short wave magazine

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JW REVIEWS THE NEW HF-350 HF RECEIVER

SCANNER OF THE YEAR?

DJ-X2 MINI SCANNER REVIEWED

'LIGHTWEIGHT' SCANNING

- PAGE 49

LOW NOISE LOW BAND ANTENNAS

August 2000 £2.99

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World Radio History

High - the new Alinco DJ-X2

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August 2000 Issue

short wave magazine

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features

BROADCAST

COVER SUBJECT
Two reviews and a Land Rover FFR with radios in – bliss.

Join the SWM Readers E-mail forum, send an E-mail to: SWM_readers-subscribe@egroups.com

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NEXT MONTH IN SEPTEMBER *SWM*

- **World Space Radio**
- **Part 2 of Low Noise Medium Wave & Tropical Band Antennas**
- **Receiving Inmarsat**
- **JW on the Hallicrafters Classic SX117**
- **And all your regular favourites**

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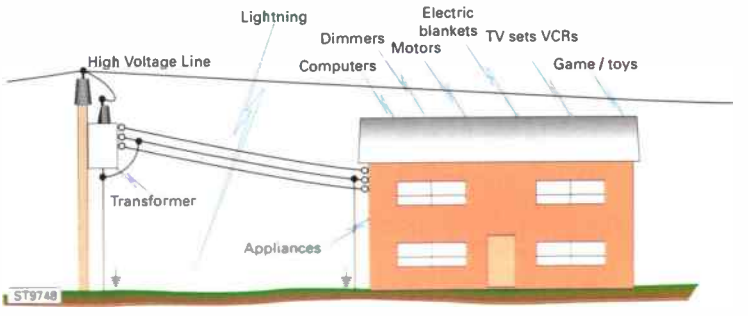
Paul Essery GW3KFE tells us how to get the best QSL returns from amateur stations. Read his rough and ready guide and you too can experience QSL success.

43 LOW NOISE MEDIUM WAVE & TROPICAL BAND ANTENNAS

In part one of this two part series, Joe Carr K4IPV suggests some very useful antennas for frequencies up to 7.5MHz, just the job if you are a low-band DXer.



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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, **KANGA PRODUCTS, Sandford Works, Cobden Street, Long Eaton, Nottingham NG10 1BL. Tel: 0115 - 967 0918. Fax: 0870 - 056 8608.**

Photocopies & 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 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 for *SWM* are £2.99 each and photocopies are £2 per article.
Binders are also available (each binder takes one volume) for £6.50 plus £1 P&P for one binder, £2 P&P for two or more, UK or overseas. Prices include VAT where appropriate.
A complete review listing for *SWM/PW* is also available from the Editorial Offices for £1 inc P&P.

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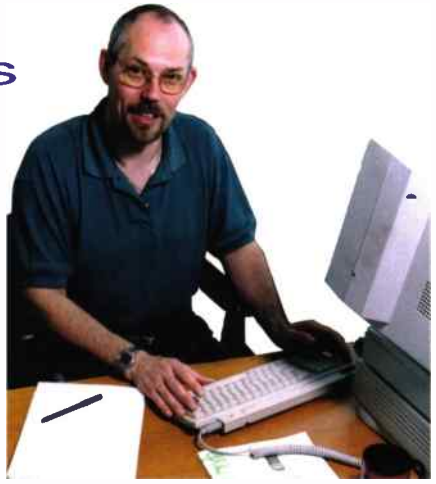
Technical Help
We regret that due to Editorial time scales, replies to technical queries cannot be given over the telephone. Any technical queries by E-mail are very unlikely to receive immediate attention either. So, if you require help with problems relating to topics covered by *SWM*, then please write to the Editorial Offices, we will do our best to help and reply by mail.

ed's comments



Space & Disappointment

A concerned reader has E-mailed me to enquire as to the whereabouts of the reader equipment survey that I suggested in the May issue of *SWM*. Unfortunately, so far, I've only had 13 responses so I guess that you all consider the equipment that you use to be a secret. What's the chance of proving me wrong? The enquirer, like me, would really like to see what the most popular *SWM* reader receiver and antenna combination is. As I said back in May, details via E-mail or letter, please use the subject 'Top 10 Receivers' and let me know what gear you use.

On a similar note, next month we will feature the first of our resurrected 'Other Man's Shack' features so keep your eyes peeled for that. Unfortunately, we are always pushed for space in each magazine we produce. This results in an increasing backlog of articles that we intend to bring you. A casualty of this situation is this month's RIAT 2000 feature from Ian Doyle. We had intended to publish Ian's article last month so it would be a reference for tattoo attendees, however I'm sure you'll all enjoy reading it just as much after the event.

Book Store Web Page

Here at the Editorial Offices we get a regular stream of enquiries about the contents of books on offer from the *SWM* Book Store. To help those of you with access to our web we are developing an on-line directory of descriptions and cover pictures of each book available as you can see in the example here. The URL to browse these pages is: **www.pwpublishing.ltd.uk/bookstore** please note that the Book Store pages are currently under development, any comments would be welcomed by our webmaster so feel free to mail him at **webmaster@pwpublishing.ltd.uk**

MSF

Within previous issues of *SWM* there has been some unfortunate confusion regarding MSF. To put things straight, following are some facts regarding the UK's time standard service:

MSF is the radio signal which broadcasts the national time standard for the UK. The MSF service broadcast from Rugby is the principal means of disseminating the UK national standards of time and frequency which are maintained by the National Physical Laboratory. Transmission is 24 hours a day, and the carrier frequency is maintained at 60kHz to within 2 parts in 1012.

What do the letters MSF stand for? Well, they do not stand for anything. MSF is simply a callsign which uniquely identifies the broadcast. M is one of three prefixes (2, G or M) allocated to the UK by international agreement for station identification. There is speculation that SF was intended to represent the words 'standard frequency', but NPL has no evidence for this.

The MSF 60kHz standard time and frequency service is funded by the Department of Trade and Industry (DTI) as part of its provision of time and frequency measurement standards in the UK. The maintenance and development of those standards is carried out by the National Physical Laboratory (NPL), with the MSF 60kHz signal being transmitted from the Rugby Radio Station by BT Radio Engineering Services under contract from NPL. The signal is generated at Rugby using the atomic clocks and time code equipment provided by NPL. The broadcast signal is monitored and controlled relative to the national time standard at the NPL site in Teddington.

The MSF transmitter at Rugby is at latitude 52° 22'N, and longitude 1° 11'W. The estimated equivalent monopole radiated power (e.m.r.p.) is 15kW and the horizontal radiation pattern is substantially omnidirectional. The signal provides a field strength exceeding 100μV/m throughout the UK, and it can be satisfactorily received throughout much of north and west Europe. The main cause of reception difficulties are local interference and screening due to nearby metalwork, for example in a steel-framed building.

For more information regarding MSF you can visit there website at: **http://www.npl.co.uk/npl/ctm/msf.html**

On reflection though, it seems to me that the subject deserves a feature in *SWM* later in the year.

And Lastly

Friday June 30 saw the closure of the remaining UK coast radio stations at 1200UTC. The stations that shut down at this time were all remotely controlled by Radio Officers at Stonehaven. Those stations that ceased operation were Land's End (GLD), Humber (GKZ), Portpatrick (GPK), Stonehaven (GND) and Wick (GKR), all were operational on 2MHz radiotelephony only.

Stonehaven made a farewell broadcast through all stations at 1200 on Friday on 2.182MHz. I'm sure many a tear was shed throughout the radio and maritime world.

Kevin

73

Dear Sir

I cannot understand the negativity in the letter written by G.E.R. Denman (May 2000 *SWM*) concerning John Wilson's reviews of professional type radio receivers. I myself just love John's reviews and eagerly look forward to them. When I receive *SWM* without one I feel something is missing.

Sure most of us will never be able to afford one, but what the heck, I sure would like to know how much better than my receivers they really are. And if the truth be known, they're not that much better.

As to his statement that it would be very difficult to get spares, if a radio is really good, it will have a dedicated band of owners, some of which are very knowledgeable when it comes to repairs. I speak from experience here, one of my receivers, a Collins R-390A, which has been around for almost half a century now and I can still get pretty well any part from a simple capacitor or resistor to a complete overhaul if I so desired.

Yes they're expensive, both to purchase and to repair, but then so too are a Rolls Royce or an Aston Martin. Sure a Skoda or a Panda gets one from A to B, but it's not quite the same. (My apologies to all Skoda and Panda owners).

Also Mr. Denman says that John never says very much as to how a particular receiver receives real radio signals. I disagree. John always does an on air test with three very particular signals, namely Radio Milan on 900kHz, the BBC Radio 5 on 909 and another station on 918kHz.

I know how important it is to be able to separate out weak signals from either side a strong local station. As a m.w. DXer myself, living within two miles of a 10kW m.w. station, I too relish this ability. If a receiver can pass this test at m.w. frequencies where signal strengths can be super high, then surely it will be able to do the same at s.w. frequencies. It's an excellent test of any receivers ability.

Tell John Wilson to continue with his excellent reviews. The more exotic the receiver the better I like it. Though some day I would very much like him to do a review on a tubed receiver, like his Collins 51S-1 or my R-390A, as a comparison to today's solid state receivers.

Michael J. Stonebridge
Canada

*Last month JW looked at the AR88, keep reading for more relevant valved receiver reviews. - **Ed.***

Dear Sir

Being fairly new to listening on short wave, etc., I have the following problem. I am able to pick up Morse signals on various frequencies between 290 and 420kHz - these sound to me like identification codes of radio beacons. Perhaps you would be kind enough to tell me what they are and where they are located. A two or three letter code is transmitted.

P. Roadhouse
S. Yorkshire

The Morse transmissions to which you refer are omni-directional beacons. In SWM, *on a quarterly basis, we run a column dedicated to the reporting of such maritime beacons. The most recent was page 73 of the June* SWM. *- **Ed.***

Dear Sir

I have been following with interest the series by John Wilson on receiver design and performance and must say that it is one of the best series I have read on that subject. Arising from the reviews and comments, however, I would like to ask if a few points of technical detail could be answered either in the magazine or by direct correspondence.

1) Mention is often made of oscillator noise. How is this measured and can it be done using the type of equipment found in the experimenter's workshop?

2) For third order effect measurements, John says he uses two very clean crystal oscillators. What are the design features which give the desired clean signal and what are the output levels?

3) How are the output levels measured?

4) Are there any available references which cover the whole subject of receiver performance measurements in good practical detail without going into deep mathematical analysis?

5) If not, how about *SWM* doing one?

May I wish you all success with the magazine and I look forward to reading many more of John's words of wisdom on the designs and details of the very best of receivers.

D.J. Goacher G3LLZ
Wiltshire

*I have forwarded your letter to John, it is very likely that he will answer your queries in a future 'In My Experience'. - **Ed.***

Dear Sir

I agree with Graham Galbraith (July *SWM*) that it was a pity that the Nascom was not mentioned in the Old Computers article. A large number of people cut their teeth on that device. I can remember one frustrating day, trying to get one of these beasts to behave, when a member of the assembled company asked what 'Nascom' stood for. In the end it was generally agreed that it was "Not Any Software Contains One Microprocessor".

Ron Gouldstone G3TAG
Cambridge

Dear Sir

TOP QSL

I would like to draw the attention of your readers to an article I came across by Richard Q. Marris in the August 1997 issue of *Practical Wireless*, (pages 28-29). In it he describes the construction of a helically wound antenna ('The Probe') for use in difficult locations.

I live in a block of flats in which it is almost impossible to erect a conventional antenna: 1) because of the difficulties of installation, (my window box is to small to string up an 100m plus long wire and 2) local authority regulations prevent it.

Also, due to the screening effect caused by the buildings construction, an indoor antenna is of limited or no use as I am effectively living inside a Faraday cage. Even getting my local radio stations on f.m. is a challenge.

The above article will be of great interest to anyone with similar problems. Construction is simple and the cost is minimal. I built mine using an old broom handle, the wire from a discarded 'phone cable, plus various bits and bobs that I happened to have lying around.

Used with my DX-394 receiver, I am now able to pull in signals from across most of the h.f. spectrum even though the antenna was designed specifically for use on the 80m amateur band.

P.S. Great magazine!

Peter Czerwinski
Sheffield

Well done Peter, PW *often have useful antenna articles. For your Band II reception, you might try the 'Flat Dweller's Delight' on page 49 of the same* PW *issue you mention. - **Ed.***

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 at QSL, Short Wave Magazine, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW.

THE BEST LETTER WILL RECEIVE A £20 VOUCHER TO SPEND ON ANY SWM SERVICE.

Obituary - Louis Varney G5RV

Louis Varney G5RV died peacefully at home on June 28th at the age of 89. He was a member of the RSGB for 74 years and contributed much to amateur radio. Born in June 1911, Louis became BRS102 about 1926 and in 1927 he obtained the AA callsign 2ARV. Louis and the late Jack Hum 2AJI, later G5JH, collaborated on the research which led in 1928 to Louis Varney dropping the AA call and becoming G5RV with a full radiating permit - (up to 1939 you had to propose a programme of research which *required* the radiation of a signal before a licence would be granted. AA licences only permitted one to load a transmitter into a dummy load).

While he is probably most famous for the G5RV antenna - and its half and double size cousins - he contributed much more. In July 1953 for example the article in the RSGB Bulletin on his Elizabethan transmitter showed us how to build a TVI-proof transmitter at a time when TVI kept almost every amateur in the London area off the h.f. bands and commercial equipment was all but unknown.

In 1957 Louis was working for Marconi in Venezuela and managed to obtain a 'vacation' licence as CX5RV. That was the 'first crack in the wall' which led, after long negotiations, to reciprocal licensing between the UK, USA and other administrations in 1964/65. Later, of course, reciprocal licensing became far more common.

So much for G5RV's influence on amateur radio. What about G5RV the man? He was liked and respected by almost everyone who met him, in person or on the air. His amateur activity was always on c.w. and his skill with a key was legendary - but he did have the occasional 'phone contact with one or two personal friends. I recall a G-QRP Club meeting in Steyning at which Louis was present - modest though he was - G5RV naturally dominated our talk.

It is banal to say G5RV will be missed - he was one of amateur radio's greats. He is survived by his second wife and by a son from his first marriage. We offer our sympathies on behalf of all our readers.

Paul Essery GW3KFE

Compiled by Zoë Shortland - News & Production Editor

Annual Novice Contest

Chris Carrington G0IYZ has informed us that the **Nunsfield House Amateur Radio Group**, of which he is Publicity Officer, are now organising and running the Annual Novice Contest. Now spread over two days, the contest also has two different entry categories. Contestants may choose the best six consecutive hours to operate from within the 24-hour period. The dates of the contest are the **26/27th of August 2000**.

The Nunsfield House Amateur Radio Group are pleased to announce that **Martin Lynch & Sons**, **Waters & Stanton** and **Radioworld** have all agreed to sponsor the contest. Consequently, the winner of each category will receive a Standard C108 v.h.f. transceiver and gift vouchers will be awarded to the runner-up in each category.

There will also be a Hora C408 u.h.f. transceiver awarded to the contestant who contacts the greatest number of Novice Licensees during the contest. Certificates, like the one illustrated, will be presented to the top six scores in each category.

If you would like a copy of the rules and conditions for this contest, contact **Neil Davison M1AFB, Novice Contest Manager** at **1 Retford Close, Breadsall Estate, Derby DE21 4DX**. To enter the contest, you need to send a copy of your log, in accordance with the rules and conditions, to the address above.

New Website

An all new website for the **Low Power Radio Association** (LPRA) has recently been launched. Features of the new site include: A brand new online database with full details of all members companies, a special section devoted to the LPRA's exhibitions and conferences, full details of benefits of membership of the LPRA, along with application details and the option to apply online, and a 'What's New' section with regular updates on what's happening both within the LPRA and the industry as a whole. Visit **www.lpra.org** for more details.

Two New Supplies

The well known Japanese manufacturer, Diamond Antenna Corporation, have just announced two switch mode and therefore lightweight power supplies which are fully approved for CE and LVD for UK use. Two models are available - the **GZV-2500** - a 25A unit weighing only 2.5kg, with a retail price of £119.95. Secondly, the **GZV-4000** - a 40A unit weighing 3.5kg, with a retail price of £159.95.

These power supplies are an alternative to the existing low cost switch mode power supplies which are basic units, but the Diamond models include output voltage and current metering, variable voltage, choice of outputs and a built-in cooling fan.

More information from **Waters & Stanton PLC** at **5pa House, 22 Main Road, Hockley, Essex 555 4QS, Tel: (01702) 206835/204965, FAX: (01702) 205843** or E-mail W&S at **info@wsplc.demon.co.uk**

Lake Catalogue

The latest illustrated catalogue, July 2000, is now available from **Lake Electronics**. The complete Lake range is fully described, including the new Novice receivers and amplifier, essential for aspiring NRAE students. A summer discount voucher is enclosed in the catalogue, offering a 10% discount on all orders places before the end of August (including payments by credit card). To receive your free copy, send at least an A5 sized stamped, addressed envelope to Lake Electronics at **7 Middleton Close, Nuthall, Nottingham NG16 1BX** or telephone **0115-938 2509.**

BDXC Manchester Meetings

The first weekend in June saw a hugely successful get-together in Twickenham for the 25th anniversary of the **British DX Club**. A large turnout of BDXC members travelled in from all over England to participate in what was a most enjoyable evening.

The next of the popular series of Manchester BDXC meetings will take place on **Saturday 29 July** from 1600 in the Weatherspoons Pub, in Piccadilly gardens. This is a change from the usual Wednesday nights in response to local members for whom mid week is inconvenient, and some DXers further afield who have indicated they would like to travel up for a meeting, but realistically would need a weekend to do so. If this is a success, then future Saturday get-togethers will be organised, while keeping Wednesday as the more regular day.

All listeners, DXers and radio hobbyists are welcome and encouraged to attend - you do not have to be a BDXC member. Look out for QSL cards and copies of *Communication* - the BDXC monthly journal on the tables. After a few drinks and a good chat, everyone will no doubt head on into Manchester's famous Chinatown for a meal.

Further details from **Tom Read** on **(01625) 612916** or E-mail: **tommyread@hotmail.com**

On The Move

RadioSport, organisers of the London Amateur Radio & Computer Shows, are pleased to announce that their highly successful events will be moving to Alexandra Palace next year and the first LARCS to take place at this new venue will be on **Saturday 21** and **Sunday 22 April 2001**. The reason for this move is the impending demolition of the Lee Valley Leisure Centre (Picketts Lock), which is making way for a brand new multi-million pound athletics stadium that will host the 2005 World Athletic Championships.

The new venue, which rates as one of the top exhibition centres in London, will greatly enhance the Amateur Radio and Computer Show and will undoubtedly attract more exhibitors and many more visitors. It is therefore encouraging that, as a result, many more people will be attracted to the communication hobbies.

You can contact RadioSport at **www.radiosport.co.uk**

Morse & RAE

The **Stratford upon Avon & District Radio Society** are again holding classes for the Radio Amateurs Examination and Morse Classes. For details about the RAE, please contact **John Harris G8HJS** on **(01789) 295257**. Morse classes are normally held before meetings on the 2nd and 4th Mondays of the month at the Home Guard Club, Tiddington, Near Stratford upon Avon. For further details, visit the Society's web site at **www.stratfordradiosociety.freeserve.co.uk** or contact **David Jones G6FEO, 8 Kenilworth Road, Lighthorne Heath, Leamington Spa, Warwickshire CV33 9TH, Tel: (07970) 148204, FAX: (01926) 642858** or E-mail David at **david.g_jones@cwcom.net**

The **Sandwell Amateur Radio Club** will be running courses for both the RAE and Novice RAE in September at their

Competition Winner

Pictured here is the winner of our h.f. station competition with his new JRC NRD-345 receiver which was kindly donated by Lowe Electronics Ltd. of Matlock. Winner Anthony Ireland now looks forward to setting up his new receiver and his Wellbrook ALA1530 active loop antenna alongside his current collection of radio gear, such as his AOR AR8200 hand-held and Dressler ARA 2000 active antenna. Anthony told *SWM* Editor, Kevin Nice that, "he'll have a great time getting to grips with his new equipment".

Headquarters in Broadway, Oldbury, West Midlands. The courses will run on Thursday evenings at 1930 and will prepare candidates for the above courses. The courses commence on Thursday September 14th, with enrolment on Thursday September 7th. The club is also a registered examination centre. Further details from **Martin G2BXP** on **0121-552 4902**, **Archie G4OJJ** on **0121-532 7039** or from **Clive G0TVR** on **0121-429 6061** - all QTHR.

The **Radio Society of Harrow** are starting a Novice course for anybody wanting to sit the Radio Amateur Novice Licence on Monday 18 September. More details from **Don Lamb G0ACK** on **020-8845 9575**.

Tony Skaife G4XIV has written in to let you all know that he will be teaching a class (RAE and 5w.p.m. Morse) for the A/B licence. The venue is at Huntington School in York, telephone **(01904) 752102**, E-mail: **s.duff@huntington-ed.org.uk**

The **Bishop Auckland Radio Amateurs Club** will be running RAE and NRAE courses, starting at the beginning of September. Courses will be held at the club, which meets every Thursday evening at the Stanley Village Hall. Those interested should contact **Tim Bevan** on **(01388) 832948**.

Surge To Safety

Maplin Electronics has increased its range of Surge Protection Extension Leads - now stocking a complete range of 4 and 6-way, surge, spike and r.f.i. protected extension leads, as well as a range offering additional modem protection. The jewel in the crown is a 4-way surge protected extension lead which comes with a free 3 year £1500 connected equipment warranty, all at a market leading price of just £14.99. This product safeguards sensitive electrical equipment such as PCs, receivers and Hi-Fis from mains-borne surges and spikes that can damage vital components as well as offering protection from radio frequency interference.

More information from Maplin Electronics on **(0870) 264 6000** or visit Maplin's web site at **http://www.maplin.co.uk**

Precision With Maplin

The Precision Tool Kit, £19.99, from **Maplin Electronics** is sure to meet many needs. This multi-purpose tool kit, which is ideal for students, hobbyists and service engineers, is a welcome addition to any toolbox through its durability and versatility. More information from Maplin Electronics on **(0870) 264 6000** or visit Maplin's web site at **http://www.maplin.co.uk**

Special Event

To mark the 60th Anniversary of Dunkirk, the **Scarborough Special Events Group** operated a site overlooking Scarborough Harbour where two of the few remaining rescue ships are based. They also set up an amateur radio station **GB65S/MM**, on board *Coronia* during a commemorative voyage from Scarborough to Whitby. The *Coronia*, as HMS *Watchful* saved 900 troops from the beaches at Dunkirk in 1940.

This was a special moment in amateur radio history as never before had the RA given permission for a shore-based Special Event Station to operate maritime mobile. On the day of the voyage, the group was besieged by local press photographers in both ports and were accompanied on the voyage by a BBC television crew and a recording unit from BBC Radio York, giving an insight into the hobby to tens of thousands of viewers and listeners in the North of England. The two QSL cards shown here are to commemorate the anniversary.

Upgraded

Remember the Watson WMM-1 - a low cost multi-mode data package made specially for **Waters & Stanton PLC**. For a low cost of only £69, a customer can decode Packet, RTTY, FAX, c.w. and AMTOR when used with an appropriate receiver and PC. Now, the manufacturers have produced an upgraded unit, model WMM-3, still at the same price of £69.

The WMM-3 builds on the reputation of the WMM-1, offering a range of features and facilities that have been put together in one very compact and efficient package, the WMM-3 represents great value, just connect between PC and your transceiver or receiver and you will be up and active within a very short time.

Another new product from the same manufacturers is the WSA-1, which is also a multi-mode modem, but without Packet capability, selling at a low price of just £39.95.

For more information about these products, contact Waters & Stanton PLC at **Spa House, 22 Main Road. Hockley, Essex SS5 4QS, Tel: (01702) 206835/204965, FAX: (01702) 205843**, E-mail: **info@wsplc.demon.co.uk** or visit their web site at **http://www.waters-and-stanton.co.uk**

Send your news to Zoë Shortland at the Editorial Offices

rallies

Attention Please!

Would you like to have your Rally publicised? If so, all you have to do is put together as much information as possible about the Rally, i.e. date, location, times, who to contact, etc. and send it to the Editorial Offices.

August 11: The 2000 Cockenzie & Port Seton ARC's 6th annual radio junk night takes place from 1830-2130 at the Cockenzie & Port Seton Community Centre, South Seton Park, Port Seton, East Lothian. Bring along your own junk and sell it yourself. Tables will be provided on a first come, first served basis and there will be no charge for the table. Raffle at approximately 2100. Refreshments available, disabled access. Entry Fee: £1, all money donated to the British Heart Foundation.

August 13: The 11th Great Eastern Radio & Computer Rally is to be held at the Park High, Queen Mary Rd, Gaywood, Kings Lynn, Norfolk. Refreshments will be available all day. Talk-in on S22, free parking, Bring & Buy and lots more. Contact telephone number is **(01553) 841189**. For latest, please see **www.qsl.net/G3XYZ**

August 20: The Leeds & District ARS are holding the second of their twice yearly car boot sales at the Yarnbury Rugby Club, Brownberrie Lane, Horsforth, Leeds. Please contact **J.A. Mortimer M1CAI** on **(01943) 874650** for details. It will be a general car boot sale but with Amateur Radio, electronics and computer sections. Sellers' cars (inc. small trailer) will be £5 with vans/large trailers being charged £10. Refreshments and plenty of free parking will also be available.

August 27: The Milton Keynes ARS will be holding their 14th fayre and car boot at Bletchley Park Museum. Open to Traders from 0700, £7 in advance, £10 on the day. Doors open to buyers at 0900 and entrance is just £1. Talk-in on 145.550/433.550MHz, refreshments, Morse tests, museum open. For more details contact **Dave G3ZPA** on **(01908) 501310** or E-mail: **m0bzk@bletchley.madasafish.com**

August 27: The Coleraine & District ARS will be holding their annual rally at the Bohill Hotel, Coleraine. Usual traders and Bring & Buy present, doors open at 1200, all welcome. Further details are available from **Brian GI8LTB** on **0287-035 8664** or **Jim GI4ORI** on **0287-035 2393**.

August 28: Huntingdonshire Amateur Radio Rally will take place at Ernulf Community School, St. Neots, Cambridgeshire (near Tesco Superstore on A428). Open 1000-1400, admission £1.50. Hot and cold refreshments available, features hall and car boot sale on hardstanding. Talk-in on S22. Details from **David Leech G7DIU** on **(01480) 431333** (between 0900-2100).

■ Gerry L. Dexter, c/o *SWM* EDITORIAL OFFICES, ARROWSMITH COURT, STATION APPROACH, BROADSTONE, DORSET BH18 8PW.
■ E-MAIL: gdexter@pwpublishing.ltd.uk

Bandscan America

BROADCAST

A new station has come on the air in troubled Colombia. Colombia Estereo, operated by the army, is using 4.895 24-hours per day. The station carries the programming of the Colombian army's rather extensive domestic network - Cadena Radial del Ejercito Colombiano (CREER).

The addition of short wave may well be tied to the government's ongoing fight against the drug traffickers and guerrillas which have virtually taken over much of the country. Reception reports can be sent to: **Emisora Colombia Stereo, Escuela de Cadetes Jose Maria Cordoba, Calle 80, No. 38-00, Santa Fe de Bogota, Colombia.** The frequency 4.895 was formerly used by La Voz del Rio Aruca.

New from Bolivia is Radio Yura, named after the town and river in the Department of Potosi. It is operating just a hair below 4.717 and appears to sign on around 1000, broadcasting in Quechua, and probably some Spanish too. The station appears to be running very low power.

Another new Bolivian is Radio Mauro Nunez, on 6.064 and a fraction. Sign on is at 1000 and programming runs until around 0130. The weekend schedule may be shorter. It's located in Villa Serrano, Chuquisaca Department.

Brazil has re-established it's Radio Nacional Amazonia, which was off the air for a few months. 6.180 and 11.780 have resumed activity, although they are not on the air at the same time. However, no one we know of has yet spotted the Radiobras overseas service, though it may have returned by the time you read this.

New from somewhere in Peru is Radio Tigre which, initially at least, is wandering widely in its frequency usage, heard as low as 5.580 all the way up to 5.620. Even its sign off varies considerably - anywhere from 0100 to 0300. The location of this one is still uncertain.

Another new Peruvian is Radio Paraton, also announcing as Radio La Voz del Campesino, using 6.9566 from sign on around 1055, and have been heard as late as 0100 in North American evenings. They are located in Huarmaca, Huancabamba. This one is being heard quite widely and appears to be causing problems for the various US illegal broadcasters who like to use 6.955.

And another new one is radio Superior, in Bolivar, La Libertad (although there is some question as to whether this is the right 'Bolivar' or whether it refers to a city or province). The station is using 5.300, with sign on around 1050, apparently relaying local 1000kHz medium wave. It runs on a split schedule, to 1530 and is on again from 2300 - 0300.

And here's still another one: Radio Cielo, location unknown, on 4.693, signing on around 1030.

Radio Canada issued this attractive QSL card in 1967, commemorating the Centennial of the Canadian Confederation.

Exciting News

Here's some exciting news which one hopes may become actual fact sometime in the future. An organisation called Baptist Radio International has plans to put a short wave station on the air from Panama! Panama has had no voice on short wave for something like 25 or 30 years so the appearance of a station there would add a new country for most short wave broadcast DXers. The station in question would be called Radio Guaymi, and operate with 500W from David. It would serve some 40,000 Guaymi people living in that area.

The Baptist group also hopes to put a station called Radio Bautista on the air near Lake Atitlan to serve several of the indigenous peoples in that area. It, too, would use 500W. Baptist Radio International already operates Radio K' Radio K'ekchi' (4.845) in Guatemala. It also operates Radio Buenas Nuevas/HRET (4.960) in Honduras and m.w./f.m. stations in Nicaragua, Jamaica, Guatemala and Panama. So this organisation knows what it's doing, which means we can probably put more faith in seeing these stations come to reality than might be the case with an unknown group.

A new Guatemalan station already in operation is Radio Verdad, operating from Chiquimula on 4.052. This one signs on around 1100. It's 'evening' schedule is limited, but normally ends at the rather odd time of 0020. The address for reports is: **Estation Educativa Evangelica, Radio Verdad, Apartado No. 5, Chiquimula, Guatemala.**

Time stations WWV and WWVH are to up their power to 50kW.

Back On Air

Nicaragua's Radio Miskut, which has been gone from short wave for some months, should be back on the air by now. It has been off the air while waiting to obtain parts for the transmitter. Check 5.770 around 2300, give or take.

Also back on the air is Mexico's Radio Transcontinental de America - XERTA - on 4.800, but whether on their previous 24-hour schedule or not isn't certain. Check the frequency whenever 60m is open in your area.

One of the hardest of the South American nations to pick up is Uruguay. Currently active stations here include: Emisora Ciudad de Montevideo on 9.650; SODRE, Montevideo, operates on 6.125 and 9.620; Radio Montecarlo/Radio Oriental on 6.140 and Radio Sarandi Sport/Radio Libertad Sport on 6.045.

African Beacon, operated by a Christian advertising agency called the Affiliated Media Group, has begun broadcasting programming produced by various Black churches and ministries, beamed to African audiences via Merlin communications transmitters in the UK and South Africa. The initial schedule was (or is) 0430-0630 on 6.115 to South Africa, 1600-1800 on 6.145, also to South Africa, 1800 to 2200 on 9.675 to North, Central and South Africa. You can send reports to: **Affiliated Media Group, 22521 St. John's Bluff Road, Jacksonville, FL 32246.** They say they are in the process of building a world-wide network of stations.

Radio Canada International's Sackville transmitter site is now relaying the Voice of Vietnam! The initial schedule was 0100-0259 on 9.695, 0300-0359 and 0400-0459 on 9.795. Some of us can remember when VoV was relayed by Radio Havana Cuba!

Another Argentine broadcaster now occasionally relayed in sideband over that country's military communications facility is Milenium FM from Buenos Aires, heard in lower sideband on the oft-used 15.820. These broadcasts don't seem to run according to any schedule beyond whim, so the best way to catch any of these (Radio Rividavia and others) is to simply 'sit' on the frequency or check it frequently during your listening sessions. Other frequencies to check on are 8.098, 20.276 and 29.810.

Meantime, Argentina's external service, Radiodifusion Argentina al Exterior, is scheduled with English on 11.710 weekdays from 0200-0300 and 1800-1900 to Europe on 15.345, also weekdays only. Saturday and Sunday broadcasts are on 6.060 in Spanish only, relaying Radio Nacional's Buenos Aires f.m. outlet.

You might want to keep an ear on the various Radio Havana Cuba frequencies while the Elian matter is still unsettled. RHC has been carrying the occasional live rallies and demonstrations, sometimes by relaying a local station or national network. Radio Havana currently airs English at 0100 - 0500 on 6.000 and 9.820; 2030 to 2130 on 13.660 (s.s.b.) and 13.750; 2230-2330 on 9.550. Note, though, that any live 'Elian' action would be in Spanish and likely not limited to (or maybe even included in) the English segments.

It appears as though HCJB has found a new future home for its transmitting facility within Ecuador. The station is having to close down its site at Pifo to clear the way for a new Quito airport sometime in the future. A new site has been located, and apparently purchased, on Ecuador's Pacific coast, near the peninsula known as Santa Elena. There's no word as to how long the relocation will take.

With the sunspot count running at or near the max, these are golden times for listening on the higher bands, although here in the Midwest things sometimes get pretty bleak during the late mornings and through mid-afternoon. Still, there's lots to be heard almost around the clock and we hope you are taking advantage of the improved conditions on the high bands.

Yes, there are some days when solar conditions create havoc, but that's usually offset by enhanced conditions at other times.

Until next month, good listening!

■ BRIAN ODDY G3FEX, THREE CORNERS, MERRYFIELD WAY, STORRINGTON, WEST SUSSEX RH20 4NS

LM&S

At this time of the year the air is often filled with the sound from portable radios owned by folk who seek to add to their enjoyment of their leisure hours by listening to cricket and football match commentaries, pop music, etc. Frequently this causes annoyance to those around them who do not share their taste in the programme selected.

Similar problems can also arise at home because some listeners enjoy searching the broadcast bands late at night whilst other members of the family are trying to sleep. With a little fore-thought such aggravation can usually be avoided because most modern receivers are fitted with a jack socket into which can be plugged a pair of earphones.

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 May.

Whilst searching the band during the early hours of May 10 **Simon Hockenhull** (E.Bristol) picked up a broadcast from Rikisutvarpid (RUV) in Reykjavik via their 300kW outlet at Gufuskalar, W.Iceland on **189kHz** and via Eider, E.Iceland (100kW) on **207kHz**. He rated the transmissions SINPO 25342 at 0115UTC and 23332 at 0117UTC.

Unusual conditions were observed during the evening of May 31 by **Fred Pallant** in Storrington. Between 2040 and 2100UTC he noticed that Bechar, Algeria, on **153kHz** was causing co-channel interference to Donebach and the Radiotelevisione Italiana (RAI) 10kW outlet at Caltanissetta, Italy, on **189kHz** was 'fighting a losing battle' with Saarlouis on **183kHz**. The broadcast from RAI via Caltanissetta was in Italian and provided the clue to identity.

Medium Wave Reports

The longer hours of daylight during May discouraged some listeners from searching the band after dark for the sky waves from m.w. stations in the Middle East, N.Africa and Scandinavia, nevertheless, those who did so compiled some interesting logs - see chart. There were no reports of broadcasts from m.w. stations in E.Canada and E.USA reaching our shores during the night.

Writing from Gt.Bookham, **Brian Keyte** says "The transmissions from Vatican Radio Italy on **1611kHz** are interesting in that they change their antenna arrangements frequently to reach different countries. During the repeated musical ident between programmes I have often heard the signal very suddenly increase, drop or disappear altogether".

During daylight the ground waves from some local radio stations reached quite distant places - see chart. Some forty-eight stations were logged during daylight by **Harry Richards** in Barton-upon-Humber.

Long Wave Chart

Freq (kHz)	Station	Country	Power (kW)	Listener
153	Bechar	Algeria	1000	E*
153	Donebach DLF	Germany	500	A,B*,C,D,E*,G
162	Allouis	France	2000	B*,C,D,E*,F*,G
171	Nador Medi-1	Morocco	2000	E*
171	B'shakovo etc	Russia	1200	A*,D
177	Oranienburg	Germany	500	A,B*,C*,D,E*,F*,G
183	Saarlouis	Germany	2000	B*,C,D,E*,F*,G
189	Gufuskalar	W.Iceland	150	A*,C*
189	Caltanissetta	Italy	10	E*
198	Droitwich BBC	UK	500	B,C,D,F*,G
207	Munich DLF	Germany	500	A*,D,E*,F*,G
207	Eidar	E.Iceland	100	A*
216	Roumoules RMC	S.France	1400	A,B*,C,D,E*,F*,G*
225	Polskie R-1	Poland	?	A,C*,F*,G*
234	Beidweiler	Luxembourg	2000	C,D,E*,F*,G
243	Kalundborg	Denmark	300	A,B,C,D,E*,G
252	Atlantic 252	Eire	500	D,E*,F*,G
261	Burg(R.Ropa)	Germany	85	A*,D,E*,G
270	Topolna	Czech Rep	1500	A*,B*,C,D,E*,F*,G*
279	Sasnovy	Belarus	500	B*,D,E*,G*

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

Listeners:-
(A) Simon Hockenhull, E.Bristol.
(B) Sheila Hughes, Morden.
(C) Eddie McKeown, Newry.
(D) George Millmore, Wootton, IoW.
(E) Fred Pallant, Storrington.
(F) Tom Smyth, Co.Fermanagh.
(G) Fred Wilmshurst, Northampton.

Short Wave Reports

The level of activity in the **25MHz (11m)** band is disappointingly low. Radio France International (RFI) broadcasts daily to listeners in E/C.Africa on **25.820** (Fr 0900-1300) but no reports arrived here to indicate how well they are being received in that area. Their transmissions have been reaching the UK via back scatter and other modes and were rated 35522 at 0900 by **Vic Prier** in Colyton; 24422 at 1035 in E.Bristol; 35433 at 1205 by **Fred Wilmshurst** in Northampton; 35333 at 1235 by **Eddie McKeown** in Newry.

The only other broadcaster known to be active in this band is Radio For Peace International (RFPI), Costa Rica. Their u.s.b. transmission on **25.930** (Eng to Americas 1200-?) was not mentioned in the reports this time, but listeners in the UK may well find it worthwhile to monitor that frequency.

