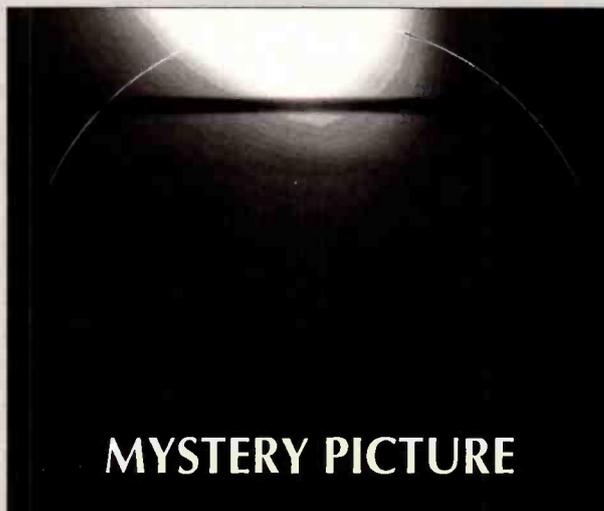
Composite images are included in the transmission schedules for GOES-8, and

are also made available on the Internet at various sites. The Space Science and Engineering Center SSEC released Fig. 11. a composite of NOAA-14 infra-red images of the Antarctic region, dated 9 September at mid-night. Because there is one orbit difference between each passage over the region, clouds move between scans, so merging has imperfect joins.

I recently acquired a CD-ROM containing a wide variety of Landsat and other images, from which Fig. 12. originates. Like the French Spot satellites, Landsat is a high resolution mapping satellite used for commercial projects. By sensing the earth in a number of spectral bands it provides a volume of scientifically valuable data for land monitoring and other purposes. This image of the southern section of Cyprus was taken on 15 December 1989.

CREDITS

My thanks to NASA's Goddard Space Flight Centre for providing most of the GOES images, Ben Huset, Scott Genari of the University of Hawaii, Geoff Chester and Earth Imaging Systems provided helpful pointers to Internet addresses. Thanks also to scientists at the Space Monitoring Information Support laboratory (SMIS in CIS) for providing their pictures. The Cyprus image is reproduced by permission of Doug Munn of Intermountain Digital Imaging of Utah; this low-cost CD-ROM, can be obtained by writing to IDI at 275 East 200 South, Suite 15, Salt Lake City, UT 84111, USA.



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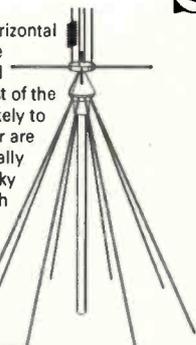


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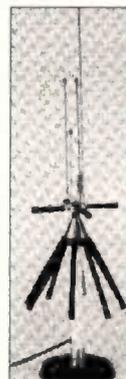
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CONTINUED FROM PAGE 48

systems. The suppliers claim that 650Mb of fascinating satellite images, educational games, and valuable image processing utilities are included.

For this article I selected some images from the sampler which show easily recognised land masses or islands.

There are three ways to obtain the sampler. Via the Internet by E-mail from: sales@idi-ut.com - insert the text 'CD-ORDER' in the subject field. This was how I obtained my copy, by FAX: 001 801 355 4063. or write to Intermountain Digital Imaging, LC, 275 East 200 South, Suite 15, Salt Lake City, UT 84111, USA.

The price depends somewhat on your status; as a educational user I qualified for the lower price of \$12.50 for a package which also included a LANDSAT poster. The normal price is \$20 including postage anywhere in the world. Frankly, I feel that this is a bargain. I paid using my credit card, from which the dollar conversion worked out to a total of about £8! Have you tried to purchase a LANDSAT CD-ROM in Britain for £8?

EOSAT distributes LANDSAT, Indian IRS, Japanese JERS, ESA-ERS and other satellite image data worldwide. CORE Software Technology provides search and browse software for locating and viewing satellite images, and has extensive libraries of images from EOSAT, SPOT, Eurimage, Russian data, and others.

LANDSATS 6 AND 7

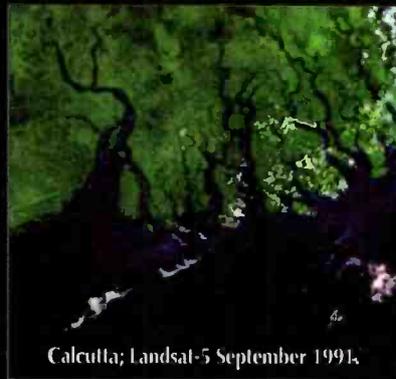
These follow on from LANDSATS-4 and 5, though due to budget constraints, LANDSAT-7 is currently scheduled for launch in 1997. Improvements for this series include the 8-channel Enhanced TM with a higher resolution of 15m, and the SeaWiFS (Sea-viewing Wide Field Sensor) instrument to measure ocean colour.

CONCLUSION

Those many people who monitor conventional WXSATs often do so because of the on-going fascination that the hobby provides. As the technology develops we can expect to be able to advance our capabilities. The actual monitoring of satellites such as LANDSAT is likely to remain beyond the reach of most amateurs, but the occasional CD-ROM can provide a real insight into the high end of imaging technology.

CREDITS

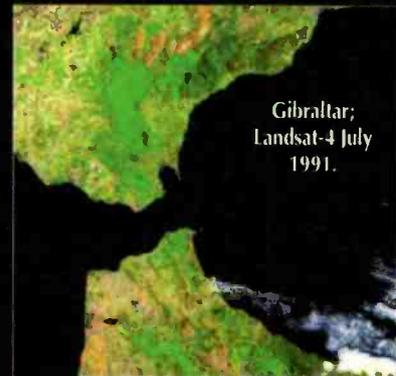
Some information was made available via the Earth Observation Directory published by Matra Marconi Space of Portsmouth, for which I am grateful. Thanks also to IDI and EOSAT as mentioned in the feature, for providing more details of the hardware.



Calcutta; Landsat-5 September 1991.



Corsica; Landsat-4 August 1988.



Gibraltar; Landsat-4 July 1991.



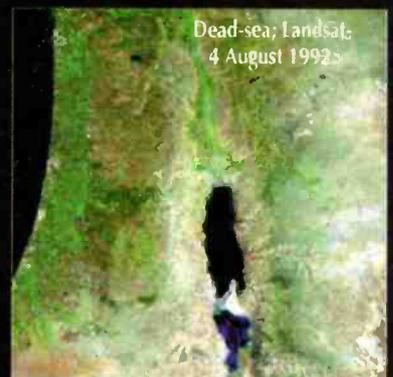
Rome; Landsat-5 May 1987.



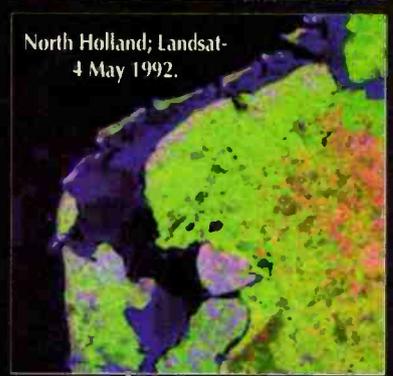
Athens; Landsat-5 June 1987.



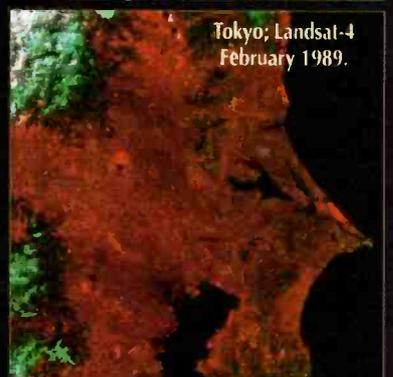
Copenhagen; Landsat-4 May 1990.



Dead-sea; Landsat-4 August 1992.

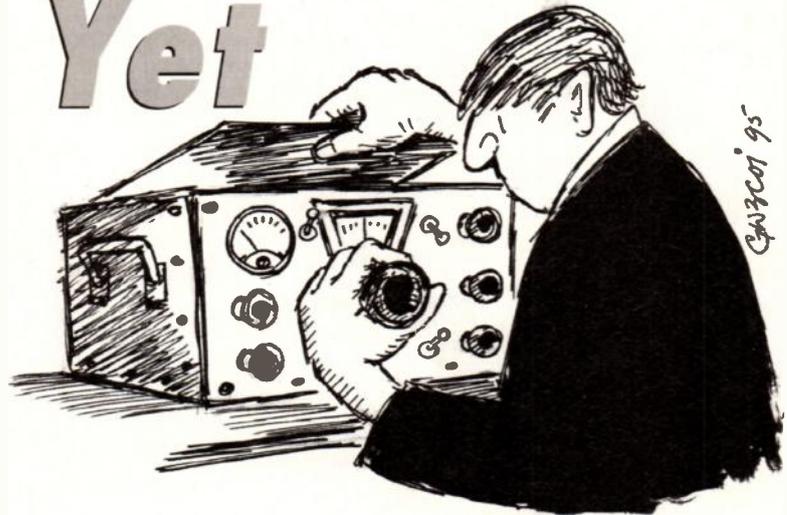


North Holland; Landsat-4 May 1992.



Tokyo; Landsat-4 February 1989.

There's Life In The Old Dog Yet



Reading through the lists of 'Stations Heard' in various magazines, I can't help noticing the wide range of receivers that listeners are using to produce impressive results, and not surprised to find many older models amongst them (*the receivers, not the listeners*).

Why am I not surprised? Because the old 'uns were made to last a long time and unlike today there was not the same marketing pressure to produce a 'new' model at regular intervals, which nowadays leads to the 'old wine in new bottles' syndrome, where an existing receiver is recast in a shiny new box and hailed as a totally new model. An illustration of that was the Trio QR-666 which vanished and reappeared as if by magic as the R-300, and Eddystone were absolute masters of the same game. Anyone who has worked on the repair of the older Eddystone series will know what I mean.

There is that comforting feeling of "I've been here before" when you see the familiar diecast coil box and the mechanically coupled variable bandwidth control diving into each i.f. transformer, which makes you wonder "Is this a 750 or a 680X or a 940?"

However, the mention of Eddystone also reminds me of the unique 'feel' of their receivers, which has not really been duplicated by anyone else - unless you have tried a Hammarlund SP-600 - and the large number of members of the Eddystone Users Group bears witness to the popularity of the brand. There is something rather enjoyable about owning and operating receivers which were designed to be used by human hands; where the tuning knob is at the right height above the desk; where the controls fall right into your grasp when you need them; where the receiver has a comforting solidity; where, dare I say it, the receiver was designed to operate without the need for external devices such as pre-selectors, and best of all where the cost of buying such a radio is

surprisingly low.

Golden Oldies

It's true that the 'golden oldies' lack some features which the latest receivers offer, such as digital frequency readout, the ability to store frequency and/or mode into a memory bank, portability, keypad frequency control and so on, but it's a cold hearted person who doesn't feel comfortably at home with an older radio, and as the newer generation of Hi-Fi enthusiasts are saying "Real audio glows in the dark". So does an Eddystone EA-12 or a Collins 51J-4, and they also have the distinction of sounding nice when listening.

Why this should be has been the topic of much discussion and I would like to expand in a future article, but take it from me, it's a fact that most valved radios are easy on the ear when used.

So far, so good, but what about obsolescence? Some of these receivers are getting on in years, and the companies which manufactured them no longer exist. Does this in fact matter, because the

older receivers were designed in a different way to more modern offerings.

Before about 1970 a designer began with a specification and built the receiver using standard components, including a standard range of valves. If a special component was required, then it was made for the job in hand and fitted the design brief exactly.

With the introduction of readily available semiconductor devices, notably integrated circuits for consumer use, some designers reversed their thinking and began to say "Here's a new chip which combines all the i.f. amplifiers and audio stages in one small package so I'll twiddle a few external components and use it to make a new receiver." In other words the design of the receiver was to

... TO BE USED BY HUMAN HANDS

some extent controlled by the designer of the chip and not by the designer of the receiver proper.

As the domestic consumer market began to use complex integrated circuits in greater and greater quantities, the device prices came down and the range of available chips expanded. Now it was possible to get an entire receiver in one chip, or a complete frequency counter and digital display driver with all i.f. offsets to suit almost any receiver. Things like audio sections were all in a single package, and we began to see devices which allowed remote control of TV channels via an infra red link being used as controllers for short wave radios. This all took place even before the microprocessor came on the scene, but every silver lining has a cloud, and perhaps you recall what happens to consumer devices as the fast moving market moves along. They can become obsolete in a very short time.....

"The Moving designer draws; and, having drawn, Moves on: nor all thy Piety nor Wit Shall lure him back to cancel half a Line, Nor all thy tears wash out a Word of it."
(With sincere apologies to Fitzgerald and anyone who does not recognise the Rubaiyat)

Wonderful Times

Do you recall the wonderful times radio amateur equipment designers had with TV sweep valves when colour TV first appeared. These valves were the answer to a maiden's prayer because they had huge cathodes which could deliver high peak current at relatively low h.t.

and we saw equipment such as the FT-100/101, and the FT-400/401 which could deliver 200 or 300W into the antenna from a pair of 6JS6 or 6KD6 valves - and the best thing of all was that the valves were cheap. They needed to be because tuning up a transmitter using them often ended in a loud tinkling noise as the red hot glass envelope cooled down, and I'm not the only one to have seen a 6KD6 with its anode completely coated in molten glass.

Then came the electronic dawn, and sweep tubes in television sets were replaced by solid state devices. RCA and all the other tube makers shut down the manufacturing plants and the plentiful supplies of cheap p.a. tubes vanished almost overnight. Today if you want a pair of 6JS6 or 6KD6 you will have to pay a high price, and once the final stocks have disappeared you may as well keep the transceiver as a doorstop, 'cos it won't be repairable.

"What has this got to do with me?" the short wave listener may ask. "Well" says I, "your favourite receiver probably contains consumer semiconductor devices which are as obsolete as the old p.a. valves, but nobody has told you that they are no longer available". The crazy truth is that one can still obtain valves for an HRO designed in the late 1930s, but can't locate some l.s.i. devices from the 1980s for receivers which many of you know and love, and that's why there's life in the old dog yet.

So long as nothing goes wrong with the receiver which might cause damage to semiconductor

John Wilson continues his travels through the world of the older receiver, probably treading on a few toes in the process.

CONTINUED ON PAGE 56



... COATED IN MOLTEN GLASS

devices, then there should be few problems, but if nature happens to choose your antenna as the best path to earth for a lightning strike you had better make sure that you have comprehensive insurance cover on a new for old basis, and don't mention God on the claim form. I suppose that you now want me to give a few examples of devices which I know are no longer available, but my advice would be to contact the distributor of the particular receiver you own and ask about the availability from stock of any large scale integrated device which may be needed. Examples of the more common consumer chips would be the digital clock/timer/frequency display devices, integrated audio amplifiers, or dedicated synthesiser chips.

In days of old when knights were bold,

*And 'chips' were not invented,
They had no cares,
They carried spares,
For armour which was dented.*

In the same way, most owners of pre-semiconductor receivers usually have at least a set of spare valves on hand in case of failure, so why not consider carrying your own spare semiconductor devices for the difficult to get items in your own receiver? Saves much heartache when the spare parts man at your favourite supplier says "Sorry sir, that device went out of production four years ago".

Before returning to the subject of 'old' receivers, and before there is wholesale panic in the streets, with owners of 1980s receivers throwing themselves off window ledges, let me reassure you that the more enlightened Japanese manufacturers operate a general policy of keeping a spare parts

holding for ten years or more after a model has been discontinued, so subject to the caveat that even they cannot guarantee the life span of a consumer i.e. you have no immediate worries.

Are then the older receivers obsolete? Strangely enough they are not, although if they have been in the hands of careless owners who have not looked after the external appearance, or have 'modified' them by drilling fascinating holes all over the front panel, they may never recover. For those receivers which have been simply used for their prime purpose, the only things which will deteriorate with time are the valves, and as I have said, many valves are still available at reasonable prices. Some of course are not, and if you own a BRT-400 receiver, you will probably know how difficult it is to get a genuine mixer for it; or for that matter some of the 'magic eye' tuning indicators have virtually disappeared from the scene, but in general there are few problems.

If an old receiver stops working due to a component failure, then there are ready supplies of resistors and capacitors available, even

the high voltage electrolytic smoothing capacitors which have re-appeared to meet the demand for the valve audio market. You are never likely to want a new front panel unless you have taken to beating your receiver with a heavy object, but contrast that with some modern receivers in which many of the push button controls are an integral part of the panel moulding, entailing a complete panel change to replace a single broken digit on the keypad - wow!

Other mechanical components can usually be fabricated even when the original replacements are not available, and I cite as an example the main tuning shaft on the Kenwood TS-520/820/R-820

series which tended to go very lumpy (square bearings was the description) after long use. The official cure was to replace the entire gearbox assembly, but I simply had a small local engineering company turn up some shafts using a worn shaft as a model, and for a couple of pounds the drive could be rebuilt as good as new. Having watched in astonishment as my friend and colleague John Thorpe stripped and re-assembled the entire mechanical drive system on a Collins R-390, replacing bits as he went along, I absolutely know that anything is possible - given the right genius to tackle it.

Repair

Which brings me to another subject; are there still folk around who can actually understand and repair these elderly classics? Well, not that many in my experience - and I do mean experience. However, I have since retreated from the front line to discover the delights of dangling my toes in a trout stream or pruning my vineyard here in Devon. Drop me a line, c/o *Short Wave Magazine* if you like, as I'd be interested to find out just how many older receivers are still in use out there. (Is there still a Collins Owners' Club?)

The Good, Bad and Ugly

Just being old and containing valves does not guarantee that a receiver is automatically good; we also have the bad, and the ugly, so perhaps I should at least give some examples of each. **The Ugly:** this just has to include a receiver called the DST-100 which dates from late WW2. This was the ugliest and heaviest monster you ever laid eyes on, but it actually had



excellent performance, as users even today will testify.

The military receivers seemed to corner the market in sheer ugliness, and devotees of the R-210, R-107, B-21, R-1475, and the B-40/41 (otherwise known as the Towering Inferno) will not disagree that they were products of a twisted brain, even though now sought after as collectors' items. Perhaps having a design brief which included the need for a receiver to resist a frontal impact from the guns of the *Graf Spee* had something to do with it. Looking at non-military receivers, I personally found the HQ-170(A) and HQ-180(A) fairly awkward in appearance, although exceptionally satisfying receivers to use, and coming right up to date I can't get to grips with the design of the top range Sony short wave receivers such as the CRF-V21, all the more puzzling because the original CRF-1 was a lovely looking radio.

The bad: I'm walking into a swamp here because I will inadvertently insult someone's pride and joy, but some of the string and sealing wax drives of receivers like the Hallicrafters S-120/S-200 series, or the National NC-190, made using them almost impossible - a remark which also applies to the Trio 9R-59 or Lafayette HA-600 and HA-800 and receivers of that ilk. Now I'll get really brave and say that some Eddystone models, despite having that superb tuning drive, left a lot to be desired in the performance department.

The 840C was a case in point. For those in the know, the 'case' in point is a pun, because the 840C had the delightful feature of the mains supply connected to the internal chassis in order to give the receiver a.c./d.c. characteristics. Woe betide any untrained *Gefinger Gepoken* inside the 840, and the r.f. performance was on a par with a well-baked plum duff. I suppose someone out there is now sticking pins into my wax effigy so that when I go to that great DX heaven in the sky, Eddy Stone himself will be there to lock the gates and keep me out.

The good: That's easy; almost anything from Collins except specialist items like the R-392; almost anything from Racal provided it's properly aligned and hasn't been 'improved'; many receivers from Eddystone although they generally need careful operating to get the best out of them; top of the range models from the American manufacturers such as National, Hallicrafters and Hammarlund - but beware of the cheaper models; anything from Drake, although they were usually intended for amateur band only operation.

Incidentally the Drake R4-C can

still hold its own in comparison with many modern receivers, and if I owned one I wouldn't let it go, especially if it had a few broadcast band accessory crystals fitted - and a set of spare valves. If you are prepared for strictly amateur band only coverage then you will be pleasantly surprised by early models from Yaesu such as the FR-100B and FR-400, and even more surprised by the later FRG series, but Trio (Kenwood) were slow to pick up the market and didn't produce anything worth while at the time - but my goodness how they hit the world with the R-820, R-1000 and R-5000. I'll draw a discreet veil over the R-2000 in this exalted company, but it had many good operating points which were not always appreciated, and for h.f. s.s.b. aircraft listening the memory scanning was a very useful feature.

Mind you, all of these Kenwood radios were solid state so they don't glow in the dark unless you have an unfortunate accident such as connecting the 12V d.c. power cord to the mains; believe me I've seen people do it and had to repair the resultant damage. I must mention Icom because in the dim and distant past Bill Lowe and I were quite close to Mr. Inoue, and his first receiver the IC-700R, although not without its faults, was a very clever design indeed particularly in the pre-selector area (remember my article on pre-selectors?). If you get a chance to look inside an IC-700R, just twiddle the pre-selector knob and see how the combination of variable inductors and capacitors works - it's the nearest thing to a Collins approach you will ever see, and certainly qualifies Mr. Inoue as an excellent and

innovative engineer. The Icom company is now a very large concern, but I understand from those in the know that Mr. Inoue still keeps a close personal watch on design, which is perhaps why the later receivers have always contained surprises for the rest of the manufacturers.

Don't take the receivers mentioned so far as a comprehensive list of good and bad; there are hundreds of different makes and models sculling around, and each of them has a place in someone's heart. Whether or not a receiver will suit you is a matter of personal tastes and interests, or could even depend on how much space you have available. Not everyone can accommodate an AR-88 on the bedside table, but I do recall Rob Gill using one as a centrally heated settee with built-in music, and I have no doubt that I might see someone staggering on to a holiday beach carrying an R-107 and a 50Ah battery. If you happen to own an oddity (a receiver, not the car) or need to know what a Davco DR-30 was, I am happy to help where I can. If I can't help directly, I probably know where information is to be found and can put you in touch with the right person.

Wallowing

So far in this short series of articles I have probably given the impression that I am wallowing in nostalgia for vintage receivers and paying no attention to modern marvels. Not so; I am constantly surprised by the ingenuity of new equipment when it is truly new and not a re-hashed version of an old model, and I hope to be discussing the finer points of recent designs in forthcoming

reviews. The development of the radio receiver has been going on for a long time and some of the whizzy new ideas are really not that new. There have been points in time when by the introduction of an 'exciting new design', receiver performance has taken a giant leap backwards. Have you had the recent experience of trying to use a Yaesu FT-100/150/101 as a receiver? By leapfrogging over the competition in introducing 'state of the art' solid state design, the FT-101 receiver section took r.f. performance to a new low, and all the more surprising considering the good performance of the Yaesu fixed station receivers (which had glowing valves in them!).

I accept that the FT-101 was designed as a go-anywhere transceiver and in this it succeeded admirably, but it's nevertheless a good example of how advances are not always forwards; perhaps more of a 'strategic withdrawal'.

My final point therefore is to remind you not to be altogether dazzled by what the advertising says and consider just how much you need some of the so-called features or 'improvements', and certainly don't cast aside your older receivers too hastily. Put them away somewhere safe and listen to them a year or so later. Just like people, you will be surprised how good the old ones can be.

Happy Listening



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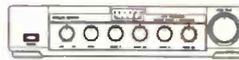
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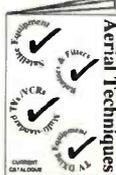


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Reflections

Not being one of the world's most tidy people, my desk is often cluttered with papers concerning the work in hand. Consequently my computer mouse was either buried in documents or did not have room to be moved around. To overcome the space problem I replaced the mouse with a trackball, **Fig. 1**, which made my desk tidier and the work a lot easier.

