short wave magazine

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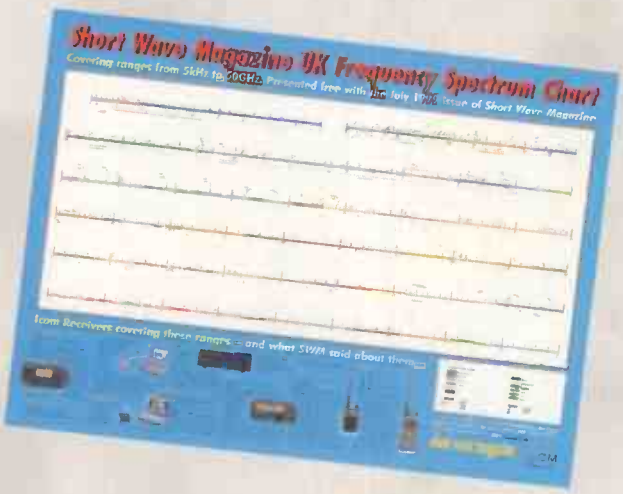

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Scan Speed....25 ch/sec
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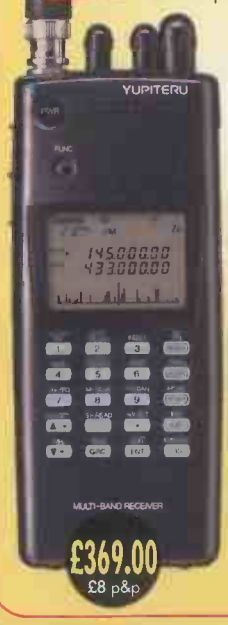

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  5, 6.25, 10, 12.5, 25kHz
- *MEMORIES:* 200
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- *PRIORITY CHANNELS:* 10
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JULY 1999 Issue

short wave

Free Gift

Monster Wall Chart. Pull-out and keep.

BROADCAST

Features

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Short Wave Magazine

Other Features

Regular Columns

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Components For *SWM* Projects
In general all components used in constructing *SWM* projects are available from a variety of component suppliers. Where special, or difficult to obtain, components are specified, a supplier will be quoted in the article. The printed circuit boards for *SWM* projects are available from the *SWM* PCB Service, **Badger Boards, 12 Hazelhurst Road, Castle Bromwich, Birmingham B36 0BH, Tel: 0121-681 4168**. A small catalogue containing components, projects and p.c.b.s is available, free, to anyone sending **Roy** or **Sue Martin** an s.s.a.e.

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

Amazing stuff adrenalin. I've been surviving on it for too long now. At least the new Editorial residence is now ready to occupy as of tonight (as I write this). Putting magazines together and gutting and refurbishing houses are not very easy bed fellows. Both require large amounts of dedicated time. Also to compete for available time there's monitoring the bands. Well, as the shack is still a greenhouse, guess which activity lost. Unfortunately my monitoring activities have taken a back seat. What I find suprising, is that all those spot frequncies that you carry around in your head, soon disappear without the need to either spin the dial or punch the keypad to listen in. I'm really hoping that everything just clicks back into place when I get the greenhouse converted. It may be some weeks yet, it'll be well worth the wait when the conversion is complete. I should end up with the radio room of my dreams. I might even end up with a Faraday Cage built-in - so all good thing do come to those who wait.

To make all this happen, I'm going to have to brush up on my brick laying and concrete mixing skills. Thought I've already remastered the art of reversing a four wheeled trailer so I'm pretty optimistic on all fronts.

All Around The World

Sadly, this month we say good-bye to our Editorial Assistant Alison Frith. Alison has decided to embark upon a trip around the world. She is planning on travelling for 12 months, her first destination is the continent of India.

Unfortunately, she tells me there is no room in her rucksack for some radio gear, so I guess we won't be getting a stream of logs from exotic DX locations - shame! Please join me and everyone at the Editorial Offices here in Broadstone in wishing her well. Have a safe and enjoyable expedition Alison.

Free Gift

In the centre of this month's *SWM* you'll find a very handy wall chart. With this spectrum chart you can see at a glance UK frequency allocations, make sure you find a suitable place on a handy wall. Sorry, but to enable us to present the information in a clear readable way it is a bit big. Icom (UK) Ltd. were very kind in sponsoring the chart so a big thanks to them for their part.

Competition

The eagle eyed amongst you would have noticed that last month, in Part 1 of the competition, we suggested that as h.f. radio was dead, that you should attempt to win the NRD-345 reciever and the ALA 1530 antenna. The key word, "not", went AWOL thus somewhat changing the meaning of what was being said. Truth is there is lots of interesting things to listen to. If I were you I'd make sure I got my entry off just as soon as possible. Part 2 of the competition is on page 59.

Good luck and happy listening.

Kevin Nice

Dear Sir

I am hoping that perhaps one of the magazine contributors could come up with what I would think would be the ultimate 'gadget' for any s.w.l. who is suffering high noise levels from the curse of the listener - the TV - especially like myself - relative beginners who live in blocks of flats where the TV generated noise can be ridiculously high. I am thinking of an article on practical ways to cure the TV problem where possible by the use of an easily 'home brewed' suppresser that could be fitted as easily as possible, because not every neighbour would appreciate someone fixing resistors and capacitors in series with their mains plug or TV set. An article on how to construct and fit one anyway, would be invaluable in those cases where the neighbours are not of the variety from hell.

For many s.w.l.s, particularly flat dwellers, advice on how to get the shortest effective antenna into the smallest possible spaces and unusual ways of getting them as high a possible in restricted 'air-space' would be most helpful as well, though I believe nowadays the noise problems are the most pressing, and any advice would be invaluable.

Anyhow, thanks for the excellent magazine - the production quality has gone right up and the design, but especially the printers deserve praise - the colour reproduction is excellent, particularly the inside cover ads, now the cover is run on heavier stock - the covers now **stay** on after heavy handling over time.

I am sure I'm not the only one who really enjoys JW's articles - the reviews of the commercial receivers were extremely interesting, and I thought that after the review of the Racal RA1792 an excellent follow-up would be a review of another commercial Racal, the RA3791 - I think its one of the latest DSP equipped current models, but surely with the resources of *SWM* it would be an easy thing to buy one for review! The Hi-Fi magazines manage to get hold of some of the top equipment in their field? Only joking, of course, but then it would make an interesting review from JW.

Shaun Read
Kent

P.S. I have found a really nasty, very deep humming, motor-boating sound with some high frequency content also that begins at 30kHz and at 30kHz spacing across most of the h.f. spectrum with peaks of 59 almost, between some points such as 500kHz - 3.0MHz, 4.4 - 5.5MHz and 7.6 - 9.5MHz; is this TV noise? Has anyone any ideas? I've tried to locate it but it's in all the wiring of my flat! Any ideas would be extremely well received.

Sounds like TV line time base to me. As for a guide to interference avoidance reduction, watch this space... **- Ed.**

Dear Sir
I wonder if you could help me. I am a senior citizen and a short wave listener. I have an Icom R-71E receiver with a Datong active antenna indoors. I have just been given a Joymatch, a three section pole, with a black box with 'Joymatch' marked on it. On the front of it there are two knobs with '0 - 10' marked on the casing. A slide switch underneath the knobs at the top is, I think, for tuning the frequencies. On either side there are two openings for a connection and under the right hand side there is another opening with red plastic cover protruding from it. I wonder if you could enlighten me as to what these connections are for, and would it be of any use to me?
John Cherry
Glasgow

*John, you have an example of the, now extinct, '70s antenna for small locations. In my opinion, it has much in common with its latter day passive cousins, "it ain't worth a light". If you're stuck for space, stick with the Datong. If you can, locate it outdoors. - **Ed.***

Dear Sir
I have, in recent weeks, been thinking about either changing my scanner (a Yupiteru MVT-5000), or purchasing further equipment with a view to expanding my horizons to encompass h.f. Enquiries in the appropriate Internet newsgroups suggested the purchase of *SWM* with a view to checking out the lay of the land.

I must admit I was thoroughly fascinated by the whole magazine. As an ex-Merchant Navy navigation officer who has a keen interest in aviation and computers, I found I was in my element, so to speak.

I found the magazine contained numerous interesting and informative articles, the contents of which never talked down to the reader, despite some of them being of an obvious educational or instructional nature. As for the 'Airband', computer and marine articles? Well, what more can I say?

I look forward to the next issue with pleasure.
Mike Brown

Dear Sir
I am writing with regard to an old program which was written to control the AR300 with a PC. The software is called *Acepac3*, and was written by AOR. The problem I have is that this program is quite old, and AOR do not sell this software anymore. I was wondering whether, through yourself or your readers, I could obtain information about this software, possibly through a private sale.

I have been in contact with AOR and as I have stated it is unavailable. I hope you can help me on this matter.

Yours Hopefully.
David Whitehead
david.whitehead1@virgin.net

Dear Sir
I have been a short wave listener for about 12 years now and I really enjoy searching the bands for interesting s.s.b. signals - mainly amateur, marine and air transmissions, but also occasionally a.m. broadcast.

Recently I had listened for about three hours without problems, and as I was about to have a break for lunch, I went to turn down the volume on my AOR AR7030 and promptly received a shock from the set. There was a hail shower outside at the time, and I immediately suspected that a charge had built up on my 30m longwire on the roof about 10m high - got another shock as I switched the set off and another as I attempted to disconnect the antenna. I quickly got hold of some rubber, disconnected the antenna, and earthed it via very thick insulated copper cable connected to a 1.1m ground stake - this caused a further mild snap as the current discharged to earth.

I consider myself lucky not to have lost my precious rig, it happened so quickly and nothing like this has happened before. So beware all you listeners - take precautions, our hobby can be dangerous.

Thanks for your excellent magazine.

*(See comments below, right - **Ed**)*
Carl Mogensen
Colchester

Dear Sir
You have clearly reached the limits of idiocy with the scanner column in the latest issue in taking up space to deal with connecting a television aerial to a scanner. Who on earth is the magazine aimed at? Do you seriously expect radio hobbyists to continue buying a magazine aimed at utter simpletons? (I didn't buy it, I just took a peek in the newsagents, I gave up after the CD fiasco, see below).

In employing amateur columnists who know little of their subject and consequently address themselves to an audience who know even less, do you seriously expect hobbyists to waste their money on such inane drivel?

Can you imagine magazines catering for other hobbies surviving if they had the same attitude? Photography? Computing? Motoring? Fishing? Cooking? You name it.

And you have the impertinence to increase the price; to charge an extra £1 plus for the last issue was nothing short of disgraceful, considering that the CD was totally without merit. It was binned in this house on the day of purchase.

You are the Editor and what are your qualifications? You know little about the hobby. The magazine is a classic case of the blind leading the blind. Columnists should know more about the subjects than the readers, this is basic common sense.
Anon

Shame you don't have the courage to identify yourself. It would then be possible to enter into dialogue with you in a less public way. At first I thought you must have written to the wrong magazine, but as you correctly identified the CD issue, this is not the case. We have writing for SWM ***authorities*** *in their respective fields. We have very few professional authors that contribute, but for this kind of specialist magazine catering for a **very** specialised interest group, that is only to be expected.*
For my part, I have been, and continue to be, an active s.w.l. since the late '60s. I have been involved in professional communication activities and my qualifications are electronics related.
Regarding the CD, a very significant number of additional readers bought the April issue, and supplied very favourable feedback. Draw your own conclusions. Perhaps you didn't read my Editorials in the February and March issues of SWM *regarding the logic of the increase in cover price for that issue.*
*I'm happy that you feel this strongly to write with your views. This seems not to be the actions of a deserter. - **Ed.***

TOP QSL

Dear Sir
I was interested to read one of the letters two months ago about the gentleman who managed to tame his AOR AR7030. If anyone would consider publishing an 'idiots guide' to this great machine, I would suggest there would be a large number of people who would be prepared to spend around £20 to get the full benefit from this great radio. Whoever wrote the current Users' Guide deserves being reported to the campaign for plain English (' I am surprised they haven't been).

As a fairly new couple to both scanning and listening we took great delight in visiting last year's Bristol show. Unfortunately, because of family commitments we couldn't get there until the last hour. We were charged full price and at least one third of the trade stands had packed up and gone, and another third were packing up. People who man these venues should be there for the full span of the event.

Finally, I think you should have a beginner's rolling column so that all subjects relevant to new listeners get covered in a very basic way at least annually. By this, I mean articles that are written for absolute beginners with no prior knowledge to any radio jargon or subject.

One thing that surprised me in radio circles is that the BBC World Service is being run on a reduced budget and is under threat - this does not appear to have been mentioned by *Short Wave* or any other magazine in the UK. If we, as a group, remain silent when such serious changes are happening in our own country, could we be surprised if world-wide interest in this media disappears?
Lawrence Gunn

*Peter Shore has been keeping us abreast of developments at the 'World Service' for some time now. Keep your eye on 'Bandscan Europe' for the latest news - **Ed.***

Antennas, can kill!
*Words to this effect are found in most beginner guides to listening. This message is often featured in this magazine. I'm surprised that your 'earthed' receiver yielded you a shock. I would check your earthing arrangement. During storms, it is always best to earth your antenna and both disconnect and switch off your receivers. It is very easy to destroy both semiconductors and wire wound components inside your receiver. Of course, this next statement is obvious, isn't it - **never touch antenna wires** during said storm - **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.

Your News

Don't forget to keep sending me information on your new products, (*photographs a definite must!*), as soon as details are released, together with any information on Open Days, Special Offers, New Catalogues and general items of news. Remember, mentions are **free**, so don't delay, send off your news today!

Bumper Weekend

Following the success of the May open weekend, **SMC Ltd.** at Southampton are holding another bumper weekend on the **17/18th July**. After a reorganisation of the stores, many new products have been uncovered and will be sold off at totally silly prices.

Open from 0900 till 1700 both days, this is a weekend not to be missed! Direction details can be obtained from **Geoff Brown** on **023-8024 6222.**

Radio & TVDX News

The 'Allied Voice Radio and Television' began propaganda broadcasts into Serbia from suitably equipped EC-130 Hercules aircraft of both radio (m.w. 1003kHz @ 10kW), v.h.f.-f.m. (87.9 and 106.4MHz) and ch.21 TV between approx 1000 - 1400UTC. Congratulations to the British DX Club for producing a very detailed and well timed account of broadcasting/mil comms over the Balkans in their May 1999 issue of *Communication*, (enquiries on E-mail: **bdxc@bigfoot.com**)

There are three applicants for the first digital audio broadcasting (DAB) multiplex licence to transmit across London in Band 3 - these are MXR London; Switch Digital and CE Digital, the Radio Authority will make their decision by July, a second DAB multiplex for London will be advertised late '99. Meanwhile, CE Digital have been given the DAB multiplex licence for the Birmingham area, the sole applicant.

NTL are expanding internationally, they've bought the National Transmission Network of Australia, comprising over 560 transmitter sites which radiate the ABC, SBS and various commercial channels, together with telecom/data information services across Australia. NTL have also recently purchased the Irish 'Cablelink' cable TV service that has 360000 subscribers in the Republic.

Digital terrestrial TV (DTT) is now on test in Germany with two multiplexes operational in the Niedersachsen state, the NDR operating out of Hamburg carries public service broadcasts from NDR, ZDF and ARD, the other multiplex operated by Deutsche Telekom, Hannover offers various private/commercial TV services. The French government is recommending that six of the present terrestrial broadcasters be given DTT multiplexes to run, each having between six to eight channels, a bill goes before their parliament this Autumn ratifying the move into DTT.