In contrast, the propagation conditions in the **21MHz (13m)** band are being used to advantage by quite a few broadcasters to reach listeners in chosen target areas. Quite often they can be received in the UK too! Those noted before noon came from Vatican R, Italy on **21.850** (Various to Asia?), rated 44444 at 0725 by **Sheila Hughes** in Morden; R.Ext.Espana via Noblejas **21.570** (Sp to S.America 0800-1700) 33343 at 0800 by **Robert Hughes** in Liverpool; BBC via Rampisham, UK **21.830** (Eng to Asia 0800-0900) 35543 at 0809 by **David Edwardson** in Wallsend; V of Russia **21.790** (Eng [WS]) 25332 at 0825 in E.Bristol; R.Australia via Shepparton **21.725** (Eng to Pacific areas 0200-0900) 24333 at 0840 in Northampton; R.Norway Int **21.755** (Norw to E.Asia 0900-0927) 24433 at 0912 by **Rhoderick Illman** in Oxted; RAI Rome **21.520** (It to Africa 0600-1300) 44444 at 0920 in Colyton; R.Austria Int, Moosbrunn **21.765** (Ger, Eng to Australia 0930-1000) 44444 at 0950 by **Thomas Williams** in Truro; R.Pakistan **21.460** (Ur to Eur 0800?-1100, Eng 1100-1105) 54554 at 1000 by **Bill Griffith** in W.London; Swiss R.Int via Sottens **21.770** (Eng, Ger, Fr, It to Asia 1100-1330) 35333 at 1140 by **Tony Hall** in Freshwater Bay, IoW.

After mid-day, R.Australia via Shepparton on **21.820** (Eng to Asia 0900-1400) was rated 34333 at 1220 by **Stan Evans** in Herstmonceux; UAE Abu Dhabi **21.735** (Ar to N.Africa 0700-1600) 44343 at 1235 in Newry; BBC via Cyprus **21.470** (Eng to Africa 1300-1700) 34443 at 1400 by **Gerald Guest** in Dudley & SIO 434 at 1500 by **Tom Smyth** in Co.Fermanagh; VOA via Greenville, USA **21.485** (Port, Fr, Hausa [Eng ident] to Africa? 1730-2130) 25443 at 1930 in Storrington; R.Nederlands via Bonaire, Ned.Antilles **21.590** (Eng to C/W.Africa 1830-

Continued on page 11...

2025) 43334 at 2015 by **Bernard Curtis** in Stalbridge; HCJB Quito, Ecuador **21.470** (Various) 54444 at 2030 by **Tom Winzor** in Plymouth.

Only a few broadcasters are active in the **18MHz (15m)** band consequently reception is relatively interference free. Mentioned in the reports were R.Sweden **18.960** (Eng to N.America ?-1300?), rated 54444 at 1138 in Plymouth; R.Norway Int **18.950** (Norw to N.America 1200-1230) 35343 at 1221 in Northampton; R.Denmark via R.Norway **18.950** (Dan to N.America 1230-1300) 55555 at 1235 in E.Bristol; WYFR via Okeechobee, USA **18.980** (Eng to Eur 2000?-2200?) 55544 at 1959 by **Martin Cowin** in Kirkby Stephen; Christian Science BC via WSHB Cypress Creek **18.910** (Fr, Eng to E/C.Africa ?-2200?) 33333 at 2115 in Stalbridge.

In the **17MHz (16m)** band R.Australia's broadcast to Asia via Shepparton on **17.750** (Eng 0000-0500, 0600-0830, 0830-1100) has been reaching the UK well. It was rated 55544 at 0650 in Herstmonceux & 34333 at 0814 by **Vera Brindley** in Woodhall Spa. Much later, their transmission to Asia via Shepparton on **17.715** (Eng 2100?-0800?) was rated 24332 at 2300 in Oxted.

R.New Zealand's broadcast to Pacific areas on **17.675** (Eng 1755-0705) has also been received quite well in the UK. It was rated 43333 at 0607 by **David Hall** in Morpeth & 24422 at 1905 in E.Bristol. At 0705 they now change frequency to **11.720MHz** in the 25m band - see that section of the text herein.

Also mentioned in the reports were the BBC via Cyprus **17.640** (Eng to E/S.Africa 0400-0700), rated 33333 at 0505 in Morden; Israel R, Jerusalem **17.545** (Heb [Home Svce relay] to Eur, N.America 0600-1900) 45434 at 0620 in Colyton; R.Pakistan, Islamabad **17.835** (Ur 0800?-1100, Eng 1100-1105 to Eur) 43443 at 1017 in Plymouth; R.Jordan via Al Karanah **17.680** (Eng to N.America 1000?-1200) 54554 at 1100 in W.London; R.Bulgaria, Sofia **17.500** (Eng to Eur 1100-1200) 55544 at 1110 in Northampton; Channel Africa via Meyerton **17.860** (Eng to W.Africa 1700-1730) 45344 at 1700 in Newry; VOA via Morocco **17.895** (Eng to Africa 1600-1800) SIO 323 at 1700 in Co.Fermanagh; BBC via Ascension Is **17.830** (Eng to Africa 0800-2100) 54444 at 1810 in Kirkby Stephen; R.Nederlands via Bonaire, Ned.Antilles **17.605** (Eng to Africa 1830-2025) 55444 at 1840 in Freshwater Bay, IoW; HCJB Quito, Ecuador **17.660** (Eng to Eur 1900-2200) 32333 at 1910 by **Peter Pollard** (Rugby), while in Kettlewell, N.Yorks; R.Canada Int via Sackville **17.820** (Fr, Eng to Eur, Africa 1800-2200) 55555 at 2030 by **Clare Pinder** in Appleby; R.Canada Int via Sackville **17.870** (Eng to Eur, Africa 2000-2200) 33343 at 2030 in Liverpool; Qatar BS, Doha **17.895** (Ar to Eur 1700-2130) 43334 at 2040 in Stalbridge; WHRI via Maine, USA **17.650** (Eng to Eur, M.East, Africa 1600-2300) 22222 at 2102 in Truro; WYFR via Okeechobee, USA **17.725** (Port to S.America 2300-0045) 35553 at 2300 in Wallsend.

The **15MHz (19m)** band is no longer being used by R.New Zealand for their morning broadcast to Pacific areas. They have moved it to the 25m band - see that section of the text herein. R.Australia has been reaching the UK well during the early morning on **15.415** from Shepparton (Eng to Asia 0100-0400, 0600-0900), rated 44444 at 0608 in Morpeth; also on **15.240** from Shepparton (Eng to Pacific areas 0000-0800), rated 35333 at 0800? in Northampton.

Some of the many other broadcasts in this band before noon also reach the UK quite well. They include R.Slovakia Int **15.460** (Eng to ? 0700?-0730), rated 54444 at 0710 in Plymouth; HCJB Quito, Ecuador **15.160** (Eng to Eur? 0600-0800) 33333 at 0755 in Truro; Swiss R.Int via Julich, Germany **15.545** (Fr, Ger, It, Eng to Nr.East, Africa 0600-0815) SIO 333 at 0757 by **Francis Hearne** in N.Bristol; KTWR Guam **15.330** (Eng to Pacific 0800-1000) 43444 at 0802 in Woodhall Spa; V of Armenia, Yerevan **15.270** (Various to Eur, M.East [Eng 0840-0900] Sun) 54443 at 0850 in Herstmonceux; BBC via Skelton, UK **15.485** (Eng to Eur, Africa 0600-1800) 45444 at 0910 in Freshwater Bay, IoW; BBC via Cyprus **15.575** (Eng to E.Eur, M.East 0900-1500) 44333 at 1000 in Morden; R.Bulgaria **15.700** (Eng to W.Eur 1100-1200) 45433 at 1119 in E.Bristol.

After mid-day R.Kuwait via Sulabiyah **15.495** (Ar to M.East 0200?-1305?) was rated 44444 at 1200 in W.London; VOA via Woofferton, UK **15.205** (Eng to E.Eur? 1500-1700) 44444 at 1500 in Dudley & SIO 322 at 1500 in Co.Fermanagh; WEWN via Vandiver, USA **15.745** (Eng to Eur 1100-2100?) 55444 at 1539 in Kirkby Stephen; R.Norway Int **15.735** (Norw to M.East 1700-1729) 44444 at 1715 in Colyton; All India R. via Bangalore **15.200** (Eng to W.Africa 1745-1945) 43334 at 1745 in Stalbridge; WWCR Nashville, USA **15.685** (Eng to N.America, Eur 1100-2100) 31222 at 1810 in Liverpool; V of Indonesia, Jakarta **15.150** (Eng to Eur, Africa 2000-2100) 45333 at 2009 in Wallsend; V of Africa via Sabrata, Libya **15.415** (Eng to M.East, Eur 2015-2100) 44444 at 2029 in Kettlewell; R.Korea **15.575** (Eng to ? 2100-2130) 43333 at 2100 in Appleby; R.Taipei Int via WYFR **15.600** (Eng to Eur 2200-2300) 25222 at 2203 in Newry; R.For Peace Int, Costa Rica **15.050** (Eng to ? 2230-2300) 25232 at 2230 by **Conway Longworth-Dames** in Brixham, Devon; VOIRI Tehran, Iran **15.084** (Home Sce relay)

Local Radio Chart

Freq (kHz)	Station	ILR BBC	e.m.r.p (kW)	Listener
558	Spectrum, London	I	0.80	A,D,E,F,H
585	R.Solway	B	2.00	F
603	Capital G,Litt'brne	I	0.10	D,E,F,H
630	R.Bedfordshire(3CR)	B	0.20	B,C,D,E,F,H
630	R.Cornwall	B	2.00	E
657	R.Clwyd	B	2.00	D,E,F
657	R.Cornwall	B	0.50	E
666	Cl.Gold 666, Exeter	I	0.34	A,D,E,H
666	R.York	B	0.80	D,F
729	BBC Essex	B	0.20	C,D,E,F,H
738	Hereford/Worcester	B	0.037	A,C,D,E,F,H,X
756	R.Cumbria	B	1.00	F
756	The Magic 756,Powys	I	0.63	B,D,E,F,H
765	BBC Essex	B	0.50	A,C,D,E,F,H
774	R.Kent	B	0.70	C,D,E,H
774	R.Leeds	B	0.50	F
774	Cl.Gold 774, Glos	I	0.14	B,D,E,F,H,X
792	Cl.Gold 792,Bedford	I	0.27	D,E,F,H
792	R.Foyle	B	1.00	G
801	R.Devon	B	2.00	A,B,D,E,X
828	Cl.Gold 828, Luton	I	0.20	A,D,H
828	Magic 828, Leeds	I	0.12	F
828	Cl.G 828 Bournem'th	I	0.27	A,E,X
837	R.Cumbria/Furness	B	1.50	F
837	Asian Netwk Leics	B	0.45	D,E,F,H
855	R.Devon	B	1.00	E
855	R.Lancashire	B	1.50	F
855	R.Norfolk, Postwick	B	1.50	C,D,F
855	Sunshine 855,Ludlow	I	0.15	A,D,H,X
873	R.Norfolk, W.Lynn	B	0.30	C,D,E,F,H
936	Brunel CG, W.Wilts	I	0.18	D,E,H,X
936	Fresh AM, Hawes	I	1.00	F
945	Cl.Gold GEM, Derby	I	0.20	F,H
945	Capital G, Bexhill	I	0.75	D,E
954	Cl.Gold 954,Torquay	I	0.32	D,E
954	Cl.Gold 954, H'ford	I	0.16	A,B,D,F,H,X
963	Liberty R, Hackney	I	1.00	D,E,F,H
972	Liberty R, Southall	I	1.00	A,D,E,F,H
990	R.Devon, E.Devon	B	1.00	A,B,D,E
990	Magic AM,Doncaster	I	0.25	F
990	Cl.G, Wolverhampton	I	0.09	D,H
999	C.Gold GEM Nott'ham	I	0.25	D,H
999	R.Solent	B	1.00	D,E
999	Valley R, Aberdare	I	0.300	A,B,X
1017	Cl.G,WABC,Shr'shire	I	0.70	C*,D,F,H,X
1026	R.Cambridgeshire	B	0.50	D,F,H
1026	Downtown R, Belfast	I	1.70	G
1026	R.Jersey	B	1.00	D,E
1035	RTL C'try(Ritz)1035	I	1.00	D,E,H
1035	R.Sheffield	B	1.00	F
1035	N.Sound 2, Aberdeen	I	0.78	D*
1116	R.Derby	B	1.20	C*,D,F,H
1116	R.Guernsey	B	0.50	A,D,E
1116	Valley R, Ebbw Vale	I	0.50	A,B,X
1152	LBC 1152 AM	I	23.50	D,E,H,X
1152	Cl.G, Birmingham	I	3.00	A,H
1161	R.Bedfordshire(3CR)	B	0.10	D,H
1161	Brunel Cl.G,Swindon	I	0.16	D,E,X
1161	Magic 1161, Goxhill	I	0.35	F,G
1161	Southern Counties R	B	1.00	C,D,E
1170	Magic 1170,Stockton	I	0.32	F
1170	Capital G,Portsm'th	I	0.50	D,E
1170	Swansea Snd,Swansea	I	0.58	B
1170	1170AM,High Wycombe	I	0.25	D,H
1242	Capital G,Maidstone	I	0.32	D,E
1251	C.G Amber,Bury StEd	I	0.76	D,H
1260	Brunel CG, Bristol	I	1.60	B,E
1260	SabrasSnd,Leicester	I	0.29	H
1260	R.York	B	0.50	F
1296	Radio XL,Birmingham	I	5.00	A,D,E,F,G,H
1305	Magic AM,Barnsley	I	0.15	F
1305	Premier via ?	I	0.50	D,E,H
1305	Touch AM, Newport	I	0.20	E
1323	Capital G,Southwick	I	0.50	D,E,H
1332	Premier, Battersea	I	1.00	D,E
1332	Cl.Gold 1332,Pt'bo	I	0.60	F,H
1332	Wiltshire Sound	B	0.30	B,E
1359	Breeze, Chelmsford	I	0.28	D
1359	Cl.Gold 1359, C'try	I	0.27	F,H
1359	R.Solent	B	0.85	E
1359	Touch AM, Cardiff	I	0.20	B
1368	R.Lincolnshire	B	2.00	F,H
1368	Southern Counties R	B	0.50	C,D,E
1368	Wiltshire Sound	B	0.10	E
1377	Asian Sd, Rochdale	I	0.10	D*
1413	R.Gloucester via ?	B	?	H
1413	R.Gloucester,Bo'ton	B	0.50	B,F
1413	Premier via ?	I	0.50	D,E
1413	Premier, Dartford	I	0.50	F
1431	Breeze,Southend	I	0.35	D
1431	Cl.Gold, Reading	I	0.14	D,E,G,H
1449	R.Peterboro/Cambs	B	0.15	D,E,F,H
1458	R.Cumbria	B	0.50	F
1458	R.Devon	B	2.00	E
1458	Sunrise, London	I	50.00	A,D,E,F,H
1458	Asian Netwk Langley	B	5.00	A,H
1485	Cl.Gold, Newbury	I	1.00	A,D,H
1485	R.Humberside (Hull)	B	1.00	F
1485	R.Merseyside	B	1.20	E,G
1485	Southern Counties R	B	1.00	D,E
1503	R.Stoke-on-Trent	B	1.00	C*,D,E,H
1521	Breeze, Reigate	I	0.64	A*,D,E,H
1530	R.Essex, Southend	B	0.15	C,D,E
1530	Cl.Gold W.Yorks	I	0.74	F
1530	Cl.Gold Worcester	I	0.52	B,D,E,H
1548	R.Bristol	B	5.00	B,E
1548	Capital G, London	I	97.50	D,E
1548	MagicAB,Liverpool	I	4.40	G
1548	Forth AM, Edinburgh	I	2.20	F
1557	R.Lancashire	B	0.25	F
1557	Cl.Gold 87,N.hant	I	0.76	D,H
1557	Capital G, So'ton	I	0.50	D,E
1566	CountySnd,Guildford	I	0.50	A*,D,E
1584	London Turkish R	I	0.20	D,E
1584	R.Nottingham	B	1.00	D,F,H
1584	R.Shropshire	B	0.50	D
1602	R.Kent	B	0.25	A*,C,D,E

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

Listeners:-
(A) Simon Hockenhull, E.Bristol.
(B) Simon Hockenhull, while in Lynmouth.
(C) Sheila Hughes, Morden.
(D) Brian Keyte, Gt.Bookham.
(E) George Millmore, Wootton, IoW.
(F) Harry Richards, Barton-upon-Humber.
(G) Tom Smyth, Co.Fermanagh.
(H) Fred Wilmshurst, Northampton.
(X) Francis Hearne, N.Bristol.

34333 at 2307 in Oxted.

The occupants of the **13MHz (22m)** band now include WYFR Okeechobee, USA **13.695** (Eng to Eur? 0700-0800), rated 43443 at 0732 in Plymouth; R.Australia via Shepparton **13.605** (Eng to Pacific 0800-1200) 22222 at 0910 in Truro; Swiss R.Int via Sottens **13.685** (Eng, It, Ger, Fr to Australia 0830-1030) 45544 at 0956 in Northampton; Croatian R, Zargreb **13.830** (Cr to Eur, N.America) 45544 at 1230 in E.Bristol; R.Prague, Czech Rep. **13.580** (Eng to Eur, Asia 1300-1330) 55444 at 1301 in Kirkby Stephen; UAER, Dubai **13.675** (Eng to Eur 1600-1640) 54444 at 1600 in Morden; R.Austria Int via Moosbrunn **13.730** (Eng to Eur, Africa 1630-1700) 44444 at 1651 in Woodhall Spa; V of Vietnam, Hanoi **13.740** (Eng, Fr to Eur 1800-1900) 34333 at 1810 in Colyton; AIR via Bangalore **13.750** (Eng to Africa 1800-1945) 33233 at 1815 in Liverpool; R.Damascus, Syria **13.610** (Eng to Eur 2005-2105) 34333 at 2028 in Kettlewell; R.Havana Cuba **13.750** (Eng to Eur 2030-?) 22222 at 2100 in Appleby; V of Turkey, Ankara **13.640** (Eng to Eur 2200-2300) 44444 at 2200 in Newry; RCI via Sackville, Canada **13.670** (Eng to USA, Mexico, Caribbean 2200-0000) 44332 at 2225 in Oxted.

The **11MHz (25m)** band is now being used by R.New Zealand Int to reach listeners in Pacific areas during the morning. Their 100kW transmission on **11.720MHz** (Eng 0705-1005) was rated 35253 at 0900 in Brixham. A special broadcast to NZ Troops in E.Timor then follows on **11.720** (1005-1205 daily).

Also mentioned in the reports were World Harvest R.(WHRI) via Maine, USA **11.565** (Eng to ?) 54444 at 0845 in Stalbridge; R.Korea Int via Sackville? **11.715** (Eng to E.USA 1030-1100) 33233 at 1030 in Appleby; R.France Int via Allouis? **11.670** (Eng to Eur 1200-1257) 45444 at 1230 in Freshwater Bay, IoW; R.Jordan via Al Karanah **11.690** (Eng to W.Eur, E.USA 1300-1730) 44433 at 1255 in Herstmonceux.

Later, R.Kuwait via Kabd **11.990** (Eng to Eur, N.America 1800-2100) was 45434 at 1803 in Colyton; R.Bulgaria **11.700** (Eng to Eur 1900-2000) 43333 at 1925 in E.Bristol; R.Nederlands via Flevo **11.655** (Eng to Africa 1730-2025) 44343 at 1930 in Newry; V of Mediterranean, Malta via Russia? **12.060** (Eng to Eur, N.Africa 1900-2000) 55455 at 1935 in Liverpool; VOIRI Iran **11.670** (Eng to Eur 1900-2000) 32333 at 1940 by **Martin Dale** in Stockport; R.Iraq Int, Baghdad **11.785** (Eng to Eur? 1900-1945) 23422 at 1942 in Newry; China R.Int via ? **11.790** (Eng to Eur 2000-2100) 43344 at 2000 in Dudley; WWCR Nashville, USA **12.160** (Eng to N.America, Eur 1400-2200) 43444 at 2000 in W.London; BBC via Woofferton, UK **12.095** (Eng to Asia 1700-2100) 43323 at 2020 in Morden; R.Prague, Czech Rep **11.600** (Eng to Eur, Asia, Aus 2000-2027) 44434 at 2025 in Woodhall Spa; R.Damascus, Syria **12.085** (Ger, Fr, Eng to Eur 1805-2105) 32333 at 2027 in Kettlewell; R.Bulgaria

Medium Wave Chart

Freq (kHz)	Station	Country	Power (kW)	Listener
531	Berg	Germany	20	F
531	RNE5 via ?	Spain	?	F
531	Beromunster	Switzerland	500	E*,F,H*,I*
540	Wavre	Belgium	150/50	A,E*,F,I
540	Sidi Bennour	Morocco	600	E*
549	Les Trembles	Algeria	600	A*,E*,F*
549	Thumau (DLF)	Germany	200	E*,F,I
558	Espoo	Finland	50	E*
558	RNE5 via ?	Spain	?	A*,E*,F*
567	Tullamore(RTE1)	Eire	500	B,D,E,F,H,I
567	RNE5 via ?	Spain	?	F*
576	Muhlacker(SDR)	Germany	500	E*,F*
576	Barcelona(RNE5)	Spain	50	F*
585	Drf Wien	Austria	600	F*
585	Paris(FIP)	France	8	F
585	Madrid(RNE1)	Spain	200	E*,F*,I*
585	Dumfries(BBCScot)	UK	2	E*
594	Frankfurt(HR)	Germany	1000/400	E*,I*
594	Muge	Portugal	100	E*
603	Newcastle(BBC)	UK	2	D,E*,H
612	Athlone(RTE2)	Eire	100	B,D,E*,F,H,I
621	Wavre	Belgium	80	E*,F,I
621	Barcelona(DCR)	Spain	50	E*
630	Vigra	Norway	100	E*,F*
630	Tunis-Djedeida	Tunisia	600	E*
639	Praha(Liblice)	Czech	1500	E*,F*
639	RNE1 via ?	Spain	?	E*,I
648	RNE1 via ?	Spain	10	E*
648	Orfordness(BBC)	UK	500	D,E*,F,H*,I
657	Napoli	Italy	120	F*
657	Madrid(RNE5)	Spain	20	E*
657	Wrexham(BBCWales)	UK	2	D,E*,I
666	MesskirchRohrd(SWF)	Germany	150	E*,I*
666	Lisboa	Portugal	135	E*
675	R10 FM	Holland	120	A,B,E*,F,I
684	Sevilla(RNE1)	Spain	500	E*,F*
693	Droitwich(BBC)	UK	150	F,I
693	Enniskillen(BBC)	UK	1	H
702	Flensburg(NDR)	Germany	5	E*
711	Rennes 1	France	300	A,B,C,E*,F,I
711	Murcia(COPE)	Spain	5	A*
720	Lisnagarvey(BBC4)	N.Ireland	10	B,F*
720	Norte	Portugal	100	E*
720	Lots Rd,Ldn(BBC4)	UK	0.5	D,F,H*
729	Cork(RTE1)	Eire	10	A*,B,E*,F,H
729	RNE1 via ?	Spain	?	E*,F*
738	Paris	France	4	E*,F
738	Barcelona(RNE1)	Spain	500	E*,F*
747	Flevo(Hilv2)	Holland	400	A,C,E*,F,I
756	Braunschweig(DLF)	Germany	800/200	E*,F*
756	Redruth(BBC)	UK	2	A*,H*
765	Sottens	Switzerland	500	E*,F*
774	Enniskillen(BBC)	N.Ireland	1	E,H
774	RNE1 via ?	Spain	?	E*,F*,I*
783	Leipzig(MDR)	Germany	100	E*
792	Lingen(NDR)	Germany	5	E*,F*
792	Sevilla(SER)	Spain	20	E*,F*
792	Londonderry(BBC)	UK	1	H
801	Munchen-Ismaning	Germany	300	E*
801	RNE1 via ?	Spain	?	E*,F*
810	Volgograd	Russia	150	F*
810	Madrid(SER)	Spain	20	E*,F*
810	Westerglen(BBCScot)	UK	100	D,E,F*,H,I*
819	Batra	Egypt	450	E*
819	Sud-Radio, Toulouse	France	20	E*
819	S.Sebastian(EI)	Spain	5	F*
828	Rotterdam	Holland	20	E*
837	Nancy	France	200	H*
837	COPE via ?	Spain	?	E*,F*
846	Rome	Italy	1200	F*,H*,I*
855	Berlin	Germany	100	E*
855	RNE1 via ?	Spain	?	E*,F*,I*
864	Santah	Egypt	500	E*
864	Paris	France	300	A,F
864	St.Petersburg(TWR)	Russia	?	E*
873	Frankfurt(AFN)	Germany	150	E*,F*
873	Zaragoza(SER)	Spain	20	E*,F*
873	Enniskillen(R.UI)	UK	1	E,H
882	COPE via ?	Spain	?	E*
882	Washford(BBCWales)	UK	100	C,D,E*,F,I
891	Algiers	Algeria	600/300	E*,F*
891	Hulsberg	Netherlands	20	E*,F*
900	Brno(CRo2)	Czech Rep	25	E*,F*
900	Milan	Italy	600	E*,F*
909	Lisnagarvey(BBC5)	N.Ireland	10	H
909	B'mans Pk(BBC5)	UK	140	F,I
918	Domzale	Slovenia	600/100	E*,F*
927	Wolvertem	Belgium	300	C*,E*,F,H,I*
936	Bremen	Germany	100	E*,F*
936	Venezia	Italy	20	F*
945	Toulouse	France	300	E*
954	Brno (CRo2)	Czech Rep.	200	F*
954	Madrid(CI)	Spain	20	F*
963	Pori	Finland	600	E*
963	Tir Chonaill	Eire	10	F*,H*
972	Hamburg(NDR)	Germany	300	E*,F*
981	Alger	Algeria	600/300	F*
990	Berlin	Germany	300	E*,F*
990	R.Bilbao(SER)	Spain	10	E*,F*
990	Tywyn(BBC)	UK	1	H
999	Schwerin (RIAS)	Germany	20	E*
1008	Flevo(Hilv-5)	Holland	400	C,E*,F,I*
1017	Rheinsender(SWF)	Germany	600	E*,H,I*
1017	RNE5 via ?	Spain	?	E*,F*
1035	Lisbon(Prog3)	Portugal	120	E*
1044	Dresden(MDR)	Germany	20	E*
1044	S.Sebastian(SER)	Spain	10	E*,F*
1053	Talk Sport via ?	UK	?	E,F,H,I
1062	Kalundborg	Denmark	250	E*,F*,I*
1062	R.Uno via ?	Italy	?	E*
1071	Bilbao(EI)	Spain	5	E*,F*,I*
1071	Talk Sport via ?	UK	?	E*
1080	SER via ?	Spain	?	E*,F*
1089	Talk Sport via ?	UK	?	E,F,H,I
1098	Nitra(Jarok)	Slovakia	1500	E*,F*
1107	AFN via ?	Germany	10	E*
1107	RNE5 via ?	Spain	?	E*
1107	Talk Sport via ?	UK	?	E*,F
1125	La Louviere	Belgium	20	E*
1125	RNE5 via ?	Spain	?	F*
1125	Llandrindod Wells	UK	1	B,H
1134	Zadar(Croatian R)	Croatia	600/1200	E*,F*,I*
1134	COPE via ?	Spain	2	F*
1143	AFN via ?	Germany	1	E*,F*
1143	Bolshakovo(Mayak)	Russia	150	A*
1143	COPE via ?	Spain	2	E*,F*
1161	Ain-Salah	Algeria	5	F*
1179	Solvesborg	Sweden	600	C,E*,F*,I*
1188	Kuurne	Belgium	5	E*,F*
1197	Munich(VOA)	Germany	300	E*
1197	Virgin via ?	UK	?	E*,F,H,I
1206	Bordeaux -	France	100	E*
1215	Virgin via ?	UK	?	E,F,H,I
1224	Lelystad	Holland	50	E*,F*
1233	RFE via ?	Czech Rep.	?	E*
1233	Virgin via ?	UK	?	E*,H,I
1242	Virgin via ?	UK	?	E,H
1251	Huisberg	Netherlands	10	E*,F*
1260	SER via ?	Spain	?	E*,F*
1269	Neumunster(DLF)	Germany	600	E*,F*,I*
1278	Dublin/Cork(RTE2)	Eire	10	B,D,E,F*,H*,I*
1287	RFE via ?	Czech Rep.	?	E*,I*
1287	Lerida(SER)	Spain	10	E*,F*
1296	Valencia(COPE)	Spain	10	F*
1296	Orfordness(BBC)	UK	500	D*,E*,H*
1305	RNE5 via ?	Spain	?	E*,F*
1314	Kvitsoy	Norway	1200	E,F,I*
1323	W'brunn (V.Russia)	Germany	1000/150	E*,I*
1332	Rome	Italy	300	E*,F*
1341	Lisnagarvey(BBC)	N.Ireland	100	B,C*,D,F*,H,I*
1341	Tarrasa(SER)	Spain	2	C*,F*
1350	Cesvaine/Kuldiga	Latvia	50	E*,F*
1359	Madrid(RNE-FS)	Spain	600	E*
1368	Foxdale(Manx R)	Is of Man	20	E,G,H
1377	Lille	France	300	E*,F,I
1386	Bolshakovo	Russia	2500	C*,E*,F*,G*
1395	TWR via Fllake	Albania	500	E*
1395	Lopic	Netherlands	120/40	F,H*,I
1404	Brest	France	20	E*,F,H*,I*
1413	RNE5 via ?	Spain	?	E*
1422	Heusweiler(DLF)	Germany	1200/600	E,F*,I*
1440	Mamach(RTL)	Luxembourg	1200	E,F
1440	Damman	Saudi Arabia	1600	A*,E*
1449	Redmoss(BBC)	UK	2	A*,E*,F*,H
1467	Monte Carlo(TWR)	Monaco	1000/400	E*,F*
1476	Wien-Bisamberg	Austria	600	A*,E*,F*
1485	SER via ?	Spain	?	F*
1494	Clermont-Ferrand	France	20	E*
1494	St.Petersburg	Russia	1200	E*,F*
1512	Wolvertem	Belgium	300	C*,E,F,I*,X*
1521	Kosice(Cizatice)	Slovakia	600	E*,F*
1521	R.Manresa(SER)	Spain	2	F*
1530	Vatican R	Italy	150/450	E*,F*,I*
1539	Mainflingen(ERF)	Germany	350(700)	E*,F*,H,I*
1539	Valladolid(SER)	Spain	5	F*
1557	Nice	France	300	H*
1575	Genova	Italy	50	A*,F*
1575	SER via ?	Spain	5	E*,F*
1584	SER via ?	Spain	2	F*
1593	Holzkirchen(VOA)	Germany	150	E*,F*
1602	SER via ?	Spain	?	E*,I*
1602	Vitoria(EI)	Spain	10	E*,F*,I*
1611	Vatican R	Italy	15	D

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

Listeners:-

(A) Simon Hockenhull, E.Bristol.
(B) Simon Hockenhull, while in Lynmouth.
(C) Sheila Hughes, Morden.
(D) Brian Keyte, Gt.Bookham.
(E) Eddie McKeown, Newry.
(F) George Millmore, Wootton IoW.
(G) Clare Pinder, while in Appleby.
(H) Tom Smyth, Co.Fermanagh
(I) Fred Wilmshurst, Northampton.
(X) Francis Heame, N.Bristol.

Tropical Bands Chart

Freq (MHz)	Station	Country	UTC	DXer
3.240	TWR Shona	Swaziland	1853	C,H
3.255	BBC via Meyerton	S.Africa	2018	C,H,K
3.270	Namibian BC,Windhoek	Namibia	2020	C,H,K
3.290	Namibian BC,Windhoek	Namibia	2018	H
3.316	SLBS Goderich	Sierra Leone	2016	H
3.320	SABC (RSG) Meyerton	S.Africa	1934	H
3.335	CBS Taipei	Taiwan	2015	H
3.365	GBC R-2	Ghana	2014	A,H,K,N
3.380	NBC Blantyre	Malawi	1912	H
3.915	BBC via Kranji	Singapore	2213	D,N
3.955	BBC via Skelton	England	2155	E,M
3.955	R.Taipei via Skelton	England	1807	I,K
3.970	R.Korea via Skelton	England	2100	E,L
3.975	R Budapest	Hungary	2130	E,I,K,L
3.995	DW via Julich	Germany	2210	E,M,N
4.760	ELWA Monrovia	Liberia	2140	E
4.770	FRCN Kaduna	Nigeria	2215	A,H,N
4.777	R.Gabon, Libreville	Gabon	1938	H
4.783	RTM Bamako	Mali	2013	B,H
4.790	Azad Kashmir R.	Pakistan	0145	G
4.815	R.Difusora, Londrina	Brazil	0005	C
4.815	R diff TV Burkina	Ouagadougou	2017	H
4.825	R.Cancao Nova	Brazil	0417	C
4.830	R.Tachira	Venezuela	2233	N
4.835	RTM Bamako	Mali	2234	B,E,F,H,N
4.845	ORTM Nouakchott	Mauritania	2011	H
4.850	R.Yaounde	Cameroon	2235	N
4.860	AIR Delhi	India	1927	H
4.885	R.Clube do Para	Brazil	0425	C,E
4.885	KBC East Sce Nairobi	Kenya	1811	C,H
4.895	R.IPB AM C'po Grande	Brazil	0020	C
4.905	R. La Oroya	Peru	0430	C
4.915	GBC-1, Accra	Ghana	1943	A,F,H,K,N
4.915	KBC Cent Sce Nairobi	Kenya	1846	H
4.920	R Quito, Quito	Ecuador	0435	E
4.935	R.Capixaba, Vitoria	Brazil	0027	C
4.935	KBC Gen Sce Nairobi	Kenya	1836	H,K
4.950	VOA via Sao Tome	Sao Tome	2000	A,E,H,I,J,K
4.955	R.Nac. de Colombia	Colombia	0115	A
4.965	Christian Voice	Zambia	1937	H,K
4.975	R.Uganda, Kampala	Uganda	1925	B,H,K
4.980	Ecos del Torbes	Venezuela	0110	A
4.985	R Brazil Central	Brazil	0031	C
5.005	R Nacional, Bata	Eq Guinea	2006	H
5.009	R.TV Malagasy	Madagascar	1829	H
5.025	R Parakou	Benin	1847	H
5.025	R.Uganda, Kampala	Uganda	1837	H
5.035	R.Educacao Rural	Brazil	0037	C
5.035	R.Bangui	C.Africa	1928	H
5.047	R Togo, Lome	Togo	1929	A,E,H,N
5.050	R.Tanzania	Tanzania	1848	H

DXers:-
(A) David Edwardson, Wallsend.
(B) Bill Griffith, W.London.
(C) David Hall, Morpeth.
(D) Simon Hockenhull, E.Bristol.
(E) Sheila Hughes, Morden.
(F) Rhoderick Illman, Dxted.
(G) Haleem Khan, Walsall.
(H) Fred Pallant, Storrington.
(I) Clare Pinder, while in Appleby.
(J) Peter Pollard, while in Kettlewell, N.Yorks.
(K) Vic Prier, Colyton.
(L) Tom Smyth, Co.Fermanagh.
(M) Thomas Williams, Truro.
(N) Fred Wilmshurst, Northampton.

11.700 (Eng to Eur 2100-2200) 55544 at 2120 in Northampton; DW via ? **11.865** (Eng to W.Africa? 2100-2150) SIO 333 at 2126 in N.Bristol; R.Japan via Ascension Is **11.855** (Eng to S.Africa? 2100-2200) SIO 444 at 2130 in Co.Fermanagh; R.Denmark via R.Norway **11.625** (Da to S.America 2230-2300) 44344 at 2256 in Oxted.

Amongst the broadcasters noted in the **9MHz (31m)** band during the morning were TWR Monte Carlo, Monaco **9.870** (Eng to Eur 0655-0820), rated 44444 at 0756 in Woodhall Spa; Swiss R.Int via Montsinery, Fr.Guiana **9.885** (Eng It, Ger, Fr to Australia 0830-1030), rated 32223 at 0835 in Stalbridge; AWR via ? **9.610** (Eng to Eur? 0930-1000) 44444 at 0932 in Freshwater Bay, IoW; R.Vlaanderen Int, Belgium **9.925** (Eng to Eur 1130-1200) 54444 at 1130 in Plymouth; R.Nederlands via Wertachtal **9.860** (Eng to Eur 1030-1225) 55555 at 1140 in Herstmonceux.

Later, the BBC via Kranji, Singapore **9.740** (Eng to S.Asia? 1800-2200) was 43343 at 1805 in Liverpool; VOA via Kavala **9.760** (Eng to M.East? 1700-2100) 44443 at 1900 in Dudley; R.Australia via Shepparton **9.500** (Eng to Asia 1430-2130) 33433 at 1906 in E.Bristol; R.Nederlands via Flevo **9.895** (Eng to Africa 1830-2025) 44343 at 1935 in Newry; RAI Rome, Italy **9.750** (Eng to Eur? 1935-1955) SIO 333 at 1941 in N.Bristol; VOIRI Tehran, Iran **9.022** (Eng to W.Eur 1930-2030) 44444 at 2005 in Kettlewell; V of Russia **9.890** (World Service [Eng 2010] 55555 at 2100 in Appleby; R.Cairo, Egypt **9.990** (Eng to Eur 2115-2245) SIO 544 at 2115 in Co.Fermanagh; AIR via Aligarh? **9.910** (Eng to Australia 2045-2230) 45544 at 2140 in Northampton; R.Nac del Paraguay **9.735** (Sp 0800-0400) 34553 at 2220 in Wallsend; RCI via Sackville **9.755** (Eng [CBC progs] to USA, Caribbean 2200-0300, 0500-0530) 34333 at 2224 in Oxted;

In the **7MHz (41m)** band there are a number of broadcasts intended for listeners to Europe. Some originate from R.Japan via Woofferton, UK **7.230** (Jap, Eng 0500-0700), rated 54554 at 0655 in Herstmonceux; WYFR via Okeechobee, USA **7.355** (Eng 0600-0800, also to Africa) 34333 at 0745 in Kettlewell; R.Polonia (Polish R), Warsaw **7.285** (Eng 1700-1800) 34233 at 1702 in Newry; R.Slovakia via Velke Kostolany **7.345** (Ger, Eng 1800-1900) 34433 at 1800 in Colyton; Voice of Greece, Athens **7.475** (Eng, Gr 1900-1930) 45544 at 1912 in Northampton; R.Minsk, Belarus **7.210** (Eng?) 43444 at 1936 in Stockport; AIR via Bangalore **7.410** (Eng 1745-1945) 33333 at 1940 in Stalbridge; Vatican R, Italy **7.250** (Eng 1950-2010) SIO 333 at 2008 in N.Bristol; DW via Sines? **7.130** (Eng 2000-2045) 44444 at 2023 in Storrington; R.Tirana, Albania **7.130** (Eng 2130-2200) 44444 at 2130 in Morden; V of Turkey **7.190** (Eng 2200-2245?) SIO 444 at 2200 in Co.Fermanagh.