Briefly, a trackball is a super 'upsidedown' mouse. The case work and lead remains still on the desk while the on-screen pointer is moved by adjusting the ball with your fingertips. The trackball in **Fig. 1** is a Otronix that I purchased from a branch of Escom for the reasonable price of £14.10. Its base is approximately 120 x 145mm and the shapely top rises from about 20mm in the front to 47mm at the back. The ball has a diameter of around 47mm and sits just above the left, right and centre 'buttons'. A good length of lead is provided and fitted with a 9-pin plug to fit the RS-232C serial port. Although its own software is provided on a 3.5in disc, I found it worked fine on the Windows mouse driver already loaded on my computer.

Astronomical Observations

Solar: **Ron Livesey** (Edinburgh), using a 2.5in refractor telescope with a 4.0in projection screen, found one active area on the sun's disc on July 1, 2, 4, 6-10 and 16, three on the 3rd and seven on the 17th. As usual **Patrick Moore** (Selsey) observed the sun daily, using his projection system, and he told me that from July 29 to August 16, there was not a sunspot in sight.

Aurora: The auroral co-ordinator

for the British Astronomical Association, **Ron Livesey**, received reports of auroral manifestations, from an observer in North Dakota, during the overnight periods on July 16/17, 23/24, 24/25 and 30/31.

Magnetic: The magnetometers used by **Karl Lewis** (Saltash), **Ron Livesey**, **David Pettitt** (Carlisle), **Tom Rackham** (Goostrey) and **Tony Rickwood** (Gillingham), between them, recorded strong disturbances to the earth's magnetic field on July 15 and 16 and lesser events on days 17, 19, 20, 23 and 24.

Technology

Recently, a colleague and I were talking about the changes in radio

design that we had seen during the past half century and the current marvels of microchip/computer technology. At one point he said, in jest, "It's as though the textbooks on v.h.f. propagation have been rewritten". Since then I have seen two examples that made me wonder, hi! First, during the hot August weather Joan and I were having tea in the garden and listening to BBC Radio 4 on a small Sony portable. The set's own 350mm telescopic antenna was fully extended, but, should we have received a very strong f.m. signal with the set laying on its back on the lawn and its antenna horizontal in the grass?

Secondly, we had a day coach tour of the Isle of Wight and, on our

return, the driver received a call on his 'pocket' mobile phone that was sitting on his parcel shelf without even a bit of its antenna showing. What's more, when the phone rang, the ferry was just entering its dock at Portsmouth and the coach was parked on the lower car-deck. I would have thought that the surrounding steel structure of the vessel would have prevented the signal



Fig. 1.



Fig. 2.



Fig. 3.

from reaching the phone, let alone the metal work of the coach itself, but it didn't!

Marconi

Our coach stopped at Alum Bay for tea where I found the

commemoration stone on the site of the The Needles Wireless Station. One of the four plaques, **Fig. 2**, on the structure says that the station was built under Marconi's personal supervision nearly a century ago in 1897 and another, **Fig. 3**, relates that on the

15 November 1899, "information for the first newspaper ever produced at sea - The *Transatlantic Times* - was transmitted from this station by wireless telegraphy and printed on the US liner *St. Paul* when 36 miles distant." The station was dismantled in June 1900.

Fig. 4.



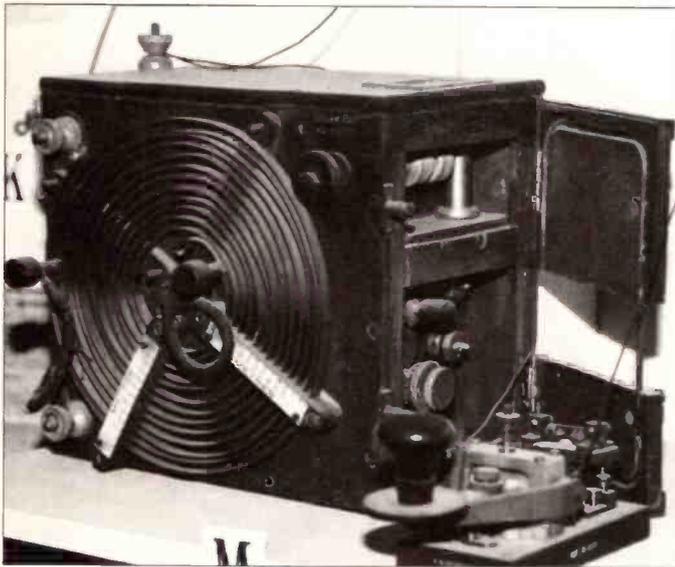


Fig. 5.

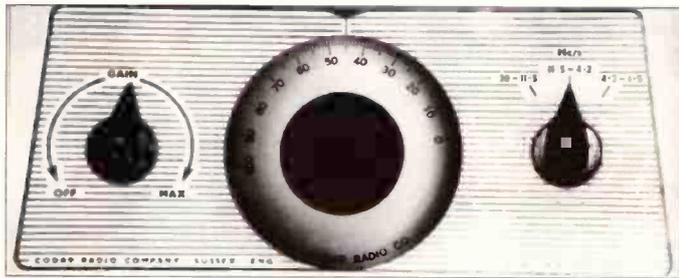


Fig. 6.

Music Of Yesteryear

On August 24 Joan and I joined a party going to Ashorne Hall, near Warwick, to see their collection of mechanical musical instruments. During the guided tour a variety of music-boxes, nickelodeons and organs were demonstrated and later we were entertained by a very talented young organist, Craig Boswell, playing the mighty Compton Cinema Organ. Ashorne Hall has its own cinema where the Compton rises through the floor, in a blaze of colour, in traditional style. In addition, there is a chance to ride around the grounds on a narrow gauge garden railway. Their brochure describes it as 'The Entertainment Spectacle Of Yesteryear' and believe me, readers, it sure is. Club secretaries,

looking for a Christmas party venue, or a good day out for the members, can obtain details from, Ashorne Hall Nickelodeon, Ashorne Hill, Near Warwick CV33 9QN or phone (01926) 651444.

Weather

Apart from an evening shower on August 30, that only dampened my rain gauge, I did not record any rain throughout the month. This compares badly with the same period last year when I recorded 2.09in. Most other parts of the UK have similar drought problems, however, the total rain fall in our neck of the woods for April, May, June, July and August, inclusive, was only 3.86in. The same months in 1994 produced 11.12in, that means that we are 7.26in down. I cannot remember



Fig. 7.

ever putting zero in the monthly rain log before this.

The daily variations in atmospheric pressure from July 26 to August 25, Fig. 4, were taken at noon and midnight from my own barograph here is Sussex.

Tropospheric

"I haven't had much luck with DX this year even though we have had some of the hottest weather for years," said **Richard Bell** from Melton Mowbray. I agree Richard with almost steady high pressure and frequent high temperatures, often in the 90s Fahrenheit, I thought there would have been a few good openings. This suggests that another ingredient for a good tropospheric opening was missing. However, Richard did receive pictures in the u.h.f. bands from Belgium (BRTN), Holland (NED2&3) and Germany (ZDF) on August 19 and 20. During these good conditions he logged his usual list of UK stations but at times the continentals won the day. At one time he had pictures from Yorkshire TV on Ch.25, but, as the night progressed these lost out to Germany's ZDF.

Returning to Edinburgh, by train, on August 11, **George Garden**, using a Sony ICFM50 RDS receiver, had an interesting haul of Band II DX. During the journey he logged programmes 1, 2 and 3 from Norway (NRK), Radio Borders, Century Radio, Northbound Radio and BBC Radio York. "The RDS display made confirmation easy without waiting a long time for idents," said George.

Vintage

While clearing my archives, I found a couple of photographs that I thought would interest the collectors among you. Fig. 5 shows an aircraft spark transmitter of the type used during the first world war and Fig. 6 displays the front panel of the single valve Codar pre-selector made, I think, in the 1960s. I found that the latter worked very well and really is efficient when trying to sort out and pull in a distant station. The variable gain control is on the left, the tuner in the centre and the three-waveband selector, 1.5 - 4.2MHz, 4.2 - 11.5MHz and 11.5 - 30MHz is the switch on the right.

SSTV

During the World Scout Jamboree, August 1 to 10, a team of operators from the Glasgow club station, GS4AGG, situated at Auchengillan, made many contacts with amateurs around the world. The station's antennas, a TH6 beam and a quad beam were mounted on a mast, about 25m high, with a good take-off. "The Scouts visiting the station from Germany and Poland passed greetings messages back home and also saw amateur radio at work," said **John Scott GM7UIK**. John added that the weather was kind and that the event was enjoyed by all concerned. GS4AGG also exchanged slow scan television pictures, in colour, with stations in Belgium, Fig. 7, France, Fig. 8, Holland, Italy, Fig. 9 and Sweden.



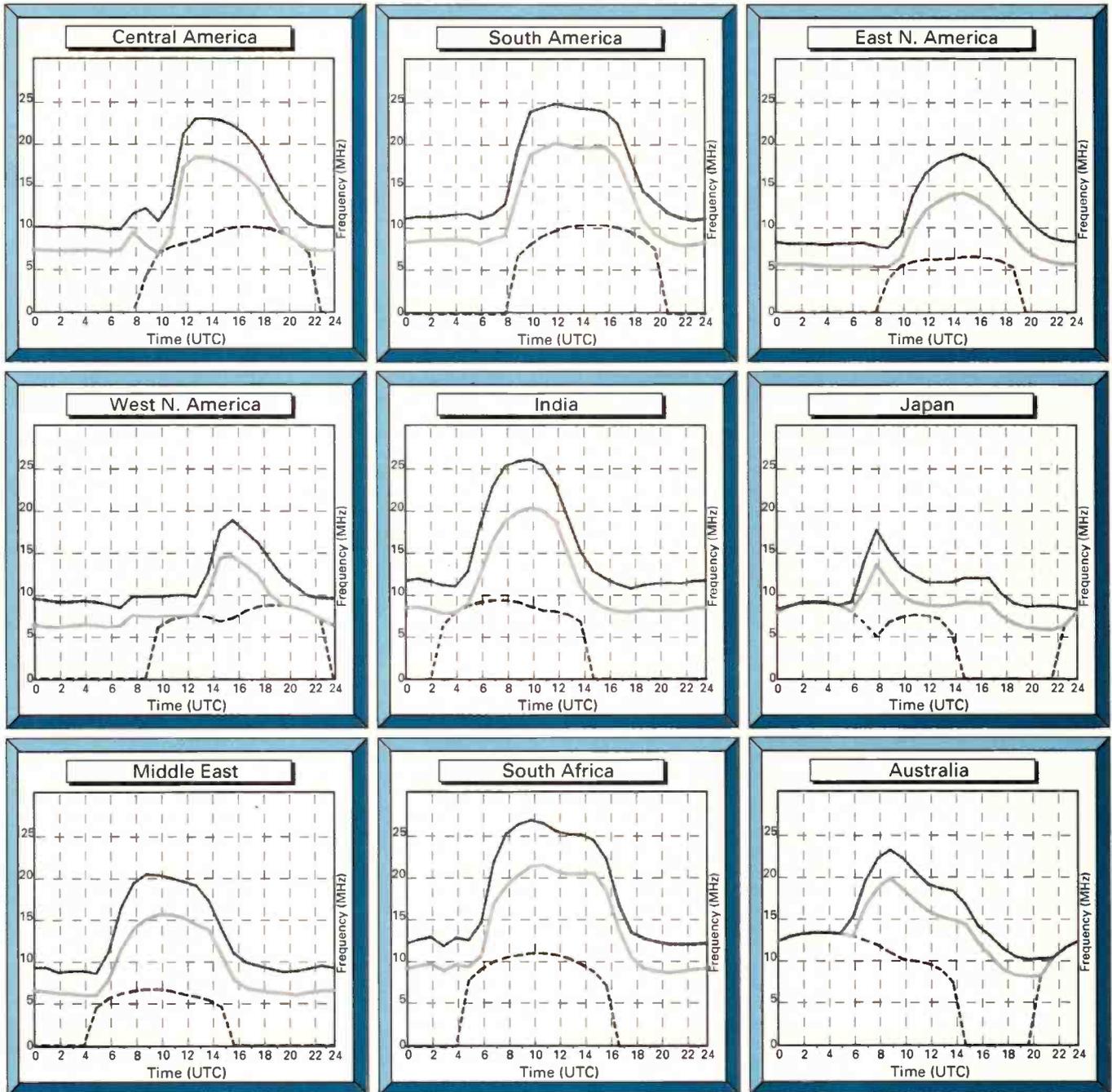
Fig. 8.



Fig. 9.

World Propagation Forecasts November

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success below this frequency are very slim.

The middle line indicates the optimum working frequency (OWF) with a 90% probability of success for the particular path and time.

Lastly, the upper dashed line, represents the maximum usable frequency (MUF) a 50%

probability of success for the path and time.

To make use of the charts you must select the chart most closely located to the region containing the station that you wish to hear. By selecting the time chosen for listening on the horizontal axis, the best frequencies for listening can be

determined by the values of the intersections of the plots against frequency.

Good luck and happy listening.

Satellite TV News

Orbital Sightings

First this month some notes for dish d.i.y. enthusiasts...after seven years of continuous use my 1.5m prime focus dish was looking decidedly scruffy. The stand and rear mechanics are both sheltered, greased and generally in good condition, but the white face had weathered and suffered paint destruction from a sticky substance deposited from the apple tree branches above. The tree apparently had an aphid disease, lots of little insects which caused knobly swellings on the branches and killed off the tree last winter. The stickiness had dissolved the paint, exposing the aluminium underneath and leaving a very rough surface.

The dish was restored to its former splendour as follows. Using very fine emery cloth the rough area of the dish - about one third of the face - was carefully smoothed down, a long job with fine emery, but the result was a completely smooth surface. (The original paint across the irregular area was not completely rubbed off, the surface was merely treated to produce a smooth feel and to lose all roughness). The dish was then washed with warm detergent water and again with warm clear water and allowed to dry. Using the larger spray cans of white primer from car accessory shops, the complete dish surface was sprayed carefully, several times over a few days - I used two cans - until the whole surface of dish face was well covered - particularly the suspect area. The surface now felt slightly rough. Again using very fine emery cloth the primer surface was sanded gently just sufficient to present a smooth surface to the touch. Another bucket of warm tap water and surplus white paint dust was washed off, once dry the feel was of smoothness.

The top coat of paint was now applied, I used three large cans of 'domestic white gloss' spraying as before over several days, taking care not to overspray and produce runs - avoid windy days as leaves, wasps, flies all like to inspect any wet painted surface! I used as a final spray coat Hammerite smooth white gloss, perhaps a luxury and the cheaper domestic spray would suffice. Discount motor spares shops carry suitable spray paints. Although gloss spray was used, the finished result gives more of a matt shine but the appearance is that of a brand new dish. Obviously a smaller dish will use much less paint, total cost of materials (1.5m dish) comprising one very fine emery cloth sheet, spray primer x2 and spray domestic

gloss x3 was £15, the de-luxe Hammerite (perhaps not essential) another £6.99 - the result - a brand new looking dish!

Whilst I've been busy painting my dish, other readers have been actually using their dishes and with some interesting sightings. Several readers comment on the very active 'UKI-78 SARAJEVO' SNG output for various European and North American broadcasters out of former Yugoslavia that from early September through to the present with output featuring the UN/NATO bombing against the Bosnian Serbs. This feed is carried on Orion 1 Atlantic (at 37°W) usually on or about 12.660GHz vertical, main customers seem to be BBC News and ABC News, New York with both recorded packages on playout or live inserts into news programmes. Orion seems to have taken over as main analogue player from Eutelsat II F1 at 13°E though of course various news feeds may be carried digitally compressed that are invisible to our analogue equipment! Recent analogue news feeds out of former Yugoslavia have been noted on the 10°E Eutelsat II F2 (11.156GHz horizontal) and 16°E II F3 (12.538GHz vertical - more often used by Belgium's VTM unit).

Stepping back into July and I reported an Intelsat 515 18°W live news feed of what seemed prison unrest, police cars, onlookers and the Italian media in force at the Questra Brescia prison feeding via the 'ITA 30' unit from early afternoon through to very late at night. An explanation has arrived from **Mr. Charlot Zahra**, a satellite enthusiast in Malta. What was relayed via ITA 30 was a round-the-clock coverage SNG feed for the three Fininvest TV stations (Canale 5; Italia 1; Rete 4). The event was the interrogation of former anti-corruption magistrate Antonio di Pietro through to 0145 the following day at the Brescia Police Headquarters in North Italy. This explains the close-ups of office windows and numerous police vehicles. The word 'Questura' is in fact mispelt, correctly it's 'Questura' and stands for police headquarters. Thanks to Charlot for this information.

And another mystery solved - 'CPT CAPAJEGO' seen via Eutelsat II F4 at 7°E as a stand alone caption, letters from Sri Lanka, Italy, Poland and the UKI advise this is 'SRT Sarajevo'.

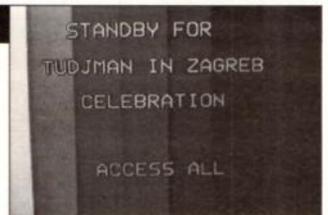
I happened across the Hispasat 30°W Spanish satellite recently lamenting a lack of on-board customers. Afternoon outside broadcast coverage linking seemed

very busy and it's well worth checking out the bird as you whirl across the Clarke Belt. Apart from the various TV programme services - numerous now in the clear to encourage Iberian viewers - I found three OB feed circuits, two of the Formula 1 World Championships, another of the American Film Festival and a 4th of the 'Adac Super Touring Cup' at Aarhus.

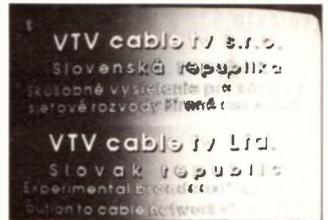
At the same time on this dismal Sunday afternoon my first Star TV (Hong Kong) feed was logged on Orion 1 Atlantic with 'Star TV Main Feed' across colour bars, after a very long wait the feed turned out to be the US Open Tennis Championships I presume feeding into the UK for onwards uplinking to the Indian Ocean Intelsats 510 (57°E) or 604 (60°E) and into Hong Kong. The question would then arise as to a Westerly link from the 'States across the Pacific into China. C Band (4GHz) capacity across America is at an all time high pricing structure with a lack of transponder space. Recently launched Orion will obviously offer attractive rates to attract new customers and the surplus of capacity across Europe and the Middle East will also dictate cheapness.

Bandula Gunasekera (Sri Lanka) is hopeful of at last expanding his C Band installation into Ku Band reception from PAS-4. A letter from **Nicholas Earley** (Victoria, Australia) comments that Western Australia may well access PAS-4 - unfortunately not Victoria! He's upgrading his Ku band installation with a larger dish in the hope of receiving the JCSAT-3 Ku band downlinks from 128°E, now on station. The bird carries 12 C Band and 28 Ku band transducers.

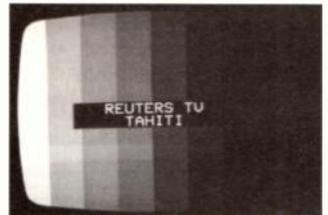
A final word from the Wirral and **John Locker** has been checking out Intelsat 605 at 34°W, a little used bird now with the superbird Orion a few degrees to the West. There are still analogue phone carriers present on this bird, John heard at 11.131GHz vertical several 'phone calls from Southern Europe/North Africa, the carriers between 100-450kHz in both l.s.b. and u.s.b. - this may be the last non-digital 'phone traffic carried by satellite. If you want to try then use a communications receiver, feed the video output via a 75Ω antenna attenuator into the RX antenna socket and tune across the band from say 100kHz upward to 8MHz using lower and/or upper sideband. If there is a 70MHz i.f. out on the satellite receiver then you can feed this signal into a scanner that covers this range.



A news flash warning screen via Eutelsat II F1 at 13°E.



An experimental broadcast by Slovakia's VTV cable company on Eutelsat II F2 at 10°E (10.971GHz vertical).



After the French nuclear test in the Pacific, civil unrest in Tahiti produced several live news inserts, reaching the UK via double hop. This one was Intelsat K at 21°W.



The Sky Sports clock seen here cued up awaiting the end of commercial break to play in the next part of the programme, via Orion 1 Atlantic at 45°W.



Recently seen on Eutelsat II F1 at 13°E.



A very soggy shot of the 'Netherlands Satellite Festival' test card of August 10 last.

Amateur Bands Round-up

Listening to the Amateurs

In my mail this morning was a note that the first sunspot of the new cycle has been sighted. The 'eleven-year' cycle is in fact one of twice that length. Visualise the sun like our earth, with north and south poles and an equator. Now imagine the first spots of a cycle appearing on the sun well up towards the north pole. As time goes on, the spots will peak in numbers and band conditions improve, then the number of spots will fall steadily, and they will appear nearer the solar equator, until we get to the present state where on some days the sun has no spots.

Now, a first spot of the new cycle will be noted out to the southern pole. For a period, spots from the old cycle and the new will both be noticeable, but over the months the new cycle will, as it were, assert itself.

Usually the first spot of a new cycle appears several months before we hear anything significant in our receivers; but at least we know it's on the way, and, seemingly, a bit ahead of schedule. What we call the 'minimum' is the 12-month running average smoothed sunspot number; this allows for the fact that any individual sunspot is a random occurrence. We might see improvement, then, in midsummer next year.

Letters

First, a nice one from **Roy Nicholls G0TNA** in Epsom. Roy spotted Phil Townsend's report on his signals in an earlier issue, went to the trouble of sending me a QSL card and an s.a.e. to forward to Phil. This has been done. However, Roy gets a lot of pleasure from listener reports, especially from places he hasn't yet worked into, and he answers all the ones that are of any use at all. The Nicholls station is, he says "100 watts and a little bit of wire in the garden" and for him to receive a s.w.l. report from JA is quite something.

Cue for Yours Truly to comment that work done on the antenna system is rarely wasted effort. Never forget that the apparatus in the shack is - more or less - equal for us all. The skill of the operator comes from practice as a listener and can be cultivated, but the antenna is the key. There is no doubt that a one-band system is best, and that means, in

the end, something like a dipole, carefully adjusted and set-up with the elements facing north-south so it 'looks' east-west.

For a long time I had a string of dipoles, one per band, each pre-made and resonated. Insulators on the supports at each end acted as pulleys, and I could lower an antenna and have its replacement up in moments. On the bands for which I couldn't accommodate a dipole I put up the lowest-frequency dipole, strapped both legs of the feeder together and to the antenna terminal of my tuner, and tuned it up against ground. 'Ground' of course means just about everything; wire fence, buried wires all over the place, the odd above-ground radial wire, and anything metallic and buriable. That set-up worked well for a long time. As for beams, the trap losses in the tribander make the difference between it and a monoband Yagi quite noticeable.