TF1 are advanced with plans for their service with a dedicated TF2 youth channel and contributions from France Television and M6. DTT is also being taken up in S.E.Asia with Korea intending to open a digital service from 2001, tests start next year. Japan reckon a start time

World's Smallest Radio

Adding another landmark to his 30 year track-record of mass-market inventions, Sir Clive Sinclair has launched the world's smallest a.m. radio, the Sinclair Z1 Micro AM radio, bringing listeners their favourite a.m. station - local, national or commercial - when and wherever they are.

Priced at £9.95 (including P&P and VAT), the new radio is the size of an acorn. It fits discretely in the ear while delivering full performance across the m.w. band (530-1600kHz).

The result of two years' research and development, it incorporates a unique Sinclair Research circuit. Ultra lightweight, it weighs just under 14g.

Supplied with a choice of antenna - integrated, rod or wire - the Sinclair Z1 is powered by a tiny SR44 silver zinc button cell. Widely available high street outlets, this lasts approximately 40 hours. The Sinclair Z1 is constructed in a robust ABS plastic and complimented by a special keyring carrycase.

"Developed primarily with news and sports listeners in mind, its radical design means that you can walk, run, watch sport - even dance - without fear of it getting in the way" comments Sir Clive. "Sitting snugly and comfortably in your ear, it will enable you to listen to your favourite station wherever you are and so discreetly that even the person sitting next to you will be unaware that you are using it".

Complete with battery, keyring, carry case and a one year guarantee, the new Sinclair Z1 Micro AM Radio is available direct by mail order only from **Sinclair Research (01933) 279300** at only £9.95 inc. P&P.

Special Event Report

Back on Saturday 24th April 1999, a very successful celebration occurred when Principessa Elettra Marconi, daughter of Guglielmo Marconi, came to Dover as a guest of honour to observe the historic re-enactments of the first transmissions of wireless messages between Wimereux, just north of Boulogne, and Dover, made by her father 100 years ago.

The first cross-channel wireless message was sent by Marconi from Wimereux to the South Foreland Lighthouse on the 27th March 1899 and this message was repeated by the Radio Club of Wimereux to the White Cliffs Experience, the Dover venue for the celebrations. The message (sent in Morse code) was "MARCONI SENDS M BRANLY

Principessa Elettra Marconi talking to ATV Presenter David Harding G0DQI, after having been presented with a bouquet by novice student Daniel Ashby. Standing behind is Ian Keyser G3ROO, who re-transmitted and received the original messages exchanged between Edouard Branly and Guglielmo Marconi 100 years ago. Picture by Hugh Burton G0WWQ.

HIS RESPECTFUL COMPLIMENTS ACROSS THE CHANNEL THIS FINE ACHIEVEMENT BEING PARTLY DUE TO THE REMARKABLE RESEARCHES OF M BRANLY". The reply was made from Dover: "GREETINGS FROM DOVER WHERE PRINCESS MARCONI IS WATCHING THE ACHIEVEMENTS OF HER FATHER RECREATED A HUNDRED YEARS LATER".

A second re-enactment then took place to acknowledge the use of wireless to send a distress message from a ship at sea. Then there followed an

exchange of messages between the Chairman of the Dover District Council and the Mayor of Wimereux, then by Principessa Marconi herself and Mme., Tournon Branly, the grand-daughter of Edouard Branly who had worked with Guglielmo Marconi and in particular developed the receiver coherer.

These messages were transmitted live between Dover and Wimereux (via a relay positioned at Dover Castle) by members of the Kent Television Group. The fact that Amateur TV signals were being exchanged on microwaves (at 10GHz) between England and France itself was an international first for Amateur Television.

In the afternoon, Principessa Elettra Marconi returned to Wimereux and Dover was equally proud to host distinguished guests, including Hilary Clayton-Smith G4JKS and Don Beattie G3OZF, President and Vice President respectively of the Radio Society of Great Britain, the Mayor of Deal and the Secretary of the Herne Bay/Wimereux twining Association.

Special event stations were established at Wimereux with the callsign TM1CW and at the White Cliffs Experience, Dover, with the callsign GB100MAR. The stations were established to operate over a found day period which included International Marconi Day, and thanks to Richard Strafford G3MRT for including Dover Radio Club as a participating station.

(L-R) Regis Vincent, founder and President of the Marconi-Branly association in Wimereux; Cllr. Bill Newman, Chairman of Dover District Council; Principessa Elettra Marconi; novice student Daniel Ashby, Josie Reeves; Ian Keyser G3ROO (seated), Vivian of Hilderstone, novice student Greg Miell; and David Harding G0DQI, who 'hosted' the proceedings throughout the day. Picture taken by Brian Cuff G4SAU.

Hilary Clayton-Smith G4JKS President RSGB speaking to her French counterpart via the live ATV link to Wimereux, L-R Cllr. Jim Rees, Mayor of Deal; Mrs Hood; Cllr. Jim Hood, Deputy Mayor of Dover; Daniel Ashby; Hilary Clayton-Smith, David Harding G0DQI; Greg Miell and Ian Keyser G3ROO. Picture taken by Brian Cuff G4SAU.

Visitors were able to witness the recreation of experiments proving the existence of wireless waves in vividly illustrated lectures by Dr Ken Smith G3JIX and to view displays of vintage radio equipment, as well as the latest DART and SDH systems produced by Marconi Communications. External exhibits were made by the Signals Unit of the Territorial Army, and by the Dover Squadron of the ATC.

Taking part in GB100MAR were the Dover Radio Club, the East Kent Radio Society, the Hilderstone Radio Club and the Kent Television Group, and thanks are due to all participating members of these clubs for the work put into organising and running this special event.

Thanks also go to: The White Cliffs Experience (for providing the venue and Dekotron of Dover for supplying the TV/Video monitors used in the White Cliffs Experience), Costumes and Clobber, Dash Computers, Dover District Council, Icom UK, Powell Print, S&B Van Hire, Smye-Rumsby and Unicom Ltd. for sponsorship. The Dover Transport Museum, The International Electronics Museum of Hove, the Police Museum of Chatham for displaying historical artefacts.

Thanks also to Dr Ken Smith G3JIX and Ian Keyser G3ROO for the historical demonstrations and re-enactments, Marconi Communications for their display of state-of-the-art communications, the 354 Dover Squadron, ATC and the Territorial Army for their external displays, The RNLI, Remote Imaging Group, Icom UK, RSGB, Goodwin Sands Potholing Clubs for the exhibits and finally to the members of the Amateur Radio and Amateur TV clubs and groups who assisted with the various facets of this very successful event.

for DTT will be between 2000-2003 and Singapore are currently deciding on technical parameters for a future service.

The Local Independent Television Network, the group representing RSL-TV stations, has been unable to gain extensions to their already agreed licences beyond the two year period, this would have provided a longer operating period and to gain sufficient funding to run a viable local service. Of the 13 RSL-TV licences already granted, only the Isle of Wight's 'TV-12' and 'Lanarkshire Television' have come onto air.

Thailand's first interactive digital TV service will open late Autumn '99 offering Vision on demand, music on demand and various computer/data and interactive services. The 'Broadcasting Network Thailand' (BNT) digital service is being managed by the UK's 'YES-TV' and Thai's 'Thai Interactive Television' (TITV).

And finally, reading in the German *Tele-Satellite International* magazine June/July '99 issue an article on global positioning systems (GPS) and how they work, I was interested to note that the satellites providing the service are orbited by the US military. Each satellite offers both military and civilian positioning, the former reckons an accuracy of 3m, whereas the civilian version - operating at 1.57542GHz - is downgraded to 100m.

In times of the US at war (and one must assume the Balkans qualifies), the downlink is further degraded to a 300m GPS accuracy to ensure that the enemy cannot use GPS accurately in attacking the US forces.

MWARS Closed

Due to the lack of support and the inability of the committee to agree on corrective actions, the club Military WARS, known as MWARS, has closed down. **John F.H. Taylor-Cram**, founder, would like to thank all those who gave their support.

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.

June 27: The Tir Conaill ARS (Ireland) are holding their annual Radio & Computer Fair in Jackson's Hotel, Ballybofey, Co. Donegal. Doors open at noon. There will be all the usual trade stands, with some new ones, a Bring & Buy stand and free parking will be available at the Hotel. Refreshments will also be available. **Gerry EI8HO** on **(072) 52598** (home) or mobile on **(086) 8391305.**

***June 27:** This will be the 42nd consecutive Rally at Longleat House. This large trade show, housed in five huge marquees, is a major attraction for all Radio, Computer and Electronics enthusiasts. The Craft Fair will once again be there, and there will be plenty of on-site catering. A major change this year is that the traditional **Bring & Buy will be replaced by** an equally worthwhile **Table-Top Sale.** Hire a table for the day at **£24**, sub-let or share with a friend if you wish. **Tables cannot be booked inadvance.** All enquiries and bookings to **Gordon Lindsay G0KGL** and his wife **Maureen**, with **Ron Ford** dealing with matters not directly affecting Traders. The combined telephone and FAX number is **0117-940 2950.**

July 4: The 10th York Radio Rally will be held in the Knavesmire Building, York Racecourse, York. Doors open 1030 and admission is **£2.** Children accompanied by adult free. There will be ample free parking. Features include Amateur Radio, electronics and computers, Morse tests and repeater groups. Refreshments will be available and a licensed bar, too. Talk-in on S22. **Pat Trask G0ORF** on **(01904) 628036.**

July 5: The Basingstoke ARC have a number of events going on in July beginning with a Club Night on July 5 which will include a talk by Frank Heritage MOAEU on the 19th XR3J World Scout jamboree in Chile. The talk takes place at the Gems Sports and Social, Lister Rd, Basingstoke, Hampshire, 1930 for an 2000 start. More details on the talk from **Bob Brown G7PKD on (01256) 461306** or S20 on the night. On July 25, they will be holding a Fox Hunt, map and further information from **Clive G4ODM** on **(01256) 325050.**

July 11 The 19th Sussex Amateur Radio and Computer Fair will take place at the Brighton Race Course from 1030-1600. There is free on-site parking and admission is **£2.** The rally is one of the largest in the South of England with well over 100 trade stands covering Amateur Radio, Computers, Electronics, etc. There will also be a large Bring & Buy display area, refreshments and bars at reasonable prices, a picnic area with views over the South Downs. Further details on **(01323) 485704.**

Continued on page 9...

CARS

The **Coventry Amateur Radio Society** meet every Friday at Binley Church Hall, Brinklow Road, Coventry, commencing 2000. Visitors are always welcome.

A few up and coming events are: June 26 - is Night on the Air, v.h.f., h.f., Packet and c.w., July 2 - Indoor DF competition, 9th - Night on the air, 16th - Portable night on the air. More information from **Robin Tew G4JDO** on **(01203) 673999**.

Sandwell Improvements

The **Sandwell Amateur Radio Club** are pleased to announce that following a grant from Sandwell Council's Seedcorn project, they have been able to carry out improvements to the club premises to aid accessibility for disabled members. These include adding a ramp access to the building and modifications to toilet facilities.

The club building, which is undergoing further refurbishment by members, is situated at The Broadway, Warley, in the West Midlands, approximately five minutes drive from junction 2 of the M5 and 15 minutes from Birmingham City Centre, and consists of its own dedicated shacks for h.f., v.h.f./u.h.f. and also its own packet station, as well as a kitchen and general meeting room.

Meetings are held three nights a week - Monday for general get togethers, Wednesday for Morse classes and Thursday for RAE classes. Further details from **Martin G2BXP (Chairman)** on **0121-552 4902, Archie G4OJJ (Treasurer)** on **0121-532 7039** or from **Clive G0TVR (Secretary)** on **0121-429 6061**.

Meeting Of The Peoples

The Asian communities of South London are to have their own programmes on SOLO.NET when it goes on air next Christmas. SOLO.NET, a community media project for south west and south central London, has won a licence from the Radio Authority to broadcast on f.m. in this area in celebration of the new millennium, and they go on air on Boxing Day.

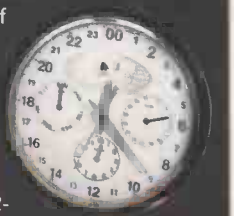
Asian Projects Co-ordinator **Bobby Chatterjee** says "SOLO.NET is committed to social inclusion and this means that all the many South Asian communities here are to have a daily three hour programme on the station, called SOLO.NET SANGAM". Sangam is Hindi for the meeting of the rivers or of the peoples. As well as a daily programme in English and a number of Asian languages, members of the Asian communities are being invited to take part in all aspects of running the station.

Training will be provided and anyone wanting to take part should contact SOLO.NET on **0181-401 1895** or write to: **88 High Street SW19 2BT**.

New Products

Waters & Stanton PLC are introducing several new products to their range. First up is a new range of Nickel Metal Hydride Batteries, under the name of Nexcell, available in packs of four AA or four AAA with a dedicated charger available separately. Retail price of all three items is £9.95 each and these cells have the advantage of high capacity, no memory effect, no initial charge required with longer shelf life and recharging up to 500 times.

MFJ have also introduced two new large analogue clocks, models 115 and 125, which sell for £29.95 and £34.95 respectively. The MFJ-115 is a 24-hour quartz clock, with a full 24-hour dial format. Premier cities are shown on the trim, and a world map is shown on the face of the clock, which is 305mm in size. The MFJ-125 is also a 24-hour quartz clock, with a full 24-hour dial format. However, this clock also shows the separate day, month and 12-hour movements, and all dials are independently set. The size of the clock is also 305mm.



Cushcraft Corporation of the USA are also complimenting their popular X7 and X9 Thunder Series beam antennas with a 40m add-on kit for each model. Retail price of both kits is £189.95 and these items are now in stock.

More information about all of the above products is available from **Waters & Stanton PLC, Spa House, 22 Main Road, Hockley, Essex SS5 4QS, Tel: (01702) 206835/204965, FAX: (01702) 205843.**

Increase In Digital Choice

Five more radio services are now on the air via DAB Digital Radio in London following the switch on of the Castle Transmission International/World Radio Network DAB RSL at Crystal Palace. These stations are: Heart 106.2, Sunrise Radio, Virgin London, BBC GLR and WRN1, serving a population base of well over 8.5 million in the M25 area. These five services join BBC Digital Radio services - all five national networks, World Service and Parliament - that have been on DAB since September 1995, and the Digital 1 test transmissions, including Classic FM.

"This new DAB RSL is important for a number of key reasons", says Simon Spanswick, Director of Corporate Affairs at World Radio Network (WRN). "We've increased the choice for the early adopters of the new digital radio technology and provided dealers with more services to demonstrate the true power and range of DAB. We're able to test new services in the marketplace and we're providing a technical test bed that WRN - and other broadcasters - can use to develop digital data services".

The transmitter at Castle Transmission International's famous Crystal Palace site in South London, is rated at 10kW and provides solid coverage throughout most of the area bounded by the M25, and to significant areas of population north, south, west and east of the capital. Over the coming months, the Crystal Palace DAB transmitter will be used to trial the new Internet audio service that WRN is developing in a consortium, that includes UK receiver manufacturer Roberts Radio and Loughborough University. The consortium, is also developing the world's first portable domestic DAB receiver, with part-funding from the UK Department of Trade & Industry.