Quite a few are beamed to other areas and some of them may be received here. They include R.Nederlands via Madagascar **7.120** (Eng to Africa 1730-2025), rated 55444 at 1858 in Freshwater Bay, IoW; VOA via Botswana **7.415** (Eng to Africa 1900-2200) 43233 at 1945 in Liverpool; WHRI via Maine, USA **7.580** (Eng to N.America) 44444 at 0107 in Morpeth.

Many more broadcasts to Europe may be received in the **6MHz (49m)** band. Those mentioned in the reports came from R.Japan via Skelton, UK **5.975** (Eng 0500-0600), rated 54544 at 0555 in Herstmonceux; R.Vlaanderen Int, Belgium **5.985** (Eng 0700-0730) SIO 433 at 0700 in Co.Fermanagh; R.Nederlands via Julich, Germany **6.045** (Eng 1030-1225) 43334 at 1130 in Dudley; R.Sweden via Horby **6.065** (Eng 1730-1800) 54444 at 1743 in Plymouth; Deutsche Welle (DW) via Julich? **6.140** (Eng Service) 44454 at 1840 in Liverpool; Sri Lanka BC via Skelton, UK **6.010** (Eng to Eur 1900-2000 Sun) 54555 at 1920 in Kettlewell; R.Finland, Helsinki **6.110** (Eng 1930-1945) 54444 at 1930 in Morden; R.Vlaanderen Int, Brussels **5.960** (Eng 1930-1956) 43334 at 1935 in Stockport; RAI Rome **5.970** (Eng 1935-1955) 44344 at 1940 in Newry; R.Canada Int via Skelton, UK **5.995** (Fr, Eng 1900-2200) 54444 at 2055 in Freshwater Bay, IoW; R.Austria Int, via Moosbrunn **6.155** (Various) 55555 at 2130 in Appleby; R.Japan via Skelton, UK **6.115** (Eng 2100-2200) SIO 444 at 2138 in N.Bristol; Deutschland R, Berlin **6.005** (Ger 24hrs) 55444 at 2217 in Northampton.

Also noted were some intended for other areas. They came from VOA via Sao Tome **6.035** (Eng to W.Africa 1800-2230), rated 42232 at 2038 in Colyton; R.Diff. TV Congolaise, Brazzaville **5.985** (Fr 1700?-2130?) 32223 at 2120 in Stalbridge; BBC via Sackville, Canada **6.175** (Eng to USA 2200-0500) 34433 at 2235 in E.Bristol; ORTM Bamako, Mali **5.995** (Fr 0555-0748, 1757-0000) 44444 at 2245 in W.London; BBC via Antigua, W.Indies **5.975** (Eng to C/N.America 2100-0800) 34433 at 2321 in Oxted; WHRI South Bend, USA **5.745** (Eng to N.America 2100?-1000) 55555 at 0042 in Morpeth.

The SINPO code is used for broadcast station reports, here is an explanation of the code.

Signal Strength
5 excellent
4 good
3 fair
2 poor
1 barely audible

Interference
5 nil
4 slight
3 moderate
2 severe
1 extreme

Noise
5 nil
4 slight
3 moderate
2 severe
1 extreme

Propagation
5 nil
4 slight
3 moderate
2 severe
1 extreme

Overall Merit
5 excellent
4 good
3 fair
2 poor
1 unusable

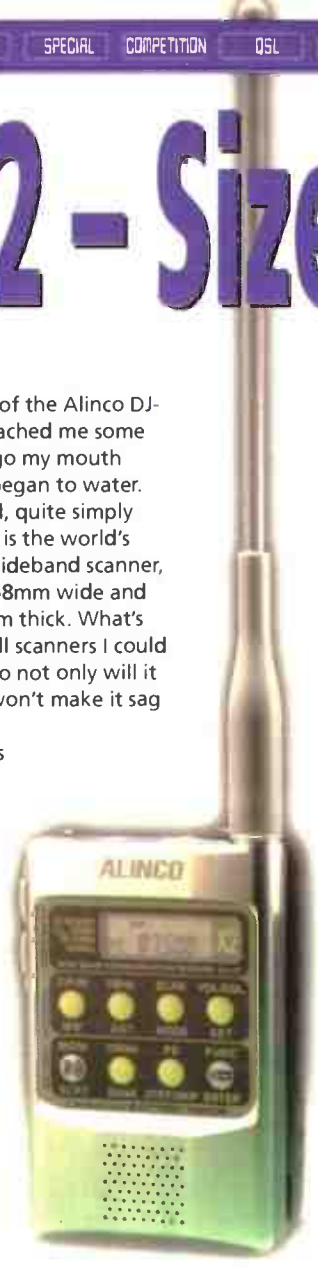
Alinco DJ-X2 - Size Matters!

Faris Raouf finally gets his mits on the DJ-X2 - question is - was it worth the wait? Read on and find out.

When news of the Alinco DJ-X2 first reached me some months ago my mouth instantly began to water. Why? Well, quite simply because it is the world's smallest wideband scanner, measuring a credit card-like 58mm wide and 90mm high, and a mere 15mm thick. What's more, unlike some other small scanners I could mention, it weighs just 85g, so not only will it easily fit in a shirt pocket, it won't make it sag down to the ground either.

Its diminutive proportions don't prevent it from having an excellent specification, though, the European version covering 522kHz to nearly 1GHz in a.m., n.b.f.m. and w.b.f.m. modes and having no less than 700 memory locations. Admittedly US users aren't so lucky, their version having two Government-imposed gaps in its coverage.

Unfortunately, just like the equally mouth-watering Icom IC-R3, whose specs have been public knowledge for some time but has steadfastly failed to make an appearance, I've not been able to physically get my hands on the DJ-X2 until now. The question is, was it worth the wait?



In The Box

My review unit came in two boxes. One contained the scanner itself, which is quite well built but nevertheless just a tad plasticy in its feel, plus a 175mm helical antenna, a reasonably well-written user manual, an earphone and an initially mysterious black plastic box. The other box contained nothing more exciting than a hefty mains power supply.

The black plastic box, which Alinco call a battery case, initially had me worried. This has space for three AA-sized cells in it, is the same height and width as the DJ-X2, but nearly twice as thick, and is designed in such a way as to attach to the back of the scanner.

At first I thought Alinco had pulled a fast one, and that this box had to be attached to the scanner in order to use in without the power supply. But in reality, this couldn't be further from the truth - the DJ-X2 has its own built-in Lithium Ion battery pack, which can power it for hours on end, and the battery slots in the black box are only there to provide a way of powering the scanner in an emergency. You will have to attach the battery case to the DJ-X2 when you want to charge its built-in battery, though, as it is where the charging electronics for the scanner are located.

DJ-X2 with charger, dwarfed by its antenna.

Controls & Connectors

Being so small, there isn't room for too many controls and connectors on the DJ-X2. On the top are a 2.5mm earphone jack, an on/off switch and an SMA antenna connector. For those of you unfamiliar with SMA connectors, these look like miniature versions of the 'F' connectors seen on satellite receivers and are proving popular with manufacturers of compact radio equipment. They prevent you from attaching standard antennas without buying an adapter, but do save a great deal of space.

The left hand side of the scanner has only two controls. One is an Up/Down control that lets you change scan directions, move up and down in frequency, or select from various options shown on the scanner's display. The other control is a simple slider that allows you to select between internal and external power sources, in other words, between its built-in Lithium Ion battery or standard AA size cells in the battery case if you have it attached. Talking of the battery case, the electrical connection between this and the DJ-X2 is dealt with via a special connector at the back of the scanner.

Although all the controls and connectors I've mentioned so far are vital to the operation of the DJ-X2, the majority of its controls, along with its backlit

l.c.d. panel and a tiny speaker, are on the front of the unit. As you can see from the pictures, there are only eight buttons here in total, all of which take the form of a simple membrane switch. Each of these has at least two functions, and for all but one of the buttons the primary function is printed in yellow above the button and a secondary function marked in white below it.

Accessing a secondary function is usually a matter of pressing the FUNC button before any of the other buttons. The exception to this rule is the FUNC button itself, which doubles as an Enter key and, if pressed and held for a few seconds, a keypad lock button. Pressing and holding this button for a few seconds again unlocks the keypad. Some of the buttons also have tertiary functions which are accessed by pressing them multiple times, with or without pressing the FUNC first.

Before I go on to describe what the scanner can do, I'd better say a few words about the DJ-X2's display. This may be small, but Alinco have managed to pack a lot into it by using a totally custom design. There are six digits plus a decimal point and three special '75', '50' and '25' segments to display the frequency, a nineteen-section vertical signal strength bar and a.m., n.b.f.m. and w.b.f.m. mode indicators, for example.

And, amongst several other things, the display also has indicators to tell you when the battery is low, when the scanner's attenuator circuit has been enabled, and which bank and channel number is currently in use. What's more, when using the Up/Down button to adjust various settings, pseudo-alphabetic characters denoting the setting in question are shown along with its current numeric value on the part of the display normally reserved for the frequency read out.

Two such settings are volume and squelch. Pressing the VOL/SQL button once displays 'uoL' (vol) on the display, followed by a number from 0 to 20 representing the current volume setting. This can then be adjusted using the Up/Down key. Pressing the VOL/SQL button again displays '59L' (sql) followed by a number from 0 to 5, which can be adjusted as before. Only five squelch settings is a bit limiting in theory, but in practice it isn't so bad, at least on a scanner like this.

Eight Keys & No Numbers

You can't have failed to notice that with just eight keys, none of which have numbers on them, entering a frequency on the DJ-X2 is not a simple prospect. Indeed, directly entering a frequency is impossible and the only way to get even close to a particular frequency is to press the 10 or 1MHz buttons then use the Up/Down button. This will move the scanner's receive frequency in 10 or 1MHz increments, from whatever is currently displayed, up or down towards the one you want.

Once you are close, you can set the exact frequency you want by scanning up or down to the frequency you want using the DJ-X2's SCAN function and the Up/Down button. This SCAN function is identical to those found on other scanners, zipping through frequencies according to a chosen step size until you either stop it manually or a signal strong enough to open up the squelch circuit is found.

By default, the frequency steps used when using the SCAN function are selected automatically for you based on a pre-programmed band plan. You can manually select a step size, though, from options of 5, 6.25, 8.33 (yes, 8.33kHz step sizes are supported!), 10, 12.5, 15, 20, 25, 30, 50 and 100kHz.

This manual override is a good thing too, as I found some of the scanner's automatically chosen step sizes to be wrong for the part of the spectrum I was listening to at the time. The receive mode, a.m., n.b.f.m. or w.b.f.m., is also automatically set for you, but again can be manually set using the MODE function as long as the STEP function is not in automatic mode.

An alternative way of finding your way to a particular frequency is by using the scanner's Program Scan mode. This continuously scans between two user-defined frequencies, of which 20 linked pairs can be stored in the scanner. Unfortunately, setting this function up is really quite long-winded, as you need to enter the upper and lowed edge frequencies somehow, and the only way to do this is to follow the long-winded method I've described above in the first place.

However, once you've set up one or more pairs, you can at least access them very easily, and if the frequency you want to listen to lies between these, you can at least use this function as a stepping stone to get to your target frequency.

Memory Matters

Once you have found an interesting frequency using the SCAN function, you can write it into one of the DJ-X2's 700 memory locations. These are split into

AA adaptor/charger.

Alinco DJ-X2 - Size Matters!

Specifications:

Frequency range:	522kHz to 999.995MHz
Modes:	a.m., n.b.f.m., w.b.f.m.
Steps:	5, 6.26, 8.33, 10, 12.5, 15, 20, 25, 30, 50 and 100kHz
User memories:	700
Size:	58 x 90 x15 (WxHxD) mm
Weight:	85g

ten banks of 70 channels.

To store a frequency, you first need to select a bank using the BANK function. You do this by pressing the FUNC button followed by the 1MHz/BANK key, which selects BANK 0. Each subsequent press of the same key steps through all the banks and then finally back to 0 again.

The channel within the bank you have selected can then be moved through using the Up/Down key. Once you have homed in on the bank and channel you want to store something in, the final step is press the V/P/M/MW button. Banks can then be scanned through individually, or you can have the scanner scan through all or only some of them. Individual channels within a bank can also be skipped during scanning if need be.

A similar method to that used to store frequencies within banks also allows you to program up to 100 search pass frequencies, eight priority scan channels, and the twenty Program Scan edge frequencies I mentioned before.

Additional Functions

As well as everything I've described so far, the DJ-X2 also has three other features worth mentioning - a bug detector mode, a descrambler mode and a Preset mode.

I'm at a loss to explain why Alinco decided to put the bug detector function in this scanner, as it isn't very useful. This is primarily because it can only find listening devices transmitting on frequencies that you've already stored in one of its memory channels. You'll also have to be close to the device in order to find it. In any case, I couldn't even manage to activate the bug detector mode, no matter how hard I tried.

In contrast to the bug detector mode, the descrambler function may actually prove very useful for some people. This won't descramble truly encrypted transmissions, but does allow you to hear transmissions scrambled using frequency inversion techniques.

Finally, Preset mode allows you to quickly access three non-adjustable edge pairs pre-programmed into the scanner. These cover a.m. radio, f.m. radio and broadcast TV bands. However, I heard little in the TV band, and certainly no TV audio transmissions when I was reviewing the scanner, despite being within sight of London's main TV transmitter at Crystal Palace.

In Use

The first thing I noticed when using the DJ-X2 was how tinny the audio quality was as a result of the tiny speaker fitted in it. Plugging in the earphone helped enormously, though, and can also help make you use the DJ-X2 even more discreetly than its small size already allows. This is not just because it prevents anyone nearby hearing what you are listening to, but also because those fiendishly clever people at Alinco have designed their scanner in such a way as to allow it to use the earphone's cable as an antenna if required. This means you can use the DJ-X2 without its normal antenna if need be, though obviously it won't be quite as sensitive. And since it isn't that sensitive to start with, this could be a problem in some circumstances.

The DJ-X2 had absolutely no problems receiving strong local transmissions, though, and I have to say that its h.f. reception wasn't too bad at all, whether you use the external antenna, the earphone wire, or the scanner's handy built-in rod antenna.

My Opinion

Even if it were the most powerful and sensitive receiver on the planet, there's no getting away from the fact that the DJ-X2 is something of a nightmare to program and use, mainly due to its lack of a quick frequency entry method. You could argue that there isn't room on such a small scanner for a full numeric keypad, and that some other small scanners have the same problem. I'd have to agree with you on these points, but Alinco could have come up with another way of entering frequencies, such as allowing you to scroll left and right through the frequency display somehow, then alter each digit individually using the Up/Down button.

The bottom line, then, is that the DJ-X2's tiny size is its only real advantage over similar-priced competitors. For some this will be more than enough reason to buy it, though, and if you do, you won't be disappointed - Alinco has, on the whole, still done a good job of cramming a great deal of scanner into such a small space without it costing the earth.

Thanks to **Nevada, Unit 1 Fitzherbert Spur, Farlington, Portsmouth PO6 1TT, Tel: 023-9231 3090, www.nevada .co.uk** for supplying me with the review unit.

The DJ-X2 costs £239.95 plus P&P.

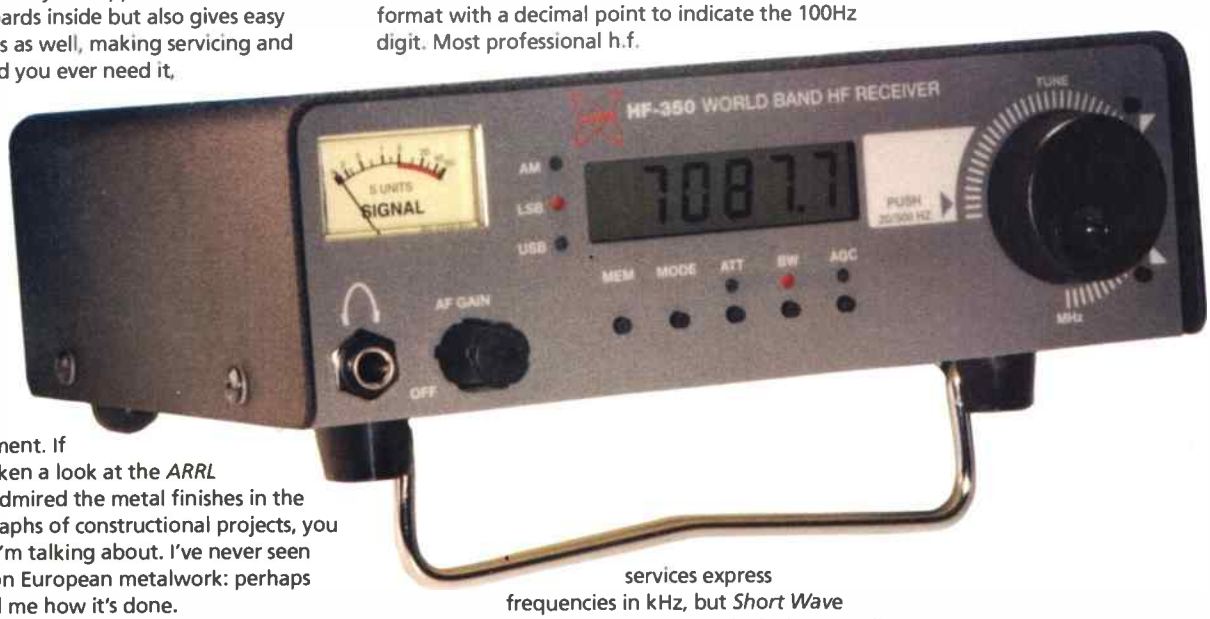
A tad thicker with the AA adaptor fitted!

Lowe Europe HF-350

John Wilson reviews the newcomer HF-350 after a seemingly long absence of new h.f. receivers to the market.

And still they keep coming; the receivers that is. Half way through my scribblings about an American receiver from the sixties, I was asked by the Editor to take a look at another American receiver, but this time one which is right up-to-date. I first saw mention of a receiver called the Palstar R30 in *Monitoring Times* sometime in the last century; 1999 that is, and followed the web site given in the review only to find that it was directed to Nevada Electronics right here in England. Not much information was available, but we popped in a request for a review sample and it finally turned up in June this year, not from Nevada, but from Lowe Electronics. Strange but true, and before trying to explain how an American manufactured radio turns up with a Lowe badge on it, let's take a look at the receiver itself.

The HF-350 is a neat looking little receiver with a front panel about the same height as the Lowe HF-150 but wider, and deeper from front to back. Construction is typically American with the outer case being formed from two 'U' shaped sections which mate together at ninety degrees to make a simple but effective box. One of the advantages of making a case this way is that removing the top cover exposes not only the upper surface of the printed circuit boards inside but also gives easy access to the sides as well, making servicing and alignment, should you ever need it, particularly easy. The material used throughout the metalwork is heavy gauge hard aluminium, with unpainted surfaces finished in that golden green sheen which characterises American equipment. If you have ever taken a look at the *ARRL Handbook* and admired the metal finishes in the internal photographs of constructional projects, you will know what I'm talking about. I've never seen the same finish on European metalwork: perhaps someone will tell me how it's done.



Plain Wrapper

The front panel follows the American design approach, being completely flat without the sometimes fussy plastic mouldings found on other equipment, and the control layout is simple and very effective. The main tuning knob follows the Austrian government and some 80m nets in being set to the far right, with two dinky press buttons even further to the right which allow the user to step up and down in frequency in 1MHz steps, and also to step up and down the memory channels when in memory mode. The frequency display uses my favourite black digits on a pale orange background when back illuminated, and Palstar have thoughtfully provided a rear panel press button to turn off the illumination, leaving black digits on a grey background. One reason for this design touch is that the HF-350 has the facility for the user to fit ten AA size cells in an internal battery pack so that the receiver can be used as a portable. Under these conditions, turning off the backlight gives a useful saving in current consumption. I measured the standing current of the receiver under no-signal conditions and a 14V d.c. supply as 250mA, with the dial illumination adding a further 130mA to this when switched on. The battery holder provides for ten cells, which would give a supply of 15V using alkaline cells and 12V using rechargeables. No provision is made for charging cells when fitted, so these would have to be taken out and re-charged in an external mains powered charger - pity - because that would have been a really useful feature. One very good point is the method of retaining the cells in the battery pack by a substantial metal strap rather than the usual bit of Velcro tape. This is one receiver in which you can be sure the batteries stay in place no matter how badly it's shaken about.

The operating frequency is shown in six digit format with a decimal point to indicate the 100Hz digit. Most professional h.f. services express frequencies in kHz, but *Short Wave Magazine* have an Editorial policy, which changes all my frequencies to MHz. (*It's actually an ITU convention that we use John - **Ed.***) When did you ever hear an aircraft calling Shanwick on "eight point eight six four", rather than "Eighty eight, sixty four"? The HF-350 is right as far as I am concerned. Under the frequency display are four push buttons which control memory store and recall, mode selection, r.f. attenuator selection, i.f. bandwidth and a.g.c. decay time constant, whilst to the left of the display are three l.e.d. indicators for a.m., l.s.b. and u.s.b. The only other control on the front panel is the a.f. gain which also carries the power on/off

Lowe Europe HF-350

it, all very straightforward and obvious; but how did the HF-350 perform when switched on?

Off We Go

Connecting a 12V d.c. supply (which will be supplied with the UK model) and turning the audio gain control clockwise lights up the frequency display and you can start listening. Only one 50Ω antenna connector is provided and no provision has been made for higher impedance feeds, although so many listeners use an external balun (I dislike that name for a simple transformer) that a separate high impedance input is probably not necessary. I poked in my balun fed wire and started tuning around. The tuning control feels a bit dead because of the lack of any weight to the knob, but its free running and moves easily with the little finger dimple for fast tuning. The smallest tuning increment is 20Hz, and there is the expected automatic speed up as the knob speed reaches a critical point. A very good feature is the way that the tuning increment can be increased to 100Hz by pushing the tuning knob in until a slight click is felt. This is a really neat idea, and works very well indeed. I wonder why no-one has done it before? The labelling of the tuning knob as '20Hz/500Hz' is a bit misleading, but it's true since the auto speed up from the 100Hz increment takes you to 500Hz. This still may sound slow, but because you have 1MHz up/down buttons to shift around quickly you can soon tune across each 1MHz band at 500Hz increments. Despite the lack of keypad entry, the HF-350 is very easy to tune on to frequency, and the 20Hz fine tuning steps are perfectly acceptable for even data signals.

A single step r.f. attenuator is fitted and selected by a front panel push button. The attenuator step is 10dB, which is a good choice bearing in mind the excellent r.f. performance of the HF-350 (see later).

Mode selection from a.m./l.s.b./u.s.b. is by single push button stepping through a carousel, with the mode in use being clearly shown by a line of l.e.d.s beside the frequency display. No provision is made for synchronous a.m., but receiving a.m. as s.s.b. is almost as good, and the sideband switching is arranged so that the receiver stays on the correct frequency all the time. The i.f. filtering has two bandwidths provided, and the familiar Murata (or equivalent) ceramic filters are used, having nominal bandwidths of 2.5 and 4kHz. Note that the Palstar R30 US home market version of this receiver has 2.5kHz and 6kHz filters fitted, which would be less satisfactory for European

Continued on page 22...

switch. The signal strength meter is a good honest moving coil analogue unit calibrated in the traditional short wave fashion, and also back illuminated, whilst the headphone jack immediately below it is also an equally good honest quarter inch socket but appears to be mono only, because plugging in a pair of stereo headphones (which most people use these days) resulted in audio in one ear only, surely an oversight on the part of the manufacturer.

The rear panel carries the usual concentric power connector for external 12V d.c. supply, the SO-239 antenna connector, an external speaker jack (quarter inch mono, rather than the 3.5mm mini jack often used these days), a mute phono socket which will put the receiver into standby when shorted, a second phono socket which provides a fixed level audio output for tape recorder or other external use, a red push button for turning off the display and 'S'-meter backlight and a slide switch for selecting phantom power for an active antenna. A single fuse holder carries the protective fuse for the internal battery pack; let's face it, you wouldn't want the kind of fire a shorted NiCad pack can produce, and that's about

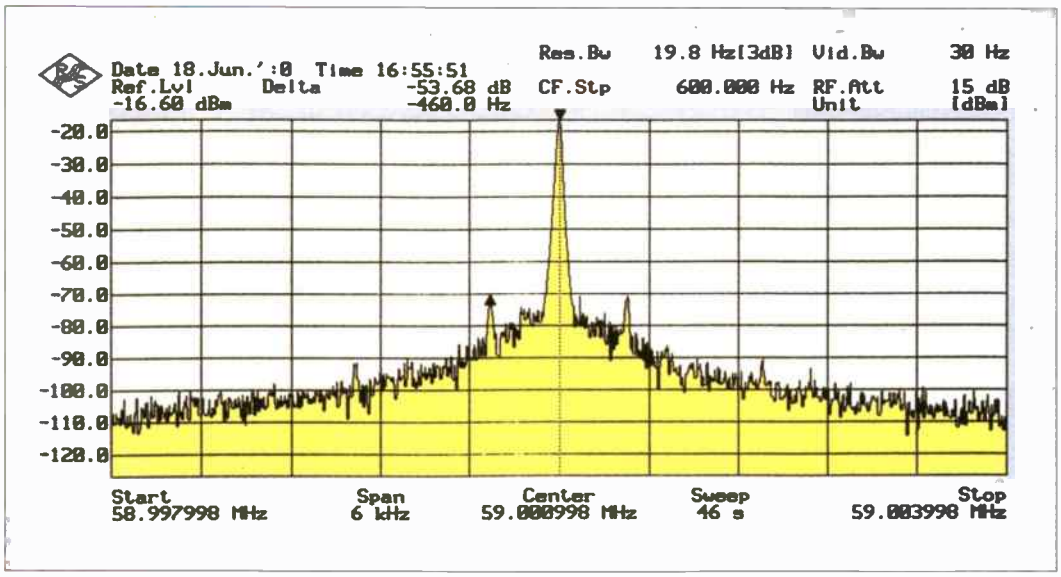


Fig. 1: HF-350 synthesiser spectral purity.

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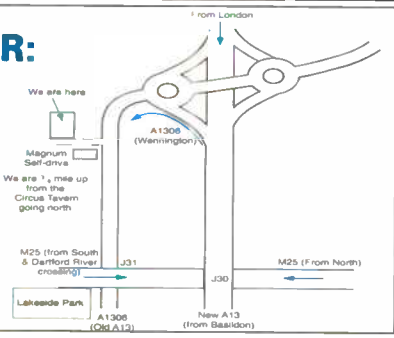

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Lowe Europe HF-350

...continued from page 18

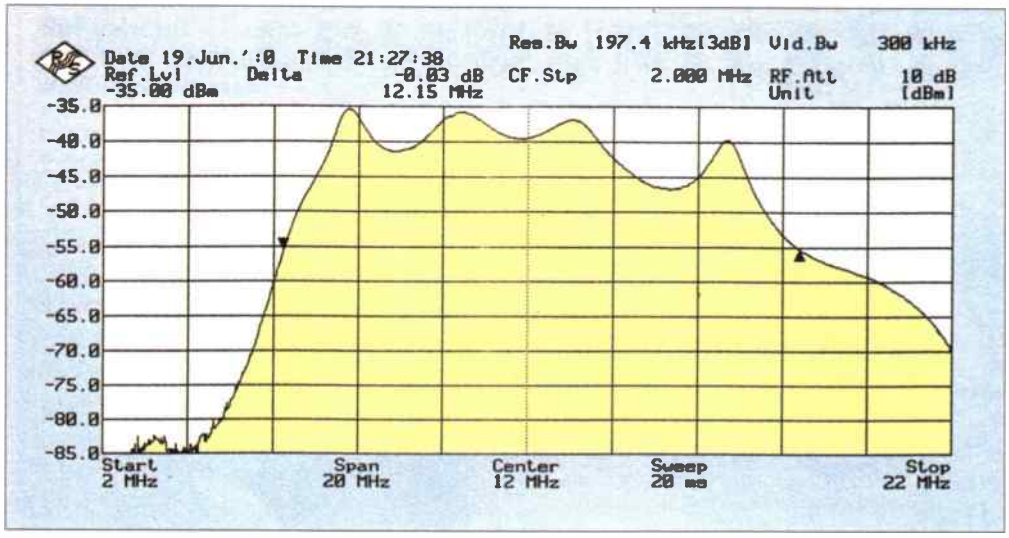


Fig. 2: HF-350 8-16MHz r.f. bandpass filter response.

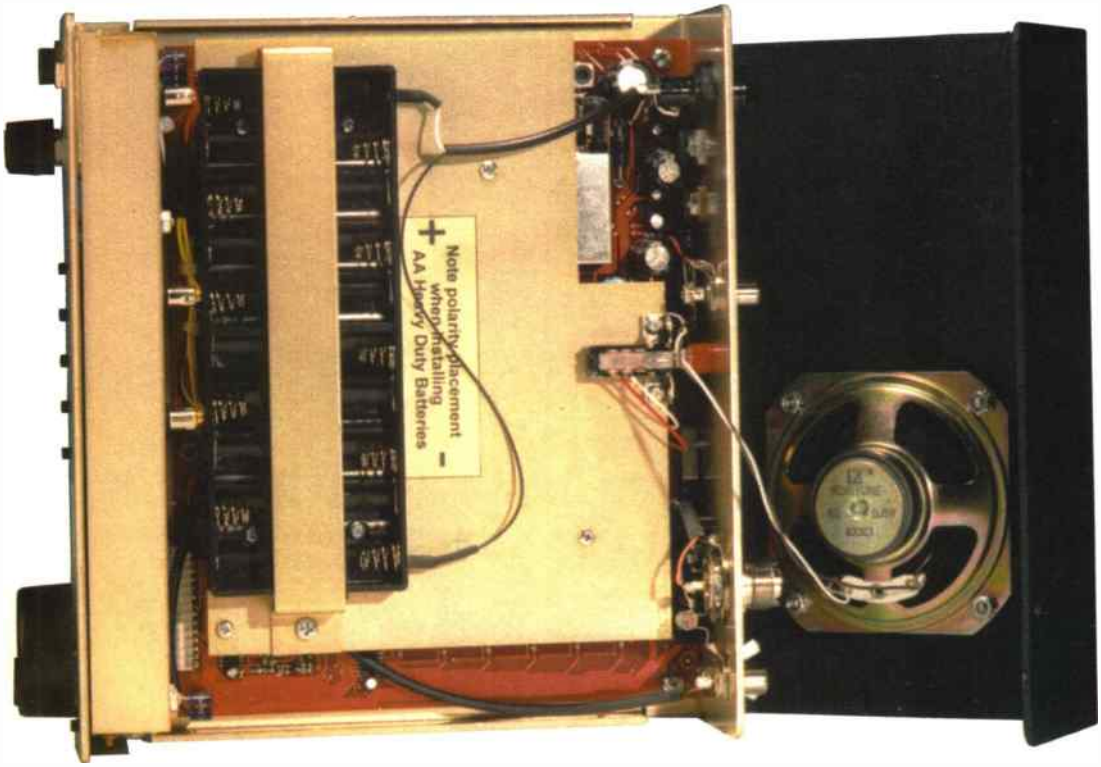
listening, and the change of specification has presumably been brought about by careful specifying on the part of the European importers. Filter selection is again by simple push button, but no indication is provided to tell you which bandwidth is in use. However, more careful thought has also gone into ensuring that if you select the a.m. mode, the 4kHz filter is used, whereas selecting l.s.b. or u.s.b. automatically selects the 2.5kHz. Good design thinking in evidence. The ceramic filters work well and provide good audio response with adequate adjacent channel rejection.

Well Matched

The a.g.c. system has two decay time constants, again selected by a single push button, and these seem very well matched to the reception modes provided. The longer decay has a smooth restoration of gain and is easy on the ear, without any of the unexpected spitting noises produced by some other receivers. All in all, the HF-350 is a totally straightforward h.f. receiver with all the easy familiarity of a close friend. I did find the memory function initially baffling because I was working without any kind of instruction manual but the European distributor, Hans Doeven, FAXed me a draft manual from Holland which told me what I wanted to know and revealed that the memory entry and recall system was actually quite simple. The reason for operation being baffling was that the HF-350 has perhaps carried simplicity a little too far. How was I to know that pressing the main tuning knob was part of the memory system? So how does it work?

A very respectable 100 memories are provided, each one storing frequency, mode, r.f. attenuator setting, a.g.c. time constant and i.f. filter bandwidth just like the expensive receivers. Let's take memory entry as it usually happens in practice; you are tuning around and decide that you have found a frequency you wish to store for future listening. Press and hold the MEM button for two seconds or longer and the display changes to showing memory channel. The channel number shown will be flashing, to indicate that this is the first available empty channel, and a second short press on the MEM button will enter the frequency to which you are listening into that channel, and the channel number will then stop flashing. If after using the receiver for some time you have filled all 100 channels, you will find the flashing channel number with P alongside it to remind you that the memory is already Programmed. Pressing the MEM button briefly will over-write the data in the memory with that from the frequency to which you are listening, so press with care, its very easy to over-write existing channels. The difficulty with this procedure is once in memory store mode, all you get on the display is the channel number, and you cannot ask the receiver what frequency is already in this channel. This means that you have to try and remember what you last put into each memory so as to avoid over-writing a favourite frequency without realising it.

Oddly enough, if you are in normal listening mode and you press the MEM button briefly, the receiver goes into memory recall mode and you can choose to step through the numbered memories by channel number, or press the main tuning knob once and the display will then show you the memorised frequencies and you can step through the memories with the frequency shown for each one. Its a real pity that the same facility wasn't included in the memory store mode as well, because it would have been a really useful feature for the user. One further slight niggle which was also brought up in the US



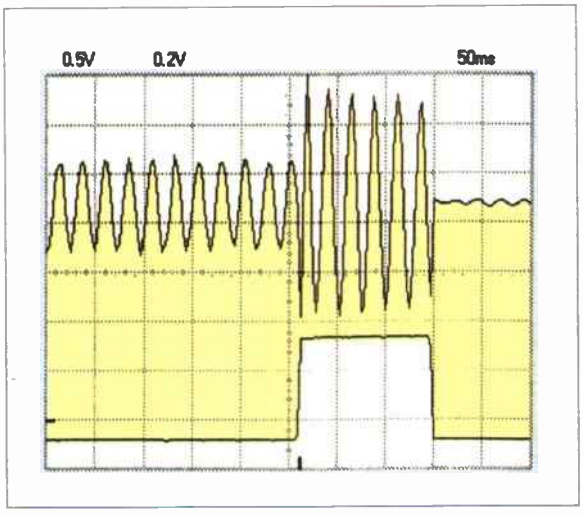


Fig. 3: HF-150 a.g.c. performance, 8dB audio change for 60dB r.f. change.

Monitoring Times review of the Palstar R30 is that the MEM button and the MODE button are next to each other, and if you dive for the MODE button its all too easy to hit the MEM button instead, which then loses the frequency to which you were listening and dumps you on to the frequency stored in whatever memory was selected before you foolishly hit the button. Even knowing this could happen, there were a few choice words when time and again I hit the wrong button and lost my frequency and had to go through the whole business of re-tuning to the lost station.

However, tuning around with the HF-350 revealed it to be a very pleasant receiver to use apart from a slight grittiness to the audio. The tuning rates were well chosen for all types of listening, and the provision of a fixed level audio output at about 150mV r.m.s. made recording and testing easy to carry out. The r.f. performance was well up with the best of receivers in the class, and reminded me so much of the way that Drake receivers have always performed with smooth grace under all conditions.

Measured Performance

I started with the usual simple sensitivity measurements which are given as the level in dBm required for 12dB SINAD using an unmodulated carrier for s.s.b. and c.w., and carrier modulated to a depth of 60% by 1kHz in a.m. Simple rule of thumb for those accustomed to thinking in microvolts: -107dBm is one microvolt; -117dBm is 0.3µV (actually 0.316 if you want to be pedantic).

Frequency (MHz)	Mode	Bandwidth (kHz)	Sensitivity (dBm)
27.200	u.s.b.	2.5	-112
27.200	a.m.	4	-103
14.200	u.s.b.	2.5	-112
14.200	a.m.	4	-103
8.500	u.s.b.	2.5	-111
8.500	a.m.	4	-103
0.900	a.m.	4	-105

Now this is very respectable, and what struck me during the sensitivity tests was how quiet the receiver seemed to be. This usually indicates well planned gain distribution in the design, and also suggests low-noise front-end performance. I wasn't wrong; the HF-350 3rd order intercept point measured at 14MHz with 20kHz signal spacing was +17.5dBm, with a dynamic range of 95dB. That in itself is excellent, but the other striking feature was the cleanliness of the synthesiser. I have mentioned before that it can sometimes be difficult to pick out and measure the weak third order product among the forest of birdies produced by close in spurii from the synthesiser, but no such problems with the HF-350; the wanted product was there in the clear something I normally find only with crystal conversion mixers. I took a peek at the spectral purity of the synthesiser, and although there are two low level spurs at ±450Hz from the wanted signal, and allowing that the noise floor is higher than you would get from a crystal, there are no other obvious discrete signals in the noise to cause the multiple birdies one finds in other receivers. See **Fig. 1**.

Formal reciprocal mixing measurements were carried out and confirm that the HF-350 meets a high standard in this respect:

Spacing from wanted signal (kHz)	Reciprocal mixing ratio	dBc/Hz
5	80	-114
10	94	-128
20	95	-129
50	101	-135
100	102	-136

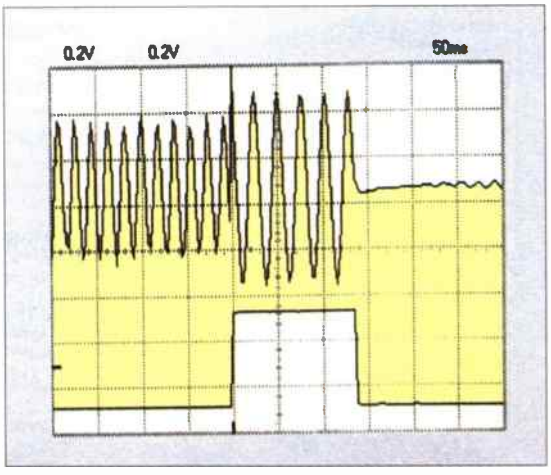
Although the ultimate noise floor at wider spacing does not fall to the levels achieved by semi-professional receivers, the HF-350 nevertheless compares very favourably with receivers in its category.

Finally, my tests on second order intercept point which reveals how the receiver will perform when subjected to large signals several MHz away from the operating frequency. To remind you of the method, I use two clean signals at 6.5 and 7MHz looking for the second order product with the receiver tuned to 13.5MHz (the sum). Receivers with tuned preselection before the first mixer perform very well in this test, usually having a second order intercept point of +80dBm, but the HF-350 produced a kind of in between result, showing a dynamic range of 84dB and a second order intercept point of +42dBm. Don't get concerned, this is better than receivers having no front-end preselection at all, such as the baby Lowe HF-150, and shows that there must be some front-end filtering.