In Barnsley lives **Colin Dean**, and he's been giving most of his time to 14MHz sideband; AP2N, A61AN, A71DX, A92FZ, BV4BN, BV5BG, BV5GU, DU7COO, DU7SAN, DU1SSR, EX9MWW, HS0/G3UUM, JY5GA, OD5VT, OH7EH/OH0, PT7BSH/PY0G, R1/N9FNQ/FJL, WD5JYP/AM over SU-land, SU1SK, TA4/G0LYZ, TR8XX, TU2DP, T53LB, VK6WOG, VR2KF, VU2BIX, XT2CH, YE5ORI, Y11KN, Y11RS, Y10EB, Y10VP, 1B1AD(?), 3V8BB, 4J0/IK2BHX, 4K6D, 4S7EF, 5A1A, 5H3TA, 5N3MZ, 5X4F, DK3LQ/6W1, 7Q7NC, 7Z1IS, 9G1BL, 9G1YR, 9J2AE, 9K2HN, 9L7AH, 9L7PG, 9M2CW, 9M8DJ and 9N1RHM. Turning to 18MHz Z2/DL1GJP, 5N0T and 7K2PMJ were spotted.

Now **Simon Oliver** of Ashford. Simon has already reported to the 'Junior Listener' column, and he runs a Yaesu FRG-7 that is buckled to about 65m of wire. Simon found 14MHz signals from (July 18) DL7JJW, SK0S; (July 19) LU9HH, 5B4ES, N2II, IK7ZKK; (July 21) Z37KWY, Z31RB, 4X4MO, and K4IO. G0INF was noted on 3.5MHz on July 19, and on Top Band a very weak N1?SW. On July 21, 21MHz produced EC2AEQ, and 28MHz CT1UD; on July 22 the latter band showed up CT1EEB and I4UJI.

In Yeovil, **Don McLean** found daytime conditions weren't too good in August; 14MHz often didn't open till as late as 1500UTC, with 18MHz from 1900, but during the first week of September things perked up a bit. Loggings on

sideband included Europeans on 21 and 28MHz, while on 14MHz A92Q, AP2JZB, HC8KU, HI8FCR, HS0/G3NOM, J47Z, JAs, N7QXQ/HR6 (for IOTA NA 057), P40CR, T88A (Seborga), TI4CF, V51BO, VU2BEJ, W51JU/CY9, YB5AQQ, YE50INA/8 (IOTA OC 146), ZC4C, ZP5FGS, ZS50A, 3V8BB, 4J0FR, 5H3MZ, 9G1RY, 9G1YR, 9K2HN and 9L1HG. At 18MHz entries were made for AA1BU/KP2, AA4VK/CY9, AP2TM, CN8TM, CP8XA, D44BS, FY5GF, HC1JO, HJ6SQQ, HK0ETU, HK0TCN, J73VE, J28JA, J28JJ, assorted JAs, KP2/VS6CT, KW2P/CY9, N7QXQ/HR6, PJ8AD, PY7XC (IOTA SA 046), SV2ASP/P (Mount Athos), TA2ZP, TJ1AD, TJ1JD, TZ6VV, YB2ARW, YS1ZV, Z21CS, ZC4C, ZD8JP, ZB2FX (and the same station using ZG2FX), ZF2DR, 5A1A, 5N0PIL, 9J2JOCV, 9M8DA, 9Q5L; that leaves 24MHz where D3T and S92SS were noted.

By contrast **Ted Trowell** is an all-c.w. type based on the Isle of Sheppey. On 21MHz there was a lone LU5GPL at 1500UTC and the same time served for 18MHz where W0IAK, 5N3/SP5XAR, J28JA, PY2OW, OD5/SP7LSE, OH0/DJ6AU, OH0/OH1NSJ, EA8CN, K8JJC and W8SUF were found. It was 0500 when Ted looked at 14MHz for 9Q5MRC, J28JA, OH0/DJ9LE, 7P8SR; with noon as the time for OY2M and VU2BK. At 1500 Ted logged JA6BDB, JH4JNG, 9K2ZC, JY74Z, JA6EXW, ZS6ME, JA4AHV, JA7BO, SV9DKA, 3B8/NK6F and 9V1WW. The 0500 start applied on 10MHz too for VK3ATC, ZL2UW and ZB2AZ. Another 0500 job was on 7MHz; here the keying of 3V8As, VK3RP, KO4IO (a twelve-year-old) OH0/DJ6AU, FY5YE, ZL2UW, PY7ASF, CO3IF, TK5MP, ZL2AGY, ZL2OT, CO2PL, 9H1AM, ZL2CD, VK2BTH, T15NW, N7DD, PY2XB, FM5GJ and VP2MDE.

On a different tack Ted wonders if anyone else noted the c.w. signal on 6.995MHz sending 'Z12' that was spreading right up to 7.080MHz on the morning of August 14?

Top Band

Half the battle on Top Band is to know what's what. Two sources of information are the occasional *Top Band Newsletter* from G3RBP/G3XTT. Although the Newsletter is not charged, the costs of around \$1 per person per

issue are solicited - as well as input! A second source is the UA9CBO/SP5INQ information net on 14.339MHz at 1230Z each Saturday. As we are approaching the winter season when the band is at its best, get ready for some night-owling. Favoured, of course, are the grey-line times, and also dawn at the eastern end of a path.

Back with **Ted Trowell**, some QSL addresses: OD5/SP7LSE to PO Box 60151 Hamburg 22215; T15NW to WB3LUI; J28JA to F2BU; 3V8AS to IK5GQM; 9Q5MRC to G3MRC; FY5YE to W5JLU; and HA9SVK to HA8RJ. **White Rose SWL Contest** The next one is between Noon January 13 and Noon January 14, UTC of course. The revised Rules are too long to reproduce in full, but an s.a.e. to **David Whitaker, c/o White Rose ARS, 57 Green Lane, Harrogate, N. Yorks HG2 9LP**. There is a plaque for the overall winner, and Certificates of Merit at the discretion of the White Rose ARS.

Finally a letter from **John St Leger**, of Throwleigh in Devon, who recalls the SLP (Set Listening Periods) as it was originally conceived by LH Thomas G6QB and Austin Forsyth G6FO back in a 'forties magazine called *Short Wave Listener*, and later, of course, transposed to the listener column in *Short Wave Magazine*, and on continuously to now. G6QB was maybe better known to the world as 'Howard Thomas at the BBC Theatre Organ'. Suffice it to say Yours Truly heard the story from both men at first hand. As for John, in those days he used a home-brew two-valver and a piece of wire. Not so many years further back again, such would have been known as an AOG Antenna - AOG meaning 'Act of God'!

Finale

That's about all for the moment. As usual, the deadline is the beginning of the month, addressed as always to me at Box 4 Newtown, Powys SY16 1ZZ.

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73 from Dave G4KQH, Technical Manager.

Bandscan

America

Still another commercial religious station has come on the air in the United States. WGTG is now broadcasting on 7.355MHz from McCaysville, Georgia. The first several weeks were to have consisted of test announcements but by now the station may have its regular programming on the air. The test announcements were being aired on weekends between 1300-2200. No schedule for regular broadcasts has been announced yet. The transmitter is a home-built unit of 50kW, the antenna a rhombic beamed to Canada and Mexico. Reception reports can be sent to PO Box 1131, Copper Hill, Tennessee 37515, which is not far from the transmitter site in Georgia.

Family Radio, which owns short wave station WYFR, has sold its f.m. station in San Diego, California for \$9 million. The reason for this move, supposedly, was to continue to fund WYFR, which is reported to be losing \$3 million per year. We've heard that a couple of the other big US religious short wave stations are also having financial problems.

The US Army's broadcasting service plans to test a new mobile radio station, which would be conducted on 1.670MHz.

No information is available as to the hours or approximate start and

end dates.

The Voice of America is now making use of some of the transmitters of Radio Free Europe/Radio Liberty. Holzkirchen, Germany, carries VOA in Russian on 7.270MHz from 1800-2100 and Lampertheim, Germany, has VOA in Uzbek on 15.235MHz from 1500-1530 weekdays and 1530-1545 Saturday/Sunday.

Radio Miami International (WRMI) continues to carry a programme in Creole intended for listeners in Haiti. Radio 16 Desanm is aired Monday to Friday from 2100 to 2300. WRMI's full schedule now runs from 2030 to 0400 and 1100-1400 plus 1700-0000 on Saturdays and Sundays, all on 9.955MHz. Adventist World Radio's *Wavescan* DX programme is aired Mondays at 0000, Tuesdays through Saturdays at 0030, Saturdays at 2200 and 2345 and Sundays at 1130.

WRMI's main, self-produced programme, *Viva Miami*, airs in English and Spanish Tuesdays through Saturdays at 0000, Monday-Friday at 2030 and 2300, Saturdays at 2100, Sundays at 1330 and 2200, and at 2230 on the second and fifth Saturday of the month.

Peru - This nation continues to be the most 'radio active' in all of Latin America. Here are some recent loggings and other developments (Table 1). Radio Altura-Huarmaca is airing religious programs.

Many, if not all, of the stations operating on out-of-band frequencies are unlicensed. All frequencies should be considered slightly variable. Most of these stations should be active until at least 0100, a few as late as 0400 or 0500. All are using quite low power. There seem to be at least some 50 Peruvian stations active on short wave at any one time.

Ecuador - A new station is Radio Buen Pastor, operating on 4.830MHz (in the midst of two or three other Latin American stations!). This is reported to be a 1kW transmitter. Reports should go to OMS International, Saraguro, Provincia de Loja, Ecuador.

La Voz de las Caras (4.795MHz) is celebrating 50 years on the air. Rich McVicar of HCJB says he believes they may be active on short wave only on Saturday nights.

One report says Emisoras Gran Colombia is due to return to short wave soon (on 4.960MHz) but another source says that's not so, that it's unlikely the station will

return to shortwave at all.

HCJB should have discontinued its s.s.b. transmissions on 15.540 and 21.555MHz if they stuck to their plan to do so as a cost-cutting measure. Programming from Trans World Radio's studio in Brazil (Radio Transmundial) is no longer being carried by HCJB, at TWR's request.

Radio Luz y Vida, 4.850MHz, has returned to short wave after an absence of some two years. Sign-off time is probably 0300 or 0400.

Mexico - Radio Huayacocotla has been given back its authority to operate on shortwave. The Mexican government had earlier ordered the station to close because of technical violations, though the station said the real reason was its strong support of the indigenous people in its coverage area.

Radio Huayacocotla has since been heard on its regular 2.390MHz frequency. The station would prefer to broadcast on medium wave but so far has not been allowed to do so. If it ever gets permission it is likely the short wave would be dropped.

Paraguay - Radio Encarnacion on 11.940MHz is not often reported in North America but it is being noted lately around 1200. 0000 is a likely time for reception in Europe.

Uruguay - Watch for a new entry from Paraguay's neighbour - Radio Emisora Ciudad de Montevideo should be operating on 9.650 and 15.230MHz soon. Also, the long-time government station SODRE is expected to begin resume its international service shortly.

Costa Rica - Not often reported is Radio Casino on 5.954MHz, a station which has been active on short wave for at least 40 years.

It was recently heard in Spanish around 1200 carrying news from the Voice of America.

Radio For Peace International has reactivated its 19m band frequency of 15.050MHz. The station recently celebrated its sixth anniversary.

Brazil - Radio Nacional Brasilia has a new address: C.P. 08840, CEP 70912-790, Brasilia, DF, Brazil. English to Europe is on the air daily at 1800 on 15.445MHz.

Bolivia - Recent activity from Frequencies tend to vary slightly, usually by a few kHz or less. Sign-off times also vary, and, on the average, tend to be somewhat earlier than Peruvian stations.

New Zealand - ZLXA, the Radio Reading Service station, now signs off at 1200 weekdays on 3.935MHz, while the 7.290

The Radio Canada International transmitter site at Sackville, New Brunswick, is also used as a relay by several international broadcasters.



The Washington Monument is one of many sights in the US capital featured on Voice of America QSL cards.



Table 2

3.478	Radio Padilla
4.451	Radio Frontera
4.473	Radio Movima
4.510	Radio San Joaquin
4.550	Radiodifusora Tropic
4.649	Radio Santa Ana
4.682	Radio Paititi
4.702	Radio San Borja
4.792	Radio Eco
4.925	Radio San Miguel
4.945	Radio Ilimani
5.125	Radio Galaxia (reactivated)
6.015	Radio El Mundo
6.142	Radio Bando Negro

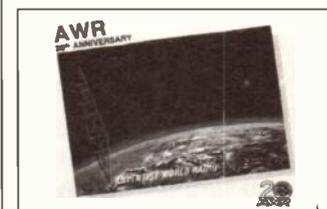
transmitter shuts down at 0800 or 0900. The transmitter which normally uses 5.960 is undergoing repairs.

Guam - Adventist World Radio has obtained the finances needed for a fourth transmitter at its Guam station and expects to have it on the air by the end of 1995.

Papua New Guinea - The main NBC station in Port Moresby uses 4.890MHz from 0700 to 1200 and 1900-2210. 9675 is on the air between 2210 and 0710.

CUBA - You can pick up broadcasts in some of the lesser-known Latin American languages via Radio Havana, i.e. Quechua from 0000-0030 on 15.340MHz, Creole from 2130-2200, 0200-0230 and 0330-0400 on 6180 and Guarani from 2300-0000 on 15.340MHz.

That's our look at the short wave scene in the Americas and the Pacific for now. Join us for more in three months time. Until then, good listening!



This 20th anniversary card from Adventist World Radio shows AWR's first QSL, issued in 1971.

Table 1

Frequencies in MHz

4.000	La Voz de la Amistad
4.183	Radio San Ignacio (not the same as 6.751)
4.504	Radio Horizonte
4.835	Radio Maranon
5.039	Radio Libertad de Junin
5.051	Radio Taysacaja
5.522	Radio Sudamerica
5.547	Radio Paccha
5.556	Radio La Inmaculada
5.660	La Voz de Cutervo
6.521	Radio Illucan
5.700	Radio Frecuencia San Ignacio
5.766	Estacion Soritor
6.045	Radio Santa Rosa
6.141	Radio Concordia
6.201	La Voz de Huamanga
6.204	Radio Cosco
6.239	Radio Superior is a new broadcaster.
6.239	Also active on this channel is Radio Yurimaguas, apparently different to Naranjos.
6.472	Radio Luz y Sonido.
6.499	Estacion 'C'
6.535	Radiodifusora Huancabamba moved from 3.370
6.545	Radio Imperial
6.726	Radio Satellite
6.751	Radio San Ignacio is active past 0300.
6.803	Radio Ondas del Mayo
7.050	La Voz de Santa Cruz
7.560	Radio

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SSB Utility Listening

After last month's write-up concerning Emergency Action Messages (EAMs) I have received more information relating to the way the transmissions are repeated.

You may recall that last month I wrote that an EAM broadcast by one station was often repeated by one-or-more other stations in the minutes following the original transmission. It now seems that there is a pattern. Not all the GHFS stations participate in the re-broadcast of EAMs; those missing-out are Albrook (Panama), Ascension Island and Bayonne (New Jersey, USA).

The most common EAMs sent are either 20- or 26-characters long, but the 'text' after the 6-character preamble never contains the number '0' for some reason; all the other number and letters are used on a fairly random basis, but the non-appearance of the '0' may have some significance. Since starting to research these messages, I have been trying to check the longer messages to see if there are any letters/numbers which never appear. I've only really managed to catch one message longer than 26 characters, so I cannot check my theories yet.

Many EAMs are directed towards specific stations, and these are almost always 20 character EAMs. The callsigns where the broadcast is directed fall into a number of distinct groups: areas (Region Alpha, Region Bravo etc.), actual names (e.g., USS *Ohio*), or 5/6/7/9 character names/words (e.g., Group, Campus, Piccolo, Big Pistol). Some of these callsigns seem to be in use for longer periods of time; the callsigns QUICKEN and DESCENT seem to crop up quite regularly.

This whole process is known as Traffic Analysis, and is one of the basic procedures of cryptography. You can tell almost nothing from a single transmission, however you can 'discover' a surprising amount of information by noting and comparing data over a longer period of time.

Skyking

The other kind of transmission which is heard on the GHFS frequencies is a brief message which begins "Skyking.. Skyking.. Do not answer...". Just like the EAMs, nobody is really sure who they are aimed at, or what they are used for. These messages pop-up at all times of the day, 365 days a year - even on Christmas Day!

The format of each transmission is very precise - 'Skyking... Skyking... Do not

answer', followed by a 3-character 'message', followed by '... Authentication..' and then a further 2-letter code. The whole message is often repeated by other stations in the GHFS network in the minutes following. A typical message could be: 'Skyking... Skyking...Do not answer, Golf, Eight, November, Authentication... Juliet, Foxtrot'.

It would seem that the 'Authentication' codes at the end of the message are time-related. By noting carefully the exact message and time of transmission, you will notice that when the message is repeated by other stations after the original broadcast, if the repeated message occurs in the following minute (or minutes), it will have a different pair of authentication codes. The codes simply move up through the alphabet. If the example above was broadcast at H+11, and the repeat was at H+12, the authentication would have been 'Juliet Golf

Architect

Back in May the RAF's VOLMET service moved to two new frequencies (4.739 and 11.178MHz). These have suffered from quite a bit of interference over the summer months, and by late August they had moved yet again.

Since August 30 (or maybe a few days earlier), the RAF VOLMET transmissions have been operating on 4.715 and 11.193MHz. I feel confident in predicting that the 11.193MHz frequency will be changing again, since it is already occupied by a Russian station (Aeroflot, Moscow, callsign RFNV, using USB and c.w.). The first change (in May, from 11.200) was to comply with the new 3kHz spacing bandplan; the latest change came about because aircraft flying around Europe were reporting great difficulty hearing the 11.178MHz broadcasts due to interference from other stations I wonder where they'll move to next? Maybe we should offer a prize for the closest guess!

Bosnia

During late August and September, the situation in the former Yugoslavia took a turn for the worse. The UN tried (eventually managing) to break the blockade and attacks on Sarajevo by using airpower to destroy the artillery and supplies of the attackers. In a busy two-week period, aircraft flying from Italy could be heard on h.f. passing information about the bombing missions. A lot of traffic was heard on 5.110MHz, where a

station with the callsign 'Bookshelf' was collecting information about the weapons dropped by the UN aircraft, the damage caused, and passing this on to a ground station.

The 'Bookshelf' aircraft is a USAF EC-130 Hercules operating from Aviano in Italy; the 'on-station' aircraft used just the callsign 'Bookshelf', but was relieved several times a day by a replacement aircraft. As the new aircraft arrived on-scene, there were several exchanges between the two aircraft using their full callsigns; one contact that I heard was between 'Bookshelf 81' and 'Bookshelf 43'. Another callsign which has been heard on this frequency is 'Cricket', which is a US Navy E-2 Hawkeye aircraft operating from aircraft carriers in the Adriatic Sea. These fulfil the same mission as the EC-130 Hercules, so obviously the mission is being shared between the two.

Both the 'Bookshelf' and 'Cricket' callsigns have been in communication with station 'Longbow', which is the Air Operations Control Centre in Kislelek near Sarajevo. Similar

traffic has also been heard on 3.178, 6.9325 & 5.788MHz.

Mururoa

Things down in the South Pacific are getting a bit tense. The French announced that they would be performing some underground nuclear tests, and there has been a huge outcry from environmentalists all over the world. A flotilla of boats sailed from New Zealand to the test site, headed by *Rainbow Warrior*. Listeners in Australia and New Zealand have reported hearing comms between the flotilla and maritime shore stations in the region. The flotilla has been heard on 14.313MHz at 0400z, and appear to have a sked with KeriKeri Radio (New Zealand) on 4.445MHz at about 07.10z. The flotilla also has a regular sked at 04.00z on 4.417MHz, but I'm not sure who with. 4.417MHz is one of the 'common international calling channels', maritime channel 421.

Traffic Log

(all freqs in MHz u.s.b., all times in UTC)

2.182	(4/9/95, 18.27) 'Mayday Relay' message regarding gas explosion on a Dutch fishing vessel at 54°07'N 6°34'E, requesting immediate assistance.
5.110	(4/9/95, 06.43) Bookshelf working Longbow, passing-on a weather report for the target area from Bullfighter.
6.683	(16/8/95) Station JWT (Norwegian Navy, Stavanger) working stations NOW5041 and NOW5050, mentioning Thule, Sondre and Narssassuaq (all in Greenland). 'NOW' prefix is used by the Norwegian Air Force.
6.727	(4/9/95, 09.17) Magic 67 (a NATO E-3 AWACS aircraft) working JWT and Magic 71. Later, Magic 71 worked station LBJ on this frequency, and mentioned that this frequency was '405' and 'NK' was 11.2705. They also mentioned frequency '121' - any ideas?
6.9925	(20/8/95, 11.30) Station MFL03 working station MFM33. These are both Sea Cadet Corps (SCC) stations, the naval equivalent of the ATC. They have a scheduled contact session each Sunday at this time.
	(27/8/95, 11.02) SCC station MFM01 calling MFJ99. There was no answer, and MFM01 announced that he was closing the net at 1107.
11.175	(19/8/95, 11.20) Wiser 46 working Croughton, requesting a discrete frequency for some secure traffic. '46 said that they had already tried 'Palladium 1', and that they had contact with 'Maestro. '46 wanted Croughton to meet them on frequency 'Gold 1', but Croughton changed this to 'Grey 1'. I have no idea what this was all about
	(12/8/95, 22.34) McClellan GHFS with a 20-character EAM with the preamble 'DK7ITA'.
	(12/8/95, 22.41) McClellan GHFS with a 20-character EAM with the preamble 'DK3BRB'.
	(12/8/95, 22.51) McClellan GHFS with a 20-character EAM with the preamble 'DKE3C7'. All three EAMs were repeated by another GHFS station, which did not announce its location.
	(29/8/95, 15.10) Reach 506CN working Croughton with a phone-patch to Hilda East, reporting their departure from UTTT (Tashkent) at 1504z.
11.217	(16/8/95, 22.00) Teal 41 (a USAF WC-130 'Weather Reconnaissance' Hercules) working MacDill for a phone-patch. '41 was almost inaudible, but they were reporting on the location of a hurricane approaching the USA; they planned to do a live TV/radio link-up as they flew through the eye of the hurricane, but conditions had changed and they were calling to cancel the link-up.

Airband

Knowing that many readers are ex-service personnel, it's interesting to reflect on the recent closures of familiar bases. I like to hope that this is all possible because the world is becoming more peaceful, but the cynic would argue that it's for reasons of reducing the public sector borrowing requirement.

A friend of mine, **Jim Corbett, WO RAF Retired** (Aylesbury), attended the closure of RAF Swanton Morley (Norfolk) in September. He had been stationed there. The sunset ceremony was apparently most moving. On a practical note to you pilots out there, many of the runways scattered around the countryside are now disused because their air base has closed down. Although they are a welcome sight should an emergency landing be necessary, they are not maintained in good condition and some are obstructed by their new users.

Follow-Ups and Foul-Ups

Apologies for the wrong caption on page 60 (lower photo) of the September issue. The aircraft manufacturer is correctly spelt 'Nord' and I hope that the misprint didn't cause any offence.

Information Sources

If your interest is helicopters in the London area, you could contact **Derek, Nicki, Michelle & Tel** (90 Portland Road, Tottenham, London N15) who have formed the Helicopter Watch Club. I'm not sure if there's a membership subscription - but that's all the details I have so far. So, if the Club would like fuller exposure in this column - please write in again.

The Club members tell me about the London Fire and Civil Defence Authority's new helicopter. Operated by McAlpine with callsign Mac Line 01, it's a Twin Squirrel. Note that an engine failure over a built-up area would be disastrous and nothing other than a twin-engined machine would be acceptable for this application. Also, not all Squirrels are twins! I saw it demonstrating a water-bombing exercise on television news. The water falls from an underslung hopper as a fine mist, an effective agent for extinguishing fires. I'm not sure if

the other Mac Line callsigns are allocated in any systematic way.