"DAB Digital Radio is the future of radio," observes Simon Spanswick, "the London DAB RSL demonstrates that WRN believes in that digital future. We're delighted to be working with Castle Transmission International to help develop DAB and to help drive consumer take-up of the technology as more receivers become available. We'll be mounting a campaign to tell retailers in the M25 area that this service is on the air and that there's

New Product

Nissei have, as a company in the past, specialised in the design and manufacture of professional power metering equipment. They have now, in conjunction with **Haydon Communications**, designed and built a professional grade power supply, the DPS-300, with features that have rarely been seen on other manufacturers' power units.

Nissei are a company that pride themselves in a quality built and finished product, this new unit is no exception. It is claimed that every aspect of customer requirement has been catered for, including a price that represents good value for money.

Features of the new Nissei DPS-300 30A 12V power supply include: over voltage protection; variable voltage (3-15V) latching at 13.8V; short circuit current limited; separate voltage and current meters (both illuminated); multiple d.c. outlets at front plus one at rear; detachable IDC mains power lead at rear (supplied); ultra quiet fan; professional black finish and visual warning indication of overload.

Supplied with instruction sheet and circuit diagram, the SSP price of the DPS-300 is £149.95, but for an introductory period, the price is just **£99.95**. More information on this and other products is available direct from Haydon Communications at **132 High Street, Edgware, Middlesex HA8 7EL, Tel: 0181-951 5781/2 or FAX: 0181-951 5782.**

now real choice on DAB".

The CTI/WRN DAB service can be received on any digital radio receiver, it is broadcast on channel 11C. More information from **World Radio Network, Wyvil Court, Wyvil Road, London SW8 2TG, Tel: 0171-896 9000, FAX: 0171-896 9007.**

RAE Course

Colin Turner, Course Tutor at the **Bexley College**, informs us that they are again planning to deliver the City & Guilds Amateur Radio Course (RAE) from 14th September 1999. The course will run for an academic year, finishing in May 2000, with students able to sit the May 2000 Exam. Morse is taught for the remainder of the year until July.

Interested enthusiasts should contact the **Guidance & Admissions Centre** on **(01322) 404000** or **404001**, leaving their name, address and telephone number, and an enrolment form will be mailed to them during the summer break.

60th Anniversary

The **Scarborough Special Events Group** will be on the air as **GB6SW** on 17th July, to commemorate the 60th Anniversary of RAF Staxton Wolds Radar Base, located on the East Coast of Yorkshire, near Scarborough. RAF Staxton Wold was one of the first sites fitted with radar at the beginning of WWII in 1939 and is the world's oldest operational Radar station. In fact, it is the only remaining station of the original 'Chain Home' radar sites still in use today, albeit in a more technologically advanced state.

In recognition of this achievement, there will be a fly-past by the Battle of Britain Memorial Flight during a families day and a special QSL card will be issued to commemorate the occasion. The main s.s.b. station will be operational around 3.725 or 7.055MHz in addition to 2m c.w. More information from **Roy Clayton G4SSH**, Chairman, on **(01723) 862924** or write direct to Roy at **9 Green Island, Irton, Scarborough YO12 4RN.**

MAXPAK Meets

Edward Loach G4ZXS has recently written in with news of MAXPAK events. Meetings are held at the **Perton Community Centre, Perton, Nr. Wolverhampton,** beginning at 2000. Just a few of the meetings planned till the end of this year are: July 5 - Using *FlexNet* with 1200 Baycom and 1200 YAM modems, August 2 - Natter night during the summer holidays, September 6 - Using CNV2HTML with *Winpack* (talk and demonstration), October 4 - Introducing the new MAX-02 modem (demonstration), November 1 - How to get the best out of *Winpack* (practical evening) and December 6 - Annual Christmas get together.

More information direct from Ed G4ZXS on **(07971) 570428** or packet on **g4zxs@gb7max.#28.gbr.eu**

Haydon's Bargain

Haydon Communications have secured a quantity of Realistic DX-394 receivers, to sell at a price which is much lower than usual. The DX-394 is a modern, synthesised, mains powered dual-conversion receiver, covering 150kHz to 30MHz.

Features of the DX-394 include an illuminated display, selectable frequency step sizes, scanning, signal strength meter, built-in clock, telescopic whip antenna and 160 memories. On the rear panel there is an r.f. attenuator switch, plus sockets for antennas, an extension speaker, a tape recorder and a 12V d.c. input.

Previously sold for £300, the DX-394 is now being offered at **only £99.95** by Haydon Communications, **132 High Street, Edgware, Middlesex HA8 7EL, Tel: 0181-951 5782.**

Send your news to Zoë Shortland at the Editorial Offices

rallies

If you're travelling a long distance to a rally, it could be worth 'phoning the contact number to check all is well, before setting off.

The Editorial Staff of *SWM* cannot be held responsible for information on Rallies, as this is supplied by the organisers and is published in good faith as a service to readers.

If you have any queries about a particular event, please contact the organisers direct.

Editor

July 18: The Leeds & District Amateur Radio Society are holding a large amateur radio, computer and car boot sale at The Radio Shack, Yarnbury Rugby Club, Brownberrie Lane, Horsforth, Leeds, W. Yorkshire. There will be a large car park, full bar and meals service, toilets, etc. Talk-in on S22. Prices are as follows: Cars £5, Vans £10. The site will be open from 0800, there will be full marshalling on site, supply your own tables. **John M1CAI** on **(01943) 874650** after 1800.

July 18: The 16th McMichael Amateur Radio Rally and Car Boot Sale is being held at The Haymill Youth & Community Centre, 112 Burnham Lane, Slough. Doors open at 1000 and admission is £1.50, car boot pitches are £10 on the day. There is free parking on-site, food, tea and coffee served and a licensed bar. The Thames Valley Packet BBS Group and the Berkshire Downs Repeater Group will also be in attendance. Talk-in on S22 GB6MMR. **Dave Chislett G4XDU** on **(01628) 625720** or E-mail **g4xdu@amsat.org** Trade enquiries and bookings should be made to **Min Standen G0JMS** on **0118-972 3504**, E-mail: **mins@mstanden.freeserve.co.uk**

July 25: The Rugby Amateur Transmitting Society are holding their Radio & Computer Rally at the BP Truckstop, A5 Watling Street. Details from **M0ASD** on **(01788) 550778**.

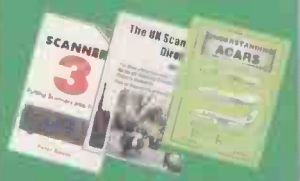
July 25: The Colchester Amateur Radio & Computer Rally is to be held at St. Helena School, Sheepen Road, Colchester, adjacent to the Colchester bypass, Avenue of Remembrance. Doors open from 1000-1600. Talk-in on S22. Admission is £1.50. There will be a wide range of Amateur Radio and Computer traders, Bring & Buy and specialist stands inside, a car boot sale and trade sale area outside. RSGB Morse tests on demand (two passport sized photos required). Catering and licensed bar. There will be ample free parking and reserved disabled parking adjacent to the main entrance, with full access for wheelchair users. Details from **Jef G7BKU** on **(01206) 728710**.

***August 8:** The Flight Refuelling ARS Hamfest 1999 will take place at Flight Refuelling Sports Ground, Merley, Wimborne, Dorset. The event will run from 1000-1700 and will include the usual mix of traders, craft exhibitors, car boot sale and field events. Overnight camping facilities available for Saturday 7 August. Talk-in will be on S22. **Note - No Bring & Buy.** Further details from **Richard Hogan G4VCQ** on **(01202) 691021**.

LOWE ELECTRONICS

LOWE BOOKSHOP

Air Traffic Control Today £8.99
Air Traffic Control Today and Tomorrow £8.99
Airband Radio Handbook 6th Ed £7.99
Air Traffic Control £10.95
Airwaves '99 ..... £9.95
Calling Shanwick £10.95
Callsign '99 ..... £8.95
Fax, Satellite and RTTY Weather Reports by Philip Mitchell £11.50
Ferrell's Confidential Frequency Guide £19.95
Flight Routings 1999 ..... £7.95
Monitoring the War in Kosovo £5.00
More Out of Thin Air £6.95
North Atlantic Flight Communications £16.50
Passport to World Band Radio '99 ..... £14.99
Pooley's Flight Guide '98 ..... £7.00
Receiving Antenna Handbook £17 50
Scanners 3 ..... £9.95



Scanning the Maritime Bands 2nd Ed £9.75
Short Wave Propagation Handbook £15.95
Shortwave Listening Guidebook - Harry Helms £16.95
Shortwave Maritime Communications £14.50
Shortwave Radio Listening for Beginners - Anita McCormick £10.95
UK Scanning Directory 6th Ed £18.50
UK Scanning Frequency Chart £3.00
Underground Frequency List £14.95
Understanding ACARS £9.95
Weather Radio - Tony Curtis £14.95
Weather Reports from Radio Sources by Philip Mitchell £7.50
World Airline Fleet and Selcal Directory £16.00
World Radio and TV Handbook 1999 ..... £19.95
Worldwide Aeronautical Communications Frequency Guide £19.95

Pooley's Flight Guide '98

Last year's Pooleys now available for all aviation enthusiasts. Airport runway maps and loads of frequencies and other really useful data inside. Quantities are limited this year so get yours now before we run out!

Just £5.00 plus £3.00 p&p.

JRC NRD545

A superlative short-wave receiver, designed to fulfil the needs of professional monitoring stations, the NRD545 is equally at home with the serious hobby listener.

The DSP implementation starts at IF frequencies so don't confuse this with lesser DSP receivers that simply process the recovered audio. You can therefore control the IF bandwidth from 10kHz down to just 40Hz allowing total control for AM, SSB, CW or data signals, really helping to reduce interference. Heterodynes and noise can also be removed and the notch filter will automatically track changes in the frequency of the interfering tone. As you would expect from a top-flight receiver, computer control is fully integrated and there are 1000 memory channels, with memory and and programmable scan features.

It's a lucky listener whose partner will allow such expenditure. My own wife reckons she could have a new fridge-freezer, washing machine, tumble drier and dishwasher for this! So, to soften the blow to the family budget, we are offering a free 14" colour TV with every NRD545 this month

(Make and model of TV may vary - picture for illustrative purposes only).

NRD545 From £1595.00

NRD345

The NRD345 continues to be a popular option for listeners with a keen eye (and ear!) for quality. Easy to use and with great specification, the NRD345 is a great choice if you have a limited budget but want the best. Terms available.

NRD345 From £549.00

Icom PCR100 & PCR1000

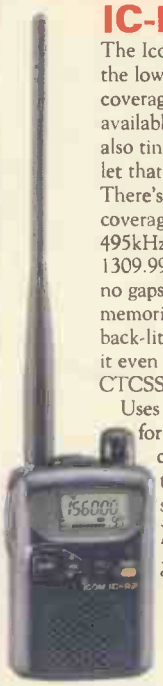
Icom PCR100 & PCR1000
For those of you that like to combine scanning and computing, these two Icom receivers are for you!

The PCR100 offers 100kHz to 1300MHz with AM, FM and WFM reception, it covers all popular broadcast and communications channels, including TV sound. There is a choice of operating screens including a multi-function control panel, with bandscope, memory list and scan controller screens just some of the options. There are multiple scanning functions too as you would expect and the software can store multiple files of 1000 memory channels giving unlimited choice

The original PCR1000 offers a similar specification but adds SSB reception and IF shift so is able to monitor the many utility stations to be found in the short-wave bands. An option DSP processor can also be added for improved performance.

Prices from £199.00 for PCR-100 & from £299.00 for PCR-1000.

ICOM IC-R2



The Icom IC-R2 is the lowest priced full coverage scanner available today. It's also tiny but don't let that fool you! There's frequency coverage from 495kHz right up to 1309.995MHz with no gaps, 400 memories, clear back-lit display and it even includes a CTCSS tone scan. Uses 2 x AA cells for power, contributing to the small size.

Price £139.00

GENERAL ENQUIRIES
All catalogue requests to Matlock address or fax please or by email to info@ lowe.co.uk.
NB Carriage extra on most items
Orders also to Matlock address or fax or email to orders@lowe.co.uk
Check or website at for latest product information www.lowe.co.uk

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Derbyshire
DE4 5LE
Fax 01629 580020
Tel 01629 580800

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79 Gloucester Road
Patchway
Bristol
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BROADCAST

Bandscan Europe

International broadcasting in Europe has been dominated by the Kosovo crisis since the refugee crisis and NATO's bombing campaign got underway. The key international radio stations in the continent responded by increasing the number of programmes transmitted to the war-torn region. All have had to place greater emphasis on short wave delivery as the Serbian government rapidly forced local broadcasters to stop relaying programmes from foreign broadcasters like the BBC and Radio Free Europe.

Broadcasters who have increased output to the Balkans include BBC World Service, Deutsche Welle, Radio France Internationale, ORF Radio Austria International, RTBF and Radio Free Europe.

ORF has added a special broadcast sequence in Albanian, Serbo-Croat, English and German between 1500 and 2400UTC on 1476kHz and 5.945MHz. Belgium's RTBF has launched *Radio Balkans* for an hour starting at 2100UTC on 621kHz within the Benelux countries and on 7.345MHz from the Julich transmitting station in Germany. Programmes are in French and Albanian.

NATO itself is engaged in a media war. Using a fleet of aircraft circling Serbia, the *Allied Voice of NATO* is broadcast on 1003kHz medium wave, plus a range of f.m. and TV frequencies. According to the excellent Radio Netherlands *Real Radio* web site, the Lockheed planes have a pair of 10kW medium wave transmitters plus a number of f.m. and TV transmitters.

A ring of f.m. transmitters was installed by the US government through its USAid operation in countries neighbouring Serbia some weeks before the conflict began. This network operates on 106.5MHz and relays RFE and VoA programmes and is reportedly heard clearly in much of Serbia including Belgrade.

RFE has added an all-night service between 2200 and 0330UTC from the medium wave transmitter on 1593kHz in Holzkirchen, Germany. This is in addition to RFE's night-long services on medium wave from Albania, Bulgaria and the VoA station in Munich. Check out the frequencies of 1458, 1224 and 1197kHz respectively for those three transmitters.

Some international stations supplemented their staple of news and current affairs with 'lifeline' broadcasts. These have characterised so much international broadcasting to regions of the world where civil or regional wars have broken out. The special programmes, often made in association with humanitarian agencies like the Red Cross, help people to trace relatives and friends displaced in the conflict.

The VoA Albanian Service opened a 'phone answering service for refugees in early April. It offered refugees the ability to call in with individual family reunification appeals. In less than 30 minutes of the on-air launch of the 'phone-in service, the lines into VoA were jammed with callers and hundreds of calls were handled within the first week of the lifeline service. The BBC followed with a similar service a week after VoA.

NATO bombing raids have reportedly targeted the transmitting stations of Radio Yugoslavia. On 8th May two 'transmission systems' were destroyed but Ivan Markovic, Director of Radio Yugoslavia, is reported by BBC Monitoring to have said that "as long as it exists, Radio Yugoslavia will find ways to broadcast truth to the world". NATO has also destroyed a number of national and local TV and radio transmitters in Serbia and Kosovo.

Russia, which has supported Serbia throughout much of the early part of the conflict, has also been involved in the media war. The Voice of Russia was initially hostile to the NATO action in its English-language programmes, but toned down its coverage as the conflict continued. But it too has increased its Serbian-language output to almost five hours daily, up from 90 minutes before the NATO campaign got underway. The station claims that it brings alternative information to the local residents 'in contrast to the Western propaganda'.