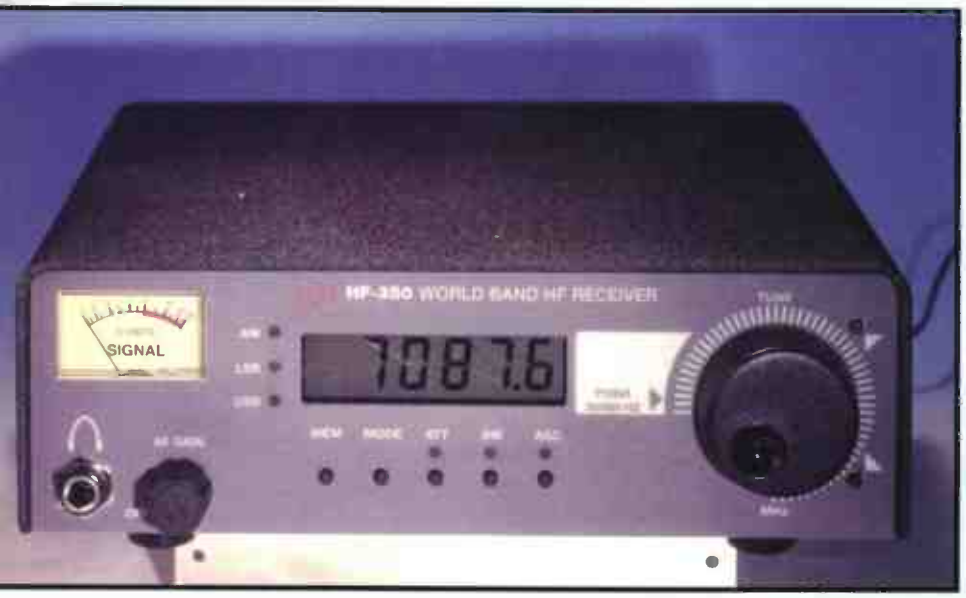
A quick look at the HF-350 circuit board soon shows the presence of a bank of octave band pass filters before the first mixer, and as usual these cover the nominal pass bands of 16 to 30MHz, 8 to 16MHz, 4 to 8MHz, 2 to 4MHz, 1 to 2 MHz and then low pass sections below 1MHz. I plotted the response of all the filters fitted to the HF-350, but since space does not permit printing all of them in the magazine (unless the Editor approves), take a look

Continued on page 25...

Fig. 4: HF-350 a.g.c. performance showing frequency shift on amplitude change. Audio level change of 2.5dB for a 60dB r.f. input step.



Introducing the new Lowe HF350



The new Lowe HF350 is a simple to operate receiver with excellent performance. It is based on an original American design with several important modifications from European RF design specialists. The result is a receiver with very good strong signal handling capabilities using high performance ceramic filters to achieve selectivity. The front end has optimised band pass filters to minimise break through.

The tuning control changes speed as the knob is rotated faster, also pushing the control in changes between fast and slow tuning speed. There are 100 memories available which hold all settings such as mode, attenuator, etc. The receiver has been designed with the requirements of operating in Europe in an environment of high powered broadcast stations in mind.

It is very simple to use, and after a few moments experimenting with the controls you will be able to drive it without even opening the manual. All external connections needed are available on the rear panel, and the receiver can be run from internal batteries or an external 12V DC power source. It is ready for an active antenna, with a DC feed already available at the antenna socket.

SPECIFICATIONS

Sensitivity
100kHz-2MHz AM 2µV, SSB 1µV
2MHz-30MHz AM 1.5µV, SSB 0.5µV

Selectivity
45MHz 8kHz BW
455kHz (AM) 4kHz
455kHz (SSB) 2.5kHz

Dynamic range
>90dB @ 10kHz from frequency
>105dB @ 100kHz from frequency

Spurious response
@ 45MHz >65dB rejection
@ 455kHz > 90dB rejection

Frequency coverage
100kHz - 30MHz

Receiver system
Microprocessor controlled PLL tuning dual conversion superhet

Display
6 digit backlit LCD display
Analogue S meter

Reception modes
Am, LSB, USB, CW

Tuning
Rotary encoder, MHz button rate 20Hz - 100Hz slow and 100Hz - 500Hz fast per step

Intermodulation
Third order intercept @ 10kHz + 15dBm
@ 50kHz + 20dBm

Frequency stability
+/- 20Hz per hour 15-50deg C

AGC range
0.5µV-500mV <2dB change
Attack time <5 mS
Delay slow <4 secs
fast <0.5 secs

Audio
3 watts into 8 ohms 1% THD

Distortion
AM @ 60% mod <1%
SSB <0.5%

S/N ratio
AM 4kHz filter @ 1kHz
5µV 20dB
500µV >50dB
SSB 5µV 20dB
500µV >50dB

Power supply
Quiescent current 300mA with lamps

Weight
1Kg (2.2lbs)

Dimensions
210mm W x 65mm H x 195mm D

Memory
100 memories selected with front panel encoder tuning knob or up/down MHz button frequency retained while switched off

IF filters
All modes 2.5kHz or 4kHz operator selectable

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Lowe Europe HF-350

...continued from page 23

at the 8 to 16MHz response in **Fig. 2**. You can see that the lower frequency slope of the filter is only 20dB down at about 6.2MHz, so my two test signals at 6.5 and 7MHz would not have been completely rejected, hence the in between second order performance, but I must again emphasise that the HF-350 is much better than a receiver having no filtering at all. Better still of course would have been a bank of half octave filters as used by JRC in the front-end of the NRD-345.

To be fair to the HF-350, I did the same measurement again using input signals of 6 and 4.1MHz, resolving the second order product at 10.1MHz, in order to place the input signals further down the input filter response, and as one might expect, the second order intercept point moved up to +64dB, with a dynamic range of 95dB. Just to place this in context, the Lowe HF-150 turned in a second order intercept point of +35dBm, some 30dB worse than the HF-350.

It was whilst using the receiver to tune around 8.3MHz that I noticed a strange gurgling sound which proved to be an internally generated band of spurious signals within the receiver. I investigated across the whole tuning range of the receiver and found quite a few very low level fast moving birdies but these were only apparent because of the very low background noise and didn't even move the S meter. However, there were just a few which appeared as S5/S7 carriers at 27.216, 26.360, 27.102 and 18.254MHz, with the gurgling sounds apparent around 4.127, 8.260, 12.446, 16.620 and 27.000MHz. Spurious signals of this kind are commonly encountered in synthesised receivers and I only mention them because of the curious flock of mad canaries sound around the latter group of frequencies. Once an antenna is connected they virtually cease to be of importance.

Previous comments on receiver a.g.c. performance prompted a regular reader to ask if it might be possible to measure the actual a.g.c. characteristics of receivers under test. In the past, this would have been done by looking at the a.g.c. line with a high impedance measuring instrument such as an oscilloscope, but in modern receivers there are often multiple a.g.c. systems and some of them are of course digitally derived. In order to keep to my objective of listening to a receiver as a potential purchaser and judging the overall effects from antenna connector to loudspeaker, I devised a test configuration in which I use a fast r.f. switch driven by a pulse generator having variable rise and fall times to apply a well defined pulse of r.f. to the receiver. Using this as a trigger into a dual channel digital storage system, and feeding the receiver audio output into the second channel allows me to directly compare r.f. input to audio output, and by arranging the switching so that I have a defined r.f. signal around the switch to start with, I can produce a signal which will step from, say, -90dBm to -30dBm, in other words a 60dB step in r.f. level, and look at the effects on the receiver audio.

I tried the technique first of all on the Lowe HF-150 and the results can be seen in **Fig. 3**. The lower trace shows the shape of the r.f. step, and you can see that the audio from the -90dBm signal steps up when the -30dBm signal appears and then disappears after the step as the a.g.c. hang time holds down the receiver gain. With longer time sweeps I hope to be able to show the receiver recovery characteristics as well. The results for the HF-150 show an 8dB change in audio for a 60dB change in r.f. The results for the HF-350 under the same test are shown in **Fig. 4**, and in this case there is only a 2.5dB audio change for 60dB r.f. change, so in this respect the HF-350 is better. However, if you look at the frequency of the audio, you can see that it shifts lower during the r.f. signal pulse, and this is clearly audible in the loudspeaker. Presumable there must be some frequency pulling within the receiver, but in the absence of any circuit information I wasn't able to pursue this further. In real life it probably won't make the slightest difference to your listening, and when I tuned across the bottom end of 40m to see how strong c.w. signals might sound it was quite clear that it not only didn't matter but also reminded me what a very nice receiver the HF-350 was. Given a narrow c.w. filter option, the good r.f. performance and low background noise would enable it to compete with much more expensive equipment.

Speaking of i.f. filters, the *Monitoring Times* review mentioned a version of the Palstar R30 with Collins filters in place of the standard ceramic units, but I have no information on whether this option will be available in Europe. I must also remember that I did do my own 900/909/918kHz test during the r.f. measurements and the HF-350 performed rather better than some other higher priced receivers.

Final Analysis

The HF-350 (Palstar R30) carries its American heart on its sleeve, combining as it does all the virtues of simplicity, good r.f. performance, ease of use and some clever features such as the push to change on the tuning knob. It is designed and built with Appalachian honesty and will satisfy beginners and experts alike. You all know my liking for an r.f. gain control, which the HF-350 doesn't have, but nor do other receivers in the same market group. There is no noise blanker, but again this is not a serious loss for a general purpose receiver. However, even the nicest receivers have to compete for your favour in a harsh competitive environment, and we have the rather curious situation where the company whose name the receiver bears and which has suggested a selling price in the UK of £375 are also representatives for JRC and are selling the NRD-345 alongside the HF-350 at an astounding price of £399. This makes no commercial sense to me, particularly since the NRD-345 was launched with a £699 price tag; much more in line with the facilities offered by it, such as keypad frequency entry, RS-232 control, sophisticated operational flexibility and not least the JRC reputation behind it. The Yaesu FRG-100 is also present in this sector of the market place, so life is not going to be easy for the HF-350, despite its good performance. If you are looking for a new receiver and have £400 to spend, the choice is going to be quite tricky.

Nonetheless, congratulations to Palstar for reminding us of all the good receiver design which is clearly still there in America, and I recommend readers to go along and give the HF-350 a trial. And despite what I said at the beginning of the review about explaining why an imported receiver is being sold under a label which suggests that it is designed and made in the UK, who really cares?

Happy listening.

SWM

The HF-350 can be obtained from:
Lowe Electronics Ltd.,
Chesterfield Road,
Matlock,
Derbyshire DE4 5LE.

Tel: (01629) 580800
Fax: (01629) 580020
E-mail: info@lowe.co.uk
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Thanks to them for the loan of the review unit.

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The latest version of this software is now available for immediate shipment.

AOR-3000A Receiver 100kHz - 2036MHz

The AOR-3000A goes on and on. It offers a wide frequency range at a very competitive price. Features include USB, LSB, CW. AM, FM * Fast 50 channels per sec search, * GaAsFET RF amplifier * Wide range of tuning steps from 50Hz * RS-232 port * 400 memory channels * Built-in clock * Channel pass feature * Back illumination * Rear whip antenna etc. Ask for leaflet.

£699
Plus £7.50 Carr.

Special Offer

30kHz - 30MHz NASA HF-4E Receiver

Computer Compatible FREE Software Disk

£149
Plus £6.00 Carr.

Was £199.95

This new receiver covers 30kHz to 30MHz and is designed for SSB, CW and AM reception. A much improved version of the Target HF-3, it is fitted with 2.6kHz SSB filter, advanced mixer design, backlighted display, active active antenna facility, and computer output. Included in the package is a software disk and 12V AC mains adapter Optional self-powered active antenna £59.95

IC-R75 Receiver 30kHz - 60MHz

FREE AC PSU & DSP Unit

ICOM

The IC-R75 has received rave reviews in the Amateur Radio Press. It's a very serious short wave receiver with coverage right up to the exciting 6m Ham Band. Features include USB, LSB, CW, AM, FM * 101 Memories * Super High Dynamic Range * Synchronous AM detection * Twin Pass band Tuning * Digital Signal Processing * Automatic Notch Filter * 101 Alphanumeric Memories * RF Gain/Squelch * Clock * Numeric keypad * Attenuator * 2-level Pre-Amp * Scanning.

£629
Plus £7.50 Carr.

UBC-3000XLT 25MHz - 1.3GHz

It has 400 channel memories, Automatic store and automatic sorting, Ultra fast scan rate, LCD backlight, 300ch per sec. scan rate, Data skip function, Supplied with AC adapter/charger and AA ni-cads.

£199.95
Plus £6.00 Carr.

YAESU Choice of the World's top DX'ers

VR-500 100KHz - 1300MHz

A true all-mode scanner offering great performance on VHF and UHF as well as the short wave bands with SSB coverage. 1000 memories, alphanumeric display, band scope, and PC programmable option.

Phone
Plus £6.00 Carr.

YAESU Choice of the World's top DX'ers

FRG-100 Receiver 50kHz - 30MHz

£389
Plus £7.50 Carr.

The FRG-100 has stood the test of time. It offers full coverage of the short wave bands plus long wave and medium wave. It features, * USB, LSB, AM, CW, * 50 memories * 2 stage attenuator * Noise Blanker * Band Scanning * Memory Scanning * Dual Speed AGC * High and low impedance antenna inputs * Programmable steps from 10Hz - 1kHz * Optional Narrow Filters, PSU and FM board * BFO reverse for CW * Twin Clocks. Ask for leaflet.

0kHz - 32MHz AOR-7030 Receiver

Needing little introduction, this receiver has become a classic of design. Features USB, LSB, CW, AM, FM, * 100 Memories * Dual VFOs * Resolution to 10Hz * Clock and Timer * Variable Bandwidth * Wide Dynamic Range * Seamless Tuning using Single Loop DDS * Clear LCD Readout * Infrared Remote Controller * AC Power Supply. Send for leaflet.

Phone
Plus £7.50 Carr.

SANGEAN *Badged up by Roberts at inflated prices. Sold by us at prices enjoyed by European's.*

Sangean ATS-818 Short -Wave Portable

SSB AM & Broadcast

£129.95
Plus £6.00 Carr.

A compact portable station covering short wave to 30MHz, LW/MW and FM broadcast. There are 54 memories in which to store your favourite stations. Power is via 6 AA cells (not supplied). Mention this advert and we'll give you a free power supply. (offer ends 31/8/00)

Sangean ATS-818ACS

Again, cheaper than the model badged up in the UK by Ropberts! (Shades of the car industry here!). Like the ATS-818 but with built-in cassette recorder and AC power supply accessory. £159.95

Plus £6.00 Carr.

Fairhaven RD-500VX 20kHz - 1.75GHz

Phone
Plus £7.50 Carr.

This very wide range receiver offers a complete listener station in one package. Features include USB, LSB, CW, AM, FM, Video out * 5Hz step accuracy * Over 13,000 memories with 20 Alphanumeric Characters * Noise Blanker * Text Search * Pass Band Tuning * Stereo CW Reception * Notch & Peak Filter etc.

We Will Match or BEAT Competitor's Prices On genuine UK Stock

wsplc.com Go

Yupiteru MVT-9000EU Mk2
100kHz - 1.99GHz

Latest Mk2 Version

Phone Plus £7.50 Carr.

Here's your chance to purchase the latest scanning receiver from Yupiteru at an unbelievable price. Covering the complete radio spectrum from long wave to UHF, you have a complete station in your pocket. Features include NFM, WFM, NAM, WAM, LSB, USB, CW, * 7 Frequency steps * 1,000 Memories in 20 banks * 500 Pass memories * 10 Priority channels, * Band Scope display * Duplex receive function lets you hear both sides of the conversation * Fast tune function, * Built-in AM antenna * Dual frequency display * Fast keypad entry. * Rechargeable batteries, AC charger and helical antenna.

Phone Plus £8.00 Carr.

Yupiteru MVT-7100EU
100kHz - 1.65GHz

Probably the best value for money, it has stood the test of time and is very sensitive. Offers USB, LSB, CW, AM, FM, WFM, * 1,000 memories * 500 Pass channels * 12 Tuning steps * Fast scan speed * Rechargeable batteries, AC charger and telescopic antenna.

£179 Plus £6.00 Carr.

Yupiteru MVT-7000EX
100kHz - 1.3GHz

The ideal scanner for those who are mainly interested in VHF and UHF listening. Features include, FM, WFM, AM reception * 200 memories in 10 banks * 20 steps per sec scanning * 6 Tuning steps * Good sensitivity * Supplied with rechargeable ni-cads and AC charger.Telescopic antenna included.

AOR-8200
500kHz - 2040MHz

This wide range scanner is fitted with a data port for computer control. Features include USB. LSB, CW, FM, WFM * Programmable steps * 1000 memories in 20 banks * Alphanumeric display * Built-in AM antenna * 8.33kHz steps for air band * Rechargeable ni-cads, AC charger and helical antenna.

Phone Plus £8.00 Carr.

£249 Plus £7.50 Carr.

IC-R10E
500kHz - 1300MHz

USB, LSB, CW, AM, FM, WFM * 1,000 Memories * Bandscope * Noise Blanker * Wide range of tuning steps * alphanumeric Display * Real Time Band Scope * Voice scan feature * Data output port * Programmable scanning * Ni-cad pack, AC charger and helical antenna.

£129 Plus £7.50 Carr.

IC-R2
500kHz - 1309MHz

This palm size handy offers great performance. Offers FM, WFM and AM * Auto squelch * 400 Memories * 11 Tuning steps * CTCSS decode * Duplex monitoring feature * PC Programmable * Built-in attenuator * Priority watch * Needs 2 x AA cells (extra). Antenna included.

ICOM New ICR-3E Scanner WITH TV RECEPTION!

Phone

* NSTC/PAL TV Receive.
* Wideband AM & FM Receive (No SSB)
* 496 KHz - 2450 MHz frequency coverage.
* Memory: Extensive Storage.
* Display: Detailed data control display.
* Dual Receive.
* AC charger and batteries included.

Icom have launched a new scanner with a built-in TV receiver. So when there is nothing to listen to, you can watch the pictures. You will need to be in a good signal area to get best results.

UBC - 220XLT Handheld Scanner

£119.95 Plus £5.00 Carr.

Ideal for general listening, this scanner covers all the major bands from 66MHz - 956MHz AM and FM. 200 memories and a very fast scanning speed make this a very attractive buy. You also get the flexible short antenna, AC charger and batteries.Very popular with Airband listeners.

Double Your Life!! NiMH Cells

These Nexcell Ni-MH cells have around twice the capacity of ni-cads and no memory effect. The AA size are 1350mAh. Ideal for handhelds and digital cameras. As supplied to the police.

4 x AA cells	£9.95
4 x AAA cells	£9.95
Charger for above	£9.95

Carriage £2 maximum. Quantity discounts - phone.

ICOM PCR-1000 10kHz - 1300MHz Computer controlled Receiver

Mode:USB, LSB, CW, AM, FM, WFM.

Connect this up to your PC and enjoy high quality reception with an amazing station data base and memory log. Can be used remotely from PC. Requires PC not included.

£279.95 Plus £8.00 Carr.

Hoka Gold-3 Decoding Software

THE SECRET'S OUT!

We are now the UK distributors. As used by governments, it can decode just about any form of data transmission on HF and VHF. Simply connect between PC and Rx audio. Can be loaded on any number of PCs. This is very advanced programme. £349.95 Plus £2.00 Carr.

GPS is now ten times more accurate!

Thanks to the American's switching off the error system

GARMIN. Full details and great prices on *On-line Catalogue* wsplc.com

WATSON Capture that Frequency!
10MHz - 3GHz
Hunts down Frequencies

Supplied with telescopic antenna and AC battery charger. If you are within 200 ft or so of the handheld, you should be able to read off the frequency. Note it down and enter it in your scanner. It's that simple and it's pocket sized. £59.95 Plus £8.00 Carr.

FB1 - 9 Skin Coloured Earpiece

£9.95 Plus £2.00 Carr.

The FBI-9 is a brand new design that is skin coloured to make it far less obvious when worn. The cable and cable exits will take a strain of 12kg so it won't break in commercial applications.

W-LWB MkII Long Wire Balun

Just attach any length of wire and feed back to radio with coax cable. Reduces interference and improves matching to receiver. £22.95 Plus £2.00 Carr.

JM-838WF

Jumbo 12 hour radio locked clock with weather forecaster, barometer, date & time, internal temperature. £49.95 Plus £2..00 Carr.

WWC-411

Jumbo 266mm diam wall clock. 12/24 hours, day date and internal temp C or F. £34.95 Plus £2..00 Carr.

MFJ-125

24 hour quartz clock with smaller day, date and 12 hour sweep dials. Each can be set independantly. £34.95 Plus £2..00 Carr.

WS-Desktop

The answer to those who want to improve the scanner performance using an indoor antenna. Covers 25 - 1300MHz and includes coax cable terminated with BNC plug. £49.95 Plus £7.50 Carr.

WS-Mobile Antenna

Just 0.9m high with magnetic base and 4m cable terminated with BNC plug. Covers 25 - 1300MHz and is the ideal choice for scanner users. £24.95 Plus £7.50 Carr.

SWL DX-1 HF Ant.

Covers 1.5 - 30Mhz and is 50m long. With 10m feeder wire back to receiver. An ideal general purpose antenna. £25.95 Plus £8.00 Carr.

Global AT-2000

The classic wire antenna tuner for short wave listening. Covering 1.8 - 30MHz, it includes our exclusive Q-switch, which improves front-end selectivity. Just connect a random length of wire and connect a coax cable from ATU back to receiver. £89.95 Plus £8.00 Carr.

High Quality Coax Switch

Sselect two anternnas or feeding two receivers at the flick of a switch. Rated up to 600MHz and almost half the price of competitive models. SO-239 sockets. £12.95 Plus £2.00 Carr.

RM-838 Radio Controlled

A radio controlled clock at a price, only W & S offers! Large display with signal strngth indicator. 2 programmable alarms and snooze feature. £9.95 Plus £2..00 Carr.

BA-928U Weather Station

Self-contained indicating weather forecast, pressur with 24-hour history (altitude ajustment), indoor and outdoor temperature, moon phases, time, day week, alarm, table or wall mount, AA cells included, plus wireless linked remote temp. sensor. £79.95 Plus £2..00 Carr.

WS-Base Discone

The classic antenna covering 25Mhz to 1300MHz. Ideal for all scanners. Height is 1.2m. Just connect coax cable to the SO-239 socket. Suitable for indoor or outdoor use. £49.95 Plus £2..00 Carr.

QS-300 Desk Stand

Designed for all handheld scanners. Your scanner sits on the adjustbale holder and a short BNC cable runs to an SO-239 socket, ready for you to plug your extenal antenna into. A really smart device. £13.95 Plus £2..00 Carr.

QS-400

The dash mount that enables any handheld to be mounted on the vent grill of your car.. £9.95 Plus £2..00 Carr.

RIAT 2000 RAF Cottesmore

With our hectic publishing schedules, we originally planned Ian Doyle's article for last month, when you would have read it before setting off to the RIAT 2000, however, instead we're running it this month, read on.

Well the airshow season is once again with us and whilst the number of shows may not be quite as prolific as it was some years ago, there is still plenty to see and of course hear. Following the end of the Cold War there has been significant cutback in Front-Line Squadrons and a number of Base Closures throughout Britain, the United States and Europe, we are therefore somewhat fortunate that the biggest and some would say the best airshow in the world continues to be held in the UK.

Each year the Royal Air Force Benevolent Fund hold their largest fund raising event, The Royal International Air Tattoo, which this year was held at RAF Cottesmore over the weekend of 22/23 July. For those with an interest in events aviation, such events hold the rare opportunity of some 'serious listening' and whilst the actual air displays and static line ups take place on the weekend itself, the arrival and departure days should have proved equally entertaining providing a valuable insight in terms of managing an airshow from the perspective of the Air Traffic Controller.

In a similar article last year covering RIAT '99, we concentrated on listening to the various UK arrival patterns for Royal Air Force Fairford, Gloucestershire, the usual home for RIAT, and the way in which aircraft are controlled in the local arrivals area, this year I have provided some basic additional information on how movements are handled on the ground.

As last year I would again reiterate that this type of article is not aimed at 'The Professional Radio Anorak', if however you do have a modest interest in aviation, own a reasonable wideband scanner and dare I say it have even attended the odd military airshow, pull up a sandbag, and read on!

RIAT Moved

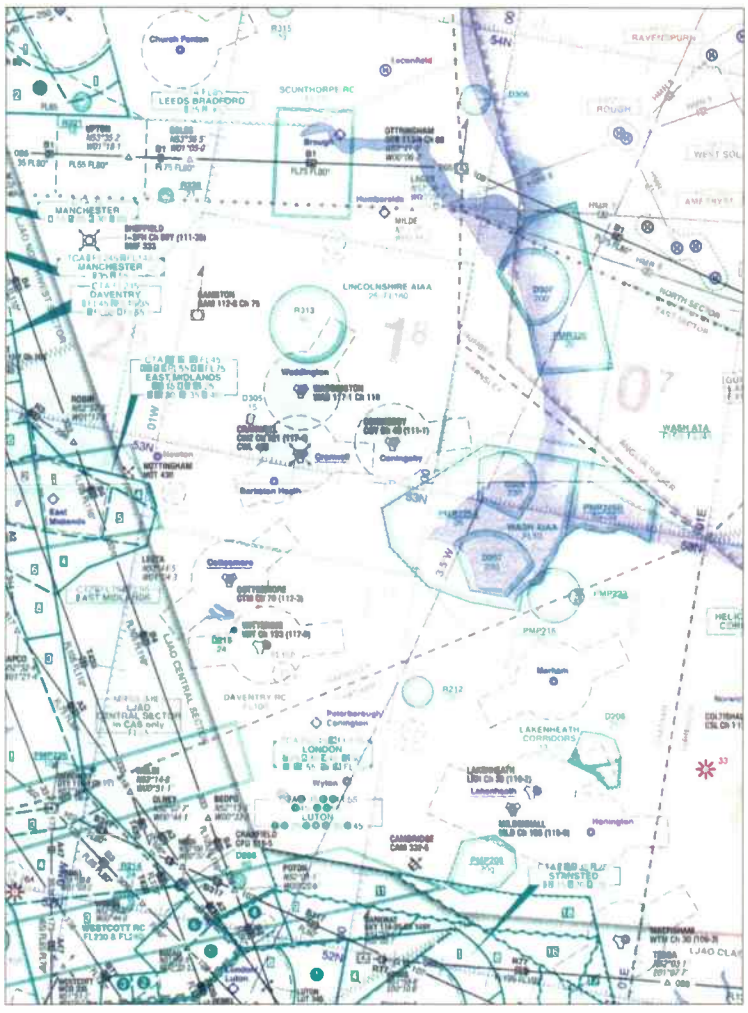
With the considerable development work underway at RAF Fairford, Gloucestershire, a decision was taken earlier this year to move RIAT 2000 to RAF Cottesmore near Oakham, Rutland. Cottesmore is of course a former Vulcan base and more recently home to a Tornado Training wing.

Today the base is home to a pair of Harrier Squadrons, formerly based in Germany. Both squadrons are expected to have temporarily vacated the base and detach to RAF Wittering just down the A1, in order to provide additional capacity for this year's show which is expected to have drawn upwards of 400 aircraft.

Whilst Cottesmore is undoubtedly one of the larger RAF bases, it could never compete with Fairford in terms of land area, so there will be an inevitable reduction in terms of the size of some participants. However, the organising committee are to be congratulated in bringing together a show that promises to have been at least comparable in term's of quality. It still has to be recognised that RIAT is one, if not the largest show of its kind in the world.

For the radio or scanner listener the move to Cottesmore should have provided new opportunities to

Fig. 1: Section of UK(L)2 *En Route Low Altitude* chart.



RIAT is all about spectacular demonstrations - none better at last year's show than this demonstration of aerial firefighting by this USAF Air National Guard C130.

locate new and interesting frequencies perhaps not previously heard. Certainly the revised location will mean that both arrival and departure patterns for aircraft attending this year's RIAT will have been somewhat different to normal.

Events On Ground

Last year I concentrated on describing the more southerly used UK arrival routes for the show, and had intended this year to concentrate primarily on events on the ground, clearly however the selection of Cottesmore adds yet another dimension for the listener and it would be remiss not to mention these changes briefly.

Arrival patterns for this year's show will of course have been considerably different to 1999, with most aircraft from the various Air Forces in Europe expected to have arrived via MC6, (On the UK/Netherlands FIR) then following a reasonably direct routing towards RAF Marham from the South with descent into a standard arrival pattern. An aircraft on this routing at a medium to high level altitude would normally work London Military, aircraft at lower levels however may well follow a similar routing this time working the local area radar for Coltishall, Marham Wittering or Cranwell, see **Fig. 1**, as they transit through each control zone which offers a radar service.

Each airfield will normally have one specific radar dedicated to in-transit traffic and whilst these tend to remain fixed, there are occasions when frequencies that are normally used for approach are also used to cover the local area, for this reason these frequencies have also been included in a potential working scenario, see **Fig. 2**.

High/Medium Level Arrivals from the North East may well have worked Scottish with a hand-off once again to London Mil, those at a lower level this time coming under the control of Leeming and Waddington. Arrivals from the United States are also likely to have taken a more Northerly routing beginning initial descent over the Irish sea and possibly passing through the Manchester TMA (Terminal Control Area) if traffic into and out of the TMA permits.

If this was not possible, they may well have been routed North of the TMA under the control of London Mil possibly routing toward Pole Hill before again being vectored towards the airfield. Other US arrivals may be routed from the south through either the Lichfield corridor or Daventry Corridor.

Aircraft routing into the show via Dublin or the Isle of Man to Wallasey or departing on the same routing, where appropriate, will have been allowed to transmit directly across Manchester Airspace via the 'MCT' (the Manchester TACAN beacon), this is on most Aerad Charts.

Fig. 2: Local u.h.f./v.h.f. frequencies.

London Mil East Sector:
135.275, 135.925, 232.025, 248.775, 254.825, 275.675, 276.775, 277.775, 279.3, 280.575, 284.3, 290.6, 290.7, 291.775, 292.6, 293.475, 299.975, 313.00

London Mil West Sector:
127.45, 128.7, 133.3, 133.9, 135.15, 233.8, 244.375, 245.175, 245.25, 247.275, 249.265, 251.225, 254.225, 254 275, 257.275, 261.025, 262.975, 264.825, 268.975, 270.00, 275.35, 275.475, 277.15, 278.025, 278.075, 279.175, 279.225, 279.475, 281.225, 283.525, 285.175, 290.575, 291.075, 292.525, 299.8, 340.25

Manchester Civil - medium to low level: 118.775 (below 27,500 ft)

Scottish Mil: 249.475

Cottesmore Local Area Frequencies:

Approach	v.h.f. - 130.500, u.h.f. - 312.075
GCA / Local Radar	123.3, 262.9, 312.075, 337.875, 358.725
Tower	v.h.f. - 121.175, u.h.f. - 370.050
Display Freq.	v.h.f. - 121.175, u.h.f. - 370.050
Ground	v.h.f. - 119.150, u.h.f. - 336.375
Operations	133.625
ATIS	242.325
Departures	376.575

Possible Low Level App/Dep/Area Radars:

Cranwell	250.05, 282.0, 285.15, 340.475, 356.925
Wittering	337.95, 376.575, 388.525, 396.85
Waddington	125.35, 127.35, 296.75, 300.575, 309.675
Conningby	262.95, 300.925, 337.975
Leeming	292.7
Marham	363.75

Credit Lowdown - Tactical Publications

RIAT also allows those with an artistic bent free reign as evidenced by this Netherlands Air Force F16.

The largest aircraft at RIAT 2000 is expected to have been another reappearance by the massive Antonov 124 transport.

Continued on page 34...

AOR® AR8200 SERIES-2

NEW

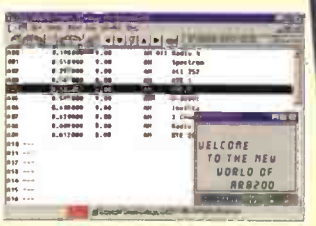
NEVER BEFORE HAS ONE HAND PORTABLE OFFERED SO MUCH

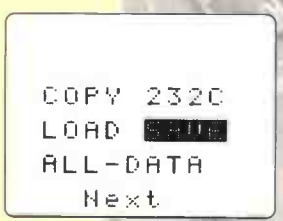
The AR8200 represented a beacon when first released, technology marches forward with the NEW *AR8200 SERIES-2* keeping the innovative concept and forward thinking alive and bright. It has not been easy improving on what many thought to be the ultimate, however the NEW *AR8200 SERIES-2* does provide even more with nothing taken away. A Temperature Compensated Crystal Oscillator (**TCXO**) now forms the heart of the NEW *AR8200 SERIES-2*, this ensures **high stability** with **minimal internal spurii**... the TCXO replaces a crystal reference as commonly employed in other receivers and is usually only seen in top of the range (more expensive) table-top models such as the AR5000 and AR7030. Performance too has seen the AOR R&D team fine tuning the design for **best sensitivity and strong signal handling** over the extremely wide coverage of 530kHz to 2040MHz (all mode receive without gaps).

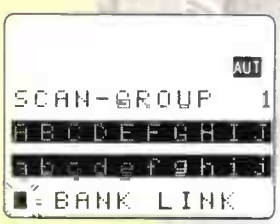
The aerial has also been replaced by a **telescopic whip** on a swivel base, this ensures the best results, a medium wave bar aerial is also provided as standard. The design team have certainly been taking account of customers wishes, the keyboard ZERO key has been swapped in position with the DECIMAL to match the telephone layout, LCD illumination has been increased (for improved visibility) and following requests for longer operation between charges, the **4 x AA size NiCads have been increased in capacity**, again reflecting improvements in modern technology. The obvious change has been left for last... the **cabinet colour** has been changed from green to **black**!

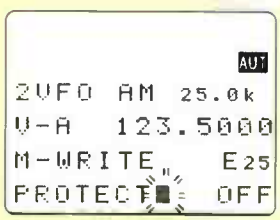
The list of features is vast, large multi-section backlit LCD, side mounted navigation keys and rotary tuning control, alpha-numeric text comments for memory channels, banks and search. The all mode receive features Wide, Standard and Narrow AM with Wide FM, Narrow FM and Super Narrow FM bandwidths provided, tuning step sizes are programmable in all modes down to 50Hz with comprehensive step adjust and correctly implemented 8.33kHz for the new VHF airband spacing.

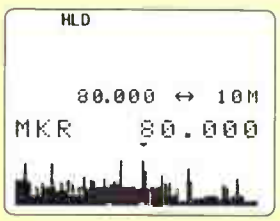
Connection to a computer is possible with the optional CC8200 lead/interface with free PC software available from the AOR web site. Unique optional slot cards further enhance features offering CTSS, Tone Eliminator, Record / Playback, Voice Inverter, External Memories (backup for 4000). Other options include the RT8200 for 'reaction tune' with the Opto Scout and other compatible devices, clone lead, soft case, option lead, record interface. Even the operating manual reflects the careful design being 140 pages of ENGLISH language with plenty of illustrations.

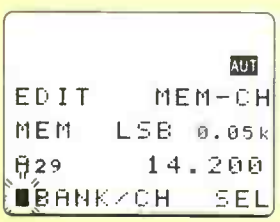


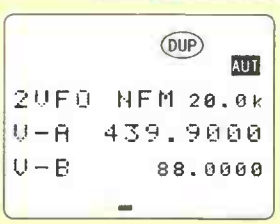


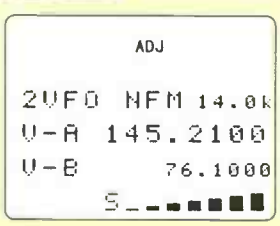












★★★★☆ AR5000+3 awarded four starts by both the authoritative Passport To World Band Radio and World Radio & TV Handbook

AR5000
True base receivers are few and far between, some have simply evolved from the hand held equivalents with little tangible improvement in performance or facilities over their smaller counterparts - *the AR5000 is not like this!*
High performance, top quality build and true wide coverage all mode receive. The "+3" version offers even more with synchronous AM, AFC and Noise Blanker. Popular with government agencies throughout the world.

AR5000c
When making critical measurements, the frequency coherence is very important whether a single or multiple unit is employed. This involves the use of a single reference for all oscillators employed throughout the receiver. The AR5000C now provides this commercially required capability. The "C" version may be provided to order in either the standard AR5000 format or with two of the +3 additions of AFC and NB. If you are a commercial operator with this application in mind, please request the separate specification leaflet for the AR5000C.

AR5000+3 - Sync AM, AFC, NB

The "+3" version offers even more with synchronous AM (upper side band, lower side band and double side band with excellent lock range), AFC (Automatic Frequency Control for accurately tracking moving transmissions or unusual band plans) and Noise Blanker.

Passport to World Band Radio'99.
"Front-end selectivity, image rejection, IF rejection, weak-signal sensitivity, AGC threshold and frequency stability all superior".
"Unlike virtually every other receiver we have tested over the past 21 years, the frequency readout is unfailingly accurate to the nearest Hertz. This should make the AR5000+3 of exceptional interest to broadcast engineers".

World Radio TV Handbook'99.
Speaking of the AR5000+3 in conclusion... "Compared with the ICOM ICR-8500 it offers considerably more features, better strong-signal handling, wider coverage and decidedly superior filters".

AR5000+3

- ✓ Wide frequency coverage 10 kHz - 2600 MHz
- ✓ All mode reception: USB, LSB, CW, AM, Synchronous AM, NFM, WFM with automode tuning (any mode and bandwidth on any frequency is possible)
- ✓ Automatic Frequency Control
- ✓ Noise blanker
- ✓ High stability TCXO reference, 1 Hz NCO tuning
- ✓ 1,000 memories, 10 memory banks, 20 search banks, 5 VFOs (all twice!), alpha tag, EEPROM chip storage
- ✓ Multiple IF bandwidth 3 kHz, 6 kHz, 15 kHz, 30 kHz, 110 kHz, 220 kHz with an option position for 500 Hz CW. (30 kHz is ideal for WEFAX).
- ✓ High sensitivity and excellent strong signal handling assisted by a preselected front end from 500 kHz - 1 GHz
- ✓ Extensive RS232 control list
- ✓ SDU ready with IF output for spectrum display unit

FOR FURTHER DETAILS, PLEASE VISIT YOUR DEALER, CALL FOR A LEAFLET OR VISIT THE AOR UK WEB SITE AT
www.aoruk.com

AR7030 / AR7030 PLUS

The AR7030 is a high performance short wave receiver designed for world-wide reception from around the world! In the July'00 edition of SWM we commented on a number or positive reviews posted to the internet from recognised DX'ers, to firm up on this claim, presented here are extracts from the AR7030 mailing list posted on 30 March'00 by **Bryan Clark, Auckland, New Zealand**. For information regarding the AR7030 internet re-mailer, visit our UK web site link list at <http://www.aoruk.com/link s.htm>

Bryan writes, ... Encouraged by reports from AR-7030 Mailing List subscribers that the 7030+ performance would not be impaired by operating with a 12 volt power supply, **I joined well-known New Zealand DXer Paul Ormandy** on a DXpedition to Waianakarua, on the east coast of our South Island, 100 kilometres north of the city of Dunedin. Our main listening target at this site is usually medium wave stations in the Americas. I had use of 2 Beverage antennas - 425 metres, end terminated, aimed at Bolivia, and 310 metres, end terminated, aimed at Florida. At Paul's DX location, there is no mains power supply within a kilometre and all power sources are DC battery (or solar) powered. A 12 volt Deep Cycle Battery was used for my AOR, Paul's Drake SPR4 and also his MFJ1026 phasing unit. This battery met our power needs over 4 days and nights of concerted DX monitoring with no obvious deterioration.