The Club members ask about McAlpine and Hayes Heliport. The company frequency in the v.h.f. airband is 123.65MHz and the heliport is (according to my map reading) immediately east of West Drayton at Rigby Lane, Dawley, Middlesex UB3. The Grand Union Canal (main line) runs along the north of the site. The heliport is not itself controlled and so has no other frequency but it is, of course, in the London Control Zone. This means that arriving and departing aircraft need to work Heathrow (and, at times, Northolt) controllers. The main frequency in the Zone is Special VFR 119.9MHz. I have no information on fire brigade liaison frequencies in the 80MHz region, so the Club members should write to John Griffiths' 'Scanning' column in this magazine.

Essential for understanding this type of operation is the chart *Helicopter Routes in the London Control Zone* from the CAA. How do you obtain it? First, send a stamped, self-addressed envelope to the Broadstone Editorial Office of this Magazine (**not to me!**) and ask for the *Airband Factsheet*. This is a single A4 page and I hope that all readers have one by now! Then look up the addresses of the various suppliers (including the CAA) as given in the *Factsheet* and contact those suppliers directly for your needs. There's nothing secret about the available information. All the suppliers listed on the *Factsheet* sell to the general public by post.

Museum Piece

Near to **Des Reed** (Malton) is the Yorkshire Air Museum (Elvington, off the A1079 south-east of York). Des reports favourably on the aircraft to be seen when they have a flying weekend.

How about a trip across the North Atlantic? Des will be able to locate waypoints more easily when he obtains the Aerad NAT1 and Polar charts, the supplier of that is listed on the *Airband Factsheet* that I mentioned previously. Des sends in a route that heads westbound and is mainly to the north of the Shanwick airspace. After approaching the southern tip of Greenland, the flights goes to the RUDLO reporting point at N64°30' W063°00' and the v.o.r. beacon at

Iqaluit in Canada (it has callsign YFB). Hope this sheds some light, Des.

Procedures

Most of the time, pilots are talking to controllers when speaking on the radio. Sometimes they talk to their company on frequencies set aside for this purpose - as in the case of McAlpine described previously. There are also some air-to-air frequencies on which pilots talk to each other and it is these that **R. Frost** (Felixstowe) asks for.

Some small aerodromes don't have a controller on duty all the time. In this case, pilots transmit their intentions 'blind'. They still send position reports, etc., but don't know if anyone's listening. So, an aircraft approaching the aerodrome can hear if another flight is in the vicinity. The usual aerodrome frequency is used for this.

A while back, 123.45MHz was unofficially used for air-to-air but this has had to stop because the frequency has been allocated to an aerodrome. For special purposes, certain other frequencies are available as follows (all MHz).

Gliders have 129.9, 130.1, 130.125 and 130.4. Balloons were also on 129.9 (talking to their ground retrieval crews as well as each other) but should move to 122.475 in the UK and 122.25 elsewhere in Europe. Over the North Atlantic, pilots monitor 131.8 as well as emergency 121.5 but it's unlikely that these signals will reach inland. Helicopters 'landing out' at remote sites warn other helicopters of their intending departure on DEPCOM 122.95. In a similar fashion, UNICOMM 130.425 enables helicopters to co-ordinate themselves when arriving at a major incident scene. Air display teams sometimes have dedicated air-to-air frequencies, perhaps the best known being The Red Arrows (243.45 mostly) and the Battle of Britain Memorial Flight (120.8).

I wonder why the Memorial Flight operate the Lancaster? This aircraft wasn't in existence at the time of the Battle, being a development of the Avro



Antonov An-2.

Christine Mlynek



Prototype

Christine Mlynek

Manchester later in the War. Answers, please!

What happens when aircraft are on the ground? So asks **John Hibberd** (Bridgend). Aircraft can talk to their appropriate controllers: clearance delivery, ground movements or aerodrome control (Tower). Pilots are also linked to their attending ground engineer by an intercom; the engineer plugs a headset into a panel on the aircraft's exterior. If no headset is plugged in, the last resort is hand-signals. Both of these means of communication are definitely non-radio! The usual v.h.f. company or handling agent's frequency is also available to the pilot. At some large airports, pilots can communicate directly with the fire service on 121.6MHz in emergency.

Aircraft are not equipped to speak to ground staff on the latter's hand-helds. These sets, as noted by John, might work in the 455-462MHz region and are usually f.m. Sometimes, the ground movements channel is relayed on one of these frequencies; the ground movements controller is actually transmitting on that channel as



Christine Mlynek

well as the usual v.h.f. one as it's important that ground staff don't interrupt the controller in the middle of speaking to an aircraft. Otherwise, it would be like calling an office that has two 'phones and being told to 'Hang on - the other line's ringing'! The 455MHz channels are allocated for use strictly within the confines of the aerodrome. It would also be worth writing to John Griffiths' 'Scanning' column in this magazine about them, as I'm sure he'd be interested.

Alan Burnett-Provan (Solihull) wonders what happens when contact is lost between controller and pilot. Pilots should never change frequency without telling the controller to whom they are currently speaking; if they do, the controller can end up ringing round the dedicated air traffic telephone network to make sure that the pilot is being safely worked by someone else! One further point, Alan, all LATCC transmissions are sent out by relay stations around the country.

You Fly

Mrs. B (Isle of Man and, at the time of writing, Majorca!) has been flying again. I think that she must know most of Britannia's flight crew by now! This time it

was between Manchester & Palma's Terminal 2 by B.757. She must be getting good at this - her 'guessed' flight plan turned out to be close to the actual one flown, and she seems to have spent most of the flights in the cockpit. Well, is there anywhere else to be in an aeroplane?

I don't think this has happened to him personally, but Alan Burnett-Provan is aware of flap problems on one type of B.747 (not certain whether -400 or classic). If the flaps become asymmetric, they would lock due to their design. Any slight tendency for the aircraft to roll can be corrected by a little opposite aileron trim. Operating the alternate flap power source will only make things worse by driving the flaps to an even more asymmetrical position. After all, it's not the power to the flaps that's failed, but the drive mechanism that transmits the power to the flap surfaces themselves.

Frequency and Operational News

From the CAA comes AIC 75/1995. This shows that the Norwich n.d.b. ('DH' on 342.5kHz) has been withdrawn. Also, the runway 10/28 at St. Mary's on the Scilly Isles has

become 09/27; magnetic north is constantly on the move!

The CAA and the RAF jointly provide air traffic control in the form of the National Air Traffic Service (NATS). A controller from LATCC (part of NATS) has written in to clear up the confusion surrounding new frequency allocations. *En-route* traffic will soon be handled by the new centre at Fareham, Hampshire, but this facility requires extra control sectors and hence more frequencies. Not surprisingly, the new allocation 136-137MHz has been invoked. Unfortunately, even now, many aircraft have not yet become equipped to operate the new frequencies. Hence LATCC are still using some of the old allocations in parallel with the new ones. This has been a relatively simple change. I wonder how airlines will cope with 8.33kHz channel spacing? At present, there isn't even an agreed nomenclature to instruct pilots which frequency to select!

I'll cover the next instalment about secondary surveillance radar next time there's space.

Abbreviations

AIC	Aeronautical Information Circular
B.	Boeing
CAA	Civil Aviation Authority
f.m.	frequency modulation
kHz	kilohertz
LATCC	London Area & Terminal Control Centre
MHz	megahertz
N	north
n.d.b.	non-directional beacon
VFR	Visual Flight Rules
v.h.f.	very high frequency
v.o.r.	very high frequency omni-directional radio range
W	west

The next three deadlines (for topical information) are November 10, December 8 and January 12. Replies always appear in this column and it is regretted that no direct correspondence is possible. Genuinely urgent information/enquiries: 0181-958 5113 (before 2130 local please).

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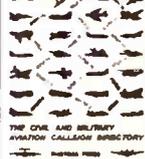
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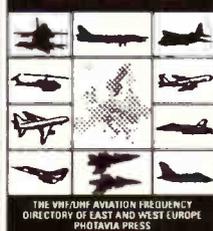


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Scanning

This month I'm going to look at military airband issues - amongst others. I get about 65% of my mail related to this area. As an enthusiast I find it quite satisfying to know that many of you are into airband. However, just for the record, if you wish to know about more technical issues and civilian airband and aircraft matters can I please request that you direct them to my fellow columnist Godfrey Manning? Whilst I'm more than happy to supply frequencies and info on military air under the scanning aspect, any other queries with an aviation flavour should be directed towards Godfrey who writes the definitive article. I think it's fair to say he is the man to ask!

Military airband, as I've said, is a popular choice for most enthusiasts. It's also one of the more frustrating as frequencies and other stuff change on a regular basis. Also it can also be tied in with h.f. - high frequency - aspects so that a good balance can be had. For example, I monitor REACH, which is USAF transport on h.f. and often 'follow' REACH assigned aircraft through UK airspace on v.h.f./u.h.f. and, via Shanwick and Croughton, on h.f. You just need to know the callsigns/tail numbers to be able to (theoretically at least) follow a take off and flight through to landing. However, an aircraft routed Fairford - Andrews AFB cannot be monitored on v.h.f. and u.h.f. during landing - but you can quite easily follow through to its last h.f. reporting point. This, in effect, puts you 'in' the aircraft and is very satisfying especially if you have a map on which to plot the reporting sites and the flight itself. Who said scanning was a simplistic hobby?

Again, you can tie up the s.s.b. issues with the excellent column written by Graham Tanner in here - proving, once more, that the subject of radio is inter-related. Obviously you need to have some equipment available to you - and more than one piece. It doesn't always have to mean spending mega-bucks on something that looks like kit out of GCHQ!

First, if you are a scanner owner into military air then I'd advise you to put the following frequencies in. These are NATO Common, and are available nationwide.

122.1	Tower.
257.8	Tower u.h.f.
123.3	Approach.
362.3	Approach u.h.f.
385.4	Radar u.h.f.
300.8	RAF Low Level u.h.f.
121.5	Emergency/ Distress v.h.f.
243.0	Emergency/ Distress u.h.f.

It's always worth having these in the banks as they would be used by any NATO aircraft using UK airspace. After that, frequencies would be given in 'plain' language for use by the visiting pilot for a particular base. Although not all aircraft would have them and would, consequently, remain on the common channels. UK Military bases use these as secondary frequencies although some bases hold them as primary. The list would be too long to mention here and I would advise you to join one of the dedicated military and airband radio users groups like the Black Cat Aviation Group, for example, for up to date frequencies.

Following on from that, it makes some sense to let you in with an idea of what is available, and how to go about getting it. Maybe you are new to the hobby or maybe you've never really explored the band - whatever, if you know how to get the most out of the hobby then you'll undoubtedly enjoy it better! It's not that hard to do

when you have some knowledge.

Here in Steeple Claydon I regularly monitor Fairford, Brize Norton and Lyneham as well as London Mil to name four examples. A trawl through a typical day of scanning would show the following captured and monitored here:

123.400	Lyneham Radar.
119.900	Brize Norton Radar.
126.500	Brize Norton Tower.
133.750	Brize Norton Approach.
130.075	Brize Norton use in ground/air comms.
118.425	Lyneham Tower/Approach.
122.100	NATO/Nationwide ATC Common.
134.300	Brize Norton/UK/Scottish Military Radar/Area Radar.
127.250	Brize Norton Radar.
275.350	UNID - Air/ground comms.
254.650	Lyneham Ops.

To capture these I first spent hours scanning and then noting down the frequencies. I also cross-checked these with those available in *Airwaves '95*, which is a standard reference work in use with my monitoring activities. Again, frequencies from *The UK Scanning Report* by Paul Wey as well as data from the BCAG's own magazine were used for ID purposes. The noting of callsigns was also made. This then gives me a positive ID - sometimes different to that appearing in other sources of information.

Once I have about ten, that are then regularly monitored for activity, I put them into the VT-225. That is then set up to scan the banks on 'perm' channels. If an aircraft then goes to another frequency that is not in the VT-225, I will 'chase' it with the AR-2000. This enables me to capture individual aircraft progress and also to build up a stud list. Aircraft will sometimes shift to a numbered stud that doesn't always appear in

publications. Scanning - sometimes for days - may well reward you with it.

For h.f. work I would follow through the reporting points on my ATS-803A and Sony ICF PRO-80. These are good, 'workhorse', sets now up and running since my antenna are aloft. It is sometimes possible to hear flights UK bound reporting in, and once you have the destination, it's easy to 'wait' for u.h.f. and v.h.f. copy.

Another example concerns U-2 flights out of Fairford but I think it's not fair to mention a juicy area that is not nationwide! You may, if you live near to an airfield, monitor flights in and out of there. For example, Nimrods out of Kinloss, Hawks from 4FTS out of Valley and USAF flights out of Mildenhall. Then there are the lucky sorts who live near to Boscombe Down that gets some pretty interesting aircraft in and out. In short, it's down to you. However, the use of an h.f. set to tie in any military activity is, in my opinion, a must. If you haven't got one yet - consider it. Let's face it, regular monitoring involves more than one set and you really are missing out on lots of action with just a hand-held.

Radio is a fascinating hobby and scanning is just one aspect of it. It can be tied in with other areas to give a much more rounded picture and to accentuate an area of interest like military airband. It is out there - you just need to look!

Column Mail

Paul Wey has sent in many brilliant frequencies again - ranging from the sublime to the fantastic! For military airbanders, here is just a snippet.
275.350 New LJAO Sector frequency replacing 291.800 Daventry.
230.050 New LJAO Sector frequency replacing 277.950 Dover.
251.225 New LJAO Sector frequency replacing 231.975 Seaford.
233.800 New LJAO Sector frequency replacing 264.475 Clacton.
LJAO - Local Joint Area Organisation.

Table 1 - Steeple Monitor.

Frequencies heard at QTHR.

254.825	Lon Mil East
251.625	UNID ID Required
339.000	Air Refuelling
283.525	Lon Mil
284.300	Lon Mil East
291.650	Boscombe Down Approach
264.400	AWACS Air-Air

Heard on 264.400 C/S Magic 89 working Mission 1313. Operating in 'Alligator Playground'.
Morning of September 14.
Thank's to Oxford Ears for confirm and telephone net on new finds.

That's just a sample of the stuff Paul regularly gets out. If you're not subscribing to his list then you are really out of touch!

Dave Howarth of Chipping in Lancashire asks for plans for a log periodic beam to cover 30-1000MHz. Anyone out there having built one or knows of the location of one? I can pass info on to Dave or reproduce it in the column. Someone must know!

Steve Brown of Newcastle-upon-Tyne has sent in a massive sheet of fire brigade status codes from his area. He also included callsigns and some frequencies. These are reproduced in **Table 2**.

An apology here for those who wrote in and haven't seen their name this time around. The Royal Mail lost my disk for the last month's column - among other letters of some importance - and I had to write up a whole new piece after my deadline (thank's for the time, Kevin!). I'm currently working back on those letters I'd answered but never got to see in print - but it means trawling through my files! The system I

use goes like this: Once a letter comes here and is answered, it is filed in a 'dead mail' folder. You want to see how many files I've got....! I'll get there.

Meanwhile, it's back to writing essays and doing the odd stint in the shack for me. I'm overhauling my antennas for the coming winter now - as I do every year before winter gets a good grip - and also finding my Howes ASL5 filter a massive improvement on selectivity and interference levels when working h.f. My Scanmaster vertical, AD370 and long wire are up and running well, but this year's plague of wasps has kept me at ground level during the summer! Time to get even? I'll probably re-organise the shack in the interim when conditions go flat, as they will do - it needs re-organising, painting and tidying up! In the meantime, happy hunting with your scanners. Be careful, respect privacy and stay low key - and don't forget to put something juicy on the Christmas present list! Until next time, best 73s.

Table 2 - Tyne and Wear Metro Fire Brigade.

Callsign	Station
Alpha	West Denton.
Bravo	Newcastle West.
Delta	Newcastle Central.
Echo	Gosforth.
Foxtrot	Fossway.
Golf	Wallsend.
Juliet	Tynemouth.
Kilo	South Shields.
Mike	Fulwell.
November	Sunderland.
Oscar	Grindon.
Romeo	Tunstall.
Sierra	Washington.
Tango	Hebburn.
Victor	Gateshead.
Whiskey	Birtley.
Yankee	Swalwell.
Zulu	Chopwell.

Each station also has individual callsigns, eg: Alpha 01 = West Denton Water Tender.

List:

01	Water Tender.
02	Water Tender.
03	Turntable ladder.
04	Emergency Rescue Tender.
05	Foam Tender.
06	Salvage Tender.
07	?
08	Rescue/Incident Support Unit.
09	Fireboat.

Frequencies:

Channel 1	71.300 & 146.025MHz.
Channel 2	71.335MHz.
Intercomms	80.212MHz.

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NEW VHF/UHF Frequency Guide with Callsigns

"Launched" at the International Air Tattoo in July our latest VHF/UHF frequency list has been updated to include the latest changes but in addition we have added a comprehensive callsign section which lists nearly 7,000 military callsigns with aircraft type and operating unit. The book now totals 232 pages, ring bound and is available for **£11.50 plus £1 postage and packing.**

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Mike Richards, SWM, May 1994.

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*****MESSAGE NUMBER 700*****

SYNOPTIC REPORT AT MAIN HOURS FROM FINLAND COMPILED BY HELSINKI (MET INSTITUTE)
SYNOPTIC REPORT FROM LAND STATION DAY 16
WIND MEASUREMENTS: TAKEN BY ANEMOMETER FROM STATION AT: SODANKYLA (02836) IN FINLAND STATION TYPE: MANNED - WITH WEATHER REPORT.

*****MESSAGE NUMBER 873*****

DEUTSCHE LUFTHANSA FLIGHT NO: 470
POSITION: 57N 0-20W TIME: 16:04 UTC
AIR TEMPERATURE:-57C WIND 100 KNOTS
AMERICAN AIRWAYS FLIGHT NO: 109
POSITION: 55N 0-30W TIME: 16:04 UTC
AIR TEMPERATURE:-46C WIND 74 KNOTS

*****MESSAGE NUMBER 704*****

BUOY REPORT FROM SHIP (MOBILE) COMPILED BY TOULOUSE (MET CENTRE) IN FRANCE
DATA FOR REGIONAL EXCHANGE FOLLOWS:
MINIMUM TEMPERATURE: 17.9C
CLOUD INFORMATION - LOWEST CLOUDS:
CUMULUS AND STRATOCUMULUS CLOUDS:
LEVELS:
ALTOSTRATUS MAINLY SEEN AT 2000 FT
CIRRUS IN THE FORM OF LIGHT FILLS
DATA FOR REGIONAL EXCHANGE FOLLOWS:-
MAXIMUM TEMPERATURE:
MINIMUM TEMPERATURE:

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ACTUAL REPORTS

PHONE HOT-LINE FOR DETAILS

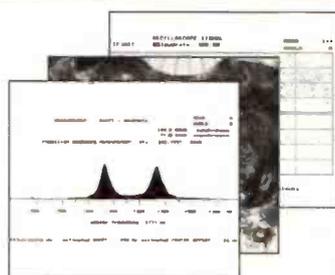
01384 896879
6 & 7 Clarkson Place, Dudley Road,
Lye, West Midlands DY9 8EL

HOKA CODE-3 UK Version

"...the standard against which all future decoders will be compared..."

Monitoring Times - December 1994 (page 103)

If you monitor Short Wave RTTY you will already know all about Baudot, Ambr, Packet and CW. You may have already had success with decoding ARO-M2, M4, ARO-E-E3, ARO-90, ARO-S, SWED-ARO, FEC-A, FEC-S, Factor etc. but what about all the other signals that are still undecodable with your present sophisticated setup. Perhaps you have even tried to get a sensible analysis of the signal and found it too difficult. Well, Hoka Electronics have the answer! There are some well known (and expensive!) RTTY decoders which still have limited facilities and difficult upgrade methods, but then there is CODE-3 from Hoka Electronics it's up to you to make the choice - but it will be easy once you know more about CODE-3. CODE-3 works on any IBM-compatible computer with MS-DOS 2.0 or later and having at least 512K of free DOS memory, a CGA monitor and a serial port. The CODE-3 hardware includes its own digital FSK Converter unit with built-in VDE safety approved 230V AC power supply and RS232 cable, ready to use. CODE-3 now includes two new exciting hardware and software developments - a fully automatic software tuned audio bandpass filter and a new 'all-in-one' automatic classification system. Press one key and CODE-3 will measure baud speed (to 0.0001 resolution) and shift (to 1Hz) then analyse the bitstream and (if it is a recognised system) drop straight into decoding the signal within seconds of tuning in. CODE-3 decodes more systems than any other commercially available decoder - in fact most more expensive decoders have no means of even identifying ANY received signal! Why spend more money on FEWER features? CODE-3 is the most sophisticated decoder available and the best news of all is that the latest version of this now famous Dutch decoder is available now. Just look at the list of features (ALL FEC systems are decoded with error correction fully implemented - unlike other more expensive decoders than only do some!)



SYSTEMS:

- Morse - Manual/Auto toggle toggle; On screen WPM indicator
- RTTY-Baudot/Murray/TAB/CITT2 plus all bit inversions
- Stop - CCR 82476-A, ARO SBMS/CBMS FEC, NAVTEX etc.
- ASCII - Packet with selective category monitoring, 300 Baud
- Facsimile, all RTM/OC (up to 15 shades at 120/4780 pixels)
- Autopsc - M's I and II with all known inversions (also SPREAD)
- Dup-ARO Ambr: 1/9 - 125/900 Baud Simplex ARQ
- Tapesec - 100 Baud F783N Simplex ARQ
- ASCII - CITT 5, various character substitutions
- ARO-90/98 - 200 Baud Simplex ARQ
- SI-ARO-ARO-S - ARO1000 simplex
- SWED-ARO-ARO-SWE - CCR 518 variant
- ARO-E-ARO1000 Duplex
- ARO-N - ARO1000 Duplex variant
- ARO-E3 - CCR 518 variant
- PCA-ARO - 100 Baud Duplex ARQ
- TDM242-ARO-242 - CCR 242 with 124 channels
- TDM342-ARO-342 - CCR 342 with 124 channels
- FEC-A - FEC100A/FEC101
- FEC-S - FEC1000 Simplex
- Hockapack - Synch/Asynch
- Sky RAW - (Normal Sky or built without synchronisation)
- ARO670
- Baudot F783N
- Packet - Ambr/Ambr (and special commercial variants)

ANALYSIS:

- Shift & Baudspeed to 0.0001 Baud
- Oscilloscope (frequency & time)
- Automatic System identification

OPTIONS:

- SPECIALS: Photo; Converter 8 & 13, TDM242/342, ROU-FEC (also RUM-FEC), HC-ARO, HNG-FEC
- SYNOP: Decodes AAMX & BBTX meso
- GMDSS/DC: Latest maritime system

All systems are preset with most commonly seen setting but all can be changed at will. Baud speed to any value between 25-500 baud, shift from 20 to 1000 Hz. Multi-channel systems display ALL channels on screen at the same time. Split screen with one window continually displaying channel control signal status e.g. 'de Alpha/Beta/RO's etc., along with all system parameter settings e.g. Unshift on space, Shift on Space (great for matrices), multiple carriage returns inhibit, auto receiver drift compensation, printer on, system sub-mode.

PRICES (all include VAT at 17.5%):

Standard CODE-3 (now includes 'Scope', 'ASCII Save to Disc' and 'Auto Classify') £499 (was £519)
Option "Specials" £150 (was £205), Option "SYNOP" £65, Option GMDSS £ 75,
Modifications to existing LF3 Interface and upgrade of software to v5.0 £125.
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Call or write for more information - there is just not enough room here to tell you everything about CODE-3!