Station News

In the last Bandscan Europe I reported on the cuts to Deutsche Welle's budget. Despite the financial stringency affecting the German international broadcaster, the station increased its English programme offer at the beginning of April. It increased its Internet audio service to a full 24 hour-a-day operation and increased satellite delivery to 21 hours a day. However, short wave output remains unchanged. English is on the air on 6.14MHz from 0600 to 1300UTC and between 1600 and 1900UTC daily across Europe.

RTE in Ireland is actively developing new services. Lyric FM, an all-classical station, went on the air on 1st May. This is a national station, on the air on 96.7MHz f.m. in Dublin, and between 96 and 99MHz nationally. RTE is also about to launch its first DAB Digital Radio experimental service in the Dublin area carrying up to six audio channels from RTE's existing range of output plus international programmes provided by World Radio Network.

Digital Radio

Digital Radio development continues across Europe, with Germany starting to license operators of DAB multiplexes in several states including Saxony-Anhalt and Bavaria. In Britain, the first local DAB commercial licence was awarded to CE Digital, a joint venture between the Capital Radio Group (that runs BRMB in Birmingham and Capital FM in London among many other radio properties) and EMAP Radio (owners of Magic FM in London and Radio Aire in Leeds). The successful application was for the Birmingham licence but it was uncontested. CE Digital has also applied for the Manchester local licence, again without competition. CE's Birmingham service will be launched in May 2000.

In London, however, the situation is different with a much more hotly fought contest underway. The closing date for the first local licence in the capital was 10th May and that Tuesday saw three bids being delivered to the Radio Authority, the regulator of commercial radio in the UK. CE Digital, MXR - a joint venture between Chrysalis Radio (owner of Heart FM in London) and Border Radio (an owner of local stations in Scotland) - and Switchdigital - a consortium of Talk Radio, Virgin Radio and US radio group Clear Channel International - have all applied to operate the first London multiplex. CE and MXR both intend to simulcast a range of existing f.m. services as part of their programme offers, while Switchdigital have proposed a new range of audio services.

The Radio Authority will examine the bids for London during the summer - and listeners in London have the opportunity to give their views to the regulator - and announce the successful applicant in late August or early September.

That's All

That's all for this time round. Let me have any snippets of news or interesting European radio loggings for the next *Bandscan Europe* in October's *SWM*.

■ ANDY CADIER, 28 ROMNEY AVENUE, FOLKESTONE, KENT CT20 3QJ

Off The Record

BROADCAST

An expression that is becoming increasingly common in radio circles is the term Micro-Radio. Unsurprisingly, this represents the small radio stations that are emerging, mainly but not exclusively, in the USA. Here in the UK the pressure groups for Community Radio possibly fall into the same category.

I suspect the Radio Authority thought that when they licensed local radio they were going to fill the various needs of the communities in which they broadcast. In actual fact, in the cut-throat business world of commercial radio, small stations are simply going overboard to emulate their bigger brothers. Not only that, there is a strong business advantage for the small stations to gobble each other up, making bigger and better stations at the end of the day. That's the theory anyway, but of course in the pursuit of profitability, the input involving local people, places and things are simply chucked out of the window.

It is against this backdrop of boring insincerity that the move for another layer of public broadcasting is being pursued. In Britain, you cannot obtain licences for low budget broadcasting, particularly if it is to be financed by means other than advertising, and in many cases using voluntary staff. The success of the dozens of pirate stations operating in the various inner cities, despite the constant attention of the authorities, indicates there is a public desire for such a service.

Clearly if the pirates could operate openly, their programming would become much more diverse and open for others to contribute. Even as things are at the moment, some pirates are stealing the high ground, in many cases both on the music and the communications front where the legal stations just cannot or will not compete.

In the USA, the micro-radio movement hope to inundate the entire country with thousands of low powered radio transmitters at very affordable prices. The intention is to force the FCC to legalise this activity and issue a frequency allocation for this kind of service, in a similar way that the UK was forced to adopt CB radio in 1981.

In Britain, it would need a change in law to allow local authorities to contribute financially to community broadcasting, which could provide a local information and education service, rather like a public library. Some churches have, apparently illegally, used CB radio to broadcast services to housebound parishioners. It is these commercially unviable local interests that are best suited to community radio where an atmosphere of public service would prevail, rather than fighting a pitched battle in any ratings war.

Pirate Radio QSLs

Stephen Black writes from Hoddesdon in Hertfordshire, saying that he listens on a Yaesu FRG-7 with an 25m long wire antenna. At the beginning of April he received Radio Galaxy on 3.905MHz, with a reasonable signal but rather poor audio. Stephen says they use a 20W valve transmitter feeding a dipole antenna and he received them on Thursday and Friday evenings between 2100 and midnight.

Damien Grehan writes from Ballina, County Mayo in Ireland, he says thanks for the s.w. pirate frequency list I sent him last year, but at that time he didn't have a s.w. receiver. Fortunately, he received a Philips AE3350 world band radio for Christmas (welcome aboard) and is now enjoying the s.w. pirate activity. Damien continues that he has sent reports to Laser Hot Hits 6.220MHz, Ozone/BBMS 6.195/6.200MHz and Jolly Roger 6.235MHz, but has not yet received a QSL.

Well these are a few tips about QSLs: do comment on the programme you hear, do include return postage (stamps or reply coupons) and do see that your own name and address is clearly legible in your letter. Many stations broadcast 'phone numbers for listeners to ring, you will be unlikely to receive a QSL as a result of a 'phone call, but they will usually give you a mention on the air. Internet addresses are becoming quite common too, giving you the opportunity to visit web sites and send E-mails.

Searchlight On Argus

During the 1970s there were many m.w. pirates, particularly in the major cities, in London, Radio Jackie is one of the most remembered. As time passed by, radio listening gradually moved to f.m., where better quality and stereophonic signals were possible.

In London at present only about two stations seem to provide a m.w. service. Radio Argus started exactly 14 years ago this month, from the fairly humble surroundings of a bed-and-breakfast guest house in Ilford. The founders were **James Halstead, Bill Lyons, Bert Bridges** and **Pete Davis**, who operated on 104.7MHz. Radio Argus then reappeared in Cornwall using both f.m. and 1503 and 1602kHz m.w.

During 1989 a split within the organisation occurred, resulting in a breakaway station 'Alice's Restaurant' taking to the air, using allegedly stolen equipment. After a few weeks, Radio Argus managed to retrieve their equipment, after which Alice's Restaurant retaliated, resulting in an unfortunate violent confrontation. Reports indicate that the Cornish station is now only a shadow of its former self and may close altogether.

In London, Bert Bridges continued with the broadcasts while off duty at his full-time occupation at a solicitors office in Bromley. An early rig was an extensively modified, Tandy 160-in-1 kit, using 50V instead of the recommended nine! Further development involved several m.w. frequencies and 279kHz l.w., their f.m. output on 92MHz wasn't very successful and ended in a raid during 1990.

In 1991 the station moved to a new address and by 1993 had secured a brief deal with their rivals Radio Free London, resulting in Argus using 1125kHz m.w. A second short-term liaison with RFL took place in 1997, however another DTI raid brought an end to this temporary partnership.

Since then, a frequency around 1600kHz has been their main channel, however plans exist to have a 24 hour service in the region of 800kHz as well as a return to c1100kHz. They say a short wave service is envisaged on or around 15MHz, when the maximum usable frequency gets there! Birthday cards may be sent **c/o 9 The Hollies, London N11 2EA.**

Radio Northsea International

Author, Broadcaster and free radio impresario **Paul Graham** is all set to relaunch Radio Northsea from an ex-lightship anchored off the Essex coast. This is to be a 28 day RSL station, recreating the original RNI that broadcast from the *MV Mebo 2* from February 1970 to 30 August 1974. (*Now that really brings memories flooding back!* – **Ed**)

The ship will be moored two miles off Holland-on-Sea, between Clacton and Frinton, and broadcast on 190m medium wave 1575kHz using a Radio Authority licence commencing on 3 August. The aim of the project is to raise money for the Royal National Lifeboat Institution in its anniversary year. The sound of the 1999 version of RNI will be that of the summer of 1970, when the original ship was off the Essex coast.

You will hear many of the original RNI presenters together with the music, commercials and general atmosphere of that era. Reception should be excellent all along the Essex coast, and possibly beyond. For further information ring Paul Graham on **(01255) 672531** or FAX: **(01255) 850528.**

Light vessel No. 18 to be used for Radio Northsea RSL. *Photo Paul Graham.*

Short Wave Pirates

A report has just arrived here from **Bob Marsh** of Bexleyheath, who says that the Radio Free London's m.w. antenna site has been vandalised and it was initially thought that another London pirate could be behind it. It is not uncommon for stations to leave antennas suspended from trees, an earth spike in the ground and a discreet electricity supply concealed somewhere.

The Swedish Report Service say that RFL seemed to be using a 350W transmitter on 5.805MHz, giving much improved reception in Germany. RFL are also reported to be testing on 15.070MHz and are happy to receive reception reports at: **RFL, BP 130, 92504 Rueil, Cedex, France** or **101B King's Cross Road, London WC1X 9LP**.

There seems to be more pirate activity in the 41m band with reports from Laser Hot Hits 7.415MHz, Weekend Music Radio with Jack Russell 7.446 and Radio Mistero on 7.462MHz. Radio Caroline, who were relayed by ABC Dublin on 6940 some months ago, appear to have moved to Jolly Roger Radio on Sunday afternoons on 6.235MHz.

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Length 1420mm
Wide Band 16 Element directional beam which gives a maximum of 11-13Db Gain Forward and 15Db Gain Front to Back Ratio. Complete with mounting hardware. *(The Ultimate Receiving Antenna - a must for the Dedicated Listener.)*

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It will receive all frequencies at all levels unlike a mono band antenna.
It has 4 capacitor loaded coils inside the vertical element to give maximum sensitivity to even the weakest of signals. *(Ideal for the New Beginner and the Experienced Listener alike.)*

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SUPER SCAN STICK II

Freq. Range 0-2000 MHz.
Length 1500 mm.
This is designed for external use. It will receive all frequencies. at all levels unlike a mono band antenna. It has 8 capacitor loaded coils inside the vertical element to give maximum sensitivity to even the weakest of signals plus there is an extra 3db gain over the standard super scan stick. *(For the expert who wants that extra sensitivity)*

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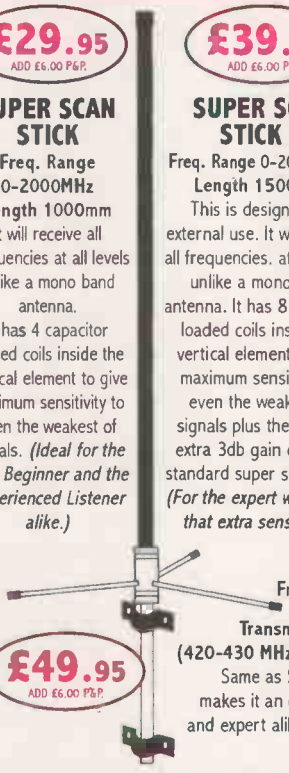
MULTISCAN STICK

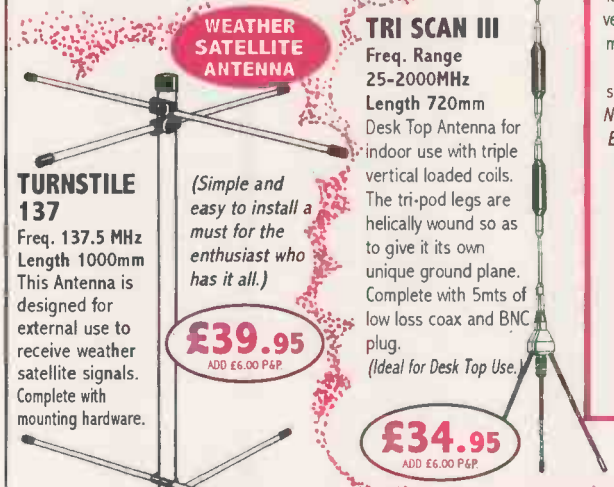
Freq. Range
Receive - 0-2000 MHz.
Transmit
144 - 146 MHz gain 2.5 DBd
430 - 440 MHz gain 4.5 DBd
Length 1000 mm.
Although marginally compromising sensitivity the multi scan stick has within its transmitting capabilities plus gain makes it an excellent antenna for the amateur and expert alike. Comes complete with mounting hardware and brackets. *(Ideal for the amateurs ham radio - user).*



£49.95 ADD £6.00 P&P.

MULTI SCAN STICK II

Freq. Range Receive (0-2000MHz)
Transmit (144-146 MHz) Gain 4.00Dbd
(420-430 MHz) Gain 6.00Dbd Length 1500mm
Same as Super Scan Stick but with extra gain, makes it an even better antenna for the amateur and expert alike. *(Ideal for the Ham Radio user)*



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TURNSTILE 137

Freq. 137.5 MHz
Length 1000mm
This Antenna is designed for external use to receive weather satellite signals. Complete with mounting hardware.

(Simple and easy to install a must for the enthusiast who has it all.)

£39.95 ADD £6.00 P&P.

TRI SCAN III

Freq. Range 25-2000MHz
Length 720mm
Desk Top Antenna for indoor use with triple vertical loaded coils. The tri-pod legs are helically wound so as to give it its own unique ground plane. Complete with 5mts of low loss coax and BNC plug.
(Ideal for Desk Top Use.)

£34.95 ADD £6.00 P&P.

MWA-H.F. WIRE ANTENNA

Freq. Range 1.1-30MHz Length 60 Metres
Internal or external use. The long wire is known to be one of the best antennas for shortwave (HF) receiving. Comes complete with con box and dog bones, wire etc.
(A must for the short wave listener.)

£29.95 ADD £6.00 P&P.

MICRO MAG MTS42

Freq. Range 25-2.1 ghz
Length 225mm
High Performance Super Magnetic Mount Antenna comes with Two Interchangeable Whips.
73mm 700-2.1 GHZ
225mm 25-1300MHz
Complete with high specification coax and BNC plug.
(The Ultimate small Magmount Antenna.)

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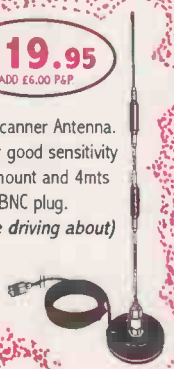
G. SCAN II

Freq. Range 25-2000 MHz.
Length 620 mm.
Magnetic mount Mobile Scanner Antenna. 2 vertical loaded coils for good sensitivity complete with magnetic mount and 4mts of coax, terminated with BNC plug.
(Good for when you are driving about)

£19.95 ADD £6.00 P&P.



SWP 2000

FREQ. 25 - 2000 MHz. Length 515mm.
Multiband good sensitivity for its small size. Fitted with two suction cups for ease of fitting to any smooth surface (i.e. inside of car window) comes with 5 metres of mini coax and BNC connector. *(Good for the car user who doesn't want an external antenna.)*

£29.95 ADD £6.00 P&P.

SWP HF30

Freq. Range 0.05-30MHz
Length 770mm
Although small, surprisingly sensitive for the H.F. user. Fitted with two suction cups for ease of fitting to any smooth surface (i.e. inside of car window) comes with 5 metres of mini coax and BNC connector. *(Good for the car user who doesn't want an external antenna.)*

£39.95 ADD £6.00 P&P.