... The DX monitored in southern New Zealand between 14 and 19 March exceeded my expectation. We were surprised at reception conditions on MW so close to the sunspot maxima. Paul was very impressed with his first sighting and use of the 7030+ receiver...

Here are some of the listening highlights from my first 7030 + DXpedition, firstly shortwave: ... Radio Apinte in Suriname finally heard after many years of trying - 3 nights in a row on 4990.9 between 0530 and 0730 UTC.

... First time reception of Costa Rica's Radio Universidad on 6105 nightly to closedown at 0559 UTC.

... Finally getting a loggable reception of Uruguay's Radio Monte Carlo on 6140 after 1000 UTC until buried by stronger signals of Radio Santa Cruz Bolivia on 6134.8

... Clear reception of low-powered Canadian CHNX on 6130kHz at 0825 UTC.

... Possibly the surprise SW catch - anti-Congo clandestine Radio Liberte audible on 15725 from 2044 tune-in right through to 2300 UTC sign-off (that's midday in New Zealand!).

Turning to medium wave: ... Latin America turned out in strength on the MW band, with Brazil, plus all the Spanish-speaking nations in South America being heard except for Ecuador and Bolivia. Mid evening, almost every frequency between 540 and 1590 kHz was occupied by Latin American broadcasters...

... All in all, I have returned from my first outing with the AOR 7030 + highly enthused at its DX performance. I now plan to build a special carry-case for it, with extra space for the battery cables, antenna switches etc, so that I am ready for more DXpeditions to quiet country locations.

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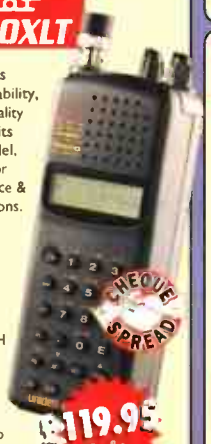

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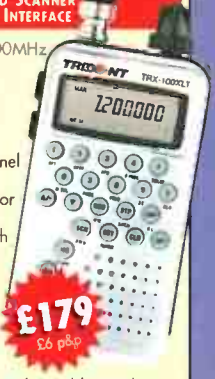

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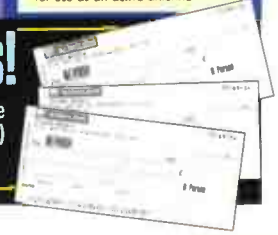


...continued from page 29

The contact frequency will have been 118.775 - this is up to flight level 27000ft where a hand off to 135.575 where London Control will have assumed responsibility.

Clearly the frequencies in Fig. 2 can only be a guide, as allocations can be moved depending on traffic density. In addition, some load may have been passed to London Civil (129.1 and 135.575), however, including these frequencies will simply mean that the scanner is unable to scan due to the volume of traffic, for this reason these frequencies have been deliberately avoided.

Always a crowd favourite, the USAF 'Stealth' F117 as used in the Gulf War and the recent Kosovo conflict.

During a recent article on monitoring the military Peter Bond, *Short Wave Magazine*'s resident Military Columnist indicated that a number of scanners dedicated to a particular band is ideal when monitoring exercise traffic, if possible the same methodology should be employed to listen in to traffic at RIAT, although two scanners is probably sufficient to catch most of the action.

RIAT always provides the opportunity to see rare and unusual aircraft. Here, surrounded by tight security, is the original 'Gary Powers spyplane' - the U2.

Organisational Set-up

Most scanners are limited to a maximum 30 to 50 channels per bank, therefore a typical set up may contain the following:-

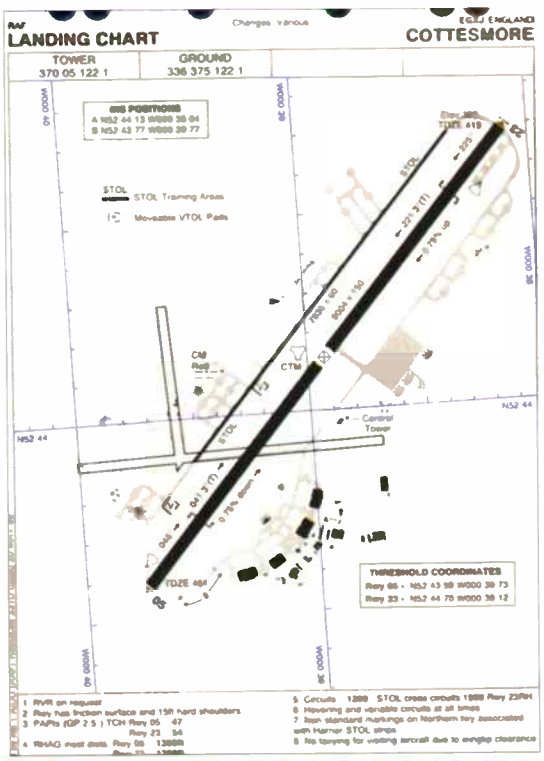
Bank 1 might contain all the London Mil Frequencies in use in the local area, including those listed in most books as secondary frequencies. It is useful to make a list of the frequencies entered, the channel number and the banks in use. The volume of traffic around the airfield, particularly on arrival and departure days, means that a much larger selection of frequencies is likely to be in operation than on a normal day, meaning that frequencies that are usually anonymous may well have been heard.

Within Bank 2 it is also worthwhile including the local area radar frequencies for those airfields capable of providing a low-level radar service, Marham, etc. It may however be useful to leave Bank One Channel One free at all times, so when traffic changes frequency the designated frequency can then be entered immediately into this channel, regardless of whether it has already been entered elsewhere.

If this does occur, some scanners will warn the user that the frequency has already been entered, however it is better to be safe than sorry. If it has already been entered you can of course simply choose to continue a scanning sweep until the desired frequency rolls round the scan.

This method of operation at least then allows time to confirm that the frequency has been entered somewhere!

Fig. 3: Cottesmore Landing Chart.



The Australian Air Force always welcome visitors, normally based on the amount of lager that is provided for the end of event party on the Sunday. A full load was bought in last year on this immaculate Boeing 707.

Alternatively some scanners provide a v.f.o. option where a direct entry can be made. Once the traffic has been heard Channel One or the v.f.o. can then be used again later to replicate the procedure. Any new frequencies noted can either be entered into a 'clean channel' as appropriate or discarded if already entered elsewhere.

Of course most of the interesting traffic can be heard on the various Air-to-Air frequencies, however clearly it would be a somewhat problematical keying in all the possible permutations, on the off chance that something may be heard. The only real solution is therefore the luxury of another 'fast' scanner searching the MilAir band from top to bottom in a continuous sweep.

As in previous years almost all the controllers for RIAT were provided by a team from the Manchester Air Traffic Control Centre, they had additional support last year from London Heathrow and Guernsey. Such a heavy voluntary contribution clearly cannot be sustained without considerable sacrifice by the teams back at base and to this end, in order to support RIAT, the remaining members of the Manchester Air Traffic centre make an invaluable contribution in order to support the 'away team'.

As well as aircraft from Europe, recent years have seen an increase in representation from the former soviet Bloc, with participation from the Ukraine, Bulgaria and Romania.

Movements On The Ground

After successfully negotiating the landing sequence, each aircraft is directed by tower to follow a 'Leader Vehicle', each vehicle has a numerical callsign numbered 'Leader 1-6' and again are manned by a number of qualified air traffic controllers. Based on a predetermined master plan that indicates where all aircraft are to be positioned,

each aircraft is assisted to a general parking location where an airfield marshaller will pick up the aircraft for final positioning, see **Fig. 3** - Cottesmore Landing Chart.

Arrivals can be strung out over 2/3 days allowing a reasonable amount of time to fine tune the parking arrangements. Departures are however a very different proposition.

Departing aircraft would of course all like to depart at 0900 on the Monday following the show, clearly this is not practicable. In order to gain first-hand experience of how these movements are handled, I spoke at length to a Senior Air Traffic Controller from Manchester Air Traffic responsible for supervising the 'away team' at RIAT, who explained in detail the problems associated with handling the large volumes of departing traffic in such a short space of time.

Each aircraft is dealt with via a master plan which is produced via a Flight Planning Section. This is a separate body to the team of air traffic controllers manning Approach, Ground and Tower, and has specific responsibility for the control of parking and departure flow control. When aircraft are parked on the arrivals days, due consideration is also given to the requirement to departing aircraft on the Monday.

Those aircraft with the earliest slot-times will typically

One of the stars from RIAT 99 was the AV8B of the US Marine Corp, more familiar to SWM readers as a heavily modified Bae Harrier Jump Jet.

be parked at either end of the taxiways allowing them easy access to the runway, due thought must also be given to the location of partner aircraft located on the opposite side of the runway which may have been involved in the flying display.

Departure plans are filed during the weekend and the ATC team in the tower have to coordinate with the ground handling teams in order to ensure that aircraft are readied for departure at the pre-assigned time, again a Leader vehicle will be called in by 'Ground' in order to provide a follow me service to the departing runway.

At RIAT the normal compliment of Leader Vehicles is six, the top boss on the ground however is the airfield movement general manager callsign 'Merlin'. The more observant listeners at previous RIAT's may be aware that the callsign leader No. 4 is not actually used, this is a tribute to Roy Ashby, an ATC Controller and former Leader vehicle volunteer from Bournemouth, who was sadly killed in a road accident whilst on holiday in the USA. The callsign has not been used since.

Based on the master plan, each aircraft requests start up at the predetermined departure time, inevitably with such a large volume of aircraft all departing in short order, and delays can and do happen. One of the most amusing situations at a previous RIAT was witnessing a request for clearance by a pair of French Air Force Mirage 2000 aircraft, after initial start up and taxi to the runway hold, it was to be some three hours before the aircraft eventually got away, despite repeated agitated requests for clearance, the aircraft were politely prevented from moving, eventually it transpired that the problem lay with 'surprise, surprise' French Air Traffic Control, definitely a case of poetic justice or *'Non En-Tente Cordiale!*

As each aircraft requests start up broadcasts can be heard on both v.h.f. and u.h.f. Ground requests that a leader vehicle is summoned to take each aircraft down to the holding point of the active runway. The Leader vehicles essentially have a free role and are dispersed around the airfield volunteering for 'requested tasks' by Ground when appropriate and dependant on location.

By 1000 on the Monday the pace can be frenetic with numerous aircraft either asking for start, or being led to down to the holding area. Fortunately in recent years the prevailing wind direction at Fairford has been consistent throughout the departure period, allowing most aircraft to depart on the same runway. Switching runways midway through the day can make life a little exciting to say the least, once the runway for departure is designated a switch would only take place if absolutely necessary, this means effectively a tailwind component exceeding ten knots.

On arrival at the holding point, each aircraft or flight is requested to contact the Tower in order to obtain an area clearance, this may involve a SID (Standard Instrument Departure) with an initial climb under the control of 'Cottesmore Radar' to join the upper airways route system, with London Control, Manchester or London Military. Alternatively the aircraft, once clear of the local area, may well be heard to go *enroute*. This is much preferred by Pilots and ATC alike who can simply get the aircraft away at a low level under there own visual flight rules, this would normally be used by RAF aircraft perhaps making a relatively short transit to another airfield or manoeuvring area.

It must be borne in mind that the majority of aircraft that fly to and from RIAT normally do so as a part of a normal training exercise, these days everything has to be fully utilised and a transit flight to and from the show will almost certainly encompass a training scenario of some description. In these cost conscious days everything has to be justified. By 1500 the pace has quietened, by which time many of the numerous participants will be well on their way home.

Our thanks to 1 AIDU RAF Northolt for Maps and Charts.

All aircraft are always immaculately turned out, none more so at last year's show than this logistics aircraft of the Danish Air Force.

Although the United States Air Force are always well represented at RIAT, their Canadian cousins are also always welcome.

And that as they say is almost it, clearly however an article such as this would not be complete without significant thanks to the following due credit should therefore go to, Mike Ridley, Pete Fothergill, John Wildeman and Tony Brown and special thank you to CRO Patti Heady at RIAT and the rest of the Manchester Air Traffic 'AwayTeam'. ***SWM***

The books listed have been selected as being of special interest to our readers. They are supplied direct to your door. Many titles are overseas in origin.

SWM Book Store

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KLINGENFUSS 1999/2000 GUIDE TO WORLD-WIDE WEATHER SERVICES 19th Edition Joerg Klingenfuss	436	£23.00
WEATHER REPORTS FROM RADIO SOURCES. Philip Mitchell	32	£7.50
RADIO DATA CODE MANUAL. 16th Edition. Joerg Klingenfuss	788	£30.00
RADIOTELEX MESSAGES (25 Years of Monitoring Global Teleprinter & Data Communications, 1st Edition	568	£20.00

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DXTV FOR BEGINNERS. Simon Hamer.	31	£3.95
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Intercept Point	+45dBm IP 3rd order (10MHz/12V)
DC power supply	11.5-13 volt DC at 70mA typ. (230V mains adaptor for 12V DC is supplied with the antenna)
Mast diameter	30-50mm can be fitted
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Technical performance

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Output impedance	50-75 ohm coaxial
Connector to Rx	PL type delivered as standard. Other standards can be fitted on request
Gain	10dB +/-0.2dBs
Intercept Point	+50dBm IP 3rd order (10MHz/12V)
DC power supply	11.5-13 volt DC at 80mA typ. (230V/12V DC stabilised mains adaptor is supplied with the antenna)
Mast diameter	30-50mm can be fitted
Dimensions	115cm total length. Antenna tube 50mm x 160mm **Ideal for base stations**

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Technical performance

Frequency range	50-2000MHz
Output impedance	50-75 ohms coaxial
Gain	19dB -1000MHz 18dB -1400MHz 16dB -2000MHz
Noise figure	1.5-2dB -1000MHz 1.8-2.5dB -1500MHz 2.5-4dB -2000MHz
3rd order IP	-35dB typical
Output impedance	50-75 ohms coaxial
Connector standards	N type connector at the antenna. BNC male connector to the receiver
Power supply	12V DC at 160mA DC. Power supply for 230V AC is delivered comes with the antenna
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The QSL Business

Paul Essery GW3KFE tells us how to get the best QSL returns from amateur stations.

The process of obtaining QSL cards divides naturally into five tutorial steps, here is my rough and ready guide to QSL success.

Logging The DX

For the licensed amateur, simple - work the guy, log the contact, write out the QSL card. What percentage come back 'not in log' or, worse, just don't come back? Moral: be sure you've got the other guy's callsign correct and be equally sure he's got yours correct. Modern sloppy operating, 'last two letters' and so on may be fashionable, but really they're as useful as an igloo in the Sahara.

Take great care to log the callsign correctly and note the frequency as accurately as possible - you never know when some twit won't try to pirate the DX callsign! These goons are usually pretty easy to spot, but if you log the phoney and his frequency plus some of the stations who 'fall for him', that will be useful knowledge to the DX station, provided you log and report to the real one.

For the listener, t'aint so easy. The DX station feels no compulsion to answer a basic listener report, so to get a card, the listener must somehow spark the DX station's interest enough for him to return a card. Nowadays, most DX stations have a 'QSL route', usually to a QSL Manager, such a manager takes on the chore of writing out the cards without the 'pleasure' of the action.

So, a listener report needs to be both interesting and useful. If it is to go direct to the DX station, the 'useful' is priority, if to a manager, 'interesting' is most important. To be useful, the listener needs to be ear-wigging for quite a while, preferably switching between two receivers. One can monitor the pile-up, the other one can look at the rest of the band.

Imagine the DX is complaining he isn't getting calls from Europe, but you can hear Europeans in the pile-up and, elsewhere on the band Europeans working into countries near the DX. He can construe your report in terms of his problem.

If you know he's a 'propagation nut' you might plot the S-meter reading of his signal over a period of hours,

...HAVING SECURED HIS INTEREST...

carefully recording only those moments when he's 'in the clear' - for the rest of the time the meter is only reading the QRM level. The more detail in your report the better.

A very useful bit of information might arise when you can hear both ends of the QSO and there are two stations who can't hear each other and think it's their QSO. You might thus help resolve a problem for the DX station!

In terms of 'interest', it ain't so easy. Personally I doubt if a letter alone is much use. If you've got 25000 contacts in the log, even if 50% are errors, that is still several thousands of QSLs to be written out, so reading a letter is a chore. If the QSL Manager is 'on the level', each report must be checked in the log. The log may be computerised, but there are still a lot of amateurs about who use paper logs.

A good photograph? It's worth a try. The shack, the antenna farm, the baby sitting at the receiver, perhaps the YL/XYL dressed to kill and sitting in the shack chair - anything to make the QSL Manager sit up and take notice! Having secured his interest, you must still include a useful report that he can send to the DX operator. Once you've got his interest, then he'll look at the extended report letter enclosed with the card.

The Report

I advise a personalised QSL card, perhaps with the 'interest' bit on the front, a brief report on the back, plus something like 'see enclosed for more a detailed report on your signals'. Then you can either use a letter or invent a form, but either way be quite sure it is readable, meaning clearly written.

Many times I've had listener reports which were totally unreadable - no excuse nowadays when typewriters and word-processors are ten-a-penny. However, do be sure your signature is genuine or say why!

Where To Send It

In a pile-up the DX station will give his QSL route every so often. Get it written down and to be quite sure, stick around until the next time he sends it, to check you got it right. My own rule is that if I've got it three times and they all agree to the very last letter, then I've probably got it! That's usually the moment when the XYL hollers that its feedtime. So, I write it next to the contact in the log.

If the DX station, say for example, 'QSL via GW3KFE' and you haven't a clue as to this mysterious character's address, then you have various ways out. Perhaps the first is a peep at the DX columns in the magazines. If that fails, the station may have a web page. And, of course, the German *Funk-Amateur* magazine publishes a list of QSL addresses annually, 96000 in the current issue, which comes either as a CD-ROM or in book form. Write to: **PO Box 73, D-10122 Berlin, Germany** - you can pay by credit card. You need Windows 3.x or later to use it.

Enclosures

Either a stamped addressed envelope stamped with the correct amount of stamps of the appropriate country or an addressed envelope with appropriate IRCs (International Reply Coupons) which can be bought from the Post Office. If you are at all active, you'll probably have received IRCs which you can put to use in your own turn. Note that some countries need more than one IRC.

A third alternative is a US dollar bill, sometimes called a 'green stamp'. Your bank can get these for you. It should be noted here that the US dollar bill seems to be valued and accepted in all countries, sometimes more so than the local money.

I have a friend who for some time now has, when chasing a card for a 'new one', sent a two dollar bill! His argument is simply that they are a bit rarer and so of more interest on the one hand, and on the other they give the recipient a bit of a profit notice to return your card.

The Envelope

Obviously, a good, stout one for a direct card or to the Bureau. The s.a.e. inside may be a bit thinner but should still be man enough to get the QSL back to you undamaged. Take care to address the envelope correctly and double check you've got it right. If an Air Mail sticker is required, put it on.

Above all, don't put a callsign anywhere on the outside of the envelope. In many countries, the postal systems are corrupt, working in such a place a sorter with any savvy will very soon realise that envelopes mentioning callsigns probably contain negotiable currency. Opening the envelope abstracting the IRC or money and destroying the rest becomes inevitable. You can't blame the DX or the Manager or indeed the Bureau if some crook pinches your card and contents. For the same reason, but more so, don't ever put coinage in the envelope.

Bureau

What about the QSL Bureau System? Of course it is a bit slower. This is why.

Firstly you send a batch to the Bureau, the Bureau sort and send it on to the Bureau at the other end. That Bureau passes the cards to the DX station or manager. Once there, usually the cards to be sent via the Bureau are dealt with after all the direct ones. And, of course, there are the odd 'rogue' QSL Managers who just won't respond to a Bureau card at all.

However, given that there are envelopes in the Bureau with suitable stamps at each end and given that the guy at the other hand shifts his cards promptly, then the Bureau system is good, and a darned sight cheaper.

Common sense says no Bureau can afford not to move their cards - they'd be smothered in a few days! What they do do though is make quite sure that when they send a pack onto another Bureau they get the most economical rate. In general, all the alleged failings of the Bureau system are down to the people at the ends - the goon who waits several months before he gets around to sending a batch of cards off or the other one who fails to keep envelopes in the Bureau. You cannot blame the Bureau for those clowns.

My own feeling, for what it is worth, is that the DXAC at Newington should refuse to accredit any operation that doesn't guarantee to respond to Bureau cards. I believe that the requirement to QSL direct with dollar bill or IRC hits firstly the new young entrant to the s.w.l. game and secondly the old timer subsisting on a pension which fails to keep track of inflation. Those youngsters are desperately needed with the number of amateurs falling world-wide.

Your envelopes for the Bureau should be of a size that will take a normal card without folding - and that says your own card should be of a normal size too! A QSL Bureau must shift the cards as quickly as possible or it drowns in the things! Again, for your benefit, they put the maximum number of cards in your envelope for your stamp. Your envelopes should be stamped with stamps from a stamp book, these are labelled '1st' or '2nd' and are still valid when the rate changes.

In conclusion, while the above hints won't guarantee you 100% success, you can certainly improve your return rate! ***SWM***

Low Noise Medium Wave & Tropical Band Antennas

In part one of this two part series, Joe Carr K4IPV suggests some very useful antennas for frequencies up to 7.5MHz, just the job if you are a low-band DXer.

The medium wave (m.w.) and tropical bands are popular with DXers, including the sub-specialist a.m. broadcast band fans. The character of these bands, which are found from 500kHz to about 7.5MHz (which I will collectively call the 'low-bands'), is very different under varying conditions. For example, at the low end, where the medium wave is found, during the day signals are local ground wave only. But at 7MHz, signals out to several hundred or even a thousand kilometres are heard. At night, the Sun goes down and the nature of the ionosphere changes. The absorptive D-layer disappears, and the F1/F2 layers begin to merge and move higher. As a result, even the m.w. 'skip' signals begin to roll in, and continue until local sunrise the next morning.

These 'low-bands' are home to a bewildering variety of signals, and that may account for their popularity. The info panel shows some of the types of signals found (although my list may be biased towards listeners on the east coast of the USA).

A Problem Lurks In These Bands!

You don't listen long in the low-bands before noticing that the noise level is considerably higher here than in the higher short wave bands. There are a number of sources (**Fig. 1.1**) of this noise. Some of these can be dealt with at the source, while others are beyond our ability to affect so must be dealt with at the receiver/antenna end.

We are all familiar with lightning bolts. The lightning oscillates back and forth between positive and negative ends very rapidly, and is effectively a fast rise time pulse. As a result, it will have significant harmonics well into the low-band, although the peak is below 500kHz. Short blasts of static characterise this noise.

The 50/60Hz alternating current (a.c.) power lines are a significant source of noise in the low-bands. This may seem counterintuitive because those bands are so low in frequency compared with the bands we are discussing. The problem is that the harmonics of 50/60Hz extend well into the low-band region of the spectrum. Although they may be down many dozens of decibels from the fundamental, the high voltage and high power levels of the fundamental still leave those 'way down' harmonics significant to radio receivers at short distances. This situation is seen in the spectrum chart of **Fig. 1.2**.

Several mechanisms are found in 50/60Hz a.c. interference. First, of course, is radiation from the high voltage distribution lines, and the local lower voltage residential feeders. The transformers also radiate signals. If any of the connections in the electrical circuit are loose or corroded, then the possibility of higher order harmonics increases significantly.

Once you get inside the house the electromagnetic interference (EMI) situation deteriorates rapidly from room to room. Computers send out very large signals, especially if one is so unwise as to buy unshielded interconnection cables. Light dimmers, microwave ovens, motors on appliances and heating equipment, appliances, and electrical blankets all have the potential for creating EMI.

Television sets and v.c.r.s are particularly troublesome in populated areas. In my neighbourhood, which is a suburb of Washington, DC, the housing density is moderately high. I can tell by listening to my Drake R8A receiver when a popular television show is being aired. How? Try listening to the low-bands! In the United States and Canada television receivers follow the NTSC colour TV standard (which some claim means 'Never Twice Same Colour'). This means that the horizontal deflection system operates at 15.734kHz. It is a high powered pulse with a moderately fast rise time. The harmonics of 15.734kHz are found up and down the radial dial all the way up to about the 13m band!

To make the situation worse, the NTSC colour sub-carrier operates at 3.58MHz, and often has enough power level to radiate through poorly shielded television and v.c.r.s. The situation in countries where the PAL and SECAM systems are used may be different, but they are certainly similar.

As The Antenna Sees It

A representation of how the radio signal looks to the antenna can be seen in **Fig. 1.3**. It looks like an advancing wave front. Although the actual shape is curved, at the very local level of the radio antenna it can be viewed as a plane surface as in **Fig. 1.3**.

The radio signal is an electromagnetic wave, so has both electrical and magnetic fields, which are represented by vectors in **Fig. 1.3**. The dotted line vectors represent the magnetic field, while the solid

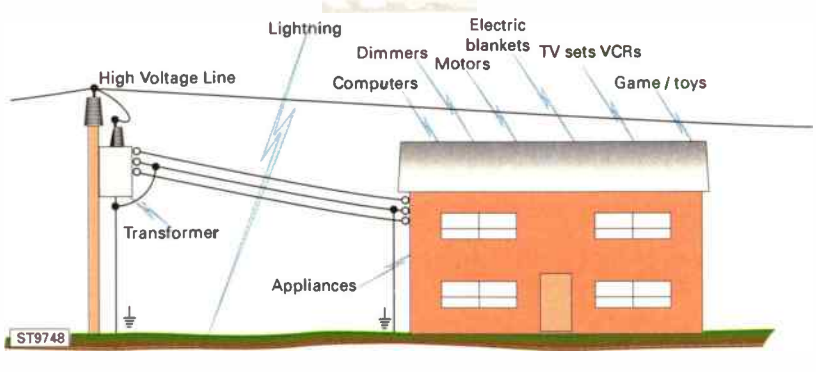

Fig. 1.1: Noise sources abound, and some of them peak in the low-band region of the spectrum.

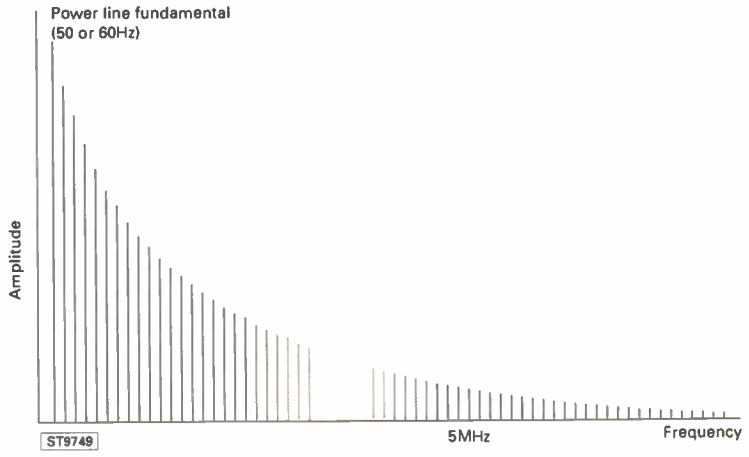

Fig. 1.2: AC power lines operate at either 50 or 60Hz, but can have harmonics that are significant to radio reception well into the short wave spectrum.

lines represent the electrical fields.

The polarisation of the signal is represented by the direction of the electrical field vector. In **Fig. 1.3a** we see vertical polarisation, while in **Fig. 1.3b** horizontal polarisation is seen.

The direction of the antenna wire at the transmitter determines the polarisation. A vertical antenna produces vertical polarisation, while a horizontal wire (like a dipole) produces horizontal polarisation.

Antennas have a reciprocal nature, so one can expect the horizontal antenna to respond better to the horizontally polarised signal, while the vertical antenna responds better to the vertically polarised signal. Using an antenna in a cross polarised situation can result in a loss of 20 to 40dB, depending on local conditions and ground reflections.

Traditional Low-Band Antennas

Although there are several different forms of antenna used in low-band, the most popular are the dipole and the random length Marconi. The latter are perhaps more popular because of the length required of a dipole. At 3MHz, for example, the half wavelength dipole is about 50m long. As a result, many urban and suburban listeners will opt for a short random length Marconi such as **Fig. 1.4**. One end will be connected to a support structure such as a tree, mast or another building. The receiver end will be brought through a wall or window to the radio receiver antenna terminal.

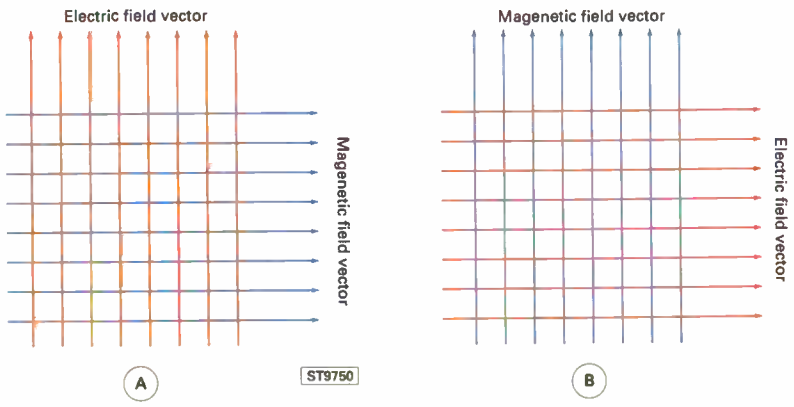

Fig. 1.3: Radio signal as seen by the antenna. a) vertical polarisation; b) horizontal polarisation.

Note that the example antenna of **Fig. 1.4** is sloped, so will exhibit both horizontally and vertically polarised responses.

The low-band antennas used by most listeners are close to the Earth's surface (i.e. less than quarter wavelength), so present some interesting problems. The reception is primarily by ground wave during the day. The ground wave is attenuated by contact with the Earth's surface, especially over terrain of low electrical conductivity (G). The degree of attenuation is inversely proportional to frequency, and directly proportional to ground conductivity. As a result, medium wave broadcasters value frequencies in the low end of the band over frequencies in the high end.

The attenuation of the signal is greatest for horizontal polarisation because the electrical field vector is parallel to the conductive ground. This is the reason why m.w. and other low-band broadcasters prefer vertically polarised antennas. The attenuation of vertically polarised signals is considerably less.

Antennas respond differently close to the ground than at altitude. Beezley (1995) performed simulations of a short single wire antenna (presumably similar to a listener's short random length Marconi). The wire showed a horizontal antenna response to noise signals that was -34dB below the vertical orientation at 3.5MHz, and -42dB at 2MHz. Clearly, one would expect the horizontal antenna to be less sensitive to noise than a vertical antenna.

Radio reception is a matter of signal-to-noise ratio, rather than absolute values of signal level. The strongest signal is still inaudible if the local noise is considerably stronger. On the other hand, a weak signal can be raised to a comfortable listening level by reducing the noise. Even though the signal power is weak, the signal-to-noise ratio is favourable, so the signal is viable. A Beezley designed horizontal antenna that we will consider shortly showed a -20.5dB response to sky wave signals compared with a reference vertical, but the noise response was -45.1dB. The net (which is what counts in the practical sense) was a 24.6dB improvement in signal-to-noise ratio for the new design.

The dipole is normally thought to have a 'figure of eight' pattern with maxima perpendicular to the wire, and minima (nulls) off the ends. One would, therefore, expect to find noise arriving off the ends of the receiving antenna to be reduced substantially. However, Beezley (1996) demonstrated that a dipole close to the ground may respond to vertically polarised ground wave signals better off the ends than perpendicular! Part of this effect is due to the radial component of the vertical antenna found due to 'bending' of the electrical field vectors over lossy ground.

Low-Noise For Low-Band

The traditional approach to receiving low-band signals in a high noise environment is to use a small loop antenna. Because such antennas have been covered in depth in this magazine in the recent past, I will not dwell on their designs. They work for low noise performance because they respond better to the magnetic field of the radio signal, rather than the electrical field.

Because most EMI sources tend to have larger

electrical fields, the relative response is more favourable even though the antenna exhibits a loss compared with a dipole. If the small loop antenna is shielded, with a small gap to prevent the shield from acting like a one-turn loop, then the magnetic response is retained while the electrical response is diminished even further.

Another approach to the low-noise problem was the Beverage antenna. It was used by the US Navy for monitoring Japanese home islands m.w. broadcasts at receiving stations in Hawaii and California. The Beverage has a high response to vertically polarised signals because it must be constructed over relatively lossy (i.e. low conductivity) soil. Such conditions cause bending of vertically polarised electrical fields in radio signals, producing a radial component close to the surface. The Beverage is sensitive to this component. The Beverage is said to work best when the far end is in salt water or brackish swamp water, and the receiver end is in rocky, sandy soil. So unless you are at the beach, the antenna may not work well.

The Beverage also suffers another little problem that makes it less desirable in practical situations. The antenna must be two wavelengths long, or longer. At 2MHz the Beverage antenna would be 300m long! Few of us can afford the luxury of such an antenna...and even if you had the land could you afford the wire and telephone poles needed to support the wire?

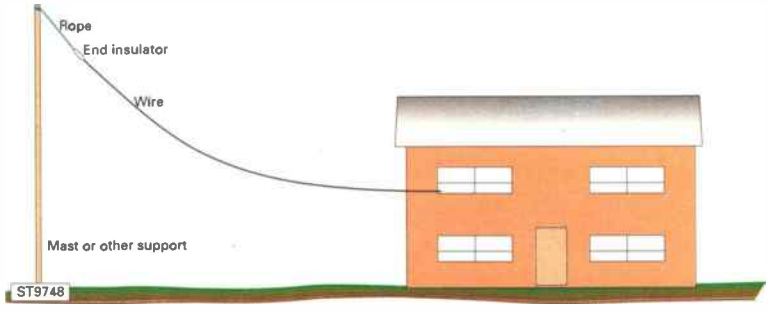

Fig. 1.4: Short, random length Marconi antenna of the sort often used in low-band by DXers on a budget.

Next month, Joe Carr discusses more low-band antenna types.

540kHz – 7.5MHz DX

540kHz-1.7MHz. Medium Wave broadcasting (formerly ended at 1600MHz). A large number of stations will be heard, especially after dark. North American stations are spaced every 10kHz (e.g. 780 and 790kHz). Other nations use frequencies between the North American frequencies (e.g. 785 and 795kHz).

1.800-2.000MHz. Amateur radio (160m band). c.w. and s.s.b. Active from evening to sunrise, especially during late autumn and winter months.

2.000-2.850MHz. Maritime s.s.b., c.w. and RTTY. International voice emergency and distress channel is 2.182MHz. Also check out 2.082, 2.638 and 2.782MHz. Coast Guard marine weather broadcast at 2.670MHz. At times you may hear South American, African and Pacific rim domestic a.m. broadcast services, especially between 2.300 and 2.500MHz (2.500MHz is used by WWV/WWVH).

2.850-3.150MHz. Some c.w. and u.s.b. s.s.b. voice communications and weather broadcasts. Primarily airlines.

3.150-3.400MHz. Fixed station and mobile stations. Some US Federal Emergency Management Agency stations. Time and frequency station CHU (Canada) on 3.330MHz. Portion of the band used for tropical broadcasting.

3.400-3.500MHz. Similar in use to 2.850-3.105MHz.

3.500-4.000MHz. 80/75m amateur radio band. Modes c.w. and RTTY are found from 3.500 to 3.750MHz. From 3.750 to 4.000MHz, l.s.b. s.s.b. is used. Occasionally you will hear European and African broadcasters, and a South American standard time and frequency station on this band.

4.000-4.065MHz. Fixed station and Military Affiliate Radio System (MARS) stations.

4.065-4.438MHz. Maritime c.w., RTTY and u.s.b. s.s.b. signals. Check 4.125MHz (international calling channel).

4.440-4.650MHz. Fixed and mobile allocations. Check out 4.449MHz for USAF u.s.b. voice activity.

4.750-4.995MHz. 60m tropical broadcast band. African stations will begin to appear right after local sunset, and continue until late evening. Also look for South and Central American stations, and Pacific rim (e.g. Indonesia) stations.

5.730-5.950MHz. Numerous stations using c.w., RTTY and s.s.b. U.S. Weather Bureau operates a network on 5.923 using u.s.b. s.s.b. voice. Also found are Department of Energy, NASA and USAF. The NASA frequency (5.810MHz) is used in support of space shuttle launches.

5.950-6.200MHz. 49m international broadcast band. Signals from Europe, South America, Asia, Eurasia, and Pacific areas (a.m.).

6.200-6.525MHz. Maritime communications. c.w., RTTY, and u.s.b. s.s.b. voice. Often used for inland waterway communications.

7.000-7.300MHz. Amateur radio operations. c.w. and RTTY is used from 7.000 to 7.150MHz, while l.s.b. s.s.b. voice and slow-scan TV is found in 7.150-7.300MHz range. At night international broadcasters share this band. This band is active at all hours. During the day communications from strictly local to about 1300-1600km occurs. After sunset, distances increase. All continents can be heard at various times of the day.

7.300-7.500MHz. CHU (Canada) time and frequency station on 7.335MHz in French and English. US Customs Service and Interpol (international police agency) use this band on occasion. Also, some international broadcasters are found.

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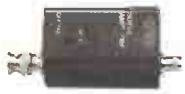

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Scanning

This PMR446 thing is really taking off isn't it? People who had been using 49MHz licence free equipment in the past have moved to PMR446 and found the range to be much better, the units smaller and better made and the transmission and reception quality very good indeed. Major manufacturers are making a good range of quality products and accessories.

For dedicated radio monitors the system is audible. With audio inversion allowed by the authorities on this band, casual listeners can be excluded. Radio monitors can hear what's going on. Everyone is happy...**but they are now thinking of introducing digital PMR446**. This will support more units, privacy, etc. With more radio systems becoming digital and other services such as the military inclined to follow that path we shall have to make the most of what we have to listen to right now.

Both of Tom's vehicles at a recent airshow.

Wasn't like that in the seventies was it? Sure, scanners didn't cost an arm and a leg, they cost all limbs plus most of your torso, but with some old ex-military receivers the listener could tune around and hear much of interest. As a result of mentioning David Hicks' collection of Pye equipment I have been in touch with **Tom** from Northern Ireland. He collects military vehicles from the period of the seventies and has two Land Rovers, one a lightweight FFR and the other is a Shorland.