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Info In Orbit

There is much activity with the Shuttle programme, as NASA works to reduce the backlog of launches that followed the Challenger disaster some years ago. I am making up-to-date Shuttle elements available to anyone requesting them - see the Kepler section near the end of the column. As usual, MIR elements are included.

Current WXSATS

Is it not fascinating to hear the beacon on 137.77MHz from NOAA-9, on most occasions that it passes over Britain? This old WXSAT no longer transmits after picture telemetry (a.p.t.), but several of its secondary equipment packages are functioning, including equipment using the beacon for communications, so the satellite remains useful. That is why I still include its elements in the print-outs sent to readers. NOAAs 12 and 14 continue routine transmissions on 137.50 and 137.62MHz respectively.

NOAA-K, the first in the new series of NOAA WXSATs remains scheduled for a 29 December launch, with tests currently running on schedule. METEOR 3-5 has continued normal operations, transmitting in sunlight only, on 137.85MHz. A change to METEOR 2-21 is possible as 3-5 approaches the terminator. Watch your satellite tracking program as it approaches the morning terminator. OKEAN-4 (1-7) and SICH-1 have been busy during the summer, and a number of people have sent images. On many passes we have seen several minutes of telemetry on 137.40MHz. Unfortunately, they are not alone on this frequency.

Interference on 137.40MHz

For those using a crossed-dipole antenna (and that includes me), it is common for more than one WXSAT to be in the wide lobe of the antenna. They have frequencies chosen to avoid the likelihood of mutual interference even when several WXSATs are simultaneously transmitting. OKEAN-4 and SICH-1 transmit imagery on 137.40MHz, but there is a group of recently launched, non-a.p.t. satellites in the ORBCOMM series, also transmitting on 137.40MHz. ORBCOMM FM1 (object number 23545) has an orbit with an inclination of about 70° and period

of about 100 minutes, bringing it over Britain several times each day. Two others in the series have similar orbits; ORBCOMM FM2 (ON 23546), and number 23547.

Tom Kleespies of NOAA (National Oceanographic and Atmospheric Administration) points out that international radio frequencies are allocated by the International Telecommunications Union in Geneva. Interference from land and space based sources was an issue raised at the Eighth International TOVS Study Conference last April in New Zealand. Tom suggests contacting the national representative to the ITU if necessary. Meteorological satellite downlinks are supposed to be protected.

Brian Does It Again

Although I leave my scanner on while working in my basement, occasionally I have sat for an hour or two having forgotten to switch it on! So when **Brian Dudman** of Harrow rang me up late one afternoon to ask whether I had just heard the mystery a.p.t. signal on 137.30MHz around 1637UTC on 7 September, I glanced at my scanner in disbelief! There are several old Russian satellites which once transmitted a.p.t. in various formats using 137.30MHz; the COSMOS series included 1602, 1766 and 1809 - early versions of OKEAN.

From the large Kepler elements file, which I collect from Goddard Space Flight Centre each Sunday evening (see the end of this column), I extracted a set of elements and put them into my satellite tracking program. There were two contenders - satellites above the horizon at Harrow at the time of Brian's observation - COSMOS 1766 and 1809. From his description "a noisy signal", the more likely would be COSMOS 1809. A second report was later received from **Colin Schulz** of Western Samoa, who captured a short-lived a.p.t. signal, also on 137.30MHz, having sync bars like the METEORs. Colin logged the

Frequencies

NOAA 14 a.p.t. on 137.62MHz
NOAA 12 a.p.t. on 137.50MHz
NOAA beacons on 136.77 or 137.77MHz.
METEOR 3-5 uses 137.85MHz.
OKEAN-4 and SICH-1 use 137.40MHz occasionally.
Interference from ORBCOMM satellites also on 137.40MHz.

time as 1830UTC, which does not tie in with COSMOS 1809, but is a valuable additional observation.

METEOSAT-5

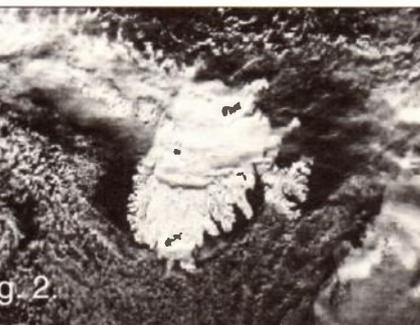
Encryption of Primary Data was extended during September to include the period 0800UTC to about 1400UTC. Unencrypted data is still available from American sources! There is no impact on WEFAX transmissions.

Letters

Jonathan Bowes of Rotherham asks whether there are any reports of readers' success monitoring WA3NAN, the Goddard amateur radio group, which re-broadcasts Shuttle voice communications on various frequencies. Coincidentally, I also received a letter from **Andy Cooper** requesting the Shuttle pack (which lists all the frequencies), and commenting that he has heard the re-transmission on 21.395MHz, which according to the list is WA3NAN!

Graeme Caie of Aberdeen uses a Cirkit receiver (which uses crystals), modified to include a frequency synthesizer - see the article on receivers in this edition. Graeme uses a Maplin decoder with the parallel output converted to serial, for interface with his 486 computer running the JVFAX program - I detect an electronics expert here! Graeme sent some images on disk, from which I have included **Fig. 1**, which shows Iceland, as seen by METEOR 3-5, taken a few weeks ago. During summer, the best pictures of Iceland are normally those from the METEORs (rather than the NOAAs) due to the better resolution offered. During winter, the METEORs normally switch off, so the choice becomes relatively limited!

Jim Gahan of Sligo in Ireland set-up his WXSAT station and uses a roof-mounted antenna. He comments on the grey-scale problem, that is, the fact that METEOR and NOAA WXSATs do not use image formats with identical image modulation. We have to count our blessings and be grateful that at least both systems use a.p.t. rather than different techniques for picture modulation.



It is a fact that if a system is optimised for the NOAA WXSATs, then METEOR images will produce bleached-out clouds. This results from the depth of modulation being greater with METEOR a.p.t. Conversely, if a set-up is optimised for METEOR WXSATs, then NOAA images look under-exposed. Jim also notices interference bands on many pictures. The most significant source of such interference is pagers, and the best cure is careful design of receiver filtering - see Beginners section. Despite such problems Jim sent a disk containing some interesting images, of which **Fig. 2**, shows a weather system approaching Britain during August. Jim is interested in meeting any fellow enthusiasts if they reside near Carron Bay.

Alastair McIntyre has been experimenting. He tested tape recordings of NOAA and METEOR passes from a standard cassette recorder, using the Martelec interface. This device converts a.p.t. signals from a receiver (or recorder in this instant) to a form suitable for feeding to a computer running the JVFAX program. The recording did not work properly, so Alastair then tried using a fairly old Panasonic J35 domestic video tape recorder. Using the audio inputs, he recorded the output from the receiver and then replayed the recorded signal into the computer via the interface.

The result was **Fig. 3**, a NOAA-9 image taken at 1127UTC on 22 July during the south-bound pass. Jim found similar results using a more recent Akai model recorder, and comments that the recorder can be programmed for various pass times, and replayed as required. Computer generated noise can be eliminated by this method.

Beginners' Section Receivers - Part 1

Ben Roberts is one of a number

of people who have recently requested suggestions concerning the setting up of a WXSAT ground station. This month I want to look at WXSAT receivers, of which there are various types. In previous columns I have tried to answer the question "Can I use my (general purpose) scanner to receive WXSATs?" It is a common question, and, when referring to picture production, the short answer is "no", due to the basic differences between the characteristics of WXSAT transmissions and those of terrestrial utility broadcasts, the latter for which general purpose receivers are eminently suited.

For a beginner, who may have little knowledge of the equipment required to receive satellites of any type, the subject is a potential minefield. Receivers are available for the polar orbiting WXSATs, and for the geostationary WXSATs. Some receivers can do both, but the situation is more complex than that! Let us look at the simplest type - an a.p.t. receiver for the polar orbiting WXSATs - those in the 137MHz band. Such receivers can be bought for a variety of prices, ranging from kits costing from £50 to sets at over £400, from any of several sources, and with a selection of features. When the polar satellite system is complete and functioning properly, one can add suitable components allowing reception of METEOSAT WEFAX data using the same receiver - assuming it can tune to 137.50MHz.

Frequency Synthesis

Within the receiver, frequencies are generated by either individual crystals, or by integrated circuits (chips). Receivers using chips can

generate a large number of frequencies - for example my Dartcom (self-build) receiver can select any of 200 channels between 136.00 and 137.99MHz, allowing scanning for any satellite transmissions in the band.

Crystal-controlled receivers use individual oscillators for each frequency, so crystals for 137.30, 137.40, 137.50, 137.62 and 137.85MHz must be purchased separately and fitted. A problem can arise when new satellites are launched, if they operate on non-familiar frequencies; the first Chinese satellites in the FENGYUN series transmitted on 137.04 and 137.80MHz. Manufacturers should be able to supply suitable crystals. In Graeme Caie's letter (see above), he modified his crystal receiver to allow frequency synthesis by micro-processor. The benefit of using crystals is undoubtedly their low noise figure.

IF Bandwidth

The signal from WXSAT image sensors is used to amplitude modulate a 2400Hz carrier frequency, so the information produces a band of frequencies representing the brightness of the scene below, ranging from black to white. This modulated 2400Hz sub-carrier now modulates the main 137.5MHz (or other frequency) carrier, so the picture information is represented by a small portion of the 137.5MHz signal.

The receiver extracts this information in a process involving converting this signal to a lower frequency, called the intermediate frequency (i.f.). Because of its content (picture information representing black-and-white

levels), the r.f. signal has a bandwidth of about 30kHz. If the satellite was not moving, the receiver could have a similar bandwidth and work effectively. This bandwidth is unusually wide, compared with general purpose receivers, and is the main reason for answering "no" to the question posed in paragraph one of the 'Beginners' section'. This 30kHz is not the whole story. The satellite moves relative to the stationary antenna, affecting the apparent frequency of the received signal.

While the satellite approaches, the frequency appears to be raised up to 20kHz, then lowered by a similar amount as the satellite recedes - the well-known Doppler effect. The bandwidth needs therefore to be up to 50kHz, when less than this, some of the signal content will be lost. The best receivers are designed using this optimised i.f. bandwidth. General purpose receivers have settings such as narrow band frequency modulation (n.b.f.m.) and will simply not pass the complete composite signal through the i.f. filters. However, if you only wish to monitor satellites, you do not need to spend out on a dedicated weather satellite receiver. Next month we can look further into the requirements of a well-designed WXSAT receiver.

New Products

I am currently testing three JVFX interfaces - the device which takes the WXSAT a.p.t./WEFAX signal from the receiver and processes it for feeding to the serial interface of a PC. Models under test are from Martelec Communications Systems, Venus Electronics and George Miller, an 'Info' reader. The reviews should be published soon.

GOMS (ELEKTRO)

It has not been easy finding out about the operational plans for the CIS geostationary WXSAT GOMS, also known as ELEKTRO. Unlike its American counterpart NOAA, the Commonwealth of Independent States does not appear to have an identifiable source from which to obtain information on specific projects. While I "continue my enquiries", the following arrived in my electronic mailbox about the equipment onboard GOMS.

The satellite has three sets of equipment:

(1) On-board television equipment to make visual and infrared observations of development and movement of cloud formations, sea-surface temperatures, cloud top heights, cloud motion winds at low, middle and upper levels of the atmosphere.

(2) A radiation and magnetic sensor system for measuring heliographic parameters.



Fig. 3.

(3) Radio equipment to handle the transmission of satellite data to earth, and the collection and retransmission of data from surface observing platforms, as well as the dissemination of satellite data over a network of independent information reception points. In addition, the radio equipment is used to exchange data between regional meteorological centres (a feature that distinguishes Russian satellites from those of other countries).

GOMS is expected to become operational after completion of all tests. Satellite data in WEFAX format will be available to all users located within GOMS's radio visibility, on a frequency of 1691.0 MHz (this is standard). Infrared data should become operational but visible won't be broadcast. My thanks to the World Meteorological Organisation (based in Geneva) for this information.

ARIANE launches

Europe's ARIANE launcher has a manifest from which I have extracted the following scheduled launches. I welcome any comments from readers, on the interest (or lack of interest) of the inclusion of such information.

Date	Payload
Oct 95	Telecom 2C then ISO (Infrared Space Observatory)
Nov 95	N-STAR b
Dec 95	PAS-3R
Jan 96	501 Cluster

Shuttle launches

STS-74	2 November 1995
STS-72	11 January 1996

Finally a correction. Last month I inadvertently gave the incorrect URL for WeatherNet, missing the 'edu' part of the string. The correct info is:

<http://cirrus.sprl.umich.edu/wxnet>

My thanks to Ken Michaelson for pointing this out to me.

Shuttle Pack

The Shuttle pack has been in heavy demand. Some people requested both the basic manifest and the pack; the pack is complete and includes the manifest, and all available information for every planned Shuttle launch - well into the next century. It includes a complete frequency list, giving NASA's locally used transmission frequencies, as well as the direct and re-broadcast frequencies. The one question that unfortunately I cannot answer, is which frequency bands are most likely to be open in Britain at any given time. As described in the pack, this depends on many factors. One kind reader suggested that (in view of the costs involved in obtaining the data) I should ask for substantially more than the 50p requested. Costing the pack accurately is difficult; I pay for an Internet subscription plus call costs and in-house computer and printer repairs. Requesters can contribute more if they feel so moved! The pack currently numbers eight sides of A4 and is still available for 50p and an s.a.e. Kepler elements - MIR and Shuttle

Different options are available:

- 1 For a print-out of the latest WXSAT elements, the Shuttle (if in orbit) and MIR, send an s.a.e. and 20p coin or separate, extra stamp. Transmission frequencies are given when operating. This data originates from NASA and is totally up-to-date.
- 2 I send monthly Kepler print-outs to many people. To join the list please send a 'subscription' of £1 (plus four self-addressed, stamped envelopes) for four editions.
- 3 You can have a computer disk file containing recent elements for the WXSATs, and a large ASCII file holding elements for thousands of satellites. A print-out is included, ideal for automatic updating of your tracking software. Please enclose £1 with your PC-formatted disk and stamped envelope.

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Decode

All the Data Modes

FAX/RTTY Interface

One of the problems facing many utility decoding stations is that of keeping the various cables and black boxes required tidy enough to please the better half! A reader from Highbridge in Somerset has written with a neat way to reduce the box count by one and maybe reduce interference as well. You need some constructional skills to take advantage of it, but it's worth repeating here.

The basic idea is to build the JVFAX/HAMCOMM comparator interface into the PC. The proposed way to do this is to build the comparator interface on a small daughter board. This daughter board can then be mounted on a standard PC serial card and wires taken directly to the relevant pins on the serial connector. If, like many, you've updated your serial card for one of the multi-I/O units you may well have a spare card kicking around. All you have to do is make sure this card can be configured to occupy one of the unused ports on your PC (usually COM 3 or 4). Sounds like a great idea, but do not attempt it unless you have constructional experience, are conversant with electrostatic precautions and understand your PC.

Carl Hender has E-mailed a request for help with his BARTG Multiterm. This is a terminal unit that takes the audio signal from the receiver and converts it into a basic logic signal ready for processing by the computer. Whilst Carl currently uses the Multiterm with his Atari ST computer, he asks if he can use it with his 486 based PC running HAMCOMM and JVFAX. I'm afraid the answer is yes and no!

Whilst the Multiterm will work very successfully with HAMCOMM, it definitely won't work with JVFAX. When using it with HAMCOMM you need to select the External converter from the Keying menu. This sets the program to use an external interface and can be used to run HAMCOMM with any compatible terminal unit. Although JVFAX uses the same comparator interface, its signal requirements are quite different and need a much more complex interface such as the one produced by Martelec for improved performance.

Another request for help comes from **Graham Cobden**. He has a particular interest in weather maps and data and asks if anyone knows where he get hold of historical

weather data. If you can help, please let me know.

Offenbach News

Ever since last year's announcement that Offenbach's excellent long wave transmissions are to cease, utility listeners have been awaiting the fateful day. **Jan Nieuwenhuis** has E-mailed a report with some more details on the proposed changes. The plan is to replace the long wave transmissions with two services known as pc-met and FAX-E. Pc-met is essentially a dial-up service that uses host software that runs on a PC to facilitate the download of charts and satellite pictures. For high quality weather images Offenbach will be introducing the satellite based FAX-E system that operates via Eutelsat 2F4. The only snag with this latter option is the terminal equipment price of around DM20000! However, there is some good news as the latest release from Offenbach indicates that transmissions will continue until the end of March 1996.

Windows '95

I've managed to resist the hype so far, mainly because my hard disk is so packed with spurious files from all the software I've reviewed that I don't have a spare 85Mb for Windows '95. However, I would be very interested to hear views on the new operating system, particularly its ability to support popular utility decoding packages such as the many FAX and RTTY packages. Whereas these packages definitely don't work under Windows 3.1, I've heard encouraging reports that the new Windows '95 may provide a more flexible platform. I'm not yet fully convinced, but if you know different please drop me a line with the details.

Internet Update

This is proving to be a regular feature with so much change as new people and organisations join the 'net. On the software front the hot news is the pending release of Netscape Navigator 2.0. The earlier versions of Navigator have deservedly taken top place in the world of World Wide Web browsers. This new version boasts a host of new features to make life on the Internet even easier. In addition to various enhancements to the browser itself there is now

full E-mail support and improved news reader. The new version should be available from <http://home.netscape.com> by the time you're reading this.

Also new is direct radio broadcasting over the Internet. This is being pioneered by World Radio Network WRN. This station specialises in the rebroadcasting of news items from radio stations around the world. To bring it's Internet delivery up-to-date they are taking advantage of the RealAudio format to give on-line audio. If you don't already have a RealAudio player you can download Windows and Mac software via WRN's Web site, <http://www.wrn.org/>.

The RealAudio player is only around 300Kb long so it doesn't take long to download. I tried a variety of broadcasts via the WRN site and was pleasantly surprised at the speech quality even over my 14.4K dial-up Internet connection. This is particularly impressive when you consider that a standard phone call demands 64Kb/s of bandwidth. Needless to say, music over this system sounded pretty terrible. I suppose that main advantage of this system is that you can listen to number of world-wide news broadcast when it suits you - could this be the news of the future?

ACARS Help

Bob Taylor of Stourbridge has written with a plea for help regarding the message formats used for ACARS transmissions. Bob is looking to develop a new decoding system but needs a good up-to-date reference as a starting point.

(If you refer to page 30 in SWM December 1994 or take a look at a copy of Understanding ACARS available from the SWM Book Store you will find a description of ACARS message format - KN). If you can help with any sound reference material please drop me a line with the details and I will pass it on to Bob.

Safety Hazard

A letter received recently from **Chris Thwaites** on the Isle of Wight raised a few alarm bells. He had read my *FactPack* on interference and realised that additional screening can go a long way to help to reduce interference problems. Unfortunately Chris has taken the advice one step too far.

Having traced the interference to radiation from the mains leads supplying his computers he decided to screen the leads. Whilst basically a sound idea, the implementation was spoilt by using some screened cable that he bought at a car boot sale. As he supplied a small sample of the cable I was able to confirm that it is actually a twin screen audio cable designed to carry only low level signals. Although Chris has got away with this so far he has put his set-up at great risk. Not only will the insulation qualities be suspect at mains voltages, but the cable may be operating beyond its current handling capability. The end result could be catastrophic with a risk of electric shock or possibly even a fire. The moral of this story is not to make and mend when dealing with mains supplies. If you really need to screen your mains lead then you will have to buy the correct cable.

News Schedules

With news broadcasts being so popular with listeners I thought it was about time to print a few schedules so you can plan your listening. The information comes courtesy of Jan Nieuwenhuis. All transmissions are 50 baud unless otherwise stated.

XINHUA, PO Box 1114, 57 Xuanwumen Xidajie, Beijing, China In English to Europe: (75 baud) 0030-0300 & 1830-2000 on 9.4911 (BZR6) and 9.417MHz (BZP59) 0630-0930 & 1030-1300 on 14.367 (BZP54) and 18.872MHz (BZR68), 1430-1700 on 11.680 (BZP51) and 12.230MHz (BZR62). In English to Asia: (75 baud) 0030-0300 & 0630-0930 on 14.923MHz (BAP44), 1030-1330 on 10.982MHz (BAP40), 1430-1700 & 1830-2000 on 6.915MHz (BAP46). In French to Africa: 1130-1400 on 17.446MHz (BZG48), 1500-1930 on 11.133MHz (BZG41).

Islamic Republic News Agency (IRNA), PO Box 764, Tehran, Iran. 1000-1100 in English to Europe on 19.200 and 19.980MHz, 1100-1230 in English to Asia on 19.200MHz, and in Arabic to Africa & America on 19.980MHz, 1500-1730 in English to Africa, Asia & America on 7.801, 7.959, 19.980MHz, 1730-1900 in Arabic to M.East, Africa, Asia & America on 7.401, 7.959 & 8.049MHz, 1900-2030 in English to Europe & M.East on 7.401, 7.959 & 8.049MHz, 2030-2200 in English to Africa, Asia & America on 7.959 & 8.049MHz.

Frequency List

This months frequency list shows a few new modes to challenge those of you with more sophisticated decoding equipment. My thanks to the following for their valuable contributions; Day Watson, Jan Nieuwenhuis, Robert Brevit, Ian Taylor, Les Crossan and many other unnamed contributors.

111.8kHz	FAX	120	576	OLT21	2050	PRAGUE MET
518.0kHz	NAVTEX	100	170		2002	CROSS OUESSANT [A]
1.6195	CW/SITOR	-	-	PCH85	2040	SCHEVENINGEN RADIO
2.1875	GMDSS	100	170	-	0725	
4.2075	GMDSS	100	170	-	1530	UNID
4.2090	SITOR	100	170	FFT	0002	ST LYS RADIO
5.0705	ARQ/S	96	170	-	1140	MFA VIENNA
5.761	Si-FEC	100	850	UNID	1540	UNID
8.478	RTTY	75	850	FUF	2325	FRENCH NAVY MARTINIQUE
9.0405	RTTY	100	850	5 YE	2304	NAIROBI MET.
9.130	RTTY	75	850	MTO	2240	R.NAVY ROSYTHE
9.2217	SITORA	100	170		2153	UNID. (4th shift Arabic ATU-80)
9.3367	RTTY	50	VFT	MKK	2253	MOD(RAF) LONDON
9.340	FAX	60	576		2133	TASHKENT MET.
10.536	FAX	120	576	CFH	2216	HALIFAX MET.
10.600	RTTY	50	500	XVN37	1545	VNA Hanoi
10.686	RTTY	50	400	9DM17	1934	TEHRAN MET
10.865	FAX	120	576	NAM	2202	US NAVY NORFOLK VA.
10.9447	RTTY	75	850	CFH	2059	HALIFAX MET.NAWS
11.039	RTTY	50	425		1306	HAMBURG MET
11.0625	RTTY	50	425		1305	SOFIA MET
11.418	CW			RMP	1250	KALININGRAD
11.4527	RTTY	50	425		1248	ROME MET
12.6105	SITORB	100	170	CFH	1150	HALIFAX RADIO
12.8567	RTTY	75	850	6 WW	2124	FRENCH NAVY DAKAR Test
13.054	RTTY	50	170	UIW	1211	KALININGRAD RADIO
13.8766	ARTRAC	125	170	HGX21	1002	MFA BUDAPEST
13.8766	ARTRAC	125	170	HGX21	0957	MFA BUDAPEST
14.4973	RTTY	50	425	CSY	1112	SANTA MARIA AIR Meteo
14.560	RTTY	50	425		1108	PETRA AMMAN Arabic
15.633	RTTY	50	425	HMP26	1050	KCNA PYONGYANG
16.706	SITORA	100	170	UDTM	1120	M/V URITSK Pos'n/ETA
16.9710	FAX	60	576	JJC	0810	TOKYO RADIO
17.180	RTTY	75	850	HWN	1203	FRENCH NAVY PARIS Test
17.510	FAX	120	576	OXT	1343	COPENHAGEN MET
17.590	RTTY	100	850		2011	JEDDAH MET Meteo

& Africa.