SUPER DISCONE

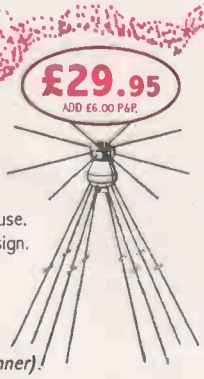
Freq. Range 25-2000MHz
Length 1380mm
Internal or External use (A Tri-Plane Antenna). The angle of the ground planes are specially designed to give maximum receiving performance within the discone design. The Super Discone gives up to 3Db Gain over a standard conventional discone. Comes complete with mounting hardware and brackets. *(Ideal for the Experienced Enthusiast.)*

£39.95 ADD £6.00 P&P.

DISCONE

Freq. Range 70-700MHz
Length 920mm
Internal or External use. (Classic Antenna Design. Comes complete with mounting hardware and brackets.
(Ideal for the Beginner).

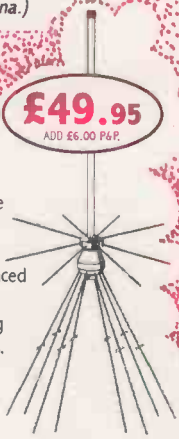
£29.95 ADD £6.00 P&P.



HF DISCONE

Freq. Range 0.05-2000MHz
Length 1840mm
Internal or External use (A Tri-Plane Antenna). Same as the Super Discone but with enhanced HF capabilities, comes complete with mounting hardware and brackets. *(Ideal for the Short Wave H.F. Listener.)*

£49.95 ADD £6.00 P&P.



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BROADCAST

LM&S

Once again the peak holiday season is with us and many listeners will be packing their bags and departing from home to some remote place to 'get away from it all'.

Exploring the chosen location may well be an interesting and enjoyable experience. There may be opportunities to search the broadcast bands too, so be sure to take a small portable receiver with you! When you return home, please send the details of your reception to me for inclusion in LM&S.

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 April.

The sky waves from the Rikisutvarpid 300kW station at Gufuskalar, W.Iceland, on **189kHz** were picked up at 2255UTC on April 25 by **Sheila Hughes** in Morden. Light music and jazz, followed by a talk in Icelandic were heard but 'splatter' from an adjacent channel and fading made reception difficult - it varied from SINPO 22212 to 12211. After midnight, **Simon Hockenhull** (E.Bristol) found reception of their transmission slightly better, logging it as 25345 at 0055UTC.

Interference to the broadcasts from stations in Europe on **153**, **171**, **207** & **252kHz** was observed by **Fred Pallant** (Storrington) when he searched the band from 2040UTC on the 30th. It was caused by the sky waves from co-channel stations in N.Africa.

Medium Wave Reports

There were only two reports of m.w. stations in Canada and E.USA being received over transatlantic paths at night. VOCM in St.John's, NF on **590kHz** was heard at 0110UTC on April 4th by **Adam Birchenall** in Manchester but he could find no trace of CJYQ on **930** at that time. At 0520 on the 25th he picked up a faint broadcast by an American on 1510, which may have come from WNRB in Boston, MA. Over in Co.Down, **Robert Connolly** (Kilkeel) heard on the 18th CKVO in Clarenville, NF on **710**, which he rated 22222 at 0205.

In contrast, quite extensive logs were compiled by some listeners who searched the band at night for the sky waves from m.w. stations in the Middle East, Africa, Europe and Scandinavia - see chart. During daylight, the ground waves from some quite distant local radio stations were logged too!

With regard to the BBC R.Wales op-outs via Wrexham on **657kHz** (see LM&S, May '99 *SWM*), **Peter Kay** (Abergele) has informed me that local news may be heard on weekdays from 0705-0710; 0730-0732; 0805-0810 and 0830-0832. There is also a Saturday morning regional broadcast from 0630-0800, which is presented by **Alan Dolby** from the Wrexham studio. The name R.Clwyd is no longer in use.

Short Wave Reports

In the **25MHz (11m)** band the broadcasts to Africa by R.France Int have been reaching some areas of the UK via back scatter. Their 500kW transmission on **25.820** (Fr to E/C.Africa 0900-1300) was rated 24412 at 0900 by **Vic Prier** in Colyton; 33323 at 1020 by **Bernard Curtis** in Stalbridge; 25343 at 1048 in Storrington; 24333 at 1056 by **Rhoderick Illman** in Oxted; 25222 at 1105 by **Ross Lockley** in Galashiels; 23322 at 1158 in Kilkeel; 33333 at 1200 by **Bill Griffith** in W.London; 35433 at 1200 in E.Bristol. Much better reception has been noted in Cyprus by **John Parry** (Larnaca) - 45554 at 1135. The latest reports suggest R.Budapest's broadcasts to Australia on **25.700** have ceased.

There is much activity in the **21MHz (13m)** band during the day. Noted before noon were DW via Sri Lanka **21.680** (Eng to W.Africa 0600-0650), rated 54444 at 0631 by **Tom Winzor** in Plymouth; R.Australia via Shepparton **21.725** (Eng to Pacific areas 0600?-0858) 24332 at 0749 in Oxted; BSKSA Saudi Arabia **21.495** (Ar [Holy Quran] to SE.Asia 0900-1200) 34443 at 0900 by **Gerald Guest** in Dudley; RAI Rome **21.520** (It to Africa 0600-1300) 35433 at 0905 by **Fred Wilmshurst** in Northampton; Vatican R, Italy **21.850** (Eng to Asia) 44343 at 1015 by **Norman Thompson** in Oadby & 33553 at 1130 in Larnaca, Cyprus; UAER, Dubai **21.605** (Eng to Eur 1030-1100) 35455 at 1036 by **Mike Casey** in NE.Manchester; Voice of Turkey **21.715** (Tur to W.Asia, Australia 0600?-1100?) 44434 at 1015 by **Robert Hughes** in Liverpool; R.Ukraine Int **21.520** (Eng to Australia 1100-1200) 44444 at 1100 in Morden; Swiss R.Int via Sottens? **21.770** (Eng, Ger, Fr, It to SE.Asia, Far East 1100-1330) 33222 at 1100 by **Clare Pinder** in Appleby; RFI via Issoudun **21.620** (Fr to E.Africa 0900-1200) 34433 at 1130 in E.Bristol.

After mid-day, HCJB Quito, Ecuador **21.455** (Eng [u.s.b. + p.c.] to N/S.America 1200-1600) was rated 54434 at 1255 by **Richard Reynolds** in Guildford; R.Portugal Int via Sines **21.655** (Port to Brazil 1200?-2200?) 33322 at 1305 in Kilkeel; Channel Africa via Meyerton, S.Africa **21.530** (Eng to Africa 1300-1455? Sat/Sun) 45243 at 1333 by **Eddie McKeown** in Newry; BBC via Cyprus **21.470** (Eng to Africa 1400-1700) 44444 at 1415 by **Stan Evans** in Herstmonceux; BBC via Ascension Is **21.660** (Eng to Africa 1100-1700) 43333 at 1500 by **David Hall** in Morpeth; UAER, Dubai **21.605** (Eng to Eur 1600-1640) 44444 at 1620 in Colyton; Voz Christiana, Chile **21.500** (Sp to N.America 1100-2100?) 54554 at 1830 by **Bill Griffith** whilst in Sevilla, Spain & 33333 at 1957 by **Thomas Williams** in Truro; R.Nederlands via Bonaire, Ned.Antilles **21.590** (Eng, Du to Africa 1830-2025) 33222 at 1955 by **Peter Pollard** in Rugby; HCJB Quito, Ecuador **21.470** (Russ?, Fr, Ger, Sp to Eur 1830-2200?) 44434 at 2015 in Stalbridge; WYFR via Okeechobee, USA **21.525** (Eng, Port?, Fr to Eur, Africa 1600-2045) 25343 at 2016 in Storrington; R.Australia via Shepparton? **21.740** (Eng to ? 2100-0200?) 24333 at 2255 by **Martin Goodey** in St.Mary's, Is of Scilly.

In the new **18MHz (15m)** band R.Sweden on **18.960** (Sw to ? 1030-1100, Eng to N.America 1130-1200) was noted as 25333 at 1055 in Northampton; Christian Science BC via WSHB Cypress Creek **18.910** (Fr, Eng to E/C.Africa 1600-?) was 44444 at 2000 in Sevilla, Spain & 35533 at 2049 in St.Mary's, IoS.

There is now much to interest the listener in the **17MHz (16m)** band. During the morning R.Romania Int **17.745** (Eng to F.East? 0700-0800) was 44534 at 0730 in E.Bristol; V of Russia **17.495** (Eng to Australia 0500-0900) 44333 at 0800 in Morden; R.Australia via Shepparton **17.750** (Eng to Asia 0600-1000?) 44444 at 0800 by **Martin Venner** in St.Austell; BBC via Skelton, UK **17.705** (Eng to Eur, Africa 0900-1515) SIO 444 at 0900 by **Tom Smyth** in Co.Fermanagh; BBC via Skelton & Woofferton, UK **17.640** (Eng to E.Eur, M.East, E.Africa 0700-1500) 25532 at 1138 in Larnaca, Cyprus; R.Bulgaria, Sofia **17.500** (Eng to Eur 1100-1200) 55444 at 1145 by **Tony Hall** in Freshwater Bay, IoW.

In the afternoon R.Finland **17.670** (Eng to N.America 1230-1300) was 43443 at 1230 in Herstmonceux; RCI via Sackville, Canada **17.765** (Eng to USA, Mexico, Caribbean 1200-1400) 33323 at 1300 in Dudley; Africa No.1, Gabon **17.630** (Fr to W.Africa 0700-1100, 1200-1600) 34433 at 1330 in Kilkeel; VOA via Morocco **17.895** (Eng to Africa 1600-1900) 44344 at 1605 in Liverpool; Israel R, Jerusalem

Long Wave Chart

Freq (kHz)	Station	Country	Power (kW)	Listener
153	Bechar	Algeria	1000	G*,I*
153	Donebach DLF	Germany	500	A,B*,D*,E,F,G*,I,K
162	Allouis	France	2000	B,D*,E,F,G*,H,I,J*,K
171	Nador Medi-1	Morocco	2000	G*,I*
171	B'shakovo etc	Russia	1200	A,B,D*,F,I,K
171	Sasnovy	Belarus	1000	I
177	Dranienburg	Germany	500	A,B*,D*,F,G*,I,K
183	Saarlouis	Germany	2000	B,D*,E,F,G*,H,I,J*,K
189	Gufuskalar	W.Iceland	150	A*,B*
189	Tbilisi	Georgia	500	I
198	Droitwich BBC	UK	500	B,D*,E,F,H,I,J*,K
207	Munich DLF	Germany	500	A,B*,D*,E,F,G*,I,J*,K*
207	Azilal	Morocco	800	G*,J*
216	Roumoules RMC	S.France	1400	A,B*,D*,E,F,G*,H,I,J*,K
225	Raszyn Resv	Poland	?	A*,B*,C*,D*,F*,G*,I,K*
234	Beidweiler	Luxembourg	2000	E,D*,F,G*,I,J*,K
243	Kalundborg	Denmark	300	A,B,C*,E,F,G*,I,K
252	Tipaza	Algeria	1500	B*,G*
252	Atlantic 252	Eire	500	B*,D*,F,G*,H,I,J*,K
261	Burg(R Ropa)	Germany	85	A*,B*,C*,D*,E,F,G*,I,J*,K*
261	Taldom Moscow	Russia	2500	G*
270	Topolna	Czech Rep	1500	A*,D*,E,F,G*,I,J*,K*
279	Sasnovy	Belarus	500	D*,F,G*,I,K*

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) Rhoderick Illman, Oxted.
(D) Eddie McKeown, Newry.
(E) Frank Miles, SW London.
(F) George Millmore, Wootton, IoW.
(G) Fred Pallant, Storrington.
(H) Tom Smyth, Co.Fermanagh.
(I) Ernie Strong, Ramsey, Cambs.
(J) Norman Thompson, Oadby.
(K) Fred Wilmshurst, Northampton.

17.545 (Heb [Home Sce rly] to W.Eur, N.America 0700?-?) 44534 at 1645 in Colyton; Channel Africa via Meyerton **17.860** (Eng to W.Africa 1700-1730) 44444 at 1707 by **Vera Brindley** in Woodhall Spa.

During the evening R.New Zealand's broadcast to Pacific areas on **17.675** (Eng 1958-0705?) has been reaching the UK. It was rated 32332 at 2003 in Guildford & 35543 at 2020 by **David Edwardson** in Wallsend. Also received were HCJB Quito, Ecuador **17.660** (Eng to Eur 1900-2200), rated 33333 at 1946 in Plymouth; R.Canada Int via Sackville **17.870** (Fr, Eng to Eur, M.East, Africa 1900-2200) 44433 at 1951 in Oxted; Swiss R.Int via ? **17.580** (It, Ar, Eng, Ger, Fr to S.Africa 1830-2100) 33333 at 2010 in Rugby; BBC via Ascension Is **17.830** (Eng to Africa 0700-2100) 45444 at 2010 in Northampton; R.Nederlands via Bonaire, Ned Antilles **17.605** (Eng to Africa 1730-2025) 35444 at 2020 in Storrington; RCI via Sackville **17.820** (Fr, Eng to Eur, Africa 1900-2200) 54444 at 2025 in Stalbridge; WHRI via Maine, USA **17.650** (Eng to Eur, M.East, Africa 1700-2230?) 22222 at 2028 in Truro; VOA via ? **17.725** (Eng to Africa 2000?-2200?) 44444 at 2037 in St.Mary's, IoS.

Broadcasts from many areas have been received well in the **15MHz (19m)** band. R.Australia via Shepparton on **15.510** (Eng to Pacific areas 0200-0900) was noted most mornings as 'good' from 0700 by **Patrick Connor** in Trowbridge. Their transmission to Asia from Shepparton on **15.415** (Eng 0100-0400, 0600-0900) was rated 24333 at 0715 in E.Bristol.

Also received during the morning were R.Kuwait via Sulabiyah **15.495** (Ar to M.East 0200?-1305?) rated 45554 at 0445 in Larnaca, Cyprus; Swiss R.Int via ? **15.545** (Fr, It, Eng, Ger to Africa 0600-0800) 34333 at 0730 in Morden; KTWR Guam **15.330** (Eng to Asia 0800-0930) 43433 at 0817 in Guildford; V of Malaysia, Kajang **15.295** (Eng to Asia 0455-0827) 34443 at 0820 in NE.Manchester; V of Armenia, Yerevan **15.270** (Eng to Eur 0900-0939 Sun) 53443 at 0910 in Herstmonceux; R.Bulgaria **15.700** (Eng to W.Eur 1100-1200) 44444 at 1153 in Plymouth.

During the afternoon Swiss R.Int via ? **15.315** (Ger, Fr, It, Eng to Eur 1000-1230) was 44444 at 1219 in St.Austell; R.Romania Int **15.390** (Eng to Eur 1300-1356) 55544 at 1315 in St.Mary's, IoS; R.Sweden **15.240** (Eng to N.America 1330-1400) 44444 at 1330 in Truro; BBC via Antigua **15.220** (Eng to C.America 1100-1400) 23322 at 1340 in Kilkeel; RCI via Sines, Portugal **15.325** (Eng, Fr to Eur, M.East, Africa 1330-1500) 44444 at 1437 in Freshwater Bay, IoW; KTWR Agana, Guam **15.330** (Eng to S.Asia 1500-1630?) 33333 at 1510 in Morpeth; VOA via Greece? **15.205** (Eng to M.East, Asia 1500-1700) 43344 at 1620 in Liverpool.