This is not a vehicle magazine so you may wonder what this has to do with radio. Well, they are all kitted out with the correct radio gear. The FFR has C42 radio equipment fitted in the back plus a low band Pye Westminster for accessing the 'Ulsternet' radio system for the province. There are PF70s fitted which gave access to the u.h.f. 'Spiral' system which ensured coverage in the main towns from masts in city centres.

There is a Storno low band unit mounted behind the driver in the Shorland. The Storno equipment replaced the Westminster set. The vehicles are correct for the period and although the radio equipment is not relevant to current systems, the vehicles and radios are totally correct for the period and really are valuable historical artefacts.

Tom, who has a wealth of knowledge and experience, does have a scanner fitted in each vehicle to give some audio out when the vehicles are on display at airshows or similar functions. They are both Bearcat units, a UBC760XLT in the 12V Shorland and a '3000XLT in the 24V lightweight. He says that the audio from the '760XLT is strong enough to overcome the engine noise when the Shorland is running, so that must be some severe audio from that radio.

The amount of work that has been done to restore these vehicles and their equipment to this condition is incredible. He has even fitted the trusty 'Bardic' handlamp, useless for lighting anything but first class for throwing at vehicles that ignore cunningly signalled invitations to stop for the authorities.

Regarding the June 'Scanning' column and the signals received in South Wales in the 40MHz band, a covert contact suggests that the transmissions being heard seem likely to be from shipping in the region, but he cannot understand why the vessels would be in the same region for such a length of time. Anyhow he will listen and come up with any further information as and when he gets it.

SWM Mail

The amount of mail that I get via the *SWM* office or via the E-mail is quite remarkable. It just shows that there are many, many people that scan the airwaves for information and who keep darn quiet most of the time.

John in Ashington is such a person. Basically if anything is transmitted within range of where he is at any given time, then John is likely to hear it. He travels as part of his job and that gives him the opportunity to widen his area of operations. He has been listening for 18 years and has more receivers than you can shake a stick at. He reckons that at the last count there were fifteen of them.

24V C42 radio system in the rear of the FFR Lightweight with the low band Westminster for Ulsternet.

A wide range of antennas and a Hunter frequency counter complete the hardware and together with the requisite frequency guides John has come up with some very interesting stuff. Despite the plethora of equipment, he manages to remain discrete with the gear. Quite rightly he emphasises planning and database management as priorities. This is often overlooked by even serious monitors in this field.

John says that he plans each trip like a military exercise. Having identified the areas through which he will be travelling he will then identify what frequencies he requires and enters them on a journey by journey basis. This reminds me of a friend of mine who would establish where he would be driving on a particular day and then select memory banks on his scanners which were pre-loaded with the frequencies in those areas. These channels had been identified by either previous monitoring or by reference to the *UK Scanning Directory* and similar lists.

Again the lightweight. You can see the PF70s, one in the mobile adapter, for the 'Spiral' network. There is the Bearcat 3000XLT just behind the bulkhead. The speakers are from a tapedeck which is used to play non live radio traffic. Spot the trusty Bardic handlamps?

In the early days, those lists would include the UK print-out of the Radio Communications Monitoring Association (USA Based) and some very good material printed by a group calling themselves SSC. Whatever happened to them? Their information was top stuff at the time.

Much more up-to-date, however, is the information provided by **Paul Wey** and the people at **PROMA**. The folks there have an amazing database of up-to-date frequency information all of which has been verified by monitoring. No out-of-date stuff here. They have a website at **www.geocities.com/SiliconValley/station/6670** which gives you a mass of information and details of membership at £12 per year with cheques made payable to Paul Wey.

Should you not have Internet access then Paul and the group can be contacted at **2 Icknield Way, Baldock SU7 5AJ**. Come to think of it, I reckon my membership has expired. Don't forget that PROMA only survives because of the frequency listings supplied by it's members, so if you have heard anything **please** let them know. Paul collects a mound of information but always needs more.

I have been reading a review of the new Icom scanner with the TV screen fitted, the IC-R3. This could be some machine. The review that I read indicated that the receiver would actually display any received signal to the screen. This could open up all sorts of possibilities and I eagerly await a peek at one of these new units. If this is indeed the case we may be looking ('scuse the pun) at new lease of life for the scanning hobby. This will last until users decide that digital signals should be broadcast, but this is pretty much where we came in this month isn't it?

Storno low band gear fitted in the Shorland.

Thanks to all those who have written and E-mailed. A lot of the information you send cannot be printed and many of you need to remain anonymous, or partly so. My knowledge of the subject is increasing daily - thanks again.

■ MIKE RICHARDS G4WNC, PO BOX 1863, RINGWOOD, HANTS BH24 3XD
■ E-MAIL: decode@pwpublishing.ltd.uk ■ Web: http://www.btinternet.com/~mikespage

Decode

Lot's of news for this month so let's get straight on with some problem solving.

What Frequency?

I know I've covered this before, but the question still gets asked regularly by the new listeners venturing into the world of utility decoding. This month, **Claude Laporte** amongst others, has asked for some clarity on the centre frequencies quoted in frequency lists and how they relate to tuning your h.f. receiver.

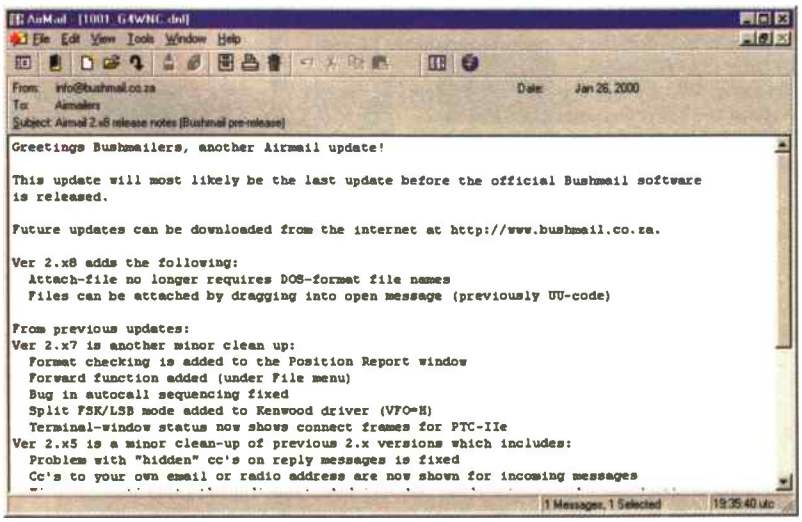
For those that don't want to get complicated, the answer is 1.7kHz. By that I mean if you want to receive a typical data signal, RTTY for example, you will have to tune your receiver 1.7kHz below the published frequency in order to be able to receive and decode it. This assumes you're using a conventional communications receiver set to upper sideband reception or u.s.b. and your decoder set up to expect 1300 and 1700Hz tones. If for some reason you're using l.s.b., then you will have to tune 1.7kHz higher than the published frequency.

For those listeners that like to know why, here's a quick run down. Let's start with the signal as it's put together at the transmitter. The data signal that's being sent comprises a voltage that varies between two fixed levels depending on whether the signal is logic 1 or 0. This is often called by many other terms, but the most popular in RTTY is Mark for 1 and Space for 0.

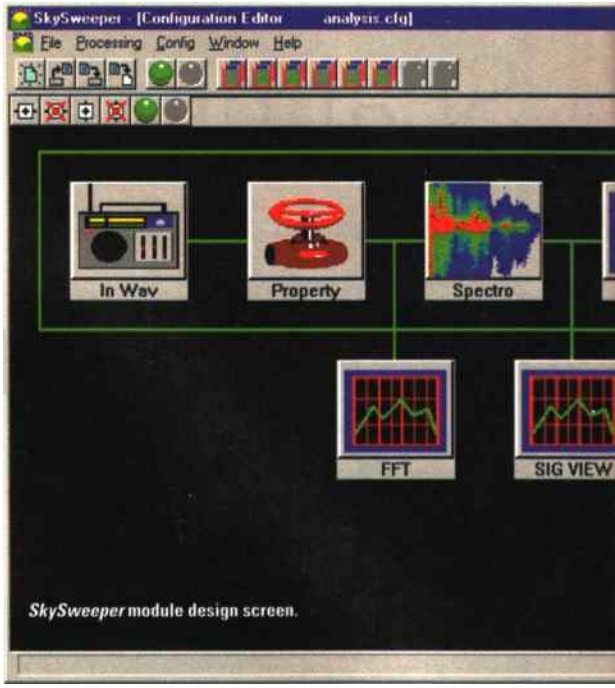
To send this information over the h.f. bands the data is used to switch a transmitter between two closely spaced frequencies. In a typical system these two frequencies would be spaced just 400Hz apart. The convention is that a space or 0 causes the transmitter to send the higher frequency whilst a mark switches to the lower frequency.

Bushmail web site.

From this you can see that we now have a transmission that's switching between the two frequencies in synchronisation with the data signal. This system of modulating a transmitter is known as Frequency Shift Keying or f.s.k.



Airmail system used bt BushMail.



SkySweeper module design screen.

At the receiving end, the ideal is to have a receiver set-up to receive f.s.k. signals. If you have such a beast you don't need to worry about tuning off-sets and you can tune to the published frequency. If, like most of us, you have to receive your data signals with your receiver set to u.s.b. or l.s.b. you need to make an adjustment to compensate - why?

Most decoder systems, both PC based and stand-alone units, have been designed to be fed with a data signal that's already been converted into audio tones. In most cases these tones are expected to be around 1300Hz for the lower frequency with the upper frequency being dependant on the shift of the signal.

In the example I've quoted with a 400Hz shift the two tones would need to be around 1300 and 1700Hz. It's this latter frequency that gives the clue as to why we need to off-set the receiver's tuning. When you set your receiver to u.s.b. or l.s.b. the receiver is expecting you to receive an a.m. signal with one side-band and the carrier removed.

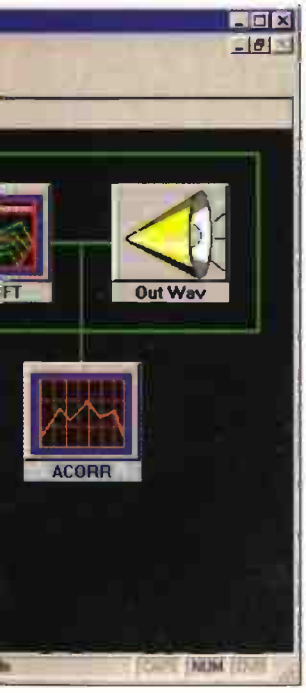
In these transmissions it is common practice to use the frequency of the removed carrier as the notional frequency of the transmission. This is the frequency that's shown on the display.

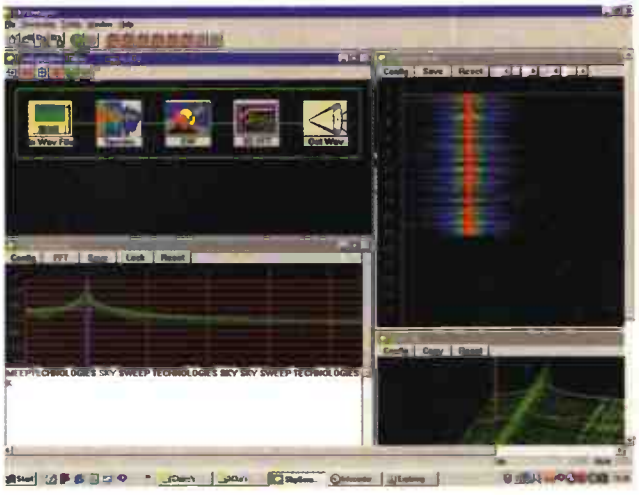
Now try a little experiment. In the evening or early morning set your receiver to l.s.b. and tune to exactly 10.0MHz - you should be hearing the 10MHz standard frequency signal. Note that as you tune-in to the frequency you will hear a beat note that reduces in frequency as you get closer to 10MHz. The important point is to slowly tune away from the signal whilst listening to the beat note.

If you watch the frequency displayed on your receiver, the last few digits will actually be showing the frequency of the beat tone, i.e. if you have a reading of 10.0013 the beat note will be 0.0013MHz or 1.3kHz. From this you can see that we would have to off-set the tuning by 1700Hz in order to get the 1700Hz tone we need for our RTTY decoder, hence the 1.7kHz tuning offset. In the end, it really is as simple as that!

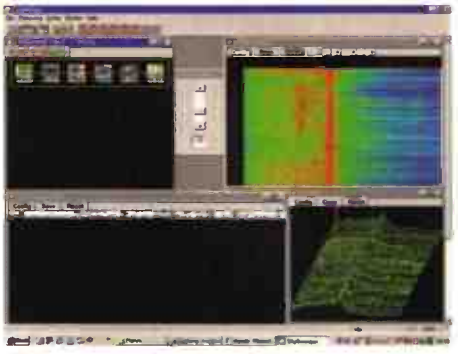
BushMail

I received an interesting E-mail this month from the team at Atlantic Internet publicising their African BushMail service. This is a brave venture to bring a





SkySweeper receiving Morse Code.



SkySweeper receiving a FAX signal.

cross-border E-mail service to the African continent. With all the troubles in various parts of Africa this is no mean feat.

The technology behind the service relies heavily on the use of PACTOR modems to handle the data traffic over h.f. links. With the huge geography, widely dispersed population and different governments it would be very difficult to set-up any form of high speed v.h.f. data backbone.

The solution has been to opt for h.f. communications with reliable PACTOR modems to process the data and provide very low error rate links. The use of h.f. means the data rates are somewhat slower than the 40+kbs those of us with landlines are used to. Typical rates would be around 100 to 200bps. However, this is still a significant step forward - if you work in a remote part of Africa, any form of E-mail must be a real blessing.

Due to the difficulties in setting-up such an operation, the existing system is operating on temporary licences and some non-standard frequencies. The best place to monitor if you want to sample some of the activity is the temporary calling channel on 7.7MHz. This is known as Channel 1 and is generally in use between 0600 and 0800 and again in the evening between 1700 and 1900.

Bushmail logo.

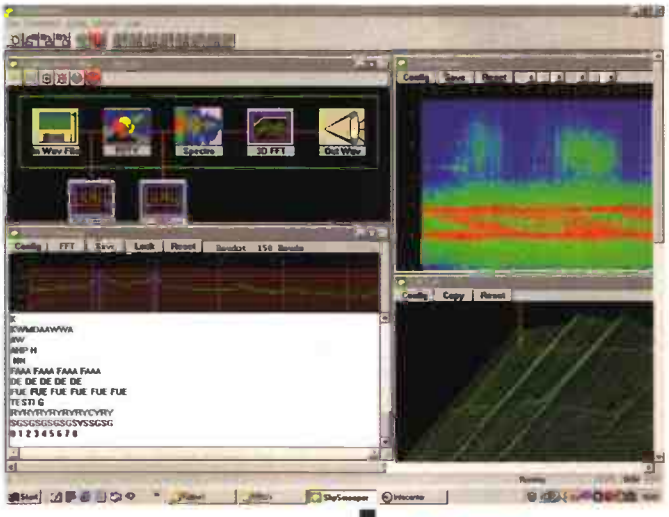
During the main daylight hours service switches to 12.125MHz (Channel 3). Another common frequency is Channel 2, 7.755MHz, which is the QSY frequency. Although these are the only published frequencies for the service, you are likely to find them operating this very useful service within the following bands: 7, 11, 14, 15 and 18MHz.

Assuming that Bushmail gets full approval, they will be getting formal ITU allocated frequencies soon. If you want to find out more about the operation you can visit their web site at **www.bushmail.co.za**

SkySweeper

The hot software for this month is a brand new package from the Finnish company Skysweep Technologies. They have really gone to town with the integration of a huge range of advanced receiver and decoder functions in a 'bog standard' PC with a soundcard! Not only is the new *Skysweeper 2.0* software very comprehensive, but it's remarkably easy to use.

To make the configuration as simple as possible they have a used a neat graphical representation of all the various functions - all you have to do is bolt them together in whatever configuration you like. It reminds me of the old music synthesisers where you just patched various units together to get the sound you wanted.



SkySweeper receiving a RTTY signal.

When setting-up *SkySweeper* you start with an input source which can be set to either take the audio from your soundcard or to process a standard recorded signal stored in a .WAV file. Once you have the signal captured, so to speak, you can really start to make things happen. In the very simplest set-up you might just want to connect the signal through to the appropriate utility decoder.

There's plenty of choice here with support for c.w., FAX, PSK, RTTY, SITOR B and SSTV. Each of the decoder modules can be set to operate over a very wide range of speeds and shifts. Probably the next enhancement you would want is some form of signal analysis to at least help with the tuning. This is catered for with modules for 3D-FFT, Spectrogram, FFT, Auto Correlation and Signal View. Not only do these make tuning a breeze, but you can easily identify problems with a signal so you can choose the appropriate filter to tidy it up.

Talking of filters, *SkySweeper* includes a huge array of standard d.s.p. filter sets including the following: FIR, Equaliser, Median, Noise Reduction and Notch Bank.

If you have any problems tuning the signal or if you're using a recorded signal, there's even Pitch and Shift modules that let you alter the frequency of the signal you're processing. As you can see, this is a really impressive range of features that you'd have a job to find anywhere else. You can see from the screen shots that the displays are very comprehensive and the design panel where you build all the modules is extremely easy to use.

If you want to take a closer look or download the demo version, take a look at their Web site: **www.skysweep.com**

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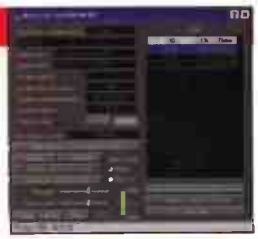

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WRTH 1999 Review

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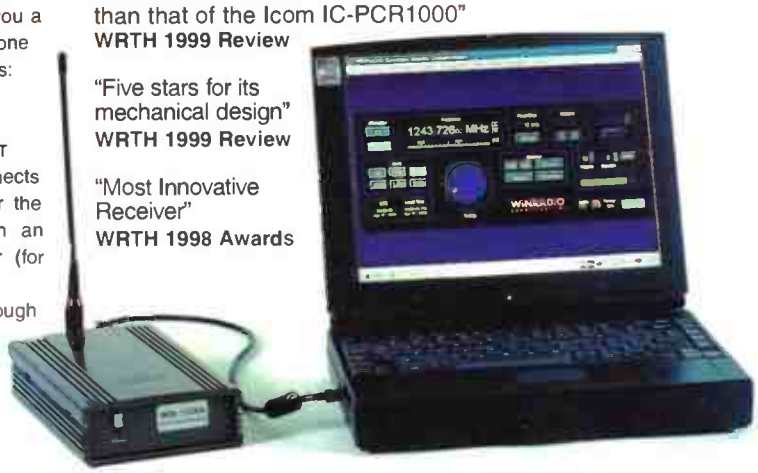

Model Name/Number	WR-1000i & WR-1000e	WR-1550i & WR-1550e	WR-3100i & WR-3100e
Construction of internals	WR-1000i/WR-1550i-3100iDSP- Internal full length ISA cards		
Construction of externals	WR-1000e/WR-1550e - 3100e - external RS232/PCMCIA (optional)		
Frequency range	0.5-1300 MHz	0.15-1500 MHz	0.15-1500 MHz
Modes	AM,SSB/CW,FM-N,FM-W	AM,LSB,USB,CW,FM-N,FM-W	AM,LSB,USB,CW,FM-N,FM-W
Tuning resolution	100 Hz (5 Hz BFO)	10 Hz (1Hz for SSB and CW)	10 Hz (1Hz for SSB and CW)
IF bandwidths	6 kHz (AM/SSB), 17 kHz (FM-N), 230 kHz (W)	2.5 kHz(SSB/CW), 6 kHz (AM) 17 kHz (FM-N), 230 kHz (W)	2.5 kHz(SSB/CW), 6 kHz (AM) 17 kHz (FM-N), 230 kHz (W)
Receiver type	PLL-based triple-conv. superhet		
Scanning speed	10 ch/sec (AM), 50 ch/sec (FM)		
Audio output on card	200mW	200mW	200mW
Max on one motherboard	8 cards	8 cards	6-8 cards (please ask)
Dynamic range	65 dB	70 dB	85dB
IF shift (passband tuning)	no	±2 kHz	±2 kHz
DSP in hardware	no - use optional DS software		YES (ISA card ONLY)
IRQ required	no	no	yes (for ISA card)
Spectrum Scope	yes	yes	yes
Visitune	yes	yes	yes
Published software API	yes	yes	yes (also DSP)
Internal ISA cards	£299 inc vat	£369 inc vat	£1169.13 inc
External units	£359 inc vat	£429 inc vat	£1169.13 inc (hardware DSP only internal)

PCMCIA Adapter (external):	£69.00 inc vat when bought with 'e' series unit (otherwise: £99 inc vat)
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■ PAUL ESSERY GW3KFE, PO BOX 4, NEWTOWN, POWYS SY16 1ZZ

Amateur Bands

We start with **Phil Townsend** in London E17. His question counterpoises versus earth? Phil looked up Norris, then G6XN's *HF Antennas For All Locations*, but remains puzzled. An antenna is equally good for transmit or receive, other things being equal. However, an antenna may be designed for an environment where rejection of received noise is more important than transmit usage - for example the Beverage, or the screened loop. Chapter 9 of G6XN's book makes this clear.

For an end-fed, the practical ploy is 'everything in sight' - wire fences, buried radials, counterpoises and so forth. I have a regular sked on 160 and 80 with a station about 11km away. Normally we exchange reports of well above S9+20 meter.

Where the lead from a.t.u. to radials exits the house there is a rose bush which XYL UR5CMM went out to trim. She didn't spot the wire and put the shears through it, but still connected to the safety earth. Signals dropped to meter S5 and repairing the break was painful 'cos the bush had grown round the wire!

Above-ground counterpoise wires are more effective the worse the underlying rock is. Why I haven't mentioned it? I have, several times! Off resonance an a.t.u. may bring up signals another couple of S-points.

RAE

Our anonymous correspondent is now, as I write, somewhat fearfully awaiting the results. Remember, there's always another time with RAE. I know at least two amateurs who had eight tries before passing! Also, there is a computer program around which sets out lots of questions and answers, exam-style. Do the equivalent of ticking the box and the computer instantly tells you if you've got it right. I suspect we will shortly see another YL licensee.

Big Wide World

Activity at last from Bhutan, thanks to years of effort by **Jim Smith VK9NS**. Bhutanese nationals will have A51 calls, the first being Yonten A51TY, while visitors get A52 calls. Against that, the Yemen expedition operated for ten days and were then told to QRT by the authorities - the promised 'licence upon arrival' just didn't happen. For the first two weeks of August keep an ear open for Tromelin, FR/T activity - callsign unknown at the time of writing.

FR/G is also slated for that time - maybe a finale as the weather station is being automated. In September we see activity booked from Malagasy 5R8 - again no callsign known yet. For most of the summer you may find KH5 Palmyra Atoll activity. The October 3B6 Agalega operation seems to be on track, though more operators are wanted.

What DXpeditioning really means: the VK9WI quartet first had to repair the boat to take them to Willis. Then VK4APG broke a leg getting off the ship and had to be airlifted back to Darwin. Later in the week another operator was hurt and it rained pretty well all the time!

Letters

Lets make a start with the Goodhalls, father and son from Oxford where they've been preparing to help the local club for NFD - logging, implying of course reading Morse and doubtless being 'elected' to fill the generator!

Their list is very long so we started by pruning out all the commoner Ws and Europeans on any band. On 3.5MHz we note RA9MW and LU1UV. On 7MHz - exception here! - several of the Windmill stations plus ZL, ZS6.

10MHz seems to be omitted, but at 14MHz we spot VU2XX, A52A, VE7DA, W0PQ, A45XM, 4Z1JS, RZ1OA/P, FG5HE, RH1F, ZD7JC, LU6UAF, PY4HI and a string working OJ0VR, XW2A, LU6ML, FW/G3TXF, ZL1DYC, VK2JE, VK7CW, CO8ZZ, JY9NX, ZL1LYK, TT2RDP, ZL1NI, VE6M and VK5AEP.

On 18MHz A52A, XX9TEP, and smaller fry, before a shift to 21MHz permitted them to log UA0FLD, JR6ZA, FW5ZL, FH/JR4PMX, A52QA, 5B4AGC, TT8JLB, CQ7Q (? was it CO7Q?), FW5ZL, ZL4MCV, JA7BY, 5B4AGX, RU0AAM, JQ6MXW, JI5SKS, A41LZA, BY4VE, A61AO, 8N2000, JI5SKS, JA2CYL, JL1UKH, FR5ZQ/6 and TF1FA. How nice to see a log with almost as many c.w. as s.s.b. loggings!

And our next is all c.w., coming as it does from **Ted Trowell** on the Isle of Sheppey. Ted seems to have given Top band and Eighty a miss of late years, so he starts on 7MHz with an 0400 logging of CP6IB. 0500 on 10MHz gave W7LGG and VE7SV, while at 1900 A52JS and JA6COW came in followed at 2100 by HF0POL, ET3USC and YM3D from Turkey.

On 14MHz JW/DL0MGM came in at 1500 and A45XR at 2100. More popular was 18MHz, with 0900 for FM/F6BUM, CO8LY, plus at 1100 OH0/OH7MM and at 1500 9M2AX, 6K0ZS, 3W7CW, FW/G3TXF, W7MD, JW/DL3NRV, 9H1AL; then 1700 3B8BD, and 1900 9M2TO, OD5NJ and 2000 saw JA7BXS, A52A, PJ2/PA2WJZ, ZP5KO. At 21MHz Ted started at 1000 with JW5LJA and 1500 3B9FR, BQ9NL, FW/G3SXW, OD5/FS5QM, 3W7CW, EP2AC, 9K2UB, E21EJC, TA1ITU and 1800 A52A, while at 2000 4S7YSG, JA1ZZR, LU1JIC, 4Z5FJ, HC5AI and an hour later BV7FF.

24MHz showed ET3VSC at 1100, with 5B4/YL2RR and A52A around 1500, 9M2AX at 1800 and ZP5KO at 1900. Finally 28MHz where Ted noted J28/F5LDY, LU1APG, FR5FD, OD5/OK1MU, 6D2X, 9M2AX, LU4GPL, PR8BNP, ZD8A, YB0FMT, JY9QJ, DJ2GM/HI9, VR2UB, 9K2UB, A71EZ, D2BB, LU6UO and CX1JJ - yet Ted reckoned conditions on some days were awful with nothing much heard above 14MHz, and Yanks scarce, even when the band was open! Incidentally we've added the times for the benefit of newcomers.

Times

Nowadays we refer not to GMT but UTC. We can observe that different parts of the world come in at different - but predictable - times. In the case of the VKs and ZLs, ownership of a beam also demonstrates that in the early morning they arrive by the long path over the Americas, later in the morning fade out and then return by the short path. In the evenings of course they are mostly wiped out by the Euro-choir.

Still talking times, it is also worthwhile to remember that if you listen at the same time of day every day, eventually you will have 'cleaned out' that time slot and a change of time will do your log the world of good! Remember that 1.8 and 3.5 are 'night-time' bands, 7 and 14MHz maybe night time, daytime or all-time, depending on the solar cycle, with the remaining bands up to 28 very definitely daytime.

John Collins in Birmingham listened for an afternoon to MW0SSB knocking 'em off on 7MHz; GI0GDF/P on EU-122, PA6TXL on EU038 (Texel), G4PMK on Mull, GB4MDI, GB2RWM, GX0MWT, GB0MN at a WW2 Open Day at Metheringham, Lincs, the wartime base of 106 Squadron of 5 Group, flying Lancaster 1 and III machines after first having the ill-fated Manchester - strange how the awful Manchester could evolve into perhaps the best bomber of the war. GB3RN was at HMS *Collingwood* GB2RN aboard HMS *Belfast* and M2000Y at a school in Bath, GU4GG was on Alderney with the inevitable pile-up and R1AP was on EU133.

Up in Barnsley lives **Colin Dean** who seems to have stuck to s.s.b. on 18MHz and above. On that band we note AL7O, AP2JZB, A52A, BW2000, FR5DX, HH2XJD, an assortment of JAs, JW2PA, PA3DJT/MM off SU, TT8LG, UN9PQ, YB0DX, 4K7DW, 4W6GH and 9V1JA.

21MHz accounted for A61AD, A61AP, A71MA, BV4VE, BV6GP, BW2000, BY4CYW, BY5QE, CE6ABC, DS2 - 3 - 5, DU1DX, DU8DJ, EP3PTT, ET3AA, ET3KV, ET3VSC, FH5/TU2AX, FR5ZQ, HL3-5-0, HS0/JH1IWI, JT1FCX, JW2PA, JW8LGA, N3WW/KH0. OH0CW, S21AR, UA0AV, UK8GK, UN7BD, VK6JDW, VK8NSB, VK9WI, VR2KM, VU3VLH, WP4AZT, EV6VV in Chechnya, 4L4KL, 4S7RF, 4S7VK, 4W6GH, 4W6MM, 5N9EAM/8, 5R8GN, 7A5QX (=YB), 7J2YAF, 8J3ITU, 9G1MR, 9K2DK, 9M2/JA4DPL, 9M6CT and 9V1DJ. Finally on 28MHz AP2JZB, A22RM, A71MA, EX7ML, NP2BT, OD5IU, PZ1EL, PZ5RA, TR8IG, UA0CAA, VU2XO, V51BG, XX9TKW, YB3-8-0, 3DA0WPX, 4J9RI, 5R8DA, 5X1Z, 9G1MR and 9K2/SQ5DAK.

Finito

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■ ROGER BUNNEY, 35 GRAYLING MEAD, FISHLAKE, ROMSEY, HANTS SO51 7RU

Satellite TV News

Mediacast, the year 2000 satellite show in London came and went, somewhat larger than last year, with many receiver manufacturers - most from the Far East - and a meeting with the Korean ATM manufacturer that produces 'badged boxes' (an OEM maker) for the world. In their range is the sought after 'Sat Cruiser' low threshold fast operating auto tuning receiver series that have been identified as within a German manufacturer. I'm hopeful that this 3rd generation box may be a low cost answer for the satellite enthusiast that needs an easy to use digital receiver. I will report back on progress in due course.

Had a call from **Mike Evans** (Suffolk), a former TVDXer from London who is now 'into' satellite DX using an Elipse analogue receiver and 1.5m dish. Mike's not yet into digits, but wishes that more analogue sightings could be included.

I'm a traditionalist and indeed wish for the days of analogue sparklie signals, even perhaps for 405-line era and valves, but we march ever onwards and the buzz action is gradually moving into digital, like it or not! I have some difficulty in understanding the theory behind MPEG compression, but like computers, I've mastered enough to use the technology for my benefit. As we move into digital so this column reflects that transition and these days more signals are digital than analogue!

But for those of us that still maintain analogue reception, we have a few sightings. Good to see some OB action out of the Balkans after the 1999 conflict, May 14th, and on *Kopernikus DFS-2* @ 28.5°E there appeared colour bars and the inlaid caption 'HRT Zagreb SNG CRO'.

At about 1100 there followed an open air church service/military dedication which came from Bleiburg. Video 11.550GHz-H, audio 6.60/7.20MHz. And three days later, alerted by Stefan Hagedorn's Internet newsletter, I checked out the 13°W slot and excitement, colour bars and inlaid 'Sirius West', 11.782GHz-H (though this was reported as RHC).

The outside broadcast digital bouquet on *Telecom 2C* @ 3°E.

The sat appears to be in an inclined orbit since over that evening the signal steadily increased with sparklies, next day and the signal was almost noise free. Still analogue and at the end of May, once more on *Kopernikus DFS-2*, a prelude to the 'Euro 2000' football season - 11.080GHz-H (audio 6.60/7.20MHz).

Several OB circuits were passed through the uplink late evening including ARD-1 and NDR Hamburg. One was captioned 'Expo 2000 Live' into a programme (?) called *tagesthemen*. German thoroughness ensured that when the crew went home to bed they provided a convenient FUBK test card 'SATKA NDR Hbg D68' ident.

Yet more analogue - 1840 on May 19 - on *Telecom 2B/D* @ 5°W a test pattern with 'CIP PARIS', 11.575GHz-H, audio 6.60/7.20, carrier cut with no other pictures - can anyone advise what is 'CIP'?

June 1st and a gunman holds a class of small kids hostage in the Luxembourg town of Wasserbillig. Sat zappers tend to sense where satellite signals may appear relating to unfolding news. I put my money on either *DFS-2* or *Eutelsat 2F3* @ 36°E. Instinct this time proved correct as 'SISLINK-27' were uplinking in clear digital (i.e. not 'encrypted') @ 11.678GHz-SR 5632+FEC 3/4.

A live report fed into the CNN London bureau and prior to signal cutting the camera crash zoomed to a window in the hostage building, the gunman could be seen dangling his pistol by the fingerguard to the police. Later that afternoon the gunman was tempted out on the pretext of addressing an RTL-TV news unit - whereupon he was shot by a police marksman!

Roy Carman (Dorking) saw the late afternoon action, though much of the content was edited out for general news broadcasts. European/Middle East broadcasters are much more open minded over news censorship when violence is involved. Witness certain of the earlier Balkans conflicts where the most graphic scenes were shown in European TV news transmissions whereas UK broadcasters suffer greater regulation as to content likely to offend or upset the viewer.

June 2nd produced quite remarkable and impressive pictures of the 'Little Ships' armada from the UK shores across the Channel to Dunkirk some 60 years after that momentous exodus of the allied forces as the Nazi war machine pushed onwards. There were many feeds out of the area, even Meridian featured a live insert into their local *Meridian Tonight* magazine programme with Fred Dineage in France, this carried via *Intelsat 801* @ 31.5°W @ 10.990GHz-V, 5632+3/4.

But *Eutelsat 2F3* carried 'UKI-511 SKY NEWS' @ 11.691GHz-H, 5632+3/4 and had organised an elaborate OB including a camera mounted on one of the 'Little Ships' as it entered Dunkirk Harbour at 1800. Picture quality was incredibly impressive, perhaps some of the best seen on a temporary digital circuit.

To complete the evening's 'entertainment' a 'phone call @ 1900 from Roy Carman alerted me to a satellite launch, that of *Eutelsat W4*, over on *W3* @ 7°E. In fact, *W4* had been successfully launched May 25th ex Cape Canaverel using the new Atlas III rocket system. Eutelsat (or someone else) was replaying the launch of *W4* on 7°E -11.571GHz-H, SR 20,000; FEC 2/3. It played over and over, in fact still playing out the next morning! It was worth the repeat, on-board rocket cameras showed the launch, the earth receeding and some dramatic shots of later stage firing against the space backdrop. Interesting that the same frequency was radiating the French TV5 channel.

Politics and Bill Clinton has been on a final world tour as his term of presidency terminates later in 2000. June 5th and Bill's in Moscow making a speech at 0800 our time. Once more I'm parked on 3°E and 11.678GHz-H is carrying the full speech by relaying the output of Moscow local channel 'YAC' - carried the service id 'MSCII Moscow'.

Meanwhile in the BBC bureau, Moscow, the speech is being monitored and then a live report into BBC News, the reporter and his backdrop of the Moscow streets on the usual BBC lease 11.600GHz-H 5632+3/4 and service ident 'RTV MOSCOW 4'. This first June weekend suffered amazing rain in the Northern UK, flooding everywhere.

The satellite uplink company 'SOLOSAT COMMS' paddled into action to take pictures and a live report of the flooded rivers for breakfast TV, 11.578GHz-H. This was a busy morning before I departed for the daily slave labour, another two SISLinks were in action, but operating in MPEG 4:2:2 they appeared as 'encrypted'.

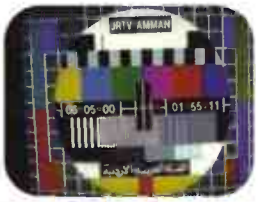
Perhaps the other big event was the Cannes Film Festival. Found on *Telecom 2C* @ 3°E with an OB bouquet, they all carried the service ident as 'FTR/F52/CANAL 1' (or CANAL 2, 3 or 4). 'Festival de Cannes' offered three French contribution channels, the first three running 625-lines SECAM whereas the 'CANAL 4' was dedicated into an NTSC output for the 'States (that is 525-lines NTSC) - 12.550GHz-V, 27500+3/4.

BT however had SNG customers from the Cannes festival and I found 'Fenetre sur Cannes 2000' appearing that same evening via *NSS-K* @ 21.5°W, again digital @ 11.550GHz-H, 5632+3/4, but with the service id 'BT TES 26'. *NSS-K* carried other feeds ex Cannes, including another 'BT TES 28 GOO152 CANNES' fed into Goonhilly, this at 0700 on the 19th - 11.559GHz-H. General content of all these feeds were bronzed media hunks and matching media girls, blue skies, sea and palm trees.

An E-mail arrived at the *SWM* office recently from reader

'Clapper board' programme ident from Cannes.

Arabic channels sometimes include sign language for deaf viewers.



The noise free digital test card from Jordan via *Hot Bird*.

The hostage drama from Luxembourg and English uplinker SISLink was in action for CNN, London.

Richard Rouse, age 15. Unfortunately his E-mail address disappeared when *SWM* E-mailed it to my workplace in-box! Richard, whilst visiting the Bath and West Show at Shepton Mallet, was able to look inside the BBC South West Bristol based SNG truck, then only a few weeks old. The SNG truck uplinked via *Eutelsat 2F3* via its 1.4m dish and apparently has a four digital uplink capability plus a digital communications (talkback) link.

The Bristol truck signs as 'UKI-162 BS' and Richard was given access for the afternoon. He learned that the BBC do not encrypt their uplinks but merely switch in different encoding - I suspect MPEG 4:2:2. This might have been the sighting on the 28th May by another reader, a country show with foxhounds and a very pro fox hunting commentator, farm tractors, etc., *2F3* @ 11.630GHz-H.

Roy Carman in Dorking was checking across the Telecom satellites May 11th and on 3°E came across an analogue news feed (12.648GHz-V) for the France-2 network showing a French town, thought in Normandy, suffering severe flooding, old buildings being flooded and cars being washed away. A couple of hours later another feed, also 3°E, but at 12.529GHz-V digital (6289+7/8), the same town, but the flash-flood had now subsided revealing completely wrecked shops, mud and rubble everywhere (service id 'FTR/F.40/1').

Roy commented 'this is nature at its damnest'. And to May 14th with a religious programme via *NSS-K* and just to show the potential of sound channels - 11.675GHz-V (6625+2/3) - the programme 'Decoding the Apocalypse' carried sound 'carriers' in English, Spanish, Polish, Korean, Mandarin, Serbian, Fijian and Samoan!