Central News Agency (CNA), 209 Sungchiang Road, Taipei, Taiwan. To Europe: 0045-0330 (exc. Sun) and 0815-1100 (exc. Sun) on 10.235 (3MA22), 10.960 (3MA28), 13.563 (3MA26) and 16.224MHz (3MA35).

WeFax News

Les Crossan of Wallsend has been a regular contributor for some time and has written describing his latest project. Les has called his project Wefax for Windows and as the name suggests is a Windows based FAX decoding system. The program is being developed for use with the SoundBlaster AWE32 soundboard and relies on this unit's d.s.p. circuitry to do all the clever stuff. Initial results look promising though there's still plenty to do before it's finished. Watch this space for more information.

Iraqi News Agency (INA), PO Box 3084, Salihiya, Baghdad, Iraq. 0700-0900 (Exc. Fri) in Arabic to M.East & Africa on 14.699MHz, 0900-1500 (Exc. Fri) in English to Europe, M.East & Asia on 10.1625MHz, and in Arabic to M.East & Africa on 14.699MHz, 1000-1500 (Fri) in English to Europe, M.East & Asia on 10.1625MHz, 1500-2000 and 2000-2200 (Exc. Fri) in Arabic to M.East & Africa on 14.699MHz.

JANA (Lybian News Agency), PO Box 2303, Tripoli, Libya. In Arabic: 0700-0900 to M.East, 0900-1000 to M.East & America, 1030-1200 to M.East & 1400-1930 to M.East, Asia & America on 14.573MHz. In English: 0800-0900 to M.East & Asia on 15.462MHz, 1400-1500 to Europe, M.East & Africa on 12.186MHz, 1600-1700 to M.East & America on 20.560MHz, 1730-1830 to Europe & America on 12.186MHz. In French: 1100-1200 to America on 15.462MHz, 1500-1600 to Europe, M.East & Africa on 12.186MHz.

Maghreb Arabe Presse (MAP), 122 Allal Ben Abdallah, Rabat, Morocco. 0900-1030 (Exc. Fri) in Arabic to M.East & Africa on 18.4961MHz (CNM80/X11), 1000-1130 (Exc. Sun) in French to Europe, Africa & Asia on 19.1711 (CNM85/X11), 18.265 (CNM78), 18.2209 (CNM76/X9), 15.6549

(CNM65/1X), 14.760 (CNM61) & 7.8424MHz (CNM20/1X), 1200-1400 (Exc. Sun) in English to Europe, M.East, Africa & Asia on 19.1711 (CNM85/X11), 18.4961 (CNM80/X11), 18.265 (CMY78), 18.2209 (CNM76/X9), 15.6549 (CNM65/1X), 14.760 (CNM61) and 7.8424MHz (CNM20/1X), 1530-1700 (Exc. Fri) in Arabic to M.East & Africa on 18.4961MHz (CNM80/X11), 1530-1700 (Exc. Sun) in French on 19.1711 (CNM85/X11), 18.265 (CNM78), 18.2209 (CNM76/X9), 15.6549 (CNM65/1X), 10.6341 (CNM37/9X) & 7.8424MHz (CNM20/1X)

ROMPRES, Bucharest, Agentia Romina de Presa, Piata Scaintei, Bucharest, Hungary. 0730-0830 (Exc. Sun) in English to Asia on 21.8075MHz (YOV28), 0900-0945 (Exc. Sun) in English to Europe and 1000-1045 (Exc. Sun) in French to Europe on 9.797MHz (YOJ27), 1100-1130 (Exc. Sun) in English to Asia on 12.110MHz (YOM21), 1530-1630 (Sun) and 1630-1745 (Exc. Sun) in French to Europe and 1800-1930 (Exc. Sun) in English to Europe on 6.972MHz (YOG59).

Sudan News Agency (SUNA), PO Box 1506, Khartoum, Sudan. 0900-1000 in French to M.East & Africa, 1000-1100 in English to Europe, 1600-1700 in French to Europe, Africa &

M.East and 1700-1800 in Arabic to M.East on 19.463MHz, 1000-1100 and 1430-1600 in Arabic to M.East

Readers Special Offers

Here's the latest list of special offers. Whilst I do my best to return orders promptly, please allow up to two weeks for delivery.

IBM PC Software(1.44Mb disks):

Disk 1 (Order Code DK1) - JVFAX 7.0, HAMCOMM 3.0 and WEFAX 3.0

Disk 2 (Order Code DK2) - DSP Starter plus Texas device selection software.

Disk 3 (Order Code DK3) - Ultrapak 2.1 and NuMorse

Disk 4 (Order Code DK4) - Mscan 1.3 and 2.0

Printed Literature:

Beginners Utility Frequency List (Order Code BL)

Complex Signals Utility Frequency List (Order Code AL)

Decode Utility Frequency List (Order Code DL)

FactPack 1 Solving Computer Interference Problems (Order Code FP1)

FactPack 2 Decoding Accessories (Order Code FP2)

FactPack 3 Starting Utility Decoding (Order Code FP3).

FactPack 4 JVFAX and HAMCOMM Primer (Order Code FP4).

FactPack 5 On the Air with JVFAX and HAMCOMM (Order Code FP5).

FactPack 6 Internet Starter (Order Code FP6).

For the printed literature just send a self-addressed sticky label plus 50p per item (£1.50 for four, £2.50 for 7 and £3.00 for 9). For software send £1.00 per disk (£1.75 for 2, £2.50 for 3 or £3.00 for all 4) and a self-addressed sticky label (don't forget I provide the disk!).

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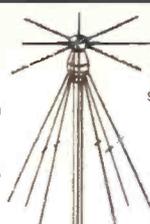
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This is designed for external mounting on a pole as you will see this antenna has stainless steel radials. The reason for this is so that it will receive all Freq. at all levels unlike an omni antenna. It has 4 capacitor loaded coils inside the vertical receiver to give maximum sensitivity to even the weakest of signals. Height 900mm.

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£16.95
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(Mobile Scanner Antenna). Receiving Freq. range 25-1300MHz. Height: 600mm.

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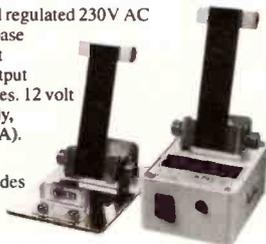
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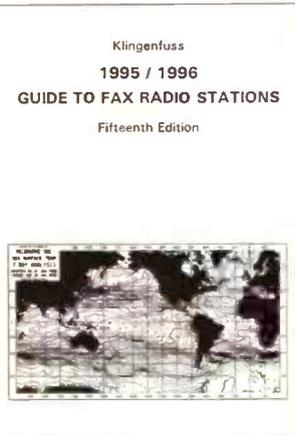
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Watching Brief

Andy Is Waving Goodbye

Those of you who used to watch a certain programme in the golden days of black and white television will recall a closing refrain along the lines of "Time to go home.... Andy is waving goodbye". If you don't remember this, it doesn't matter because the message is fairly evident anyway this column is deceased, it is no more, it is defunct.

That's not the end of amateur television in this magazine, though, because *SWM* will still carry articles on amateur television topics from time to time, whilst your letters, photographs of unusual sightings and reception reports should now go direct to the Editorial Offices. In this way, *SWM* can expand its coverage of all the speciality modes of listening. In addition, our sister magazine, *Practical Wireless*, will continue its bi-monthly column on ATV topics as well, so you should not starve for information.

But, in my final article under this heading I'd like to reflect on our hobby's past and offer some pointers to the long-term future of amateur television. I hope you find them stimulating.

Long History

The origins of amateur television go back to the year 1923 when Mel Dunbrack W1BHD started "fooling around with television reception and transmission and five years later, in February 1928 the world's first transatlantic television transmission of live pictures was made from amateur radio station G2KZ in Coulsdon, Surrey and received in New York. Pretty dramatic stuff - amateur television will have a job to beat that achievement!

By the 1930s amateurs all around the world were building replicas of the Baird type of apparatus. These were the well-known spinning disc affairs used with low-definition mechanical television and as such, they were state of the art, even if today we find these efforts slightly comical. In Australia amateur station VK2KI was transmitting 30-line pictures on 136 metres in 1932, whilst over here G2AO of Eastbourne was doing the same on 160 metres in 1934.

We move now to January 1939, when a short paragraph entitled

Amateur Television appeared in the January 1939 edition of *Television and Short Wave World*, and reads as follows: "Some American amateurs have recently installed a fairly high definition television transmitter which they are operating on a frequency of 57 megacycles. Members of their society have built their own receivers with miniature tubes, and considering the difficulties, results, are quite satisfactory."

At the New York World's Fair in the same year of 1939, amateur television was demonstrated in the amateur station there (callsign W2USA). On September 27 amateurs at W2USA and W2DKJ/2 at the New York Daily News building in Manhattan began exchanging fair quality television pictures on the amateur 112MHz band. Accompanying sound was transmitted on 56MHz. Distance between the two stations was about eight miles.

Progress followed thick and fast in the USA and although America's entry into the war put paid to further ATV development, activity re-started afterwards. So we move on to the year 1950, when W2LNP in the USA published a three-part article in *Radio and Television News* describing his home TV station. This conformed to the very same standards used by American broadcasters, namely 525 lines, 60 fields, audio subcarrier and transmitted on the 420-450MHz band.

Déjà Vu?

All this probably sounds like pretty dusty old history and give or take a pinch of dust, it probably is. But pause a moment, because you might be missing something. Throughout this period from 1923 to 1950, amateur television was at the forefront of technology, up with and in some cases ahead of the broadcasters. That's hardly the case today.

What's more, every element of the ATV technology we use on 430MHz today had already been designed and built by W2LNP back in 1950, forty-five years ago. It doesn't say much for the die-hards who are trying to retain ATV concessions on 430MHz that realise that they are repeating the experiments of 45 years ago - hardly state of the art, is it?

One of the justifications for our

amateur radio privileges (and they are a privilege, not a right) is that the purpose of the hobby radio is experimentation, or as one of the documents says, self-

training in the art of radio telegraphy and telephony. There's plenty of scope for experimentation, but we sure as eggs don't hear much of it on 430MHz. And if the band is going to be slimmed down (which is bound to happen now), you can kiss goodbye to ATV operation unless ATVer's get their act together and devise a narrow-band method of sending moving pictures. Analogue a.m. transmission is no longer state of the art, it's as out of date as people tell me 405-line television is. As it happens, I enjoy tinkering with 405-line equipment, but I wouldn't put it up as the norm for modern communication.

Onward and Upward

So, where does the future of amateur television lie? Not on 70cm, nor even on 24 or 13cm. Even if it is one of the less expensive speciality modes, ATV costs money and that's undoubtedly one of the reasons for the decline in ATV activity (fewer entries in BATC contests, few letters to this column and a steadily declining membership total for BATC). People are also short of time these days but time is money; if people have less money, they spend more time keeping body and soul together.

Operation on 24cm and 13cm requires considerable outlay on expensive amplifiers, antennas and high-grade co-axial feeder. The bands are also shared with other users and suffer heavy interference in some districts. 10GHz by comparison suffers none of these problems; the equipment is cheap, roof-mounted small-dish antennas can be fed with base-band signals using low-cost coaxial cable and antenna



Memorable 430MHz DX contacts could become mere memories of good times past if we lose amateur television rights on that band.

gain substitutes for expensive and vulnerable solid-state three-wire fuses. At 10GHz there is bandwidth to spare, with no fear of conflict from other band users. Admittedly point-to-point transmission is generally restricted, but even then spectacular DX has been achieved by exploiting suitable propagation characteristics.

Future View

I see a time perhaps ten years hence when all major towns will have a television repeater on 10GHz, with inter-site links on 13cm or 24cm. Using DTMF tones from a keypad you will be able to patch your way from one site to another, just like dialling a phone call. But all this will happen only if amateurs do something about it; it certainly won't happen by itself and currently the repeater groups are not exactly inundated with new volunteers! Think about it anyway. If you're an ATVer, the future of amateur television really does lie in your hands.

Alternatively we may just transfer amateur television to the Internet. Undoubtedly new methods of video compression will make live person-to-person communication possible with both voice and pictures, even if the pictures are not quite the broadcast-quality images we (sometimes) achieve on ATV. This would have the advantage of opening up ATV to all-comers, not just those who passed the Radio Amateur Exam. You could still endeavour to find those rare DX stations, although somehow I feel we'd miss the thrill of a real tropo opening. But whatever turns you on....!

73s, Andy Emmerson G8PHT

LM&S

Long, Medium and Short Waves

From time to time reception reports arrive here from listeners who simply state their name and a location, but only those which bear the name and full address of the sender can be accepted for publication.

To provide a measure of privacy, the full address of every contributor to LM&S is treated as strictly confidential here. Any reader who wishes to write to a contributor may initially send their letter via me.

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 August 30.

On August 7 **John Eaton** (Woking) received at 2318 UTC a broadcast in Turkish via the Turkish Radio-Television Corp. (TRT) 1000kW outlet at Agri on 162kHz. The transmission rated SINPO 35453. This outlet is seldom mentioned because the channel is usually dominated by the broadcasts from R. France-Inter via Allouis (2000kW) - on air 24 hours a day.

The sky waves from the Radiotelevisione Italiana (RAI) 10kW outlet at Caltanissetta, Italy on 189 were picked up after dark by **Paul Bowery** in Burnham-on-Crouch. A very weak transmission on that frequency was also received after dark by **Kenneth Buck** in Edinburgh on August 25. Although it was sufficient to lock the synchronous detector in his Lowe HF 225 receiver it could not be identified.

Medium Wave Reports

Until recently the long hours of daylight and the five hour time difference between E.Canada or E. USA and the UK resulted in only a short period when darkness existed along the whole length of transatlantic paths, consequently m.w. reception over them was seldom possible. Now that the hours of darkness are increasing it may be possible, given favourable conditions, for UK listeners who are prepared to search the band well into the night to receive some of the broadcasts from m.w. stations in Canada, N & S.America and the Caribbean.

Up in the Shetland Is **John Slater** (Scalloway) found the conditions

favourable during the night of August 5. At 0400 he picked up the broadcasts from CJYQ in St.John's, Newfoundland on 930kHz. They rated 22222 so he tuned around the band, but the only other station he could identify was KDKA in Pittsburg, PA on 1020, which was 22232 at 0430.

John decided to search the band again during the next night and at 0405 he heard VOCM in St. John's, NF on 590, which was peaking 34333. Despite this, only one other Canadian station was heard - it was on 710 and may have been CKVO in

Clarenceville, NF but the full ident was not obtained. At best it rated 22222.

During last winter **Harry Richards** (Barton-on-Humber) often tuned to 1510 after midnight and listened to the broadcasts from WSSH in Boston, but early this year he heard a new station on that frequency with the ident Christian Radio Music WNRB. It is now known that WNRB has replaced WSSH.

The sky waves from stations in the Middle East, N.Africa, Europe and Scandinavia reached many areas of the UK after dark - see chart. At his listening post on the Isle of Wight **George Millmore** (Wootton) noticed a marked improvement in night-time conditions during August. The broadcasts from several stations in the Middle East and N.Africa were received, but the most notable transmission came from BSKSA via Qurayyat, Saudi Arabia on 900 (1000kW), which often rated SIO434. Over in Co.Down **Eddie McKeown** (Newry) found their 1000kW outlet at Jeddah on 1512 provided good reception, but his prize catch was KCBC via Nakuru, Kenya on 1386, which peaked 25222 at 0203.

A new local radio station broadcasting in Turkish on 1584 was mentioned in some reports. Due to the language difficulty **John Wells** (E.Grinstead) has been unable to establish its true identity, but he suspects it may be 'London Turkish Radio'. **Sheila Hughes** (Morden) logged it as 'Turkish Radio' and rated their transmission 54444 at 0900. Their broadcasts have also been received in Burnham-on-Crouch. Further reports and any information about this station would be very welcome here.

Although Premier Radio's 1kW outlet at Battersea on 1332 is intended to serve listeners in Central London the sky wave component of their

Long Wave Chart

Freq (kHz)	Station	Country	Power (kW)	Listener
153	Bechar	Algeria	1000	C*,H*
153	Donebach	Germany	500	A,B,D*,F*,G,H,I*,J
153	Bod	Romania	1200	C*,F*
162	Allouis	France	2000	A,B,D,E*,F*,G,H,I,J,K*
162	Agri	Turkey	1000	C*
171	Nador Medi-1	Morocco	2000	H*,J*
171	Kaliningrad	Russia	1000	A,B,D*,F*,G,H*
177	Oranienburg	Germany	750	A,B,F*,G,H*,J*
183	Saerlouis	Germany	2000	A,B,D,E*,F*,G,H,I*,J,K*
189	Caltanissetta	Italy	10	A*
198	Droitwich BBC	UK	50	A,D,E*,F*,G,I,J,K*
198	WesterglenBBC	UK	50	B
198	St.Petersburg	Russia	150	F*
207	Munich	Germany	500	A,B*,E*,F*,G,H,I*,J*
216	Roumoules RMC	S.France	1400	A,B,D,I*,G,H,J
225	Raszyn Resv	Poland	?	A*,B,D*,F*,G*,H*,I*,J*
234	Beidweiler	Luxembourg	2000	A,B,D,F*,G,H,J
234	St.Petersburg	Russia	1000	F*
243	Kalundborg	Denmark	300	A,B,D*,F*,G,H,J
252	Tipaza	Algeria	1500	A*,D*,H*,J*
252	Atlantic 252	S.Ireland	500	A,B,D*,E*,F*,G,H,I,J
261	Burg(R.Popa)	Germany	200	A,B,F*,G,H,J*
261	Taldom Moscow	Russia	2000	B*
270	Topolina	Czech Rep	1500	A*,B,C*,D*,F*,G*,H*,I*,J*,K*
279	Minsk	Belarus	500	A*,B*,C*,D*,F*,G*,H*,I*,J*,K*

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

Listeners:-	(F)	Eddie McKeown, Newry.
(A)	(G)	George Millmore, Wootton, IoW.
(B)	(H)	Fred Pallant, Storrington.
(C)	(I)	Tom Smyth, Co.Fermanagh.
(D)	(J)	Andrew Stokes, Leicester.
(E)	(K)	Norman Thompson, Dadby.

transmission has been reaching other areas at night. In S.W.Wales **Robert Waygood** (Milford Haven) has found that after dark he can listen to their Late Night Show! On August 29 he rated their 1332 transmission 32223 at 2230, but their 0.5kW parallels on 1305 & 1413 were unintelligible. Up in Rugby **Peter Pollard** can receive Premier on 1332 and 1413 - he logged them respectively as 43444 and 32333 at 2246.

In contrast, the reception at night of Viva 963 is reported as far from satisfactory in some areas. In Herstmonceux **Stan Evans** has found their 1kW transmission from Southall a consistent 34353 during daylight, but after dark it is completely obliterated by the sky waves from R.Finland's 600kW station in Porì, also the R. France 8kW outlet in Paris.

Short Wave Reports

The propagation conditions in the 25MHz (11m) band are unpredictable, consequently international broadcasters are no longer using it.

The conditions in the 21MHz (13m) band are unreliable, nevertheless good reception from some areas has often been noted here. The most distant broadcasts come from R.Australia via Darwin, which beams to Asia on 21.725 (Eng 0630-1100). During favourable conditions their transmission was rated 35333 at 0822 by **Michael Griffn** in Ross-on-Wye, 35333 at 0859 in Burnham-on-Crouch and 24222 at 0930 by **Norman Thompson** in Oadby.

Also received here before noon were R.Denmark via RNI 21.705 (Da to ? 0830-0900), rated 22222 at 0837 by **Thomas Williams** in Truro; BSKSA Saudi Arabia 21.495 (Ar [Holy Quran] to S.E.Asia 0900-1200)

15331 at 1030 by **Eric Shaw** in Chester; UAER, Dubai 21.605 (Eng to Europe 1030-1055) 33333 at 1038 by **Chris Shorten** in Norwich.

After mid-day the BBC via Limassol, Cyprus 21.470 (Eng to E.Africa 1300-1700) was logged as 35233 at 1333 in Newry; RCI via Sines, Portugal 21.455 (Eng to Europe, M.East, Africa 1330-1400) 25332 at 1355 by **Darren Beasley** in Bridgwater; BBC via Ascension Is 21.660 (Eng to W/E.S.Africa 1100-1700) 33333 at 1500 by **Robert Connolly** in Killeel; R.Japan via Moyabi, Gabon 21.700 (Jap to Europe, M.East, Africa 1600-1700) 34443 at 1634 by in Woking; R.Portugal Int via Sines 21.655 (Port to S.America 1200-1900? Sat/Sun) 33333 at 1810 by **Bernard Curtis** in Stourbridge; WYFR via Okeechobee. USA 21.745 (Eng to Europe 1600-2145) 22222 at 2109 by **George Tebbitts** in Penmaenmawr.

The propagation conditions in the 17MHz (16m) band have varied daily. Sometimes R.Australia's broadcast to Asia and Pacific areas via Carnarvon on 17.715 (Eng 0430-0900, Sports 0100-0630 Sat/Sun) reached the UK remarkably well. It was rated 45444 at 0752 by **Mary McPhillips** in Co.Monaghan.