Later, R.Japan via Moyabi, Gabon **15.355** (Eng to Africa 1700-1800) was 24432 at 1705 in Colyton; WYFR via Okeechobee **15.695** (Eng to Eur, Africa 1600-1900) 34333 at 1809 in Woodhall Spa; VOIRI Tehran, Iran **15.084** (Home Sce relay) 44344 at 1920 in Oxted; R.Algiers Int via Bouchaoui **15.160** (Eng to Eur, M.East, N.Africa 2000-2100) 34433 at 2000 in Galashiels; Voice of Indonesia, Jakarta **15.150** (Eng to Eur, Africa 2000-2100) 45554 at 2001 in Wallsend; RCI via Sackville **15.325** (Fr, Eng to Eur, Africa 1900-2200) 33333 at 2030 in Rugby; WWCR Nashville, USA **15.685** (Eng to N.America, Eur 1100-2200) 44434 at 2050 in Stalbridge; R.Taipei Int via WYFR **15.600** (Eng to Eur 2200-2300) 55544 at 2235 in Northampton.

Good reception from some areas has also been noted in the **13MHz (22m)** band. The occupants include R.Austria Int via Moosbrunn **13.730** (Various) rated SIO444 at 0753 by **Francis Hearne** in N.Bristol & 55555 at 1237 in Newry; AIR via Bangalore **13.720** (Swa to E.Africa 1515-1615) 44344 at 1520 in Liverpool; Croatian R, Zargreb **13.830** (Cr, Eng to N.America 1230-2100) 54554 at 1600 in W.London; Vatican R, Italy **13.765** (Eng to Africa 1730-1800) 32222 at 1740 in Colyton; WWCR Nashville, USA **13.845** (Eng to Africa 1400-0000) 33443 at 1825 in Northampton; DW via Sines? **13.790** (Eng to W.Africa 1900-1950) 54444 at 1922 in Plymouth; R.Nederlands via Flevo **13.700** (Eng to S/E.W.Africa 1830-2025) 44444 at 1952 in St.Austell; RCI via Sackville, Canada **13.650** (Fr, Eng to Eur, Africa 1900-2200) 44444 at 2020 in Kilkeel; V of Vietnam, Hanoi **13.740** (Eng to Eur 2030-2100) 33233 at 2030 in Appleby; R.Havana Cuba **13.720** (Eng to Eur 2030-2130) 31431 at 2100 in Galshiels; R.Damascus, Syria **13.610** (Eng to N.America? 2105-2205) 43323 at 2130 in Stalbridge; RCI via Sackville, Canada **13.670** (Eng, Fr to Eur, Africa 1900-2200) 44333 at 2148 in Oxted; V of Turkey, Ankara **13.640** (Eng to Eur 2200?-2300?) 55545 at 2240 in E.Bristol.

Noted in the **11MHz (25m)** band before noon were R.Damascus, Syria **12.085** (Ar [Home Svce] to M.East 0600-1700) rated 43333 at 0755 in Liverpool; HCJB Quito, Ecuador **11.950** (Eng to Eur 0700-0900) 54444 at 0800 in Morden; R.Prague, Czech Rep **11.600** (Eng, Cz to Eur 0800-0857) 55555 at 0802 in NE.Manchester; HCJB Quito, Ecuador **11.950** (Eng to Eur 0700-0900) 45544 at 0831 in St.Mary's, IoS; FEBC Bocaue, Philippines **11.635** (Eng to Asia 0930-1100) 35433 at 0933 in Northampton; BBC via Skelton & Woofferton, UK **12.095** (Eng to Eur, N/W.Africa 0600-2000) 44444 at 1100 in Dudley & 54554 at 1905 in Sevilla, Spain.

During the afternoon R.Jordan via Al Karanah **11.690** (Eng to W.Eur, E.USA 1100-1730) was 44434 at 1225 in Freshwater Bay, IoW; R.Australia via Shepparton **11.660** (Various to Asia 1430?-1700) 43333 at 1435 in Herstmonceux; R.Algiers Int via Bouchaoui **11.715** (Eng to Eur, M.East, Africa 1500-1600) 33232 at 1525 in Oadby; R.Nederlands via Tashkent **12.075** (Eng to S.Asia 1430-1625) SIO 322 at 1530 in Co.Fermanagh; R.Finland via Pori **11.755** (Fin to Eur) SIO

Local Radio Chart

Freq (kHz)	Station	ILR BBC	e.m.r.p (kW)	Listener
558	Spectrum, London	I	0.80	A,D,F,H,J,K,L
585	R.Solway	B	2.00	B
603	Capital G,Litt'brne	I	0.10	B,F,G,H,J,L
630	R.Bedfordshire(3CR)	B	0.20	A,C,D*,F,G,H,J,K,L
630	R.Cornwall	B	2.00	B,F,H,J,M
657	R.Clwyd	B	2.00	B,F,H,J,K
657	R.Cornwall	B	0.50	B,F,H,M
666	Westward R, Exeter	I	0.34	B,C,D,F,H,J,L
666	R.York	B	0.80	B,F,J,K
729	BBC Essex	B	0.20	F,G,H,J,K,L
738	Hereford/Worcester	B	0.037	B,C,D,E,F,J,L
756	R.Cumbria	B	1.00	A,B,F
756	The Magic 756,Powys	I	0.63	A,F,H,J,L
765	BBC Essex	B	0.50	A,D,F,G,H,J,L
774	R.Kent	B	0.70	E,F,G,H,J,K,L
774	R.Leeds	B	0.50	A,B,F
774	Cl.Gold 774, Glos	I	0.14	A,B,C,F,H
792	Cl.Gold 792,Bedford	I	0.27	F,H,J,K,L
792	R.Foyle	B	1.00	B,I
801	R.Devon & Dorset	B	2.00	A*,B,C,D,F,H
828	Cl.Gold 828, Luton	I	0.20	C,F,J,K,L
828	Asian Netwk Sedgley	B	0.20	D
828	2CR CG, Bournemouth	I	0.27	H
828	Townland R, Ulster	I	0.80	B
837	R.Cumbria/Furness	B	1.50	B
837	Asian Netwk Leics	B	0.45	D,F,H,J,K,L
855	R.Devon & Dorset	B	1.00	B,F,H,M
855	R.Lancashire	B	1.50	B
855	R.Norfolk, Postwick	B	1.50	F,G,J
855	Sunshine 855,Ludlow	I	0.15	A,D,F,K,L
873	R.Norfolk, W.Lynn	B	0.30	A,F,G,H,J,K,L
936	Brunel CG, W.Wilts	I	0.18	F,H,J,K,L
936	Yks Dales R, Hawes	I	1.00	B,F
945	Cl.Gold GEM, Derby	I	0.20	A,B,F,J,K,L
945	Capital G, Bexhill	I	0.75	D*,E*,F,G,H,J
954	Westward R, Torquay	I	0.32	F,H
954	Cl.Gold 954, H'ford	I	0.16	D,F,J,K,L
963	Asian Sd, E.Lancs	I	0.80	B
963	Liberty R, Hackney	I	1.00	E,F,G,H,J,L
972	Liberty R, Southall	I	1.00	D,E,F,H,J,K,L
990	R.Devon, E.Devon	B	1.00	B,D,F,H
990	Magic AM,Doncaster	I	0.25	J
990	Cl.G, Wolverhampton	I	0.09	A,F,L
999	C.Gold GEM Nott'ham	I	0.25	F,J,K,L
999	Red Rose 9-99 P'stn	I	0.80	B
999	R.Solent	B	1.00	G,F,H
1017	Cl.G, Shrewsbury	I	0.70	B,D,F,K
1026	R.Cambridgeshire	B	0.50	F,J,K,L
1026	Downtown R, Belfast	I	1.70	B,I
1026	R.Jersey	B	1.00	F,H
1035	RTL Country 1035	I	1.00	F,G,H,J,K,L
1035	N.Sound 2, Aberdeen	I	0.78	B,F*
1116	R.Derby	B	1.20	B,F,J,K,L
1116	R.Guernsey	B	0.50	F,H
1116	Valley R, Ebbw Vale	I	0.50	D
1152	Cl.G Amber, Norwich	I	0.83	J,K
1152	LBC 1152 AM	I	23.50	F,H,J
1152	Pic'ly 1152,Manch'r	I	1.50	B
1152	PlymSnd AM,Plymouth	I	0.32	M
1152	Cl.G, Birmingham	I	3.00	D,L
1161	R.Bedfordshire(3CR)	B	0.10	F,J,L
1161	Brunel Cl.G,Swindon	I	0.16	F,H
1161	Magic AM,Humberside	I	0.35	B,F*
1161	Southern Counties R	B	1.00	F,H
1161	Tay AM, Dundee	I	1.40	E*,F
1170	Cl.G Amber, Ipswich	I	0.28	J
1170	GNR, Stockton	I	0.32	B
1170	Capital G,Portsm'th	I	0.50	F,H
1170	Signal 2,Stoke-on-T	I	0.20	B
1170	1170AM,High Wycombe	I	0.25	F
1242	Capital G,Maidstone	I	0.32	F,H
1251	C.G Amber,Bury StEd	I	0.76	B,F,J
1260	Brunel CG, Bristol	I	1.60	H
1260	Marcher G, Wrexham	I	0.64	A
1260	SabrasSnd,Leicester	I	0.29	J,L
1260	R.York	B	0.50	B
1296	Radio XL,Birmingham	I	5.00	B,D,F,H,J,L
1305	Magic AM,Barnsley	I	0.15	B
1305	Premier via ?	I	0.50	F,H,J,L
1323	Capital G,Southwick	I	0.50	E*,F,H
1323	SomersetSnd,Bristol	B	0.63	B
1332	Premier, Battersea	I	1.00	C*,F,H
1332	Cl.Gold 1332,Pt'bo	I	0.60	B,J,L
1332	Wiltshire Sound	B	0.30	C*,H
1359	The Breeze,Chelms'd	I	0.28	F
1359	Cl.Gold 1359, C'try	I	0.27	F,J,L
1359	R.Solent	B	0.85	F,H
1368	R.Lincolnshire	B	2.00	F,J,L
1368	Southern Counties R	B	0.50	F,H
1377	Asian Sd, Rochdale	I	0.10	F*
1413	R.Gloucester via ?	B	?	C,L
1413	Premier via ?	I	0.50	F,H,J
1413	Yks Dales R,Skipton	I	0.10	B
1431	The Breeze,Southend	I	0.35	F,J
1431	Cl.Gold, Reading	I	0.14	F,H,L
1449	R.Peterboro/Cambs	B	0.15	B,F,H,J,L
1458	R.Cumbria	B	0.50	B
1458	R.Devon & Dorset	B	2.00	B,H
1458	Sunrise, London	I	50.00	F,H,J,L
1458	Asian Netwk Langley	B	5.00	J,L
1476	CountySnd,Guildford	I	0.50	E,F,H,J,L
1485	Cl.Gold, Newbury	I	1.00	F,J,L
1485	R.Humberside (Hull)	B	1.00	B,J
1485	R.Merseyside	B	1.20	B,F,H,J
1485	Southern Counties R	B	1.00	F,H
1503	R.Stoke-on-Trent	B	1.00	B,E*,F,H,J,L
1521	Heartbeat 1521AM,NI	I	0.50	B,I
1521	Fame 1521, Reigate	I	0.64	F,H,J
1530	R.Essex, Southend	B	0.15	F,J
1530	Cl.Gold W.Yorks	I	0.74	B,J,L
1530	Cl.Gold Worcester	I	0.52	F,H
1548	R.Bristol	B	5.00	F,H
1548	Capital G, London	I	97.50	F,H,J
1548	Magic1548,Liverpool	I	4.40	A,B,F,I
1557	R.Lancashire	B	0.25	A,B
1557	Cl.Gold 1557,N.hant	I	0.76	A*,F,J,L
1557	Capital G, So'ton	I	0.50	F,H
1584	London Turkish R	I	0.20	F,J
1584	R.Nottingham	B	1.00	A,E*,F,J
1584	R.Shropshire	B	0.50	B,F
1584	Tay, Perth	I	0.21	E*,F
1602	R.Kent	B	0.25	A*,E,F,H,J

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

Listeners:-

(A) Adam Birchenall, Manchester.
(B) Robert Connolly, Kilkeel.
(C) Francis Hearne, N.Bristol.
(D) Simon Hockenhull, E.Bristol.
(E) Sheila Hughes, Morden.
(F) Brian Keyte, Bookham.
(G) Frank Miles, SW London.
(H) George Millmore, Wootton, IoW.
(I) Tom Smyth, Co.Fermanagh.
(J) Emie Strong, Ramsey, Cambs.
(K) Norman Thompson, Oadby.
(L) Fred Wilmshurst, Northampton.
(M) Tom Winzor, Plymouth.

555 at 1705 by **Philip Rambaut** in Macclesfield.

Later, R.Bulgaria, Sofia **11.720** (Ger to Eur 1800-1900) was 44434 at 1800 in Colyton; R.Kuwait via Kabd **11.990** (Eng to Eur, N.America 1800-2100) 54554 at 1800 in W.London; Israel R, Jerusalem **11.605** (Eng to Eur. N.America 1900-1930) 55555 at 1900 in Appleby; R.New Zealand Int **11.695** (Eng to ? 1750-1958) 53444 at 1905 in Guildford; R.Nederlands via Flevo **11.655** (Eng to Africa 1730-2025) 22222 at 1920 in Truro; R.Minsk, Belarus **11.960** (Eng to Eur 1930-2000, Tues/Thurs) 33433 at 1930 in Galashiels; R.Bulgaria, Sofia **11.720** (Eng to Eur 1900-2000) 43433 at 1936 in St.Austell; V of Malta via Russia **12.060** (Eng to Eur 1900-2000) 33333 at 1950 in Plymouth; RCI via Skelton, UK **11.690** (Eng to Eur 2000-2130) 34232 at 2003 in Newry; RAI Int, Rome **11.880** (Eng to Eur? 2025-2045) 43333 at 2027 in Stalbridge; AIR via Bangalore **11.620** (Eng, Hin to Eur 1745-2230) 34343 at 2115 in Woodhall Spa; BBC via Skelton, UK **11.835** (Eng to W.Africa 1900-2300) 43443 at 2115 in Kilkeel; BBC via Ascension Is **12.095** (Eng to S.America 2000-0200) 35333 at 2255 in E.Bristol; R.Romania Int, Bucharest **11.830** (Eng to Eur, USA 2300-2356) SIO 444 at 2336 in N.Bristol.

In the **9MHz (31m)** band R.New Zealand's early morning broadcast to Pacific areas on **9.700** (Eng 0707-1115) was rated 32222 at 0905 in Stalbridge. Also noted during the morning were R.Mediterranee Int, Morocco **9.575** (Ar, Fr to N.Africa, S.Eur 0500-0100) SIO 555 at 0652 by Frank Miles in SW.Lomdon; TWR Monte Carlo, Monaco **9.870** (Eng to Eur 0700-0850?) 55544 at 0750 in St.Mary's, IoS; R.Vilnius, Lithuania **9.710** (Eng to Eur 0930-1000) 22222 at 0932 in Truro; R.Nederlands via Wertachtal **9.860** (Eng to Eur 1130-1325) 55444 at 1134 in Freshwater Bay, IoW.