Enter the English and Turkish football fans and we have violent exchanges - and so it was mid May in Copenhagen when the local police (State and City) did their thing and got amongst the melee, the beautiful city was tarnished by the battle that ensued - the few blacking the majority. Extensively covered by Europe's media, the pictures made their way over to the 'States via *NSS-K* -11.491GHz-H (5632+3/4) on the 17th, unfortunate publicity for this European sport.

May 5th post election report on the London election via *2F3* digital.

NSS-K is still a very active bird for trans-Atlantic feeds. Check out these known BTI digital feed frequencies:- 11.488, 11.502, 11.519, 11.528 and 11.537GHz - all 5632+3/4. The first two channels are often used for Reuters ex Moscow early evening for news exchanges.

Finally for those sat-zappers with a clear look to the East, *Intelsat 602* @ 62°E has an Iranian bouquet at 11.135GHz-V (27500+3/4). There's Jaam-e-Jam Network 1, Network 2, Sahar Network and about four radio programmes as of mid May.

I am often asked about satellite listings. With the spread of digital there are new channels appearing almost daily. The magazine *What Satellite TV*, monthly, (from WH Smiths, etc.) contains an updated listing on the main programme channels though minimal OB and news feed sources.

The *Tele Satellite International*, a subscription bi-monthly magazine, is an active listing source with S, C and Ku-Band frequencies world-wide. Recently they've dropped printed listings in favour of CD-ROM, but this hasn't met with total excitement and reversal back to a mega printed listing (which runs for pages in small print) is being brought back by the Aug/Sept issue. In German/English - **Christine Williams, PO Box 1124, Ascot, Berks SL5 0XH, Tel: (0344) 620799**, E-mail: **chris@tele-satellite.com** costs about £35 for two years (12 issues). Or the Internet...

Orbital News

Though the problem of MPEG-4:2:2 prevents satellite enthusiasts in tuning to their favourite international news exchanges on 7°E, there could be a (dim) light at the end of the tunnel. **Christian Mass** is visiting several Korean manufacturing groups later this year and one firm has already expressed an interest in producing a 4:2:2 receiver in its product range.

The ITN Euronews channel based in Lyon has added the German language to its downlinking channel for NTV Plus (Russia) from *2F3* and the viability of adding a Russian sound channel is under discussion. More hard porn with the 'Hustler Channel' opening on *Hot Bird* (!) @ 13°E and *Astra* 19°E, both digital and encrypted. Hustler on *Astra* will share time with 'Adult X', the latter also appears on *Hot Bird* in D2MAC analogue, though this too will get into digits. Hustler will be full-time on air early July.

The NRK Norway will be launching a three channel bouquet Autumn 2001 - news, youth and town/lifestyle channels. And our Channel 4 is to originate a horse racing channel in conjunction with the BBC and to rival the BSkyB 'The Racing Channel', reckoning to come on-air late November this year. Meanwhile, a French horse racing channel 'Equidia' is airing on 12.627FGz-H digital-(27500+3/4) via *Telecom 2C* @ 3°E.

International s.w. broadcast DXers will have heard of the satellite fed World Radio Network (WRN), a London based group that offer many international s.w. stations via satellite. WRN are opening a digital radio package soon via *Hot Bird* capacity (frequency to be advised) which will include Euromix (Multilingual), EuroMax (German) and WRN-1 Europe (English). Future expansion may well include RTE-1, NRK-Worldwide, Radio Voyager (a US music offering) and transmisions in Russian.

CNBC Europe is to introduce a Scandinavian variant. CNBC Nordic will be produced in a purpose built studio in Copenhagen and be available on both satellite and cable providing business and financial news for the region.

The BBC have succeeded in transmitting news footage via Immarsat 'phone, based around their video conferencing technology. Previously the video information had to be stored on off-board capacity and then fed into the 'phone, taking approx 10 minutes to create 30 seconds of moving pictures based around MPEG-1 compression. Now the BBC have perfected a system whereby 'simpler video images' such as interviews with minimal movement can be transmitted via Immarsat in real time. It's already been used to transmit news pictures from Sierra Leone.

Immarsat in recent times have seen dramatic growth, this past year 32% up in subscriber sign-ons and 16% growth in traffic. They have succeeded by providing a range of voice, data and imaging services. Iridium however has failed - having concentrated on voice communication only - and Motorola are now planning to 'de-orbit' their 66 satellite fleet by burning them up in the outer layers. They had hoped for 1.5 million subscribers, instead they reached 55,000, it's reckoned that each of the 55,000 subscribers cost Iridium $140,000!

The EBU have completed satisfactory tests on their Basic Interoperable Scrambling System (BISS) for use with satellite news gathering, thus enabling a cross boundary flexibility in digital transmissions with equipment available from several manufacturers.

An article in the *SatFACTS* NZ trade magazine describes how the Clinton/Gore team fought the American presidential election in 1992. Senator Albert Gore was a satellite enthusiast and was aware of news feeds and their content.

A group of satellite enthusiasts were assembled at the campaign HQ in Little Rock where already large C-Band dishes had been installed. The enthusiasts were committed to tracking the movements of the opposing 'Bush' team. Interest was in not the broadcast proper but the odd chat, off-camera comments and pre-recorded broadcasts being linked back to the broadcaster for later transmission. These were recorded, analysed and very rapid answers and responses could be generated, often being on-air with the 'answers' before the original Bush recording hit the official air waves.

Useful information could be gleaned from comments heard over the opposition campaign moves, all was recorded and filed away. Tricks of the political trade!

Satellite operator GlobeCast Northern and Barak ITC have bought a 26% share interest into the Israeli earth station company Satlink. This will allow a single hop option for hookups between Australia, the Middle East, Europe and the Americas - and points inbetween.

Finally an old friend has been laid to rest, the *Eutelsat 1F5* satellite until recently slumbering at 4°E has been 'decommissioned' and probably will be de-orbited.

NITV heavily promotes this American bank on their Hot Bird downlink.

Analogue caption via *Telecom 2B/D* @ 5°W. 'CIP' remains unidentified.

***Sirius West* @ 13°W, an analogue test transmission.**

The Kentucky Derby was relayed via *NSS-K* into Europe.

■ PETER BOND c/o EDITORIAL OFFICES, BROADSTONE
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MilAir Goes To Mildenhall

The Missing Years

Regular readers will probably have realised that I have a bit of an affinity for RAF Mildenhall and its Air Shows. I had been in attendance at every show from 1969 to 1997, (the 1969 show was my first ever visit to Mildenhall as a school boy).

It was therefore a bit of a surprise to many friends that they had not seen me at the Air Fete since 1997. A family illness and cancellation due to the affair in the Balkans meant that I had missed two years, so consequently it was to be with renewed enthusiasm that I was to set off to Air Fete 2000.

Incidentally, for those of you who like obscure facts, I dug out my Kodak Instamatic photographs of the 1969 show and the B-52H that was in the static display that year, (61-0027 is still in service with the 5th Bomb Wing, 31 years later!). By the way, I make no apologies for making several comments about the weather - it very much controlled my few days away and many enthusiasts will remember this year's show because of it!

Wednesday

After a painful 480km drive to Mildenhall on the Tuesday in heavy rain, Wednesday dawned cloudless much to my surprise, (totally against the previous evening's local forecast). So, armed with radios and camera and the advance knowledge that Mildenhall was to have few show arrivals on the Wednesday, I headed to Lakenheath for the morning.

The F-15s were launching regularly and the airwaves were very active, in the three hours I was there over 40 missions were flown. I won't list the Lakenheath Radar frequencies as I have covered them in recent months, but a couple of items are worth a mention.

In addition to the Approach frequency 337.6, 309.075 is still the Primary Lakenheath Radar frequency for Mildenhall inbounds, but it was noted that 375.0 was also used. On occasion they were both in use simultaneously, so it may act as a backup when traffic levels require it.

A new v.h.f. frequency - 123.825 - was also noted in use with aircraft calling Lakenheath Arrivals. This doesn't appear to be a temporary allocation for the show as the locals told me that it was noted for the first time on May 15th and has also been heard since the show. As 137.2 is out of service until late June this may be a temporary replacement?

I was parked by the road under the Approach to Runway 24, so with the afterburner departures and the traffic it was very difficult to listen to the radio at times. Most of the callsigns heard were regulars such as ATTACK, BONES, JAZZ and STAG, but I did note two F-15 callsigns that I have not heard before, they were BUZZ and TUTOR, (possibly TUDOR), can anyone confirm which units they are used by?

Our lunchtime departure back to Mildenhall also coincided with the start of a decline in the weather, by mid afternoon it was very gloomy and starting to rain - typical! It was a relatively quiet afternoon with only two movements of interest, a Belgian F-16 into Mildenhall, callsign BAF 442 and a pair of German Tornados into Lakenheath, (neither were show related).

The rain increased in intensity and so we retired for the day. During the evening there was a call on 142.65 (352 SOG OPS), where Shadow 03 tried to call 'VICTOR RED' but got no reply, anyone any ideas who this is?

Thursday

Thursday dawned bright, sunny and windy, the forecast was for heavy showers and this time they were not wrong! An early start saw us set-up base camp down by 'The Hump' adjacent to the Runway 29 approach. Overnight I had set up one radio with every known Mildenhall frequency in the memory including a few queries.

▲ The Austrian AF Draken with special theme.

I managed to confirm loads of the common ATC and OPS frequencies, but the only two items of interest were that I heard the 352 SOG OPS frequency 142.375 in use - I hadn't seen this reported for some time. Plus, one new piece of information, Air Fete 2000 v.h.f. ground frequency was 119.6.

DOOM 92 and 95, a pair of 2nd BW B-52s opened the days proceedings, they were followed a while later by the B-2, using the callsign FURY 95. To my mind there were few new or interesting callsigns used, mostly they had all been previously reported.

One age old problem did come to light, when a Lakenheath F-15E arrived I noted the callsign as DRAG 61, on conferring with a couple of other people they had it as DRAKE 61 and DRAX 61. Ho Hum! It shows how differently people can interpret an accent.

The best visitors to the show in my opinion were the two Austrian Air Force Drakens who arrived during the afternoon, one of which was in a special red and white scheme. The Austrian SAAB 105 in the Tiger scheme was also very nice.

◀ The Italian AF AMX coming in to land on Thursday.

Two interesting incidents occurred during the day, the first was the approach of the Italian Air Force AMX, callsign India 7158. From his lack of height he had to have

MilAir Goes To Mildenhall

been a Starfighter jockey earlier in his career, it was one of the lowest approaches I have seen at Mildenhall. We couldn't see his landing because of trees but from the wailing of sirens it was soon obvious that all was not right.

The AMX had apparently touched down quite hard, continued down the runway and then spun just past the Control Tower. The canopy was opened and the pilot was out like a shot, fortunately nobody was hurt except perhaps the pilot's pride. The airfield was closed for almost an hour and several aircraft had to divert to Lakenheath due to lack of fuel, some being on the point of declaring an emergency. It was very reminiscent of when a RAF Buccaneer did a similar thing back in the Eighties.

The second incident was the arrival of the two Turkish Phantoms. Their initial contact was to call Mildenhall Tower to report that they were 104km South of the field at Flight Level 210! Well, according to my calculations that put them somewhere North of Southend in the middle of a lot of controlled airspace. I can only guess that they had arrived in the UK via the Airways UG1 or UR1 and decided that they would just turn right and go direct to Mildenhall.

The controller asked them if they were talking to anyone else, their English was poor but I think the gist of the answer was no - London Control must have been tearing their hair out. After what was presumably a lot of land line co-ordination between the affected Air Traffic Units, (and their mistaking Honington for Mildenhall), they eventually arrived safely.

There was four or five very heavy showers during the day but also a reasonable amount of sunshine which provided some good photographs. We were very fortunate to miss the thunderstorm which passed about eight miles to the West and North of us which dumped over two inches of hailstones on several villages near Ely! To my mind, the Thursday seemed to be a busier and more interesting arrival day than the Friday, which was perhaps a good job considering the weather that was to come the next day.

Friday

Friday dawned dull and got steadily worse. One of the locals had opened up his field for parking under the approach to Runway 29, we elected to pay a fiver and set up camp in there as it looked like the sort of day to be close to the car.

Despite a steady stream of inbounds, my camera hardly came out of its bag, the light got worse and by late morning the rain had started, then to compound matters they changed runways! The rain got steadily heavier and the visibility became very poor!

▲ Aviano F-16C sporting a special 16th Air Force scheme.

Notable visitors were the EC-130H from the 43 ECS at Davis Monthan (BAT 13), and the AC-130H from the 16 SOS at Hurlburt Field (Ghost 61). Only one bit of frequency information - one MilAir reader reports he heard 142.75 in use during Friday evening by possibly 100 ARW maintenance, I have no other reports of this frequency - any ideas ?

Saturday

Sunshine and some very heavy showers were again the order of the day. The flying display was disrupted by the weather with almost all of the aerobatic teams following each other at the end of the day with flying going on well past 1900. I don't normally take many pictures of the flying as you are shooting into the sun, but the B-2 flew in sunshine and made a couple of cracking turns from behind the crowd with some tremendous top-lighting. Fortunately, I had the right lens on the camera.

◀ B2 Spirit of Alaska on Saturday.

Other frequencies noted by MilAir correspondents between Thursday and Saturday: Frecce Tricolori 307.8 and 313.75; Patroille Suisse 288.85; Pat de France 143.1; B-1B Air Refuelling 301.6 and F-117A Air Refuelling 303.0. During my visit I had a brief scan around the 406 - 420MHz band and I will report on that next month along with any further information and updates from the show.

Due to other commitments on the Sunday, we had to head for home mid afternoon on the Saturday. From what I have heard of the Sunday weather perhaps it was a good thing. Apparently, some of the traders packed up and went home by 1030! Altogether a reasonable show with some nice aircraft, it will definitely be remembered by many for the weather.

With thanks to Kev, Mike R, Steve L, John L and the anons.

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*The **MFJ-9340 Cub** (courtesy of **Waters & Stanton PLC**) is reviewed jointly by **Clive Hardy G4SLU** and **Rob Mannion G3XFD**. It's a 7MHz QRP transceiver kit with a difference as it comes partly assembled to get you operating quicker.

*RAE COURSES

*It's that time of year again - RAE courses are starting all over the country! You'll find a comprehensive list to help you find a course in your area together with useful contact numbers.

Antennas-in-Action

This time of year is prefect for antenna construction, so join **Tex Swann G1TEX** as he offers lots of hints, tips and ideas on antennas large and small.

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DX Television

What at first seemed to be a sluggish month, May developed into a DXer's dream with exotics from at least three Middle Eastern countries flooding into the UK over the May Bank holiday weekend.

Reception Reports

Thanks to intense tropospheric activity between the 4th and 11th, **Ian Milton** (Ryton) logged many Norwegian and Danish signals in Band III and on u.h.f. **Peter Barclay** (Sunderland) captured lots of Dutch stations, including local station TV Oost on E22 and E36. Many German u.h.f. transmitters were present during the opening.

In India, **Lt. Col. Rana Roy** first noted Sporadic-E signals on May 8th with a new Russian station on Channel R1, sporting a logo resembling 'TV5'. The reception lasted around fifteen minutes. A Chinese station also appeared on Channel C1/R1 with the logo 'CCTV-4'.

In the UK, Sporadic-E openings were evident from around mid-May. But the real excitement commenced on the 27th with an intense all-day opening. **Stephen Michie** noted Sporadic-E signals from Hungary, Italy and Slovenia shortly after 0747. At 0846, JTV Jordan emerged on E3 identified by its broken ellipse logo in the top-left of the screen. The station was also received in the north-east by Ian Milton but during the afternoon.

By late morning, the m.u.f. had risen into Band II and it was awash with f.m. signals. **Tim Bucknall** (Congleton, Cheshire) heard the Channel R5 sound channel on 99.75MHz but was unable to identify it. Several DXers reported signals on Channel C which were not RAIUNO (Italy). In Derby, Channel C signals were identified as Albania from the 100kW Tirana outlet; the TVSH logo was clearly visible in the top-left of the picture. At 1245, two Ukrainian stations on R1 were present.

Tuning down to E2 revealed an Arabic station which, upon closer examination, could be identified by the Syrian 'L'-shaped logo which was visible in the lower left of the picture. Reception was strong and stable with sound. **Peter Barber** (Coventry) also resolved it, judging by his reference to a 'line' logo. **Peter Chalkley** (Luton) also identified the station but over an hour later.

By 1500, another Arabic station was present on E2 with a female newsreader and a large white star symbol to her right. During an Arabic 'soap-opera', there was a white circular logo in the top-left but over on E4 there was an Arabic film commencing. Tim Bucknall measured the E2 offset confirming that it was not Syria but more likely Iran! Peter Barber also concluded this by the picture content. We have no idea what the E4 signal was as it finally submerged beneath a European station. **Roger Bunney** (Romsey) also received an Arabic station on E2 during the afternoon.

The exotics continued the following morning with a news bulletin and programme material from Jordan on E3. This was present in Derby and Bristol between 0700 and 0900.

On the 30th, **Martin Dale** (Stockport) discovered a short but impressive opening around 1910 when Norway, Croatia, Hungary and Lithuania were all identified within the space of thirty-five minutes. A reception path was established to Iceland on the 29th and 31st, according to Peter Barber who resolved RUV text pages on E4.

Polarisation Changes

David Hamilton (Cumnock, Ayrshire) is using both vertical and horizontal loop antennas feeding separate TV receivers. This has confirmed how frequently polarisation changes occur. David intends to upgrade his system using three-element, or possibly four-element, cubical quad antennas with one vertically mounted, the other horizontal.

Fig. 1: Some of the DXing equipment used by David Hamilton in Cumnock, Ayrshire.

Fig. 2: Slow-scan TV (SSTV) reception by Paul Crankshaw (Troon) of FR5AB in Reunion off the coast of Madagascar.

Fig. 3: Paul's reception via SSTV of IS0FMI in Sardinia.

Fig. 4: An example of Japanese SSTV from JA5TFF, received by Paul Crankshaw.

Continued on page 62...

DXTV Log For May

This month's compilation of reception has been supplied by Stephen Michie, Peter Barclay, Ian Milton, Martin Dale, Peter Barber and **Simon Hockenhull**. Reception is via Sporadic-E unless otherwise stated.

Day	Log
2	Finland (YLE-1) or Sweden (SVT-1) E3 via Meteor-Shower.
3	Denmark E3 via Meteor-Shower.
5	Denmark E3; Sweden E3; Italy A (RAIUNO); Spain E4.
6	Sweden E2.
7	Italy A (RAIUNO).
8	Denmark E3 via Meteor-Shower.
10	Denmark E3 via Meteor-Shower; Slovenia (SLO-1) E3; Hungary R2 (RTL Klub); Croatia (HRT) E4; Italy A (RAIUNO).
11	Denmark E3 via Meteor-Shower.
12	Unidentified weak signals from the south-east around 1800.
14	Austria (ORF-1) E2a; Italy A (RAIUNO); Switzerland (DRS SF-1) E3.
15	Moldova (TVM) R2.
16	Italy E2 ('VIDEO' private station), A (TVA private station), A and B (RAIUNO); Spain (TVE-1) E2, E3 and E4.
17	Spain E3.
19	Sweden E2; Spain E2, E3 and E4.
20	Sweden E2 and E3; Spain E3; Italy (RAIUNO) A and B; Italy (TVA) A; Croatia E4; Norway (NRK-1) E3.
21	Sweden E3 via Meteor-Shower; Spain E2, E3 and E4; Portugal E3; Italian f.m. opening.
22	Spain E2, E3 and E4; Portugal (RTP-1) E2 and E3; Italy (RAIUNO) A and B; Italy (Unidentified station) A with blank raster; Slovenia (SLO-1) E3; Corsica (Canal Plus) L2 and L4; France (Canal Plus) L3; Switzerland (TSR-1) E4; Germany (ARD) E2; Spanish f.m. opening.
25	Italy E2 (VIDEO), A and B (RAIUNO); Hungary R2 (RTL Klub).
26	Italy (VIDEO) E2; Spain E2 and E3; France L3.
27	Italy (RAIUNO) A and B; Italy (VIDEO) E2; Corsica L2 and L4; Spain E2 and E3; Germany E2; Albania (TVSH) C; Slovenia E3; Croatia E4; Germany E4; Moldova (TVM) R2 and R3; Hungary (RTL KLUB) R2; Rumania (TVR-1) R3; Czech Republic (TV NOVA) R2; Syria (SYR-2) E2; Iran E2; Unidentified Arabic station E4; Jordan (JTV) E3; widespread f.m. openings.
28	Italy (RAIUNO) A and B; Spain E2, E3 and E4; Portugal E3; Russia (ORT) R3; Jordan E3.
29	Italy A (TVA), A and B (RAIUNO), E2 (Video); TVE-1 E2 and E4; Portugal (RTP) E3; Iceland (RUV) E4; Norway E3; Slovenia E3; Croatia E4; Albania C; Hungary R2 (RTL Klub); Unidentified PM5544 test card, possibly from Macedonia.
30	Italy E2 (Video), A and B (RAIUNO); Portugal E3; Hungary R2 (RTL Klub); Croatia E4; Norway E3 and E4; Lithuania R2; Hungary R2 (RTL Klub).
31	Italy E2 (Video), A (RAIUNO); Spain E2; Portugal E3; Norway E2; Iceland (RUV) E4.

■ GODFREY MANNING G4GLM , C/O THE GODFREY MANNING AIRCRAFT MUSEUM, 63 THE DRIVE, EDGWARE, MIDDLESEX HA8 8PS

Airband

Here are the planned *Red Arrows* displays, starting on the day this issue of *SWM* goes on sale. Dates in July (in parenthesis). Farnborough (27, 28, 29, 30); Sunderland (29, 30); Cranwell (31). Now August. Broadstairs (2); Lowestoft (3, 4); Marham (3). No promises, though, so do check prior to setting out on a journey to see any particular display. Source: *AIC* 29/2000 from the CAA.

That other major event, Farnborough, will be keeping the skies of Hampshire busy from before publication of this *SWM* until and probably including August 1, the non-show departure day (*AIC* 27/2000).

Distant Lands

Our long-haul flight today will first take us to Sydney, Australia. Here, **Rodney Hale** (Bricket Wood) finds that the air traffic controllers are a bit more considerate than our own, they break the windspeed into separate headwind and crosswind components.

In the UK, they state speed and direction, leaving the pilot to calculate the crosswind. Trigonometry isn't much fun in the air, but you can at least remember that half the speed of a wind blowing 30° to the runway heading will be the crosswind component.

Now on to Ashok Nagiar, India, where we meet **E.K. Satyan**. Madras (Chennai) International Airport Tower is on 118.9 with Radar 127.9MHz. European readers should appreciate that it's a different world. As I well know from other aspects of my professional work, books and journals are hard to come by. A scanning receiver is also an unlikely proposition.

Could EKS get a Panasonic RFB65 to operate on the airband? I don't know the equipment myself, but if any reader can suggest a modification or provide a circuit diagram, then I will pass it on direct. I don't usually send correspondence directly, but I'm sure that all my more fortunate European readers will support me in trying to help out in this case of genuine need. As E.K.S. says, lack of facilities means making the best out of a difficult situation, although it is satisfying when something is actually achieved.

Near To Home

Barton Aerodrome, near Manchester, has some history on show, as discovered by **Mark Dean** (Disley). Now the home of the Lancashire Aero Club (the UK's oldest), it was once the world's first municipal aerodrome and the old passenger terminal remains. The Tower is a listed building, and a shed with a tall roof was used to pack parachutes in World War II. The 'chutes were hung from the roof ready for packing.

Mark asks if aircraft may fly without radio. Yes, they may, except in controlled airspace where radio is mandatory. Under Visual Flight Rules, the technique is see and avoid. This is permitted in Class E, F and G airspace. Looking for other aircraft and keeping out of the way is more important than talking on the radio.

In the UK, you don't even need radio under Instrument Flight Rules in Class F and G airspace (e.g. at night). Under these rules, aircraft fly at different altitudes according to direction, thereby preventing mid-air collisions. For example, flying south-westwards is done at an even whole multiple of thousands of feet, but flying north-westwards requires a climb to 500 feet higher than this.

Certain airspace is accessible to non-radio aircraft provided that prior permission is obtained, usually by telephoning the Air Traffic Service Unit at the aerodrome and giving an estimated time of arrival. Landing is still not advised unless the Air Traffic officer displays a green signal light or flare. The Aldis-pattern light has a built-in reflector and is quite directional, hence powerful. You have to aim it at the aircraft through a sight, like a gun! I had experience of this when helping out at a Moth Club rally.

Electrical Safety

Many receivers have low-voltage power connections of the coaxial variety (often 2.1 or 2.5mm, but there are now other sizes such as 1.3 and 3.1). Many can run off a car battery, through the cigarette lighter socket (the only thing it's good for!). Being negative earth, it makes safety sense for the plug to be negative outer. The WIN 108, notes Mark, is the wrong way round. So's my FT-290 amateur transceiver, so take care prior to connecting anything!

In June, I advised caution when earthing an antenna. When not in use, the static electricity from rain must be discharged to earth so that the antenna doesn't become a lightning target. Unfortunately for **Kevin Duckhouse** (Christchurch) you need to make the correct arrangement according to the type of mains supply that you have. That's why you must seek advice if in doubt.

I can only mention general principles which might not be suitable for your installation. Apart from draining away static when not in use, antennas for v.h.f. and above don't need a radio-frequency earth. An h.f. receiver would usually benefit from one, though. It's preferable to make a special earth, driving a conductive, non-corroding, rod into the ground (not through any underground pipes, etc.!) and connecting back to the receiver through thick cable. If you connect directly to mains earth, interference carried on the mains could spoil reception. The receiver's power supply still needs a safety mains earth, unless isolated through a purpose-designed transformer.

Some houses, especially in rural areas where fed from overhead cables, are wired on the Protective Multiple Earth (TN-C-S) system. Here, all metalwork (such as water pipes) is connected (bonded) back to the mains earth. The trouble is that this earth is really the neutral mains wire, joined to local earth rods.

Certain faults can cause high voltages to appear on the neutral/earth wiring but, as all are joined together, everything in the house is at the same voltage and no dangerous current flows. If you bring in a real earth from outside, you could now get a shock between it and the mains earth wiring.

One recommendation is to connect your radio's earthing rod to the mains earth system, to keep them at the same voltage. The current flowing in this connection could be high if there's a fault and you would be surprised at the minimum size of cable needed (10mm^2 and perfect connections!). An earth-leakage (residual current) circuit breaker cannot be recommended too strongly as a safety device. A friend of mine is alive today thanks to one, but has the burn-mark on her finger to prove it.

The mains supplies alternating current. Fault

Abbreviations

AIC	*Aeronautical Information Circular*
CAA	Civil Aviation Authority
ft	feet
h.f.	high frequency
LATCC	London Area & Transit Control Centre
MHz	megahertz
nm	nautical miles
STAR	Standard Terminal Arrival Route
v.h.f.	very high frequency
v.o.r.	very high frequency omni-directional radio range

Continued on page 62

Luscombe 8E. *Christine Mlynek.*

Airband

Continued from page 61

Yak-11. *Christine Mlynek.*

currents can be large. Therefore, the resistance of the wiring isn't all that matters, it's the impedance at the mains frequency. Again, qualified electricians can measure that this impedance is low enough using an earth loop (Z_s) tester.

You can see now, Kevin, why *SWM* can't be the 'definitive, authoritative source' on safety that you hoped for. Each installation must be individually reviewed, correctly designed and then tested for safety before use. As they say, don't try this at home - unless you are conversant with the requirements and have a Z_s tester.

In The Air

Aeroplanes can't hover so, when required to hold position *en-route* or prior to landing, a racetrack-shaped pattern is flown. The place where this happens is called a hold but, because several aircraft might be doing the same thing but at 1000ft vertical intervals, it is colloquially referred to (also by **Clive Parker**, Aylesbury) as a 'stack'.

An example would be the Lambourne hold, about 6nm long by 3nm wide, potentially able to hold one aircraft at each 1000ft multiple from 3000 to 24000ft.

Frequency & Operational News

In the June 'Airband' I mentioned that Decca Navigator is no longer available for aviation purposes. I have since discovered that it has been withdrawn altogether so it can't even be used at sea. Another technological era ends. Also, the TABIS significant point is on the Luton LOREL 1R STAR, 14nm east of the Barkway v.o.r. A significant point defines a route; a reporting point is a significant point where a position report is mandatory during procedural (non-radar) control.

What will happen when the new air traffic control centre becomes operational? **P. Halligey** (Bridgend) will be interested to know that the centre was built at Fareham but will be known by the local name of Swanwick. That's just one character different to Shanwick, so take care!

At a recent lecture, it was explained that there are technological difficulties still to be overcome. This means the start-up date is still well in the future - and undecided. However, my understanding is that *en-route* (not terminal control) operations will move to Swanwick from LATCC. It seems unlikely that this would involve any major frequency changes. Indeed, pilots need not even know to which centre they are speaking! They've got enough to worry about.

Some of you requested photos of larger aircraft and Chris has just what you asked for lined up for the coming months. Write in to encourage her if you enjoy them! Next month I will answer letters from **Anonymous** (*Casa Loma*), **George Jacob** and **Stacy Barron**. All other letters received up to June 7 have been answered. The next three deadlines (for topical information) are August 7, September 12 and October 9. Replies always appear in this column and it is regretted that **no** direct correspondence is possible.

...continued from page 60.

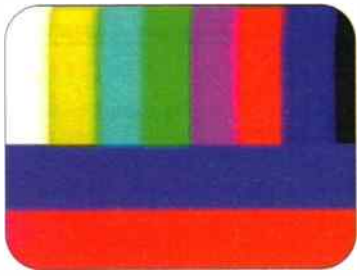

Fig. 5: An unusual set of colour bars radiated by one of the TV stations in Hungary and supplied on a video cassette by Laszlo Kozari.

Mysteries

Peter Barclay (Sunderland) discovered a dark blank raster on Italian Channel A around lunch-time on the 22nd. Peter also queries a horizontal letter 'H' logo, perched in the top-right of the screen on R1 during openings to the north-east. Whilst on the subject of logos, Ian Milton (Ryton) advises that a 'TV1' logo seen on R3 originates from Latvia.

At 1530 on the 27th on R4, a logo consisting of a darkish figure '1' inside a white rectangle in the top-right of the picture was seen. There seemed to be a word below it and diagonal stripes to the left of the '1'.

During an opening to Slovenia and Croatia at 0440 on the 29th, Stephen Michie noticed a PM5544 test card on E4 but its identification could not be deciphered. Although NED-1 (Netherlands) is usually broadcasting the PM5544 at this time, its origin was thought to be more distant, possibly Macedonia.

FM DXing

Several Sporadic-E openings have supported f.m. signals. **Chris Howles** (Lichfield) discovered Spanish and French-speaking stations as high as 106MHz around noon during the grand opening on the 27th. Martin Dale (Stockport) encountered a host of European f.m. stations but the only announcement deciphered sounded like 'Radio 3'.

During a holiday at Lynton in Devon, Simon Hockenhull logged Today FM on 101.4MHz from Mt. Leinster in Éire. A spot of mobile DXing on Cairn o' Mounth in Aberdeenshire rewarded **George Garden** (Edinburgh) with BBC Radio York on 104.3MHz from the 500W Woolmar relay.

Service Information

Sweden: Stephen Michie has noticed the PM5534 test card bearing the identification 'SVT-1 SVERIGE' in smaller lettering than previously. In addition, there is now a small white marker shuttling horizontally. Presumably this has been introduced as a digital test.

Éire: Martin Dale advises that RTE-1 and Network-2 now identify as 'ONE' and 'N 2' respectively. During the afternoon, while N2 takes a break, DEN TV takes to the airwaves. The Irish-language service TnaG, launched in October 1996, now identifies as 'TG 4'.

Fig. 6: For this month's 'Down Memory Lane' spot we go north of the border to Scotland and the logo used during the Fifties.

Keep On Writing!

Please send your DXTV, slow-scan TV and f.m. reception reports, news, off-screen photographs and information to arrive by the first of the month to:- **Garry Smith, 17 Collingham Gardens, Derby DE22 4FS.** We can also use off-air pictures stored as JPG files on PC disks and good-quality video recordings.

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SSB Utilities

EAM Article

The EAM Article ('Fun with EAMs') in the June 2000 issue of *SWM* has naturally generated some interesting comments and observations from readers, both by post and by E-mail.

Bob Meech in Dartford says that he "has been listening to these transmissions for a short while and not really knowing what he was hearing". Well Bob, that was one of the main aims of the article. So often one hears from people who have heard something a bit 'different' and they want to know more about what they have heard.

EAMs are surprisingly common on the h.f. bands, but there appears to be very few people who have a real in-depth knowledge and interest in them. The article was designed to show just how much can be discovered when you look at a lot of 'apparently meaningless' letters and numbers collected over a long period of time.

The first step is to start collecting the information, and keep doing so until patterns start to appear. I don't imagine for one minute that anybody will ever manage to fully decode one of the messages, but there is still plenty of information worth investigating on a day-to-day basis.

John Parry in Cyprus offers some historical flashbacks on the 'Sky King' messages that were briefly mentioned in the EAM Article. John remembers them from the early 1950s, however Croughton was still one of the operating stations even then. In those days there were several Wings of US bombers based in the UK and North Africa, and frequent visits by bombers from the USA to the UK and Europe, so there was much more h.f. activity and many more 'coded messages' being passed.

John also mentioned another mysterious h.f. network, known as the 'Cemetery' net because all the callsigns used the prefix 'cemetery', for example 'Cemetary 8, this is Cemetery 24'. Although I never heard any transmissions from the Cemetery Network, I have not seen any reports of activity for over 20 years, so I am quite certain that it is now defunct.

ALE

The other major article in the 'SSB Utilities' special was an explanation of how the USAF allocated ALE addresses for its aircraft. This prompted **Colin Wellard** in Norfolk to download the software and install it on his computer (good! - that was one of the objectives of the article), and he now has some questions about the program. Some of these questions are probably best answered by Mike Richards in his 'Decode' column, but some are more general and can be mentioned here.

Colin says that he would like to be able to make the PC-ALE software force his AOR AR7030 to scan the USAF ALE frequencies. I am not sure if the software is able to do this, as it only supports a limited number of receivers and transceivers - has anybody managed to get their AOR AR7030 to 'scan' via PC-ALE and offer some advice to Colin? He comments that 11.226MHz is quite busy, and from all the reports that I have seen, this seems to be the nearest USAF ALE equivalent of a calling frequency.

Colin also asks how to tell if he is listening to a ground-station or an aircraft. The answer to this question comes down to some simple analysis of the messages displayed on the screen. The display in the PC-ALE program shows the time and frequency (or channel) as the first two fields, and this is followed by the destination and origin fields (my terms). Here is an example: [17:27:41][CHN 00][TO][TAG][TIS][270047].

The time and channel are obvious; the [TO] field indicates that the [TAG] field is the station being called (LTAG - Incirlik in Turkey, in this example), while the [TIS] field shows that what follows is the calling station. I will leave you to find out what you can from the ALE article in the June 2000 issue exactly what the calling station was, but for Colin's benefit, the [TIS] field and the value that follows is the calling station and if the calling station is not listed in the ALE article as one of the ground stations, then it will almost certainly be an aircraft.

Remember that quite often one ground station will call another ground station to check the propagation conditions between the stations on the chosen frequency, and is still the 'TIS' station that is doing the 'calling' and the 'TO' station that is being called.

Irton Moor

The subject of the CSOS Irton Moor installation has also prompted a number of letters and E-mails. Both **John Parry** in Cyprus and **'J'** sent in additional information, and my anonymous contributor wrote in with a list of other sites. Firstly, a correction - the 'CSOS' in the title stands for 'Composite Signals Organisation Station' rather than the title I gave it in the June 2000 issue.

Combining the information from the three sources above, the following CSOS locations have been identified: **CSOS Irton Moor**, Scarborough, has been in operation since the First World War, used for h.f. reception and d.f. using the ring of verticals; **CSOS Cheadle**, Cheshire, closed in the 1990s; **CSOS Culmhead**, near Taunton, Somerset, closed in February 1999; **CSOS Ford End**, NW of Chelmsford, Essex, another d.f. site, closed during the 1960s; **CSOS Flowerdown**, near Winchester, closed during 1970s/1980s; **CSOS Forest Moor**, near Harrogate, still operating, and full of Americans!; **CSOS Two Boats**, Ascension Island, still operating and **CSOS Little Sai Wan**, Hong Kong, now closed, obviously!

ATC 2000 - Update

Last month I wrote about the special Air Training Corps event being held during late July, and the fact that the cadets will be using their h.f. network frequencies to contact aircraft. I have now received some updated information about the event.

The event is now known as 'AC2K' (Air Cadet 2000), and it will involve the CCF (Combined Cadet Force) also. The event will run from 26th July until 2nd August, and as this issue will reach most readers towards the end of July, it seems a good opportunity to pass on the extra information.

On the h.f. network during the 'AC2K' event, the station will be using the 'MRFxx' series of callsigns (and also on their v.h.f. & u.h.f. networks, if you know where to listen), while their 'Project Millecom' callsign on the amateur bands will be M2000Y/MRF01.

On their h.f. network frequencies, the cadets will be contacting as many civil and military aircraft as possible, just like their previous stations at the Royal Tournament in London. This time, they should have plenty of space to erect full size antennas, and will not be plagued by noise and interference from adjacent transmitters and air-conditioning units. There is a possibility that the station may manage to make a few contacts either side of the official event dates, so keep listening for activity.

In a similar fashion to the 1999 Royal Tournament, the ATC have agreed to provide QSLs for listeners who are able to report contacts between the ATC station and aircraft during the event. To get your QSL card you must send details of your loggings and a stamped s.a.e. or International Reply Coupon (IRC) to: **D. Horsley, 5, Edwards Gardens, Swanley, Kent BR8 8HP, United Kingdom.**

Please try to include as much information as possible, so that your QSL 'claim' can be verified with the radio logs compiled by the radio operators. QSL requests will not be processed until after the 'AC2K' event is completely finished, so be prepared to wait a while for your QSLs.

Balloons

Now that the non-stop global circumnavigation record has been broken, you would think that there would be nothing else left to do in a balloon. While all those long-distance balloon flights were taking place in the late 1990s, one of the commonest questions was for a list of h.f. frequencies being used, and my standard reply was to listen to the h.f. ATC frequencies and the LDOC frequencies such as Portishead, Berne or Stockholm.

I was quite surprised to hear that explorer David Hempleman-Adams was attempting to reach the North Pole by balloon. By now, most people will have heard that he managed to achieve his goal, but **Kevin Hughes** actually heard him on h.f. soon after passing over the North Pole.

At the start of June, Kevin heard the explorer on 11.279MHz (a NAT-B/NAT-D frequency) talking to his ground-crew soon after crossing the North Pole. He was then transferred to the LDOC frequencies of 10.030 and 8.924MHz where the explorer conducted interviews with journalists in Iceland.

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Attention-123!

Numbers Stations: The Future

Every so often we have mentioned a decline in transmissions from a particular station, or even a complete extinction. This pattern has slowly gathered pace since the ending of the Cold War.