Also received here during the morning were R.Slovakia Int via Rimavska Sobota 17.485 (Eng to Australia 0830-0857), noted as 35343 at 0830 in Scalloway; Israel R, Jerusalem 17.545 (Heb [Home Scery] to Europe, N.America 0800-1700) SIO433 at 0838 by **Philip Rambaut** in Macclesfield; SRI via Schwarzenburg? 17.515 (It, Eng, Fr, Ger, Port to Australia, S.Pacific 0830-1030) 44444 at 0920 in Killeel; BBC via Skelton, UK 17.705 (Eng to Europe 0900-1615) SIO333 at 1000 by **Tom Smyth** in Co.Fermanagh; R.Tunisia Int via Sfax 17.500 (Ar, Fr

Medium Wave Chart

Freq (kHz)	Station	Country	Power (kW)	Listener	Freq (kHz)	Station	Country	Power (kW)	Listener	Freq (kHz)	Station	Country	Power (kW)	Listener
520	Hof-Saale (BR)	Germany	0.2	B*	891	Huisberg	Netherlands	20	A*,B,I	1332	Rome	Italy	300	A*,B*,H*,I*
531	Ain Beida	Algeria	600	A*,B*,I*,L*	900	Brno(CRo2)	Czech Rep	25	I*	1341	Lakihagy	Hungary	300	B*
531	Leipzig	Germany	100	B*,G*,H*,J*,K*,L*,M*	900	Milan	Italy	600	A*,B*,I*,L*	1341	Lisnagarvey(BBC)	Ireland (N)	100	B*,F*,J*,K*,L*,M*
531	RNES via ?	Spain	?	A*,G*,H*,I*,L*	900	COPE via ?	Spain	?	A*,H*,I*,L*	1341	Almeria(OCR)	Spain	2	B*
540	Wavre	Belgium	150/50	A*,H*,I*,L*	900	Ururayvat	Saudi Arabia	1000	I*	1341	Tarrasa(SER)	Spain	2	A*,F*,I*
540	Sidi Bennour	Morocco	600	A*,H*,I*,L*	909	B'mens Pk(BBCS)	UK	140	B,I,LM*	1350	Nancy/Nice	France	100	A*,B*,H*,I*,K*,L*,M*
540	Vitoria(E)	Spain	10	B*,L*	918	Plesivec(Sloven/nf)	Slovenia	600/100	B*,H*,I*,L*					I*
549	Les Trembles	Algeria	600	A*,H*,I*	918	Madrid(R.Int)	Spain	20	A*,H*,I*	1350	Cesvaine/Kuldiga	Latvia	50	I*
549	Thurau (DLF)	Germany	200	B,C,D*,G*,H*,J*,L*	927	Wolvertem	Belgium	300	B,H*,J,LM*	1359	Arganda (RNE-FS)	Spain	600	A*,B*,J*,L*,M*
558	Espoo	Finland	100	A*,C,I*	936	Bremen	Germany	100	B*,D*,H*,J*,L*	1368	Foxdale(Manz.R)	L.O.M.	20	F*,J,K
558	Rostock(NDR)	Germany	20	H*	936	Venezia	Italy	20	A*,B*,C*,I*	1377	Lille	France	300	A*,B,F,LL
558	RNES via ?	Spain	?	A*,C,I*	936	RNES via ?	Spain	?	A*,J*	1386	Nakuru(KBC)	Kenya	20	H*
567	Berlin	Germany	100	B*,H*	945	Toulouse	France	300	H*,I*,M*	1386	Bolshakovo	Russia	2500	I*,L*,M*
567	Tullamore(RTE1)	Ireland (S)	500	B,C,E*,J,K,L*,M*,N*	954	Brno (CRo2)	Czech Rep.	200	B*,H*,J*	1386	R.Nad via B'shakovo	Russia	2500	A*,H*
567	RNES via ?	Spain	?	A*,B*,I*,L*	954	Madrid(CI)	Spain	20	A*,B*,I*,K*,L*	1395	Lushnje(Tirana)	Albania	1000	B*,H*,I*
576	Muhlacker(SDR)	Germany	500	B*,D*,H*,I*,L*	963	Pori	Finland	600	A*,B*,H*,I*,L*	1395	TWR via Lushnje	Albania	500	A*
576	Barcelona(RNES)	Spain	50	A*,B*,H*,I*,L*	963	Paris	France	8	A*,H*	1404	Brest	France	20	A*,B*,H*,I*,L*
585	Paris(RFI)	France	8	B,C,I*,L*	963	Tir Chonail	Ireland (S)	10	C*,L*	1413	RNES via ?	Spain	?	A*,B*,H*,I*,L*
585	Madrid(RNE1)	Spain	200	A*,B*,H*,I*,L*,M*	972	Hamburg(NDR)	Germany	300	B*,H*,J*,K*,L*,M*	1422	Heusweiler(DLF)	Germany	1200/600	B*,H*,I*,L*
585	Safsa	Tunisia	350	I*	972	RNE1 via ?	Spain	?	A*,B*,I*	1431	Nikolayev	Ukraine	400	H*
585	Dumfries(BBCScott)	UK	2	K*	981	Alger	Algeria	600/300	A*,B*,C*,F*,H*,J*,L*	1440	Mamach(RTL)	Luxembourg	1200	A*,B*,H*,I*,M*
594	Frankfurt(HF)	Germany	1000/400	B*,D*,H*,I*,K*,L*,M*	990	Berlin	Germany	300	A*,B*,I*,L*	1440	Damman	Saudi Arabia	1600	C*,F*,H*,I*,L*
594	Dujda-1	Morocco	100	A*,J*	990	R.Bilbao(SER)	Spain	10	M	1449	Squinzano	Italy	50	A*,B*,I*
594	Muge	Portugal	100	A*,B*,H*	990	Redmosst(BBC)	UK	1	M	1449	Redmosst(BBC)	UK	2	H*,K
603	Sevilla(RNES)	Spain	50	G*,H*,I*	999	Schwerin(RIAS)	Germany	20	H*	1458	Lushnje(Tirana)	Albania	500	A*,L*
603	Newcastle(BBC)	UK	2	K*	999	Torino	Italy	20	B*	1467	Monte Carlo(TWR)	Monaco	1000/400	A*,B*,F*,H*,I*,L*
612	Athlone(RTE2)	Ireland (S)	100	B*,I,K,L*,M*	999	Madrid(COPE)	Spain	50	A*,B*,C*,H*	1485	SER via ?	Spain	?	A*,B*,K*,L*
612	RNE1 via ?	Spain	10	A*,B*,I*,L*	1008	Las Palmas(SER)	Gran Canaria	10	A*	1494	Ciamont-Ferrand	France	20	I*
621	Wavre	Belgium	80	A*,B,C,H*,I*,K*,L	1008	Flevo(Hilv-5)	Holland	400	A*,B*,H*,I,LM*	1494	St.Petersburg	Russia	1000	A*,F*,H*,I*,K*,L*
621	Barcelona(OCR)	Spain	50	A*,H*,I*,L*	1017	Rheinsender(SWF)	Germany	600	B*,D*,H*,J*,K*,L*,M*	1503	Stargard	Poland	300	I*
630	Vigra	Norway	100	F*,H*,I*,L*	1017	RNES via ?	Spain	?	B*,H*	1503	RNES via ?	Spain	?	A*,C*,I*,L*
630	Tunis-Djedeida	Tunisia	600	A*,B*,I*	1026	SER via ?	Spain	?	A*,C*,L*	1512	Wolvertem	Belgium	800	A*,B,F,H*,I*,J*,K*,L*
639	Praha(Libice)	Czech	1500	B*,I*	1035	Milan	Italy	50	B*	1512	Jedda	Saudi Arabia	1000	H*
639	RNE1 via ?	Spain	?	A*,B*,H*,I*,L*	1035	Lisbon(Prog3)	Portugal	120	A*,H*,M*	1521	Kosice(Cizatice)	Slovakia	600	A*,H*,I*
648	RNE1 via ?	Spain	10	A*	1044	Drasden	Germany	250	A*,B*,D*,H*,I*,L*	1521	Duba	Saudi Arabia	2000	A*,L*
648	Orfordness(BBC)	UK	500	B,C,G*,I,K*,L*,M*,N	1044	Sebba-Aioun	Morocco	300	I*	1521	R.Venezia(SER)	Spain	2	B*,J*
657	Neubrandenburg(NDR)	Germany	250	H*,I*	1044	Sevilla	Spain	?	L*	1530	Vatican R	Italy	150/450	A*,B*,F*,H*,I*,L*
657	Napoli	Italy	120	A*,B*,I*	1044	S.Sebastian(SER)	Spain	10	A*,B*,H*,I*	1539	SER via ?	Spain	?	A*,B*,I*,L*
657	Madrid(RNES)	Spain	20	A*,B*,I*,L*	1053	Zaragoza(COPE)	Spain	10	A*,B*,H*,I*,L*	1566	Sfax	Tunisia	1200	A*,C*,F*,H*,K*,L*
657	Wrexham(BBCWales)	UK	2	B,C,L,M*,N	1053	Talk Radio UK via ?	UK	?	B,G*,J,LM*	1575	Genova	Italy	50	A*,B*,I*,L*
666	Messkirch(Rohrd(SWF)	Germany	300/180	H*,J*,K*,L*	1062	Kalundborg	Denmark	250	B*,H*,I*,L*	1575	SER via ?	Spain	5	A*,B*,I*,L*
666	Lisboa	Portugal	135	A*,B*,I*,L*	1062	R.Uno via ?	Italy	?	B*	1584	SER via ?	Spain	2	A*,B*,I*
675	Marseille	France	600	A*,B*,I*,L*	1062	Norte	Portugal	100	A*,H*,I*	1593	Holdirchen(RFE)	Germany	150	A*,B*,H*,I*
675	Lopic(R10 Gold)	Holland	120	A*,B,C,H*,I,LM*	1071	Brest	France	20	I*	1602	SER via ?	Spain	?	A*,L*
684	Sevilla(RNE1)	Spain	500	A*,B*,H*,I*,L*,M*	1071	France-Inter via ?	France	?	H*,L*	1602	Vitoria(EI)	Spain	10	A*,J*,K*,L*
684	Avata(Beograd-1)	Yugoslavia	2000	B*,H*,I*	1071	Lille	France	40	A*,B,K					
693	Potenza	Italy	20	B*	1071	Bilbao(EI)	Spain	5	A*,B*,H*,I*,L*					
693	Drortwicht(BBCS)	UK	150	B,C,I*,K,L,M*	1071	Talk Radio UK via ?	UK	?	B*,L					
702	Flensburg(NDR)	Germany	5	B*,H*,I*	1080	Katowice	Poland	1500	A*,B*,H*,I*,L*					
702	Banska	Slovak Rep.	200	B*	1080	Toledo(OCR)	Spain	5	B*					
702	Zamora(RNE1)	Spain	10	A*,G*,I*,L*	1080	SER via ?	Spain	?	A*,B*,H*,I*					
711	Rennes 1	France	300	A*,B*,H*,I*	1089	Talk Radio UK via ?	UK	?	B*,F*,I,K,L					
711	Heidelberg	Germany	5	B*,D*	1098	Nitra(Jarok)	Slovakia	1500	A*,B*,H*,I*,L*					
711	Lazyoune	Morocco	600	A*,I*	1098	RNES via ?	Spain	?	A*,B*,I*,L*					
711	Murcia(COPE)	Spain	5	L*	1107	AFN via ?	Germany	10	A*,B*,H*,I*,L*					
711	Nis	Yugoslavia	100/20	B*	1107	RNES via ?	Spain	?	A*,L*					
720	Langenberg	Germany	200	I*,L*	1107	Talk R.UK via ?	UK	?	B,I,K,L*,M					
720	Lisnagarvey(BBC4)	Ireland (N)	10	I*,L*	1116	Bar	Italy	150	A*,B*,C*,H*,I*					
720	Norte	Portugal	100	A*,B*,H*,I*,L*	1116	Pontevedra(SER)	Spain	5	A*					
720	Lots Rd.Ldn(BBC4)	UK	0.5	B,I,K,L	1125	La Louviere	Belgium	20	A*,B,J*					
729	Cord(RTE1)	Ireland (S)	10	I,K	1125	Deanowice	Croatia	100	B*,L*					
729	RNES via ?	Spain	?	A*,B*,H*,I*,L*,M*	1125	RNES via ?	Spain	?	A*,B*,H*,I*,L*					
738	Paris	France	4	B,I,L*	1134	COPE via ?	Spain	2	A*,B*,H*,I*,L*					
738	Poznan	Poland	300	B*,H*,I*	1134	Zadar(Croatian R)	Yugoslavia	600/1200	A*,B*,D*,H*,I*,L*					
738	Barcelona(RNE1)	Spain	500	A*,B*,H*,I*,L*	1143	AFN via ?	Germany	10	A*,B*					
747	Flevo(Hilv2)	Holland	400	A*,B,H*,I	1143	Stuttgart(ARN)	Germany	10	H*,I*,L*					
747	Cadix(RNES)	Spain	10	H*,I*	1143	R.Due via ?	Italy	?	B*					
747	Braunschweig(DLF)	Germany	800/200	B*,D*,H*,I*,L*,M*	1143	COPE via ?	Spain	2	A*,B*,H*,I*,L*					
756	Bilbao(EI)	Spain	5	A*,B*,H*,I*,L*	1152	RNES via ?	Spain	10	A*,B*,H*,I*,L*					
756	Redruth(BBC)	UK	2	I,K*	1161	Strasbourg(Rint)	France	200	A*,B*,F*,H*,I*,L*,M*					
756	Sottens	Switzerland	500	A*,H*,I*,L*	1179	SER via ?	Spain	?	A*,L*					
774	Sofia	Bulgaria	50	I*	1179	Solweborg	Sweden	600	A*,C*,E*,H*,I*,K*,L*,N*					
774	Enniskillen(BBC)	Ireland (N)	1	K	1188	Kuurne	Belgium	5	A*,B*,H*,I*,L*					
774	RNE1 via ?	Spain	?	A*,B*,H*,I*,L*	1188	Reichenbach(MDR)	Germany	5	A*,D*,L*					
783	Burg	Germany	1000	B*,D*,H*,I*,L*	1188	Szolnok	Hungary	135	B*,H*,I*					
783	Miramar(R.Porto)	Portugal	100	A*,B*,173*	1197	Munich(VOA)	Germany	300	H*,L*					
783	Dammam	Saudi Arabia	100	I*	1197	Virgin via ?	UK	?	B,C,I,LM*					
792	Limoges	France	300	I,L*	1206	Bordeaux	France	100	H*,L*					
792	Lingen(NDR)	Germany	5	A*,H*,I*	1206	Wroclaw	Poland	200	B*,I*,L*					
792	Sevilla(SER)	Spain	20	A*,B*,H*,I*	1215	Virgin via ?	UK	?	B,C,I,LM*					
801	Munchen-Ismaning	Germany	300	B*,H*,I*,L*	1224	Lohstadi	Holland	25	B*,H*,I*,L*					
801	RNE1 via ?	Spain	?	A*,B*,I*,L*	1224	Virgin via ?	UK	?	C,K*					
810	Madrid(SER)	Spain	20	A*,G*,I*	1233	Liege	Belgium	5	L*					
810	Westertgen(BBCScott)	UK	100	B*,C*,G*,I*,K*,L*	1233	Nitra	Slovakia	40	H*					
819	Batra	Egypt	450	B*,I*,L*	1233	Virgin via ?	UK	?	B,C,I,L					
819	Toulouse	France	50	A*,L*	1242	Marseille	France	150	A*,H*,K*					
819	Trieste	Italy	25	B*	1242	Virgin via ?	UK	?	C,I					
819	Warsaw	Poland	300	A*,B*,G*,H*,I*	1251	Marcali	Hungary	500	A*,B*,H*					
819	S Sebastian(EI)	Spain	5	A*,H*	1251	Huisberg	Netherlands	10	A*,B*,H*,I*,L*					
828	Hannover(NDR)	Germany	100/5	H*,L*	1260	SER via ?	Spain	?	A*,B*,H*,I*,L*					
828	Barcelona(SER)	Spain	50	A*,B*	1260	Gulldford (V)	UK	?	B,C,I,L*					
837	Nancy	France	200	H*,I,K*	1269	Neumunster(DLF)	Germany	600	B*,D*,H*,I*,L*					
837	COPE via ?	Spain	?	A*,B*,H*,I*	1269	COPE via ?	Spain	?	H*					
837	Sombor	Yugoslavia	10	B*	1269	Novi Sad	Yugoslavia	600/150	B*					
846	Rome	Italy	540	A*,B*,H*,I*,L*	1278	Strasbourg	France	300	A*					
855	Berlin	Germany	100	B*,H*,L*,M*	1278	Dublin/Cord(RTE2)	Ireland (S)	10	B*,I,K,L*,M*					
855	RNE1 via ?	Spain	?	A*,B*,H*,I*,L*	1287	RFE via ?	Czech Rep.	10	A*,I*,L*					
864	Santah	Egypt	500	A*,B*,H*,I*,L*	1287	Lenda(SER)	Spain	10	B*,H*,I*,L*					
864	Paris	France	300	B,I	1296	Kardzali	Bulgaria	150	I*					
864	Socuellamos(RNE1)	Spain	2	A*,B*,C*,I*,L*	1296	Valencia(COPE)	Spain	10	A*,B*,H*,I*,L*					
873	Frankfurt(AFN)	Germany	150	A*,B*,H*,I*,L*,M*	1296	Orfordness(BBC)	UK	500	B*,H*					
873	Zaragoza(SER)	Spain	20	A*,B*,H*,I*,L*	1305	Rzeszow	Poland	100	A*,B*,H*,I*,L*					
873	Enniskillen(R.U.I)	UK	1	K	1305	RNES via ?	Spain	?	B*,D*,H*,I*,L*					
882	COPE via ?	Spain	?	A*,B*,H*,I*	1314	R.Due via ?	Italy	?	B*					
882	Washford(BBCWales)	UK	100	B,I,LM*	1314	Kvitsov	Norway	1200	A*,B*,F*,H*,I*,L*,M*					
891	Algiers	Algeria	600/300	A*,B*,F*	1323	Zyri(BBC)	Cyprus	200	B*					
				H*,I*,L*,M*	1323	Wachenbrunn(RMWWS)	Germany	1000/150</						

Local Radio Chart

Freq (kHz)	Station	ILR BBC	e.m.p (kW)	Listener	Freq (kHz)	Station	ILR BBC	e.m.p (kW)	Listener
558	Spectrum R	I	0.80	A,B,C,H,K,L,N	1170	Swansea Sound	I	0.58	A*
585	R.Sohwy	B	2.00	J*	1242	Invicta Snd(Coast)	I	0.32	AL,N
603	Cheltenham(CD603)	I	0.10	B,D,H,K,L,N	1242	Isle of Wight R	I	0.50	B,H,N
603	Invicta SG (Coast)	I	0.10	A,H,K*,N	1251	Saxon R(SGR)	I	0.76	A,N
630	R.Bedfordshire(SCR)	B	0.20	A,B,C,H,K,L,N	1260	Brunel R(Ci.Gold)	I	1.60	B,H
630	R.Cornwall	B	2.00	H,N	1260	Marcher Snd(Gold)	I	0.64	J
657	R.Chwyd	B	2.00	H,L,N	1260	Sunrise R. Midlands	I	0.29	K,L,N
657	R.Cornwall	B	0.50	H	1278	Bradford(Gt.Yks)	I	0.43	J*
666	Gemini AM	I	0.34	B,H,L,N	1296	Birmingham(RJL)	I	?	A*,B,C*,E,H,K,L,N
666	R.York	B	0.80	K,N	1305	Barnsley(Gt.Yks)	I	0.15	K
729	BBC Essex	B	0.20	A,H,J,K,L*,N	1305	Premier R via ?	I	0.50	A,F,H,N
738	Hereford/Worcester	B	0.037	K,N	1305	Touch R	I	0.20	D*,H,N
756	R.Maldwyn	I	0.63	H,N	1323	R.Bristol(Som.Snd)	B	0.63	N
765	BBC Essex	B	0.50	A,H,K,L,N	1323	Brighton(SCR)	I	0.50	A,E,H,N
774	Gloucester(3CSG)	I	0.14	D,H	1332	Hereford R(WGMS)	I	0.60	A,K,L
774	R.Kent	B	0.70	A,H,L,N	1332	Premier R, Batterssea	I	1.00	A,F,H,J*,M*
774	R.Leeds	B	0.50	K	1332	Wiltshire Sound	B	0.30	H,K
792	Chiltern(S Gold)	I	0.27	A,H,K,L,N	1359	Essex R(BreezeAM)	I	0.28	A,K*,N
801	R.Devon & Dorset	B	2.00	B,H,N	1359	Merca Snd(Xtra-AM)	I	0.27	K,L
828	Chiltern(S Gold)	I	0.20	A,D,K,N	1359	Red Dragon(Touch R)	I	0.20	D*
828	2CR(Ci Gold)	I	0.27	H	1359	R.Solent	B	0.85	H,N
837	R.Leicester	B	0.45	A,D,H,K,L,N	1368	R.Lincolnshire	B	2.00	J,K,L,N
855	R.Devon & Dorset	B	1.00	H	1368	Southern Counties R	B	0.50	A*,E,H,N
855	R.Norfolk	B	1.50	A,K,N	1368	Wiltshire Sound	B	0.10	H
855	Sunshine R	I	0.15	D,L,N	1413	Premier R via ?	I	0.50	A,B,F,I*,K*,N
873	R.Norfolk	B	0.30	A,H,K,L,N	1431	Essex R(BreezeAM)	I	0.35	A,H,K*,N
936	Brunel R(Ci.Gold)	I	0.18	H,L,N	1431	R.21(Ci.Gold)	I	0.14	B,H,K*,N
945	R.Trent(Gem AM)	I	0.20	H,K,N	1449	R.Peterboro/Cambis	B	0.15	E,H,K,L,N
954	Gemini AM	I	0.32	H,N	1458	Fortune	I	5.00	J,L
954	R.Wyvern(WYVN)	I	0.16	H,N	1458	R.Devon & Dorset	B	2.00	H,N
963	Viva 963, Southall	I	1.00	A,F,H,I,N	1458	Radio WM	B	5.00	K
990	WABC(Nice & Easy)	I	0.09	N	1458	Sunrise R	I	50.00	A,H,K*,I*,N
990	R.Devon & Dorset	B	1.00	B,H,N	1476	Goldford(M.Xtra)	I	0.50	A,B,H,K*,N
990	Hallam R(Gt.Yks)	I	0.25	K,N	1485	R.Humberside (Hull)	B	1.00	L
999	R.Solent	B	1.00	A,H,N	1485	R.Merseyside	B	1.20	J*
999	R.Trent(Gem AM)	I	0.25	K,L,N	1485	Southern Counties R	B	1.00	A,B,H,K,N
1017	Beacon R(WABC)	I	0.70	H,K,L,N	1503	R.Stoke-on-Trent	B	1.00	A*,E*,G*,H,K,L,N
1026	Downtown R	I	1.70	J,L	1521	Reigate(M.Xtra)	I	0.64	A,G*,H,K*,N
1026	R.Cambridgeshire	B	0.50	A,E,K,L*,N	1530	R.Essex	B	0.15	A,H,N
1026	R.Jersey	B	1.00	B,E,H,N	1530	R.Wyvern(WYVN)	I	0.52	G*,H,L,N
1035	Country 1035	I	?	A,B,G*,H,N	1548	Capital R(Cap G)	I	97.50	A,H,L,N
1035	R.Sherfield	B	1.00	J,K,L	1548	Liverpool(City G)	I	4.40	G*
1035	West Sound AM	I	0.32	G*	1548	R.Forth(Max AM)	I	2.20	G*
1107	Moray Firth R	I	1.50	L	1557	Northants R(S.Gold)	I	0.76	G*,K,L
1116	R.Derby	B	1.20	A*,E*,J*,K,L,N	1557	Southampton(SCR)	I	0.50	B,H,N
1116	R.Guernsey	B	0.50	A*,B,E,H,N	1557	R.Lancashire	B	0.25	G*
1152	BRN(BXtra-AM)	I	3.00	K	1557	Tending(Mellow)	I	0.125	A,N
1152	LBC(LondonNewstalk)	I	23.50	A,H,L,N	1584	Kettering(KCBC)	I	0.04	K,L
1152	R.Broadland	I	0.83	A,N	1584	London Turkish R.	I	?	A,E,N
1152	R.Chyde(Chyde 2)	I	3.06	J	1584	R.Nottingham	B	1.00	G*,K,L
1161	Brunel R(Ci.Gold)	I	0.16	D*,H,N	1584	R.Shropshire	B	0.50	H
1161	R.Bedfordshire(SCR)	B	0.10	A,K,L*,N	1584	R.Tay	I	0.21	G*
1161	Southern Counties R	B	1.00	H,N	1602	R.Kent	B	0.25	A,B,G*,H,N
1170	Hi Wycombe 1170AM	I	?	L,N					
1170	Portsmouth(SCR)	I	0.12	E,H,N					
1170	R.Orwell(SGR)	I	0.28	A					
1170	Signal R(S.Gold)	I	0.20	K					

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

- Listeners:-
 (A) Paul Bowery, Burnham-on-Crouch.
 (B) Bernard Curtis, Stalbridge.
 (C) John Eaton, Woking.
 (D) Francis Heame, N.Bristol.
 (E) Sheila Hughes, Morden.
 (F) Laurence Mason, Hassocks.
 (G) Eddie McKeown, Newry.
 (H) George Millmore, Wootton, IoW.
 (I) Peter Pollard, Rugby.
 (J) Tom Smyth, Co.Fermanagh.
 (K) Andrew Stokes, Leicester.
 (L) Norman Thompson, Dadbly.
 (M) Robert Waygood, Millford Haven.
 (N) John Wells, East Grinstead.