After mid-day, R.France Int via Allouis? **9.805** (Eng to Eur 1200-1300) was 45555 at 1213 in NE.Manchester; BBC via Kranji, Singapore **9.740** (Eng to S.Asia? 1100-2200) 45444 at 1700 in E.Bristol; R.Norway Int **9.985** (Norw to Eur 1700-1730) SIO 444 at 1707 in Macclesfield; VOA via Morocco? **9.760** (Eng to Eur, M.East, N.Africa 1700-2200) 55544 at 1855 in Northampton; BBC via Skelton & Woofferton, UK **9.410** (Eng to Eur, N/C.Africa 0300-2200) 54554 at 1905 in Sevilla, Spain; VOIRI Tehran, Iran **9.022** (Fr, Eng to Eur 1830-2030) 33333 at 1915 in Rugby; R.Cairo, Egypt **9.990** (Various to Eur 1900-2200?) 44344 at 1915 in Liverpool; BBC via Cyprus **9.915** (Ar to M.East, N.Africa 1800-2115) 54434 at 1920 in Oxted; R.Bulgaria **9.400** (Eng to Eur 1900-2000) 43333 at 1924 in Plymouth; R.Australia via Shepparton **9.500** (Eng to Asia, Pacific 1430?-2130) 35543 at 2000 in Wallsend; China R.Int, Beijing **9.535** (Eng to Eur 2000-2200?) 44333 at 2000 in Dudley; Voice of Russia **9.775** (Eng [WS]) 44444 at 2018 in St.Austell; R.Pyongyang, Korea **9.335** (Eng to Eur 2100-2200) 34433 at 2100 in Galashiels; R.Bulgaria, Sofia **9.400** (Eng to Eur 2100-2200) 54444 at 2100 in Morden; AIR via Delhi **9.950** (Eng to Eur

Continued on page 20...

Medium Wave Chart

Freq (kHz)	Station	Country	Power (kW)	Listener
526	Vatican R	Italy	5	L*
531	Berg	Germany	20	G*,I
531	RNE5 via ?	Spain	?	I,L*
531	Beromunster	Switzerland	500	I*,M
540	Wavre	Belgium	150/50	A*,C,G*,H,I,L,M
540	Sidi Bennour	Morocco	600	I*,L*
549	Les Trembles	Algeria	600	C*,D*,I*,L*
549	Sasnovy	Belarus	1000	L*
549	Thumau (DLF)	Germany	200	D*,G*,I,L,M
558	RNE5 via ?	Spain	?	G*,I*
558	Valencia(RNE5)	Spain	20	L*
567	Tullamore(RTE1)	Eire	500	B*,C,F,I,K,L,M,N
576	Muhlacker(SDR)	Germany	500	G*,L*
576	Riga	Latvia	500	I,L*
576	Barcelona(RNE5)	Spain	50	I*,L*
585	Orl Wien	Austria	600	I*
585	Paris(FIP)	France	8	I,L
585	Madrid(RNE1)	Spain	200	A*,C*,G*,H,I*,L*,M*
585	Dumfries(BBCScot)	UK	2	K*
594	Frankfurt(HR)	Germany	1000/400	G*,I*,M
594	Oujda-1	Morocco	100	I*,L*
594	Muge	Portugal	100	G*,L*
603	Lyon	France	300	C*,L
603	Sevilla(RNE5)	Spain	50	C*,G*,L*
603	Sousse	Tunisia	10	I*
603	Newcastle(BBC)	UK	2	F,K*,L
612	Athlone(RTE2)	Eire	100	C,F,H,I,K,L,M
612	RNE1 via ?	Spain	10	I*,L*
612	Tallinn	Estonia	100	L*
621	Wavre	Belgium	80	H,G*,I,L,M
621	RNE1 via ?	Spain	10	L*
621	Barcelona(OCR)	Spain	50	G*,I*
630	Vigra	Norway	100	G*,I*
630	Tunis-Djedeida	Tunisia	600	G*,L*
639	Praha(Liblice)	Czech	1500	G*,I*
639	RNE1 via ?	Spain	?	G*,H,I*,L*
648	Orfordness(BBC)	UK	500	C*,D*,F,G*,H,I,L,M
648	Kharkiv	Ukraine	150	L*
657	Madrid(RNE5)	Spain	20	G*,I*,L,M*
657	Wrexham(BBCWales)	UK	2	C,F,G*,K,L,M
666	MesskirchRohrdt(SWF)	Germany	150	G*
666	Sirdunai(R.Vilnius)	Lithuania	500	G
666	Lisboa	Portugal	135	I*,L*
675	Lopic(R10 Gold)	Holland	120	A*,C,D,G,H,I,L,M
684	Sevilla(RNE1)	Spain	500	G*,I*,L*,M
684	Avala(Beograd-1)	Yugoslavia	2000	C*,G*,I*,L*
693	Droitwich(BBC)	UK	150	H,I,L,M,N
693	Enniskillen(BBC)	UK	1	K
702	Yerevan	Armenia	100	L*
702	Flensburg(NDR)	Germany	5	G*,I*
702	Monte Carlo	Monaco	40	L*
702	Zamora(RNE1)	Spain	10	G*
711	Rennes 1	France	300	C,G*,H,I,L,M
711	Laayoune	Morocco	600	I*,L*
720	Langenberg	Germany	200	L*
720	Lots Rd,Ldn(BBC4)	UK	0.5	F,I,K,L,M
729	Cork(RTE1)	Eire	10	F,G*,I*,K,L
729	RNE1 via ?	Spain	?	G*,I*,L*,M*
738	Paris	France	4	I
738	Barcelona(RNE1)	Spain	500	I*,L*
747	Flevo(Hilv2)	Holland	400	A*,C,G*,H,I,L,M
756	Braunschweig(DLF)	Germany	800/200	G*,I*,L*
756	Bilbao(EI)	Spain	5	G*,I*
756	Redruth(BBC)	UK	2	K,L*
765	Sottens	Switzerland	500	G*,I*
774	Enniskillen(BBC)	N.Ireland	1	G,K
774	RNE1 via ?	Spain	?	D,G*,I*,L*,M*
774	Plymouth(BBC)	UK	1	N
783	Leipzig(MDR)	Germany	100	G*,I*,L*
783	Miramar(R.Porto)	Portugal	100	I*
792	Limoges	France	300	H,I
792	Lingen(NDR)	Germany	5	G*,I*
792	Sevilla(SER)	Spain	20	I*
792	Londonderry(BBC)	UK	1	K
801	Munchen-Ismaning	Germany	300	G*,I*,L*
801	RNE1 via ?	Spain	?	G*,H,I*
810	Madrid(SER)	Spain	20	G*,L*
810	Westerglen(BBCScot)	UK	100	A*,C*,F,H,I*,K,L,M*
819	Batra	Egypt	450	I*,L*
819	S.Sebastian(EI)	Spain	5	G*,I*,L*
828	Rotterdam	Holland	20	G*,H
837	Nancy	France	200	G*
837	Amchit	Lebanon	100	L*
837	COPE via ?	Spain	?	G*,I*,L*
846	Rome	Italy	1200	C*,G*,I*,L*
855	Berlin	Germany	100	G*
855	RNE1 via ?	Spain	?	G*,I*,L*,M*
864	Santah	Egypt	500	C*,G*,L*
864	Paris	France	300	C,D,H,I,L*,M
864	Socueliamos(RNE1)	Spain	2	L*
873	Frankfurt(AFN)	Germany	150	F,G*,I*
873	Zaragoza(SER)	Spain	20	G*,I*
873	Enniskillen(R.UI)	UK	1	F,G*,K
882	COPE via ?	Spain	?	G*,I*,L*
882	Washford(BBCWales)	UK	100	F,H,I,L,M
891	Algiers	Algeria	600/300	C*,G*,I*,L*
891	Huisberg	Netherlands	20	I*
900	Brno(CRo2)	Czech Rep	25	G*,I*
900	Milan	Italy	600	C*,G*,L*
909	Lisnagarvey(BBC5)	N.Ireland	10	K
909	B'mans Pk(BBC5)	UK	140	H,I,L,M
918	Domzale	Slovenia	600/100	C*,D*,G*,I*,L*
918	Madrid(R Int)	Spain	20	I*,L*
927	Wolvertem	Belgium	300	G,H,I,L,M
936	Bremen	Germany	100	A*,G*,I*
936	Venezia	Italy	20	I*
936	RNE5 via ?	Spain	?	L*
945	Toulouse	France	300	G*,L*
954	Brno (CRo2)	Czech Rep	200	G*,L*
954	Madrid(CI)	Spain	20	I*,L*
963	Pori	Finland	600	G*,I*,L*,M*
963	Tir Chonaill	Eire	10	K*
972	Hamburg(NDR)	Germany	300	G,I*,L*,M*
972	Nikolayev	Ukraine	500	L*
981	Alger	Algeria	600/300	C*,L*,M*
990	Berlin	Germany	300	G*,I*
990	R Bilbao(SER)	Spain	10	G*,L*
990	Tywyn(BBC)	UK	1	F,K*
999	Madrid(COPE)	Spain	50	G*,L*,M*
1008	Flevo(Hilv-5)	Holland	400	A*,G,H,I,L,M*
1017	Rheinsender(SWF)	Germany	600	G*,I*,L*
1017	RNE5 via ?	Spain	?	I*,L*
1035	Tallinn	Estonia	500	L*
1035	Milan	Italy	50	L*
1035	Lisbon(Prog3)	Portugal	120	G*
1044	Dresden(MDR)	Germany	20	G*,I*
1044	S.Sebastian(SER)	Spain	10	I*,L*
1053	Talk R.UK via ?	UK	?	I,K,L*,M,N
1062	Kalundborg	Denmark	250	G,I*,L,M*
1062	R.Uno via ?	Italy	?	G*,I*
1071	Cairo	Egypt	100	L*
1071	R.France via ?	France	?	G*,I*
1071	Bilbao(EI)	Spain	5	M*
1071	Talk Radio UK via ?	UK	?	L,M
1080	SER via ?	Spain	?	I*,L*
1089	Talk Radio UK via ?	UK	?	I,K,L*,M
1098	Nitra(Jarok)	Slovakia	1500	G*,I*,L*,M
1098	RNE5 via ?	Spain	?	L*
1107	AFN via ?	Germany	10	G*
1107	Talk R.UK via ?	UK	?	I,L*,M
1125	La Louviere	Belgium	20	G*,I*,L*,M*
1125	Deanovec	Croatia	100	C*
1125	RNE5 via ?	Spain	?	G*,I*,L*
1125	Llandrindod Wells	UK	1	F,K*
1134	COPE via ?	Spain	2	G*,I*
1134	Zadar(Croatian R)	Yugoslavia	600/1200	A*,C*,G,I*,L*,M*
1143	AFN via ?	Germany	1	C*,G*,I*
1143	COPE via ?	Spain	2	I*,L*
1179	SER via ?	Spain	?	L*
1179	Solvesborg	Sweden	600	G,I*,J*,M*
1188	Kuurne	Belgium	5	G*,I*,L
1197	Munich(VOA)	Germany	300	G
1197	Virgin via ?	UK	?	I,L,M
1206	Bordeaux	France	100	C*
1215	Virgin via ?	UK	?	I,K,L,M,N
1224	Lelystad	Holland	50	G*
1233	Liege	Belgium	5	G*,I*
1233	Virgin via ?	UK	?	L,M
1242	Marseille	France	150	C*,G*
1242	Virgin via ?	UK	?	L
1251	Marcali	Hungary	500	G*
1251	Huisberg	Netherlands	10	G*,I*
1251	Dubai	UAE	600	L*
1260	Rhodes(VOA)	Greece	500	L*
1260	SER via ?	Spain	?	G*
1269	Neumunster(DLF)	Germany	600	A*,G*,I*,L*,M*
1278	Dublin/Cork(RTE2)	Eire	10	F,G*,I*,L*,M*
1287	RFE via ?	Czech Rep	400	G*,I*
1287	Lerida(SER)	Spain	10	I*
1296	Valencia(COPE)	Spain	10	A*,L*
1296	Orfordness(BBC)	UK	500	F,G*
1305	RNE5 via ?	Spain	?	G*,I*,L*
1314	Kvitsoy	Norway	1200	A,C*,D*,E*,G,I*,L,M
1323	W'brunn (V.Russia)	Germany	1000/150	A,C,G*,J*,M*
1332	Rome	Italy	300	A*,G*,I*,M*
1341	Lisnagarvey(BBC)	N.Ireland	100	A,B*,C*,D*,F*,J,K,L*,M*
1350	Cesvaine/Kuldiga	Latvia	50	I*
1359	Madrid(RNE-FS)	Spain	600	A*,G*,I*,L*
1368	Foxdale(Manx R)	I.O.M.	20	B*,C*,F,G*,J*,J,K
1377	Lille	France	300	G*,I,L,M
1386	Bolshakovo	Russia	2500	C*,D*,G,I*,M*
1395	Fliake	Albania	1000	G
1395	Lopic	Netherlands	120/40	I,L,M*
1404	Brest	France	20	G*,I,L*,M*
1413	RNE5 via ?	Spain	?	L*
1413	Pristina	Yugoslavia	1000	G*,M*
1422	Alger	Algeria	50/25	G*
1422	Heuswelier(DLF)	Germany	1200/600	G*,I*,L*,M*
1440	Marnach(RTL)	Luxembourg	1200	A,G,I,M*
1440	Damman	Saudi Arabia	1600	A*,C*,G*
1449	Squinzano (RAI)	Italy	50	I*
1449	Redmoss(BBC)	UK	2	C*,G*,I*
1458	Fliake	Albania	500	L*
1467	Monte Carlo(TWR)	Monaco	1000/400	A*,G*,I*,M*
1476	Wien-Bisamberg	Austria	600	C*,G*,M*
1485	SER via ?	Spain	?	L*,M*
1494	Clermont-Ferrand	France	20	G*,I,L*
1494	St Petersburg	Russia	1200	C*,D,G*,M*
1512	Wolvertem	Belgium	300	A,B*,D,G,I*,J*,K,L,M*
1521	Kosice(Cicatice)	Slovakia	600	I*
1521	Duba	Saudi Arabia	2000	C*,L*
1530	Vatican R	Italy	150/450	D,F,G*,I*,L*,M*
1539	Mainflingen(ERF)	Germany	350(700)	G*,I*,M*
1539	SER via ?	Spain	?	L*
1575	Genova	Italy	50	I*,M*
1575	SER via ?	Spain	5	G*,I*,L*
1584	SER via ?	Spain	2	L*,M*
1593	Holzkirchen(VOA)	Germany	150	G,I*,M*
1602	SER via ?	Spain	?	L*
1602	Vitoria(EI)	Spain	10	G*,I*,L*,M*
1611	Vatican R	Italy	15	F,M*

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

Listeners:-

(A) Adam Birchenall, Manchester.
(B) Francis Hearne, N.Bristol.
(C) Simon Hockenhull, E.Bristol.
(D) Sheila Hughes, Morden.
(E) Rhodenck Illman, Oxted.
(F) Brian Keyte, Gt.Bookham.
(G) Eddie McKeown, Newry.
(H) Frank Miles, SW London.
(I) George Millmore, Wootton IoW.
(J) Clare Pinder, while in Appleby.
(K) Tom Smyth, Co Fermanagh.
(L) Ernie Strong, Ramsey, Cambs.
(M) Fred Wilmshurst, Northampton.
(N) ```Tom Winzor, Plymouth.