In many cases, the reasons for this will probably be related to changes in international politics, however, there are inexplicable exceptions, and even cases of **increased** activity and entirely new stations appearing. Part of this reduction in activity may simply reflect the general abandoning of h.f. by so many other agencies, due to the rise of secure satellite voice and data communications.

In the world of espionage, the Internet and satellite 'phones still have one major disadvantage: they identify the recipient - far too risky for serious special operations. The only alternative to h.f. is one-way satellite 'broadcasting'. This could account for the virtual ending of BND's h.f. Numbers Stations.

Perhaps Golf Kilo and friends are now all operating on much higher frequencies - into satellite 'phones receiving only. However, the average spy working as an illegal under a cover identity is unlikely to possess such a suspect piece of equipment, still not in widespread use, unless the 'cover occupation' justified its use.

HF Decline In Perspective

On the whole, though, activity in general has greatly reduced over the past ten years. We have received several letters from readers asking about sites and their operating agencies and, by reading comments by other *SWM* contributors, there is clearly very little knowledge or understanding of this subject outside official circles. This article will, we hope, help to throw a little more light in this area, as well as giving a flavour of h.f. activity in around 1970 (it is as complete as it can be in the space available, and most important sites have been covered, but not all).

At the time the short wave bands were far busier than they are today. Transmitters also remained running in no-traffic periods far moreso than nowadays, and many repeatedly sent their callsigns in Morse - very useful.

Who remembers MHU, GLO21, GYA from HMS *Inskip*...or B9TP from RAF Finningley, for example? Virtually all international diplomatic traffic was carried over h.f., from large sprawling stations at Hanslope, Poundon, Gawcott, Creslow and Stoke Hammond (mainly Piccolo, Morse and Baudot RTTY).

Commercial traffic (News Agencies, long-distance 'phone calls, etc.) was at a very high level and made use of GPO sites. There was also much more maritime traffic (a.m. and c.w.), including numerous ship-to-shore telephone calls. These also used the large GPO sites at Leafield, Bearley, Dorchester, Rugby, Ongar, Somerton, Baldock, Criggion, Lanivet and Bridgewater - Portishead Radio was controlled from Burnham-on-Sea.

The time signal station MSF then operated from Rugby on h.f. and m.f. as well as 60kHz. Even the GPO coastal ship-to-shore stations (Anglesey, Niton, etc.) were fully-manned and operating Morse (MCW) on l.f. and voice (a.m.) on m.f.

There was very little v.h.f. operation outside ports. The Navy still uses its large v.l.f. sites at Criggion (& v.l.f. 'GBZ'), Crimond (& l.f.), Rugby (& v.l.f. 'GBR'), Inskip (& l.f.) and Forest Moor (& NATO's vast v.l.f. site at Anthorn 'GQD').

Probably closed now are its sites at Humberston, Caistor, Inverkip and Beacon Hill, E Meon and Chattendon - used to jam RNI, before the high power Canewdon site was established by the Army.

Aeronautical traffic on h.f. was widespread, all speech being in a.m., including Shannon Air Radio (now VOLMET) and AT2J (formerly Upavon radio, now Architect). AT2J used transmitters at Chenies and Bulford and receivers at Upavon. The Defence Communications Network (RAF, Met Office, Army) still use h.f. sites at Edlesborough, Bampton Castle and Chelveston (which replaced Greatworth) along with their Scottish sites at Balado Bridge and Milltown.

At one time, these carried high levels of Sigint traffic from world-wide monitoring sites. The RAF's 'MKL' still sends its Morse meteo data every hour. International air-traffic data (f.s.k. RTTY) was carried on h.f. point-to-point links, using many transmitters at Winstone with the receivers at Birdlip.

The amateur bands were busier too, as fewer amateurs used v.h.f./u.h.f. - commercial equipment was sparse and most built their own transmitters and convertors - and of course there were no Internet communications. Needless to say, the 45m 'Echo Charlie' band was choc-a-bloc with pirate QSO nets (mainly a.m.) using home-brew equipment or the old 19 sets, 38 sets, etc.

Naturally, with so much h.f. activity, GCHQ needed numerous h.f. monitoring sites - their Composite Signals Organisation Stations (CSOS as they are still called today). Many of these were very large and several continue to operate.

From North to South: Bower, Brora, Comber (Island Hill), Gilnahirk, Hawklaw, Kirknewton, Redbrae, Irton Moor, Cheadle, Chilwell, Digby (RAF), Beaumanor (Army), Shenley Church End, Blakehill (GCHQ research/experimental), Culmhead, Wincombe, Bude, Goonhaven, Flowerdown, Fort Bridgewoods, Shorncliffe, etc. Even GCHQ Eastcote and Bletchley Park (with just two rhombics) were still in use then and the secret of the ENIGMA machine was still an Official Secret! Their old site at Sandridge was by then an MI5 radio research (bugging, etc.) facility.

While the Russians were running hundreds of h.f. jamming transmitters, the BBC were trying to get through with many h.f. transmitters at Daventry and a couple at the m.w. 'Aspidistra' site at Crowborough, as well as those at Rampisham, Skelton and VOA at Wooferton. As today, they ran their Caversham-based Monitoring Service from receivers at Crowsley Park, but they also had an outstation at Tatsfield.

Incidentally, they ran a string of little-known secret m.w. WTBS (Wartime Broadcasting Service) sites - never used, but fitted out with transmitters, masts and petrol generators - controlled from their six-storey-deep Wood Norton WTBS bunker and the SRCs. (Orford Ness was then a secret MoD site and also the USAF had its very powerful 'Western Woodpecker' OTH radar there - known as 'Cobra Mist'. Its pulses could be heard throughout the h.f. bands).

Even the 27 SRCs (Sub-Regional Controls - government nuclear bunkers) were fitted up for emergency h.f. nets using 125W s.s.b. transceivers working between each other and the immense National Seat of Government bunker at Corsham (with a reserve at Rhydymwyn). These were tested during NATO and Home Defence exercises as back-up for the GTN's (Govt Telecom Network) extensive u.h.f./v.h.f. system.

Lastly, various ionosheric sounders regularly swept across short wave from Ditchley Park, the eight Met Office Upper Air Stations used balloon-borne radiosondes in the 27MHz band, and Interpol, callsign GMP, operated Morse from W. Wickham

Back To Numbers Stations Again!

On top of all this, of course, there were the Numbers Stations which could be found at any time of day or night. MI6's Lincolnshire Poacher (E3) operated (in a.m.) from DWS sites at home, or from DCN sites (run by RAF) overseas - such as Akrotiri Lake. In addition, there were the less conspicuous but more interesting Morse Numbers operations serving MI6, special forces and Stay-Behind Networks.

The SIS still uses its two h.f. sites in Herefordshire, but very few readers will be aware of the h.f. transmitters at Montreathmont Moor with its nearby receiving station at Laurencekirk used for regular SB exercises and for sending covert messages in Morse to mercenaries and special forces.

There was probably nowhere on earth (apart from, perhaps, Germany) with so many h.f. facilities concentrated in such a small area. As the heady days of h.f. monitoring are now over, those Numbers Stations which still operate are all the more conspicuous - many habitually appearing in relatively quiet bands allocated to a 'fixed' service which nowadays often consists of little more than the Numbers Stations themselves!

These are particularly noticeable when using a.m. or MCW Morse for even if we tune through the signal in a traffic break, we still can't avoid noticing the carrier. Once, in the days when virtually all voice Numbers Stations used pure a.m., these carriers were very useful, particularly in the much more crowded bands.

Numbers Stations are likely to be with us for some time to come on h.f., and special operations communications in Morse will continue to appear and disappear without warning. So don't give up listening - search the bands methodically - and don't forget to keep letting us know what you find.

■ LAWRENCE HARRIS, 5 BURNHAM PARK ROAD, PEVERELL, PLYMOUTH, DEVON PL3 5QB
■ E-MAIL: info.orbit@pwpublishing.ltd.uk ■ WEB SITE: http://www.itchycoo-park.freeserve.co.uk

Info in Orbit

Rarely have I spent so much time monitoring weather satellites, or, to be more specific, simultaneous transmissions of high resolution picture telemetry (h.r.p.t.) and automatic picture telemetry (a.p.t.). Since installing the new h.r.p.t. system, I have been building up a profile of my horizon, such as it is!

The tracking dish is positioned at ground level on the south-west part of the backyard where I believe it has the best reception potential. After several more weeks' operations, I expect to have it re-mounted near the roof eaves, following a kind offer from my antenna-mounting friend Frank Russell.

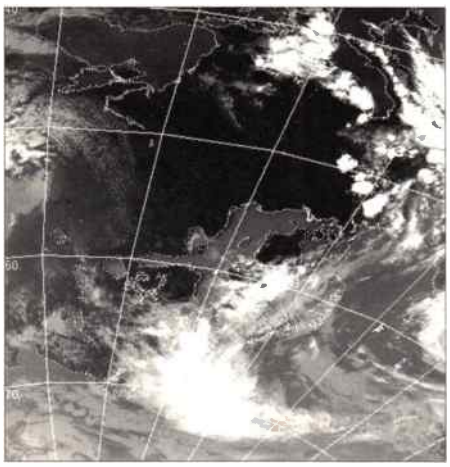


Fig. 1: SMIS h.r.p.t. image *NOAA-12* orbit 47129 - 1357UTC 10 June.

I can currently monitor images from near the top of north Africa, and up through central Europe. I see little of Scandinavia - except for small portions seen during westerly passes. Iceland is tantalisingly just within range on those passes where the satellite signal passes between roofs.

Satellite Monitoring - Why Do We Do It?

I was pleased to receive an E-mail from **Ben Ramsden**, commenting on my introduction paragraph in the June 2000 issue. I explained my preference to collect satellite imagery from the satellites, rather than via the Internet. Ben asks: "Why is it that we continue to toil receiving images direct from satellites, when downloading via the internet is cheaper, easier and usually gives better quality results?"

Fig. 2: *METEOR 3-5* 0845UTC 9 June.

Ben continues "I understand your motivation for continuing the 'difficult' way, I suspect that I am of a like mind. The problem is that potential newcomers to the hobby may not see it that way. The reason that I got into remote imaging was because I became aware of the means of obtaining pictures of the earth's surface from space, and wanted to try it for myself. Will many of today's potential beginners be similarly motivated if they can get better results quicker and cheaper via the internet? I fear not - the challenge has gone".

In practice, images available via the Internet are largely limited to WEFAX (transmission) formats, and highly selected regional h.r.p.t. images, with a few a.p.t. images. American universities and NOAA-associated organisations provide a reliable source of GOES east and west WEFAX (from *GOES-8* and *GOES-10* respectively). To collect these images continuously from the Internet would probably require a dedicated 'phone (or higher quality) line, and that would immediately add real cost to the project - even if connection access is freely available.

Images from the polar orbiters (whether h.r.p.t. or a.p.t.) are made available from certain sites such as SMIS - see **Fig. 1**. There may be some UK sources of comparable images of which I am unaware.

Russia's Space Monitoring Information Support laboratory publishes a schedule of h.r.p.t. passes from which they put data on the web - see **http://smis.iki.rssi.ru/data/today/sched_e.shtml** They are one of the most consistent providers of such images of which I am aware. Each significant pass of the three NOAA satellites is taken, and JPG images are made available shortly after, as in **Fig. 1**.

Personally, I delight in receiving GOES images direct from the satellite. The cost of occasional access via the Internet is low (I currently have free access during the evenings and weekends), but I don't want to tie up my telephone line for long periods and I certainly would not wish to pay for a second line.

Ben concludes: "I regard the Internet as a **huge** opportunity rather than a threat. Us 'remote imagers' must learn how to harness the opportunity that it presents and move forward. For me our challenge is to push the boundaries beyond what can be received via the net - to re-inject the challenge and excitement. My personal motivation is to build and operate portable systems which can be used in remote parts of the world to receive images which are not usually seen. But that's me, everyone must find their own source of enjoyment. Most importantly the hobby as a whole has to present itself as interesting and challenging to newcomers".

Current WXSATs

RESURS 01-N4 has been behaving a little erratically during May and June. This WXSAT usually transmits a.p.t. on 137.85MHz, but image quality has somewhat degraded in recent months - at least as received at my station. Others have also reported problems, particularly people monitoring the 'rig-l' WXSAT mailing list.

The satellite has apparently been switched off for variable periods. I noticed one non-transmission - so carefully checked the clock-time and the age of my Kepler elements (usually less than two or three days old!). Transmissions would usually resume an orbit or two later, and my impression has been that image quality improved after 'power down'.

On 9 June the first pass was so bad that I could not keep it for use as a sample RESURS image, one orbit later it was not transmitting. RESURS' orbit is sun-synchronous, passing south-bound during the afternoon and north-bound during the evening. Unusually for a 'METEOR'-type WXSAT, *RESURS 01-N4* transmits a.p.t. during (at least) the latter part of night orbits, albeit an empty picture! Again on 11 June, the main pass, at about 1100UTC, was not heard.

METEOR 3-5 has provided slightly better quality images on 137.30MHz, but many have various line faults, unfortunately spoiling an otherwise relatively high resolution image, see **Fig. 2**. This is not a raw image. The sensors on the satellite are optimised for cloud and snow - land is invariably dark. Moderate contrast enhancement of the darker levels can bring out considerable detail - subject only to the image quality itself.

Close examination of this image shows much line jitter, making it only suitable for general cloud monitoring. The satellite was launched in 1991 and is due to be replaced by the next generation *METEOR-3M*, currently scheduled for launch at the end of July.

The satellite's orbital plane continues to precess during June and July, changing the nature of *METEOR 3-5* transmission passes from morning rising to afternoon descending. As at 9 June, the times of maximum elevation passes are nominally 0815UTC for the morning

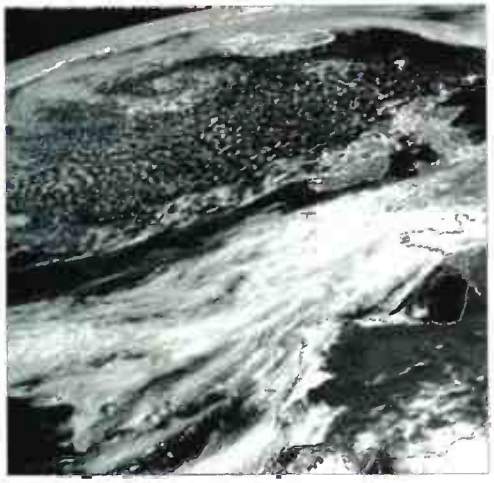


Fig. 3: *METEOSAT-7* WEFAX C02 format 24 May.

north-bound passes, and 1800UTC for the afternoon south-bound pass. The plane is always moving westwards, so passes move earlier in the day. Some 12 hours after the ascending pass, we see the series of south-bound passes. These are coming 'down' from the north polar regions in summer daylight, so the satellite remains transmitting during these evening passes. As the satellite rises, it approaches the evening twilight terminator, and cuts off abruptly. During following days, the satellite remains in sunlight for longer periods as its plane continues to move westwards, from late to early evening, then to afternoon.

Fig. 4: Italy - 1619UTC *NOAA-12* from Cedric Roberts.

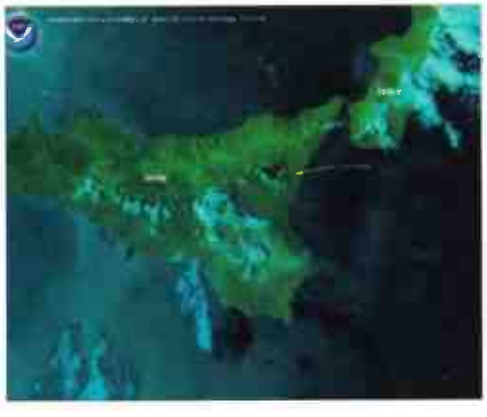


Fig. 5: Etna erupts: *NOAA-14* 1416UTC 1 June - OSE team courtesy NOAA.

NOAA WXSATs

With the three NOAA satellites providing continuous (24-hour) transmissions once more, we are spoilt for imagery. There are just two periods each day when all three satellites are 'elsewhere': after *NOAA-15*'s morning (and then evening) passes, there is a gap of a few hours before *NOAA-14* starts the ball rolling again.

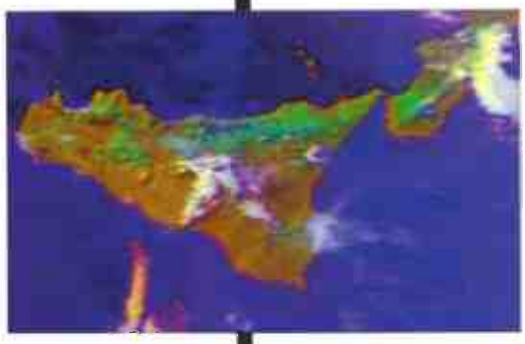


Fig. 6: Etna erupts: *NOAA-12* 1641UTC 1 June.

Correspondence

Several images came in from correspondents during May and June. Fellow Plymothian **Tim Healey** sent in **Fig. 3**, commenting on the unusual weather features seen off the south-west coast of Spain in this visible-light image. I presume they are clouds of some type.

Cedric Roberts wrote to me about his recent decision to "go h.r.p.t." despite his limited horizon - noting my similar comments. He wrote "I, too, have made a similar decision, and have recently installed an h.r.p.t. system even though the dish is at ground level and I too have a very restricted field of view". Cedric adds that he has "received some superb images, though access does not occur on northbound passes before 10, and southbound before 21". He enclosed an image of Italy - see **Fig. 4** - taken on June 2nd at 1619UTC from *NOAA-12*. His system is "part Dartcom and I have used David Taylor's ReadHRPT and HRPT geocorrect to give the image seen here".

Roy Hawkes of Harle Syke, Burnley discovered two WEFAX type transmissions and wondered whether any readers know anything about them. At his location (Burnley, Lancashire) he has found two frequencies having decent signal strength: 162.925 and 165.875MHz. These are presumably v.h.f. transmissions from terrestrial transmitters. Roy is using a standard scanner, having a 8kHz i.f. bandwidth. Roy wonders (as do I) whether anyone knows where these signals are transmitted from, and for whom they are intended.

Fig. 7: *METEOSAT-5* over Indian ocean - visible-light image 11 June 1020UTC.

Fig. 8: *GOES-E* visible-light format 10 June.

Etna Erupts

On occasions, when you look carefully at an image, you may see a significant feature such as a severe storm, usually much further south than Britain. It is easy to miss at least one or two events on any images.

As mentioned previously, I subscribe to the OSE (Operational Significant Event) team mailing list that sends an E-mail each day, recording any significant events wherever they occur. I retain my own images for

several days, as well as slowly accumulating an archive of images that are of particular interest.

In early June, Mount Etna, Sicily, erupted. Although I had collected an image of the area that very day - and even glanced at Sicily - I did not notice anything unusual. After receiving the OSE mail, I checked back to see an image that covered the region, and there was the 'hot spot' - see **Fig. 5** and **Fig. 6**. Most of my *NOAA-14* image from 1416UTC was behind the wall of the house, so I have included the OSE picture from that pass, and a later one of mine from *NOAA-12*.

Figure 5 was annotated by the OSE team to show the volcano. **Figure 6** is from my new Timestep h.r.p.t. system showing the *NOAA-12* pass, and is a multi-spectral image combining channels 1, 2 and 4 (visible-light and infra-red).

METEOSAT

When the Russian geostationary WXSAT GOMS failed, the end of GOMS data transmissions was inevitable, but at least long-term plans call for *GOMS-2* to be launched next year. Meanwhile, EUMETSAT has continued to use the GOMS slots previously allocated on *METEOSAT-7*, to re-transmit formats from *METEOSAT-5*, currently positioned over the Indian ocean. Pictures are transmitted in both WEFAX (low resolution) and PD (high resolution Primary Data) formats.

Fig. 9: *GOES-W* visible-light format 10 June.

Figure 7 is a Primary Data image from my own system; the satellite provides complete coverage of the region of India. Also transmitted from *METEOSAT-7* are whole-disc images (visible-light and infra-red) from GOES-east and west - see **Fig. 8** and **Fig. 9**.

I have included **Fig. 10** - a WEFAX image - to allow comparison of the image presentation. Common practice is to use a colour mask for WEFAX images to allow country outlines to determine the background colour. Comparison of this *GOES-8* image with the *GOES-E* (same satellite) whole-disc image from a few hours earlier, shows the same clouds a little displaced.

GOES-east and west WXSATs are separated in longitude, and transmit independent schedules. The WEFAX versions are sectored, but provide excellent detail.

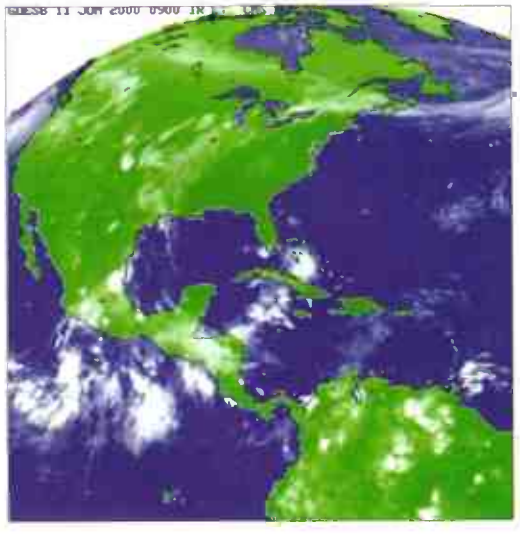


Fig. 10: *GOES-8* WEFAX - infra-red (LY) image 11 June 0900UTC.

Competition?

Although I cannot offer any prizes for this feature, I invite readers to identify the image in **Fig. 11**, taken from the *NOAA-12* pass at 1550UTC on 8 June. A clear sky over much of the region prompted me to select this area for those who enjoy puzzles. *SWM* hits the news-stands at different times on different days so I expect that a 'Shirley Sharp-eyes' with Internet access will be the first to get an answer in via E-mail.

Fig. 11: Geographical feature from *NOAA-12* pass at 1550UTC on 8 June 2000.

Shuttle Launch Schedule

Mission STS-106 (*Atlantis*) is the 4th ISS Flight (2A.2b) and scheduled for launch on 8 September 2000 at a time to be determined - depending on the current orbital data for the ISS. Orbital altitude 177 nautical miles and inclination 51.6°.

Mission STS-92 (*Discovery*) is the 5th ISS Flight (3A) and scheduled for launch on 28 September 2000 at a time to be determined. This flight is also under review. Orbital details as for STS-106.

A comprehensive listing of all Shuttle flights and payloads, together with associated information is available from me, at the address at the head of the column, as the *Shuttle Pack*. Please include £1.50 and stamped s.a.e. for the A4 booklet.

Kepler Elements - WXSATs, *MIR* and Shuttle

If you want a computer disk file containing recent elements for the WXSATs, AMSATS and others of general interest, together with a large file holding elements for thousands of satellites please enclose 50p with a PC-formatted disk and stamped envelope. A print-out is included that identifies NASA catalogue numbers for the WXSATs. The disk file is ideal for automatic updating of tracking software.

Frequencies

NOAA-14 transmits a.p.t. on 137.62MHz.
NOAA-15 transmits a.p.t. on 137.50MHz.
NOAAs transmit beacon data on 137.77 or 136.77MHz.
METEOR 3-5 uses 137.30MHz.
OKEAN-4 and *SICH-1* use 137.40MHz for brief transmissions.
RESURS 01#4 transmits a.p.t. on 137.85MHz.
METEOSAT-7 (geostationary) uses 1691 and 1694.5MHz for WEFAX.
GOES-8 (western horizon) uses 1691MHz for WEFAX.

■ JACQUES D'AVIGNON VE3VIA ■ E-MAIL: jacques@pwpublishing.ltd.uk

Propagation Forecasts

How to use the Propagation Charts

The charts contain three plots. The lower dashed line represents the lowest usable frequency (LUF), or ALF (Absorption Limiting Frequency). The chances of success below this frequency are very slim.

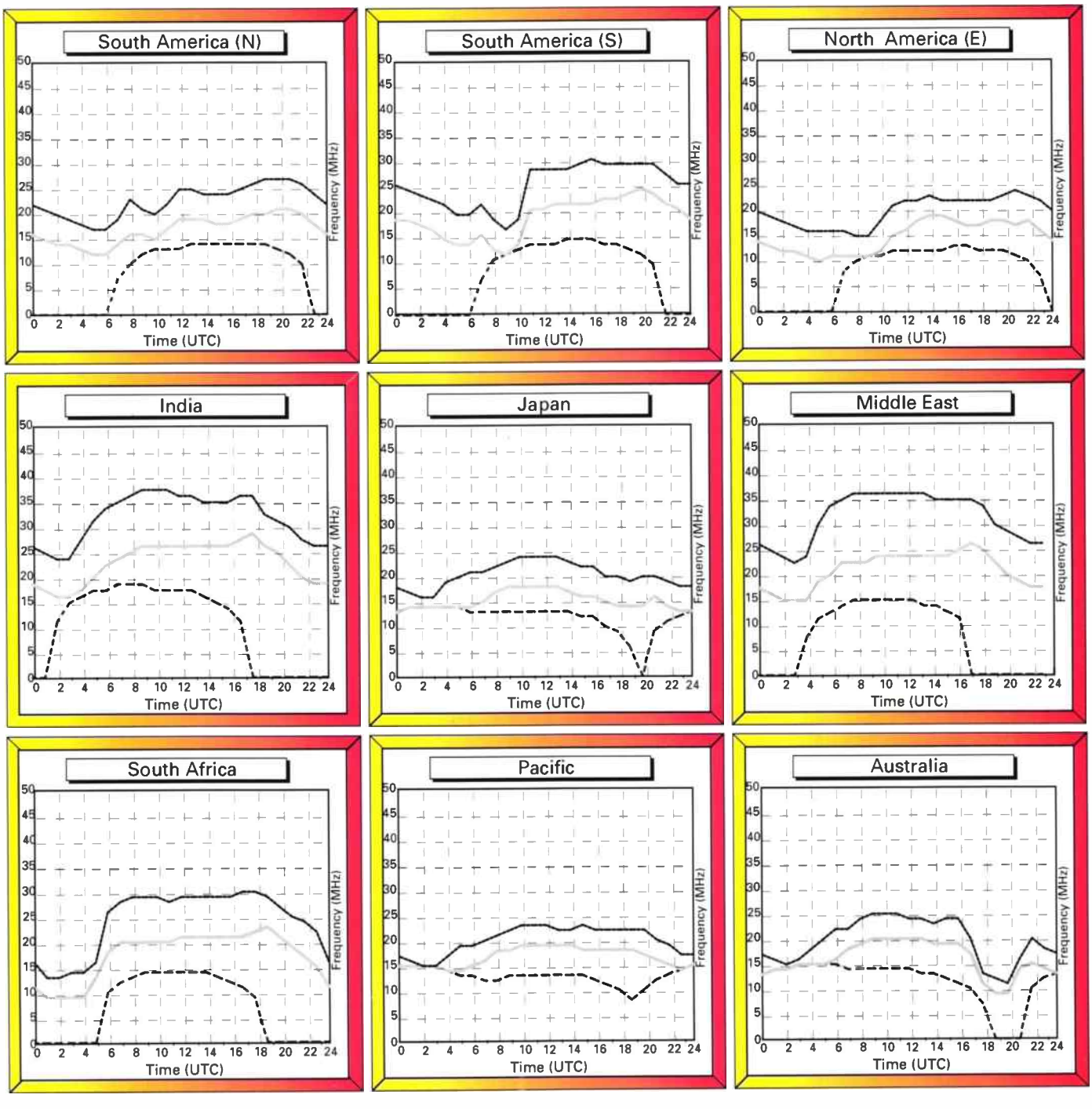
The middle line indicates the optimum working frequency (OWF) with a 90% probability of success for the particular path and time.

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.

August 2000
Circuits to London

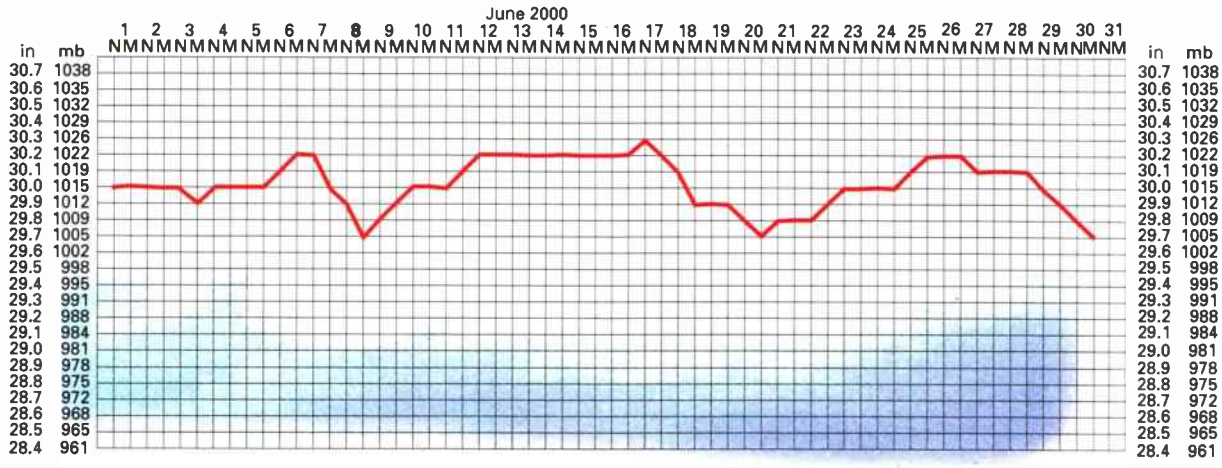


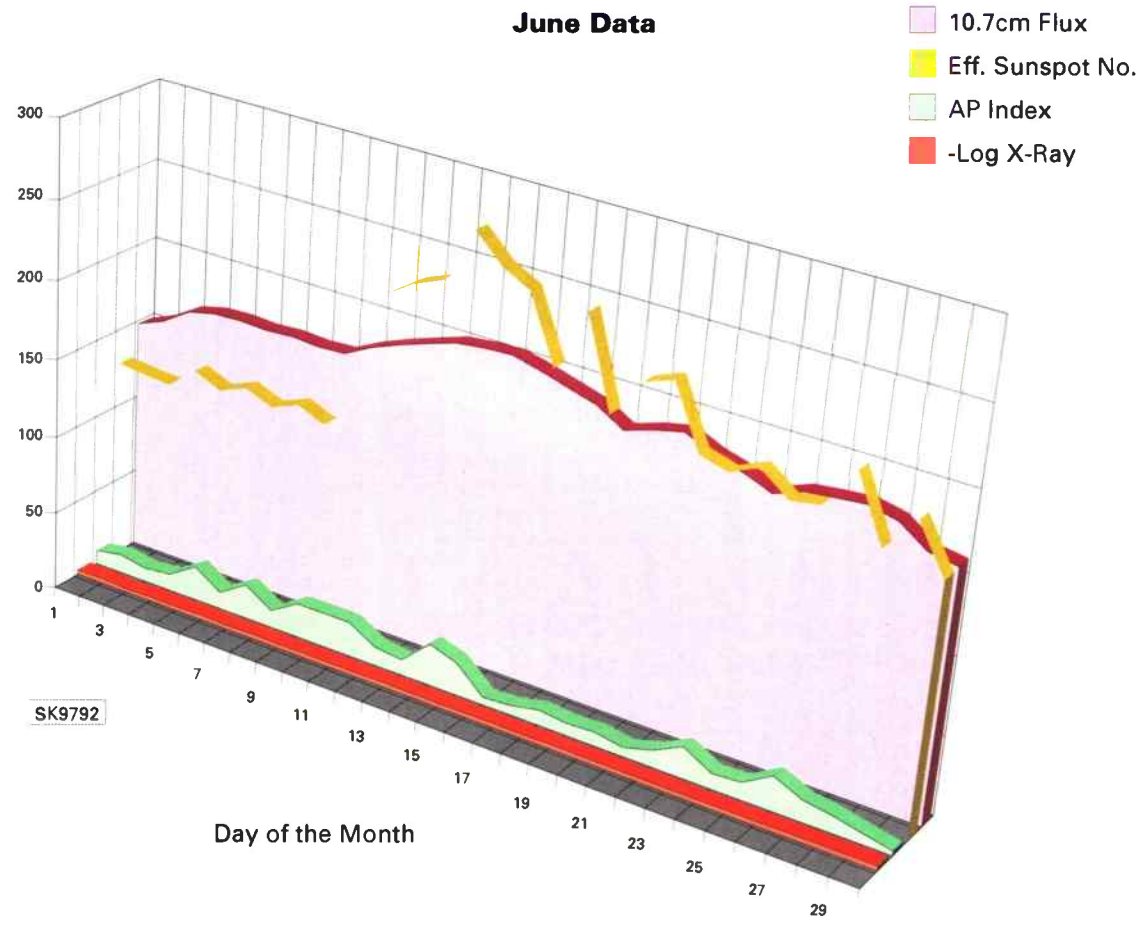
SK9791

■ KEVIN NICE G7TZC, SWM EDITORIAL OFFICES, BROADSTONE ■ E-MAIL: kevin@pwpublishing.ltd.uk

Propagation Extra

Ron Ham's barometric pressure chart, taken at Storrington, W. Sussex, June 2000.





guide to the chart

The 10.7cm solar radio flux is used as an indicator of the general level of solar activity.

The K and AP indices are measures of geomagnetic activity.

The K index ranges from zero (very quiet) to nine (severely disturbed).

K values of five or greater correspond to geomagnetic storm conditions that can relate to poor propagation conditions.

The AP index ranges from 0 to 400. An AP of 30 is the threshold for geomagnetic storm conditions.

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AOR AR5000+3, as new, with box and manual, £950 or swap for Commtel COM225 or PRO-2042 with cash adjustment. Fred, Barnsley. Tel: (01226) 750083.

AOR AR7030, as new, hardly used, as too advanced for my limited knowledge of receivers, £350. David, Maidstone. Tel: (01622) 737361.

AOR AR8000 hand-held receiver, a.m., w.f.m., u.s.b., l.s.b., c.w., still boxed with case, no offers, £190. Tel: (01267) 220977.

Commtel COM225 base scanner, new, boxed, receipt to prove, 25-1300, no gaps, 500 memories, a.m./f.m., w.f.m./n.f.m., squelch, tune, signal meter, pensioner, must sell, £150. FRG-7 h.f. receiver, £120, good condition. Tel: (01608) 662488.

Datong FL3 multi-mode audio filter, as new condition, with manuals, £40 o.n.o. Tel: 0114-247 1654.

FRG-8800 communications RX, manual, v.h.f. module fitted, plus extras, £190 boxed. Tel: 0121-445 4283 after 1800 any night.

Heathkit Mohican communications RX, mint, £150 o.v.n.o. Realistic 10-band stereo equaliser, £15. Five channel mixer (mains), £15. Maplin notch filter, £15. SG Brown dynamic headphones, £15. Digital timer, two settings, £15. Goodmans a.m./f.m. CD player, £25. AVO meter, (no leads), model 8/9 MkIV, £30. Mike Evans, Suffolk. Tel: (01986) 896658.

Icom IC-R7000 h.f. wideband receiver, 500kHz to 2GHz, excellent condition, with remote control, d.c. lead, instructions and full service manual, £525. Mike on (01592) 641530.

Icom R7000 h.f. receiver, good condition, £425 cash sale only. Will deliver up to 400 miles of Swansea. Tel: Swansea (01792) 896422, leave message and contact telephone number if no reply.

Icom R75, £495. AR3000A scanner, £350. Yupiteru MVT-7100 scanner, mint, £160, PRO-2026 scanner, £95, Global AT-1000 a.t.u., £30, Howes a.t.u. CTU9, £30, Howes antenna selector ASU8, £20. Zetagi antenna selector, £20. All excellent condition, all o.n.o. Tel: Warwicks (01926) 854556.

Japan Radio NRD-525, superb receiver, excellent condition and boxed, hardly used, £450. Ron Houghton on (01604) 770371.

JRC NRD-525 communications receiver, mint, boxed with manual, fitted with CMH-532 RS-232 PC computer control interface with programming manual (frequency, mode, bandwidth, a.g.c., attenuator, memory channels), £500 o.n.o. Tel: Bucks (01753) 885163.

JRC NRD-545 d.s.p. receiver, 10 months, as new, accept £750. Ken Kaye, Lincs. Tel: (01724) 783195.

Kenwood R-5000 h.f. receiver, immaculate, demo on site, £400 o.n.o. Tel: Soton (01489) 790934 or (07803) 597761 daytime.

Kenwood R-5000 receiver, computer interface, magnetic longwire balun, KEF C15 monitor, *Hoka Code3* signal decoding system, *Scancat v.5* scanning software, offers around £375. Tel: N. Kent (01634) 362066.

Optoelectronics micro counter with matching mini antenna, boxed, as new, £40 inc. postage. Tel: (01255) 502996.

Private collection of receivers: Collins, Drake, Eddystone, Racal, Plessey, RCA, Heath, HRO, Hammarlund, XWD, Hallicrafters, also transmitters, hi-fi, testgear, check www.riola.com for full listing. E-mail: radio@riola.com or Tel: 028-2588 0740 or FAX: 028-2588 1955.

PRO-2042 base scanner, 1000 channels c/w manual and boxed, v.g.c., £125. Tel: Essex (01268) 475124.

Sony ICF-SW100E latest version short wave radio, pocket size, as new, unwanted present, paid £199, sale for £129, headphones, booklets, boxed, receipts, unused. E-mail: hillkatharine@aol.com or Tel: 0118-948 3965.

Yaesu digital GC receivers: FRG-7000 and FRG-7700, £120 and £150 respectively - both are in first class condition and have original manuals, prefer buyer to collect. John, Lancs. Tel: (01995) 606137.

Yaesu FRG-7 with manual, good condition, £85. Matsui MR4099 f.m.-l.w., m.w.-a.m., 150kHz to 29.999MHz, good condition, £30. Battery, mains, bought FRG-100. Wilkinson, Preston. Tel: (01772) 311709.

Yaesu FRG-8800 h.f. receiver, a.m., s.s.b., c.w., f.m., narrow/wide, plus v.h.f. 118-174MHz, superb world-wide reception, £260. Derek, Devon. Tel: (01803) 326797.

Yupiteru VT-125 airband receiver, c/w charger, NiCads, car cord, antenna, instruction book, boxed, £75 o.n.o. Tel: Norfolk (01953) 662852.

Wanted

Icom R9000 receiver. Tel: Warwicks (01926) 854556.

Kenwood SP31 speaker, AOR AR3030 communications receiver, vendor must be able to deliver receiver to Middlesborough. Stuart on (01642) 211685.

R1155 a.m. identification serial number plate from below dial tuning knob. Ron on 0208-508 2306.

Signal R535 receiver in good working condition. Tony on (07803) 317365.

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