Birmingham, USA 11.820 (Eng to Europe 2200-0000?) 35232 at 2235 in Bridgwater.

Also mentioned in the reports were the Voice of the Mediterranean via Cyclops, Malta 11.925 (Eng, Ar to N.Africa 1400-1600), rated 33333 at 1404 in Newry; R.Austria Int via Moosbrunn 11.780 (Ger, Eng to S/S.E.Asia 1500-1800) SIO333 at 1530 in Co.Fermanagh; Israel R, Jerusalem 11.685 (Eng to Europe? 1900-1930?) 54444 at 1909 in Norwich; R.Kuwait via Kabd 11.990 (Eng to Europe, N.America 1800-2100) 45544 at 2021 in Woking; R.Dniester Int via Grigoriopol 11.750 (Eng 2030-2100) 44444 at 2030 in Scalloway; Voice of Armenia, Yerevan 11.920 (Eng to Europe? 2030-2057) 44333 at 2030 in Morden; R.Bulgaria, Sofia 11.720 (Eng to Europe 2100-2200) 41431 at 2126 in Ross-on-Wye; Voice of Turkey via Cakirlar 11.710 (Eng to USA? 2200-2300) 33333 at 2215 in Penmaenmawr; UAER, Abu Dhabi 11.885 (Eng to USA 2200-0000) 32332 at 2310 in Kilkeel; Voice of Russia 11.730 (Eng WS) SIO444 at 2330 in N.Bristol.

In the 9MHz (31m) band R.New Zealand's broadcast to Pacific areas on 9.700 (Eng 0717-1206) has sometimes reached the UK. In Macclesfield it peaked SIO322 at 0805, but there was co-channel interference from R.France Int. R.Australia also beams to Pacific areas from Shepparton on 9.580 (Eng 0730-?) and was rated 32332 at 0817 in Ross-on-Wye.

During the daytime the Voice of Greece, Athens 9.375 (Gr, Eng to Europe 0600-0800) was SIO433 at 0745 in N.Bristol; SRI via Montsinery, Fr.Guiana 9.885 (It, Eng, Fr, Ger, Port to Australia, S.Pacific 0830-1100) 35444 at 0926 in Burnham-on-Crouch; AWR via KSDA Agat, Guam 9.370 (Chin [Eng ident] to Asia 1500-1700) 34333 at 1500 in Oxted; FEBC Mahe, Seychelles 9.810 (Eng to Asia 1500-1600) 45423 at 1513 by Frederic Collin in Tokyo; R.Australia via Darwin 9.615 (Eng to Asia 1430-1755) 43444 at 1600 in Chester; VOIRI Tehran, Iran 9.022 (Russ to E.Europe (1530-1630) 32223 at 1625 in Penmaenmawr; VOA via Tinang, Philippines 9.760 (Eng to S.Asia 1400-1700) heard at 1630 in Oadbly.

In the evening Sudan Nat.Broadcasting, Omdurman 9.200 (Eng 1800-1900) was 34533 at 1802

44333 at 0840 in Scalloway; R.Slovakia via Rimavaska Sobota 15.640 (Eng to Australia 0830-0857) 55444 at 0848 in Ross-on-Wye; R.Vlaanderen Int, Belgium 15.545 (Eng to Europe 0900-0925) 34343 at 0910 in Bridgwater; AIR via Allgarh? 15.050 (Eng to N.E.Asia 1000-1100) 54333 at 1030 in Norwich; VOA via Philippines 15.160 (Eng to E.Asia 1100-1500) 14331 at 1145 in Chester.

After mid-day, R. Japan via Moyabi, Gabon 15.355 (Eng to S.Africa 1500-1600) was 32333 at 1600 in Oadbly; Monitor R.Int via WSHB 15.665 (Eng to Europe 1800-2200) 33333 at 1800 in Stalbridge; Voice of Vietnam, Hanoi 15.009 (Eng, Fr, Sp to Europe 1800-2130) 45444 at 1805 in Burnham-on-Crouch; Voice of Greece, Athens 15.650 (Gr, Eng to S.Africa 1800-1850) 33333 at 1840 in Morden; Israel R, Jerusalem 15.640 (Eng to Europe?, N.America? 1900-1930) 55555 at 1900 by Clare Pinder in Appleby; R.Finland via Pori 15.440 (Eng to ? 1900-1930) 34433 at 1905 in Co.Monaghan; RNB Brazil 15.265 (Eng, Ger to Europe 1800-2020) 32343 at 1930 in Woking; RAE Buenos Aires, Argentina 15.345 (Sp, Eng, It, Fr, Ger to Europe, Africa

1800-2300) 23332 at 2300 in Kilkeel.

In the 13MHz (22m) band reception was often good from R.Austria Int via Moosbrunn 13.730 (Ger, Eng, Fr, Sp to Europe 0400-1800), rated 45555 at 0910 by Ted Harris in Manchester; R.Norway Int, Oslo 13.800 (Norw [Eng Sun] to Asia 1200-1230 Sun) 44444 at 1200 in Scalloway; UAER, Dubai 13.675 (Eng to Europe 1330-1355) 42443 at 1347 in Burnham-on-Crouch; R.Pakistan, Islamabad 13.590 (Eng to M.East 1600-1630) 43343 at 1615 in Norwich; UAER, Dubai 13.675 (Eng to Europe 1600-1640) heard at 1630 in Oadbly; R.Pyongyang, Korea 13.785 (Eng to Europe, M.East 1700-1750) 54444 at 1700 in Norwich; VOA via Selebi-Phikwe, Botswana 13.710 (Eng to Africa 1630-1900) 45544 at 1718 in Woking; WJCR via Millerstown, USA 13.595 (Eng 12hrs, Chin 12hrs) 43433 at 1745 in Bridgwater; AWR via Slovakia 13.595 (Eng to Africa? 1700-1800) 44444 at 1800 in Chester; SRI via Schwarzenburg? 13.635 (Eng, Fr, It, Ger to Africa 2000-2200) 32222 at 2000 in Truro; WHRI South Bend, USA 13.760 (Eng to E.USA, Europe 1500-2200) 54444 at 2143 in Penmaenmawr; RCI via Sackville 13.670 (Eng to Caribbean, S.America

2200-0000) 55555 at 2230 in Appleby; WWCR Nashville, USA 13.845 (Eng to E.USA 1400-0100) 44444 at 2300 in Morden; Monitor R.Int via WSHB 13.770 (Eng to S.Europe, N.Africa 2200-0000) 44333 at 2345 in Kilkeel.

Some broadcasts from distant places were received in the 11MHz (25m) band. They came from HCJB Quito 11.615 (Eng to Europe 0700-0830), rated SIO333 at 0813 in Macclesfield; FEBC Bocaue, Philippines 11.995 (Eng to India, S.E.Asia 1300-1600) 14311 at 1454 in Burnham-on-Crouch; BBC via Kranji, Singapore 11.750 (Eng to Far East 1100-1800) 33332 at 1457 by Rhoderick Illman in Oxted; R.Australia via Camarvon 11.660 (Eng to S.Asia 1430-2100) 35543 at 1759 in Wallsend; WWCR Nashville, USA 12.160 (Eng 1400-2300) 21222 at 1810 in Stalbridge; AIR via Bangalore 11.620 (Eng, Hi to Europe 1745-2230) heard at 1900 in Oadbly; R.Havana Cuba 11.705 (Eng to Europe 2000-2100) 43444 at 2000 in Appleby; RCI via Sackville 11.690 Eng to Europe, M.East, Africa 2100-?) 45534 at 2120 in Co.Monaghan; R.Japan via Moyabi, Gabon 11.865 (Eng to Europe 2100-2200) 43443 at 2130 in Chester; WEWN

Tropical Bands Chart

Freq (MHz)	Station	Country	UTC	DXer	Freq (MHz)	Station	Country	UTC	DXer
2.310	ABC Alice Springs	Australia	2019	D,E,I	4.970	R.Rumbos, Caracas	Venezuela	2355	B
2.325	ABC Tennant Creek	Australia	2004	D,E,I	4.975	R.Uganda, Kampala	Uganda	2003	C,H,N
2.465	ABC Katherine	Australia	2019	E,I	4.980	PBS Xinjiang, Urumqi	China	2314	C
3.200	TWR Manzini	Swaziland	2013	E	4.980	Ecos del Torbes	Venezuela	2257	B,C,D,H,L,N,O
3.220	Channel Africa	S.Africa	0410	H,M,N	4.985	R.Brazil Central	Brazil	0130	B
3.220	R.Kara, Lome	Togo	2020	E,I	4.990	AIR Ext. Service	India	0006	B,H
3.223	AIR Simla	India	0045	B,E	4.990	FRON Lagos	Nigeria	2113	H
3.230	R.Sol de Los Andes	Peru	0105	H	5.005	R7 Jaisal, Bata	Eq Guinea	0015	H
3.230	SABC Meyerton	S.Africa	2044	B,E,G,K,N	5.005	R.Nepal, Kathmandu	Nepal	1702	E
3.240	TWR Shona	Swaziland	1904	E	5.009	R.Madagasikara	Madagascar	1856	E
3.245	AIR Lucknow	India	1723	E	5.010	Guangxi 2, Nanning	China	0050	H
3.255	BBC via Maseru	Lesotho	2026	C,D,E,I,L,N	5.010	AIR Thiru'puram	India	0115	B
3.270	SWABC 1, Namibia	S.W.Africa	2026	B,C,E,H,I,L,N	5.020	PBS-Jiangxi Nanchang	China	2330	K,L,N
3.280	R.Beira	Mozambique	1953	C	5.020	Voz del Upano, Macas	Ecuador	2350	B
3.290	SWABC 2, Namibia	S.W.Africa	2011	B,E,H,L,N	5.020	La V du Sahel, Niamey	Niger	2029	A,C,E,I,L,N
3.300	R.Cultural	Guatemala	0045	B,D,N	5.020	SIBC Tamil Home Sce.	Sri-Lanka	1646	E,O
3.305	R.Western, Daru	Pap.N.Guinea	2013	C	5.025	R.Parakou	Benin	2155	H,L,N
3.306	ZBC Prog 2	Zimbabwe	2027	C,E,H,I,L,N	5.025	R.Rebelde, Habana	Cuba	2355	B
3.315	AIR Bhopal	India	0100	B,E	5.025	R.Uganda, Kampala	Uganda	2257	H,N,O
3.320	R.France Int. via 7	France?	0108	H	5.030	AWR Latin America	Costa Rica	0016	H,N
3.320	SABC Meyerton	S.Africa	2027	B,E,I,L,N,O	5.035	R.Bangui	C.Africa	2245	B,O
3.325	FRON Lagos	Nigeria	1723	E	5.040	Voz del Upano, Macas	Ecuador	2321	H,D
3.335	CBS Taipei	Taiwan	2028	E,I,L	5.045	R.Cultura do Para	Brazil	0350	N
3.345	AIR Jaipur	India	0045	B	5.047	R.Togo, Lome	Togo	2030	A,B,C,H,I,L,N,O
3.345	AIR Jammu	India	1723	E	5.050	AIR Aizawl	India	0345	B,C
3.345	Channel Africa	S.Africa	1857	E,N	5.050	R.Tanzania	Tanzania	2030	A,C,H,I,L,N
3.356	R.Botswana	Gaborone	2029	I,N	5.055	Faro del Caribe	Costa Rica	0530	N
3.365	GBC R-2	Ghana	1947	B,C,G,H,I,K,L,N,O	5.055	RFO Cayenne(Matoury)	French Guiana	0115	B,H
3.365	AIR Delhi	India	1751	E	5.055	TWR Manzini	Swaziland	0400	N
3.380	NBC Blantyre	Malawi	2029	E,I,L,N	5.060	PBS Xinjiang, Urumqi	China	2345	B,E,K,N
3.395	ZBC Gweru	Zimbabwe	0335	C,N	5.065	R.Candip, Burma	Zaire	1826	E,O
3.915	BBC via Kranji	Singapore	2058	C,E,H,I,O,P	5.075	Caracol Bogota	Colombia	2310	A,B,G,H,L,N,O
3.925	NSB (R.Tampa)	Japan	0255	N					
3.955	BBC via Skelton	England	0400	A,B,H					
3.955	R.Budapest	Hungary	2050	B,G,H,J,M					
3.965	RFI Paris	France	2240	A,B,C,G,H,K,O					
3.975	R.Budapest	Hungary	0400	A,B,H					
3.980	VOA via Munich	Germany	2030	B					
3.985	China R via SRI	Switzerland	2100	F,G,J,M					
3.985	SRI Beromunster	Switzerland	2045	B,G					
3.995	DW via Julich	Germany	2100	B,H,O,P					
3.995	DW via Meyerton	S.Africa	0347	A					
4.500	Xinjiang BS, Urumqi	China	2325	A,G					
4.735	Xinjiang, Urumqi	China	2300	A,B,C,K,L,N,O					
4.750	Xizang BS, Lhasa	Tibet	2315	K					
4.760	Yunnan PBS,Kunming	China	2247	C,I					
4.760	AIR Port Blair	India	1644	E					
4.760	ELWA Monrovia	Liberia	2005	C,E,H,I,J,L,N					
4.765	R.Integracao	Brazil	0055	B,H					
4.770	FRON Kaduna	Nigeria	2035	G,H,I,J,L,N,O					
4.775	AIR Guwahati	India	1708	E					
4.777	R.Gabon, Libreville	Gabon	2139	B,C,E,H,I,L,N					
4.783	RTM Bamako	Mali	2002	A,B,C,H,I,L,N,O					
4.785	R.Tanzania	Tanzania	0307	H					
4.790	Azad Kashmir R.	Pakistan	1735	B,C,E,N					
4.790	R.Antanda	Peru	0133	O,H					
4.800	CPBS 2 Beijing	China	2246	C,H					
4.800	AIR Hyderabad	India	1702	C,E					
4.800	LNBS Lesotho	Masaru	2002	B,E,H,I,L,N,O					
4.805	R.Nac.Amazonas	Brazil	0005	B					
4.810	R.San Martin Tara	Peru	1957	C					
4.810	SABC Meyerton	S.Africa	2133	A					
4.815	R.diff TV Burkina	Quagadougou	2300	B,L,N					
4.820	La Voz Evangelica	Honduras	0100	B,H,N,O					
4.820	AIR Calcutta	India	1702	E					
4.820	Xizang, Lhasa	Tibet	2318	K					
4.825	R.Cancara Nova	Brazil	2316	O					
4.828	ZBC R-4	Zimbabwe	2032	E,I,N,O					
4.830	R.Botswana, Gaborone	Botswana	0343	H,N					
4.830	R.Tachira	Venezuela	0136	O					
4.832	R.Relejo	Costa Rica	0500	N					
4.835	R.Tezulutan, Coban	Guatemala	0105	B					
4.835	RTM Bamako	Mali	2033	A,B,C,G,H,I,L,N,O					
4.840	AIR Bombay	India	1712	B,E					
4.845	RTM Kuala Lumpur	Malaysia	2205	C,E					
4.845	ORTM Nouakchott	Mauritania	2200	B,L,N,O					
4.850	R.Yaounde	Cameroon	2105	B,C,H,I,O					
4.850	R.Luz y Vida, Loja	Ecuador	2007	C					
4.860	AIR Kingsway(Feeder)	India	2005	B,C,E,H,I,L,N					
4.865	PBS Lanzhou	China	2301	B,C,L,O					
4.865	LV del Cimanuco	Colombia	0105	B					
4.870	R.Cotonou	Benin	2002	B,I,N,O					
4.879	R.Bangladesh	Bangladesh	0055	B					
4.885	R.Clube do Para	Brazil	2350	B,N					
4.885	KBC East Sea Nairobi	Kenya	1836	E					
4.890	RFI Paris	via Gabon	0356	H					
4.890	R.Port Moresby	New Guinea	2015	I					
4.890	ORTS Dakar	Senegal	0443	N					
4.895	Pakistan BC	Pakistan	2001	C,E,I,N,O					
4.905	R.Nat.N.djamaena	Chad	2032	A,C,H,I,L,N,O					
4.910	R.Zambia, Lusaka	Zambia	1916	E,N					
4.915	GBC-1, Accra	Ghana	2030	B,C,D,H,I,L,N,O					
4.915	R.Cora, Lima	Peru	0455	N					
4.920	R.Quito	Ecuador	0201	D,N					
4.920	AIR Madras	India	0120	B,C					
4.925	R.Nacional, Beta	Eq Guinea	2205	C,L,O					
4.931	R.Internacional	Honduras	0450	N					
4.935	KBC Gen Sce Nairobi	Kenya	2029	A,C,E,H,I,L,N					
4.940	AIR Guwahati	India	1602	N					
4.945	Channel Africa	S.Africa	1740	N					
4.950	R.Nacional, Mulenvos	Angola	2053	E,L,N					
4.950	AIR Jammu	India	1720	B,E					
4.955	R.Marajoara, Belem	Brazil	0055	B					
4.955	R.Nac. de Colombia	Colombia	0400	N					
4.965	R.Alvorada	Brazil	2350	B					
4.965	R.Zambia, Lusaka	Zambia	2133	E,N,O					
4.966	R.San Miguel, Cusco	Peru	2215	C					

Wye.
 During the afternoon R.Prague, Czech Rep 7.345 (Ger to Europe 1200-1227) was 45333 at 1216 in Manchester; Polish R, Warsaw 7.270 (Eng to Europe 1200-1255) 44444 at 1218 in Norwich; TWR Monaco 7.160 (Ger to ? 1330-1400) 43333 at 1330 in Penmaenmawr; VOA via Udorn, Thailand 7.215 (Eng to S.Asia 1400-1800) 34232 at 1455 in Scalloway; Sudwestfunk via Rohrdorf 7.265 (Ger to Europe 24hrs) 55544 at 1531 in Manchester; R.Tirana, Albania 7.155 (Eng to Europe 1600-1615) 44344 at 1600 in Appleby; R.Nederlands via Talata Volon, Madagascar 7.120 (Eng to S/E/W.Africa 1730-2025) 44444 at 1731 in Burnham-on-Crouch.
 Later, R.Thailand, Bangkok 7.200 (Eng to Europe? 1900-2000) was 43433 at 1915 in Chester; Israel R, Jerusalem 7.465 (Eng to Europe, N.America 2000-2030) 32222 at 2000 in Truro; R.Australia via Carnarvon 7.260 (Eng to S.Asia 1800-2100) 32322 at 2045 in Morden; R.Budapest, Hungary 7.250 (Eng to Europe 2100-2130) 53543 at 2105 in Bridgwater; CPBS China 7.504 (Chin [CNR-1] 2000-1735) 55444 at 2125 in Guildford; Voice of Russia 7.350 (Eng WS) SIO333 at 2200 in N.Bristol; WJCR Upton, USA 7.490 (Eng to E.USA 24hrs) 33333 at 2340 in Kilkeel; WRNO New Orleans, USA 7.355 (Eng to E.USA 2300-0300) 35233 at 0045 in Newry.

Many of the broadcasts in the 6MHz (49m) band are intended for listeners in Europe. Some come from R.Austria Int, via Moosbrunn 6.155 (Ger, Eng, Fr, Sp 0400-2300) SIO222 at 0730 in N.Bristol; RFI via Allouis 6.175 (Fr [WS] 0700-1230) 55555 at 0855 in Rugby; Bayerischer Rundfunk, Germany 6.085 (Ger) 43444 at 1000 in Manchester; R.Nederlands via Flevo 6.045 (Eng 1030-1225) 44444 at 1205 in Morden; R.Prague, Czech Rep 5.930 (Eng 1700-1727) SIO333 at 1700 in Co.Fermanagh; BBC via Limassol, Cyprus 6.180 (Eng 1700-2200) 44434 at 1711 in Burnham-on-Crouch; R.Finland via Pori 6.120 (Eng to Europe 1900-1930) 34434 at 1900 in Oadby; SRI via Lenk 6.165 (Eng 1900-1930) 55555 at 1900 in Appleby; R.Portugal 6.130 (Eng 1900-1930?) 33342 at 1915 in Ross-on-Wye; R.Austria Int via Moosbrunn 5.945 (Fr, Sp, Eng, Ger 1800-2230) 33333 at 1930 in Truro; R.Korea via Skelton, UK 5.965 (Ger, Fr, Eng 2000-2230) 44434 at 2025 in Penmaenmawr; R.Pyongyang, Korea 6.576 (Eng, Fr 2000-2150, also to M.East, Africa) 33333 at 2025 in Co.Monaghan; R.Sweden via Karlsborg? 6.065 (Eng 2030-2100) 55354 at 2035 in Newry; REE via Noblejas? 6.125 (Eng 2100-2200) 53443 at 2120 in Chester; R.Bremen, Germany 6.190 (Ger) 34453 at 2220 in Woking; R.Japan via Skelton, UK 6.155 (Eng 2300-0100) 43553 at 2315 in Bridgwater.

Whilst beaming to other areas R.Nac da Amazonia, Brazil 6.185 (Sp 0900-0200) was 24542 at 2220 in Wallsend; BBC via Antigua, W.Indies 5.975 (Eng to C/S.America 2100-0600) 32333 at 2300 in Stourbridge; R.Havana Cuba 6.180 (Eng to C/N.America 2300-0000) 33333 at 2345 in Kilkeel; Channel Africa via Meyerton 5.955 (Eng to E/C/S.Africa 0300-0500) 43333 at 0400 in Norwich.

Station Addresses

- All India Radio, External Services Division, PO Box 500, New Delhi 110001, India.
- Channel Africa, P.O.Box 91313, Auckland Park 2006, South Africa.
- Jordan Radio & Television Corp, PO Box 1041, Amman, Jordan.
- Voice Of Free China, PO Box 24-38, Taipei, Taiwan.
- Ulaanbaatar Radio, Huvsgalyn Dzam 3, CPO Box 365, Ulaanbaatar, Mongolia.

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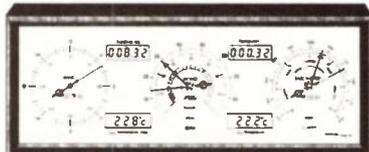
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MYSTERY PICTURE

The mystery picture on page 51 is an image from GMS-5, taken on 27 August 1995 at about 1400UTC. The WXSAT takes images at regular intervals, apparently including its 'night-time' period. The bright object is the sun, illuminating the atmosphere around the globe of the earth - a daily drama!

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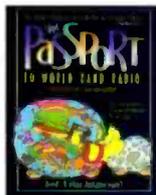
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Published by Antique Electronic Supply (Arizona)

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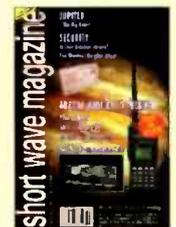
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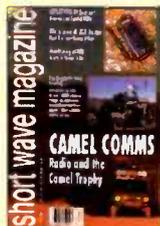
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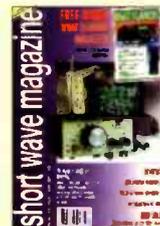
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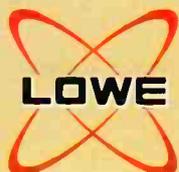
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