AR5000'C' - are your frequencies COHERENT??

AR5000/+3/C - excellent performance for semi-commercial use

When making critical measurements, the frequency coherence is very important whether a single or multiple unit is employed. Just like optical telescopes, the output from several receivers may be ADDED together to provide greater performance, however their frequencies must be absolutely coherent. This involves the use of a single reference for all oscillators employed throughout the receiver. Several receivers may then be connected to a single external frequency standard safe in the knowledge that their outputs will be coherent.

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. ***£P.O.A.***

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.

The enhanced AR5000+3 has been **awarded 4-stars** by **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".
Voted **best wide band receiver** by the readers of the German "**Funk**" magazine.
Chris Lorek **HRT**...
"Throughout the wide frequency range, the receiver was adequately sensitive, especially so at the upper end, with good overall strong signal handling characteristics."

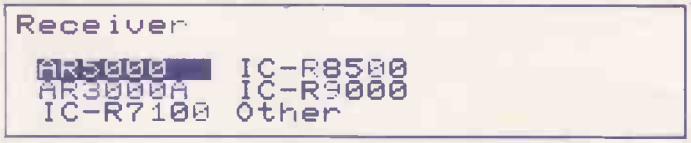
AR5000+3

- ✓ 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

AR5000 £1345 AR5000+3 £1574

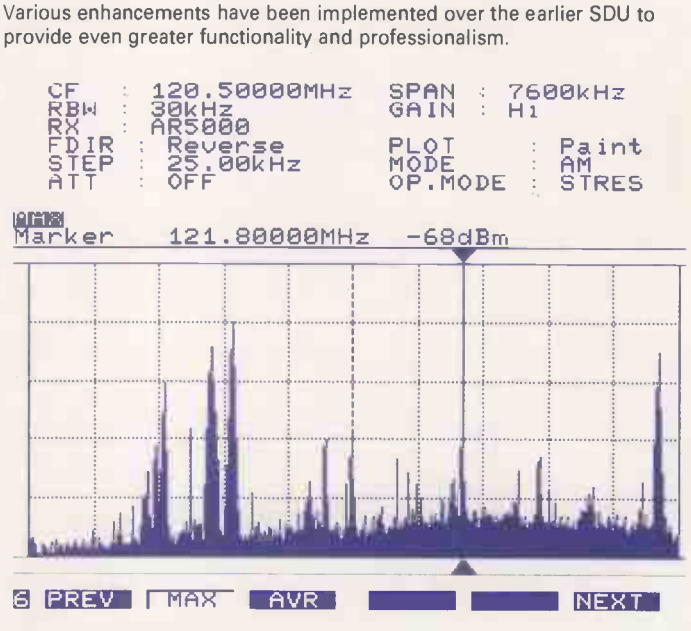
Setting new standards, **SDU5500** Spectrum Display Unit

The SDU5500 is an 'all new' Spectrum Display Unit and a worthy successor to the SDU5000 (which offered practical and cost effective monitoring). Coupled to the AR5000 receiver, it provides a spectrum display of 10 MHz bandwidth anywhere between 10 kHz and 2600 MHz.
Already pressed into commercial usage by the government, the professionalism of the unit has truly been grasped. The SDU5500 has a high resolution monochrome (white/blue) LCD with improved status read-out on the top-half of the display with a spin wheel tuner controlling the marker position, similar to a dedicated high-priced spectrum analyser.



The SDU5500 supports a number of AOR and ICOM receivers, see above. In addition, the SDU5500 may be used with other receivers which offer a 10.7 MHz I.F. output with suitably wide bandwidth, please refer to the colour leaflet for details.

Various enhancements have been implemented over the earlier SDU to provide even greater functionality and professionalism.



Free internet download software is close to completion for the PC Windows operating system and will become available from our web site <http://www.demon.co.uk/aor>

SDU-5500 £799

AR8200 - how feature packed is the rest of the pack??

AR8200 probably the most full featured hand portable, ever!

AOR

The AR8200 has been the first production unit to arrive on the market place with the new airband channel step of 8.33kHz correctly implemented. Add to this memory bank re-sizing, extensive step adjust capabilities to trace unusual band plans, an editable (via PC) meaningful auto mode bandplan, free internet download PC Windows software, optional SLOT CARDS and you have just the tip of the iceberg in respect of facilities. Compare the features list below with other receivers to see how they stack up... or don't.

AR8200 main features	Other unit ??
Wide frequency coverage without gaps 500kHz - 2040MHz, short wave & medium wave bands, top frequency rage over 2 GHz	
All mode reception inc USB/LSB/CW/WAM/AM/NAM/WFM/NFM/SNFM	
Narrow-AM and Super-Narrow-FM in addition to other standard bandwidths	
True carrier re-insertion for SSB (not using a BFO)	
RF preselection around the mid-VHF bands to assist minimal intermodulation	
Built-in noise limiter (N.L.)	
Automatic Frequency Control as standard (A.F.C.)	
Switchable attenuator	
Tuning steps selectable in multiples of 50 Hz is ALL MODES	
8.33 kHz airband channel correctly supported	
Extensive step adjust facilities for tracking unusual band plans	
Meaningful auto mode programming (editable via PC), can be manually defeated	
Duplex offset from automode data and manually programmable	
Bandscope with save trace facility	
Receive signal meter	
Twin frequency readout (VFO-A/B)	
Scan VFO frequencies and search between them	
Search / Scan PAUSE, DELAY, VOICE, LEVEL, MODE personality group programming	
Bank link feature	
FLASH memory backup (no battery required)	
1000 memory channels	
Dynamic memory band re-sizing	
Alpha-tag comments for memory channels, banks and search	
Scan / Search rates up to 37* channels per second (*see full specification sheet)	
Lockout and frequency pass	
Write protect of data	
Intelligent auto-memory store	
LCD contrast control	
Configurable keypad beep and illumination	
Keypad lock	
Configurable power save with low battery indicator	
Power from 4xAA internal batteries or external 12V d.c. supply	
Separate controls for volume & squelch	
Arrow 4-way side rocker for easy navigation through on-screen menus	
Separate main tuning dial	
Detachable MW bar aerial	
Compact stylish cabinet with non-slip finish	
Computer port built in (RS232C level shift required)	
Clone of data between sets	
Scout 'Reaction Tune' compatible (without modification)	
Free internet download PC Windows software	
Discriminator output available from AUX socket (without modification)	
External earphone and record outputs	
SLOT CARD socket for optional cards:- External memory backup store of up to 4000 channels, search banks, bandscope traces etc, CTCSS, Tone eliminator, Record/playback to chip, Analogue voice inversion	
Comprehensive illustrated 140 page operating manual	
Supplied with NiCads, charger, d.c. lead, two aerials, belt hook	

Innovation and forward thinking

AR8200

The facilities offered by the AR8200 are stunning... take the 'step-adjust' feature for example. If you have a frequency of say 151.010 MHz and wish to step in 15 kHz increments, most receivers would simply assume 151.000 MHz then step 151.015, 151.030 etc. However, the AR8200 may be programmed to step in the desired manner of 151.010, 151.025, 151.040, 151.055 MHz etc. Other real life examples would be the 27.60125 MHz CB frequency incremented in 10 kHz steps, no problem... also the 900 MHz band which implements 25 kHz steps but a 12.5 kHz offset. Add to this the foresight of 8.33 kHz airband steps and you have a very flexible unit!

Detailed leaflets available upon request along with price list and supported active UK dealer list.

AR8200 £399

Shown here with optional slot cards.

Tropical Bands Chart

Freq (MHz)	Station	Country	UTC	DXer
2.310	ABC Alice Springs	Australia	2120	M
3.200	TWR Manzini	Swaziland	0300	B,I
3.210	REE via Costa Rica	Costa Rica	0100	I
3.235	R.Luz Y Sonido	Peru	0055	B
3.240	TWR Shona	Swaziland	0334	I
3.255	BBC via Meyerton	S.Africa	1844	B,F,I,K
3.270	Namibian BC,Windhoek	Namibia	1838	B,D,I,K
3.290	Namibian BC,Windhoek	Namibia	1842	B,K
3.315	AIR Bhopal	India	0045	B
3.320	SABC (RSG) Meyerton	S.Africa	1853	B,I,K
3.335	CBS Taipei	Taiwan	1910	K
3.345	AIR Jaipur	India	0050	B
3.356	R.Botswana	Gabarone	1845	I,K
3.365	GBC R-2	Ghana	2039	B,K,M,N
3.365	AIR Delhi	India	1840	K
3.395	ZBC Gweru	Zimbabwe	2010	B
3.915	BBC via Kranji	Singapore	2100	A,B,E,I,M,N,Q
3.955	BBC via Skelton	England	2009	A,B,G,I,J,O,P,Q
3.960	Xinjiang PBS, Urumqi	China	0055	B
3.970	R.Korea via Skelton	England	2100	G,I,L,P
3.975	R.Budapest	Hungary	2130	B,C,E,I,L,M,P
3.985	Nexus, Milan	Italy	1908	B,H,I,J,M
3.995	DW via Julich	Germany	2011	A,B,G,I,J,Q
4.005	Vatican R.	Italy	2012	A,B,C,H,I,M,Q
4.755	R.Educ CP Grande	Brazil	0306	B,D,I
4.760	AIR Port Blair	India	2351	I
4.765	R.Rural, Santarem	Brazil	2340	B,D
4.770	FRCN Kaduna	Nigeria	2032	B,D,G,I,K,M,N,Q
4.775	AIR Imphal	India	0100	B
4.775	TWR Manzini	Swaziland	0341	I
4.783	RTM Bamako	Mali	2020	A,B,I,N
4.790	Azad Kashmir R.	Pakistan	0309	I
4.800	AIR Hyderabad	India	0040	B
4.800	LNBS Maseru	Lesotho	0311	I
4.805	R.Nac.Amazonas	Brazil	0045	B
4.815	R.Difusora, Londrina	Brazil	0025	B
4.815	R.diff TV Burkina	Duagadougou	2353	I
4.820	R.Botswana, Gaberone	Botswana	2024	I,M,N
4.820	La Voz Evangelica	Honduras	0545	D
4.830	R.Tachira	Venezuela	0410	B,I
4.835	R.Tezulutlan, Coban	Guatemala	0115	B
4.835	RTM Bamako	Mali	2020	A,B,D,I,K,M,N
4.840	AIR Bombay	India	0110	B,M
4.845	RTM Kuala Lumpur	Malaysia	1825	K
4.845	ORTM Nouakchott	Mauritania	2046	I,K,N
4.850	R.Yaounde	Cameroon	0314	D,I,N,Q
4.860	AIR Delhi	India	1842	H,K,N
4.870	R.Cotonou	Benin	2045	I,K,N
4.875	R.Roraima, Boa Vista	Brazil	0100	B,I
4.885	R.Clube do Para	Brazil	0316	B,I
4.885	R.Difusora Acreana	Brazil	0055	B
4.885	KBC East Sce Nairobi	Kenya	1844	K
4.890	RFI Paris	via Gabon	0358	D,I
4.895	Voz del Rio Arauca	Colombia	0318	I
4.895	Pakistan BC	Pakistan	1844	I,K
4.900	Haixia 2,V of Strait	China	2118	I
4.915	GBC-1, Accra	Ghana	2036	B,D,G,I,K,N,Q
4.915	KBC Cent Sce Nairobi	Kenya	1850	K
4.920	R.Quito, Quito	Ecuador	0615	J
4.920	AIR Chennai	India	0105	B
4.930	R.Internacional	Honduras	0321	I
4.935	KBC Gen Sce Nairobi	Kenya	1845	K
4.950	VOA via Sao Tome	Sao Tome	2010	A,K,Q
4.955	R.Nac. de Colombia	Colombia	0413	B,D,I
4.960	VOA via Sao Tome	Sao Tome	0322	I
4.965	R.Alvorada	Brazil	0040	B
4.965	Christian Voice	Zambia	1857	I,K,N
4.975	R.Uganda, Kampala	Uganda	2024	A,B,D,I,K,N,P
4.980	PBS Xinjiang, Urumqi	China	0110	B
4.980	Ecos del Torbes	Venezuela	2240	B,D,G,I
4.985	R.Brazil Central	Brazil	0105	B
4.990	FRCN Lagos	Nigeria	2035	B
5.005	R.Nacional, Bata	Eq.Guinea	1900	K,N
5.010	R.Garoua	Cameroon	2025	B
5.010	Guangxi 2, Nanning	China	2146	N
5.010	AIR Thiru'puram	India	0019	B,I
5.015	R.Brazil Tropical	Brazil	0045	B
5.020	La V du Sahel,Niamey	Niger	2152	D,N
5.025	R.Parakou	Benin	1815	B,K,N
5.025	R.Rebelde, Habana	Cuba	0438	B,D
5.025	R.Uganda, Kampala	Uganda	1838	I,K,N
5.030	AWR Latin America	Costa Rica	0040	B
5.040	PBS Fujian, Fuzhou	China	2110	G
5.047	R.Togo, Lome	Togo	2036	B,G,I,K,N
5.050	Haixia 1,V of Strait	China	2109	I,N
5.050	R.Tanzania	Tanzania	1826	B,I,K
5.055	RFD Cayenne(Matoury)	French Guiana	0326	I
5.075	Caracol Bogata	Colombia	0231	A,B,D,G,I
5.100	R.Liberia, Totota	Liberia	2037	G,K,N
5.320	CNR 1	China	2030	M

DXers:-

(A) Michael Casey, NE.Manchester.
(B) Robert Connolly, Kilkeel.
(C) Bill Griffith, while in Cordoba, Spain.
(D) David Hall, Morpeth.
(E) Simon Hockenhull, E.Bristol.
(F) Robert Hughes, Liverpool.
(G) Sheila Hughes, Morden.
(H) Rhoderick Illman, Oxted.
(I) Eddie McKeown, Newry.
(J) Frank Miles, SW.London.
(K) Fred Pallant, Storrington.
(L) Clare Pinder, while in Appleby.
(M) Vic Prier, Colyton.
(N) Richard Reynolds, Guildford.
(O) Tom Smyth, Co.Fermanagh.
(P) Norman Thompson, Oadby
(Q) Fred Wilmshurst, Northampton.

2100-2130?) 24322 at 2122 in Woodhall Spa; R.Record, Sao Paulo, Brazil **9.905** (Port 0900-0000) 44333 at 2142 in Guildford; RCI via Sackville **9.755** (Eng, Fr [CBC progs] to USA, Caribbean 2200-0300) SIO 444 at 2200 in Co.Fermanagh; R.Nederlands via Bonaire, Ned.Antilles **9.845** (Eng to N.America 2330-0125) SIO444 at 0053 in N.Bristol.

There are quite a few broadcasts to Europe in the **7MHz (41m)** band. Some come from R.Japan via Woofferton, UK **7.230** (Jap, Eng 0500-0700), rated 55555 at 0630 in Herstmonceux; WYFR via Okeechobee, USA **7.355** (Eng 0600-0800, also to Africa) 55545 at 0645 in SW.London; BBC via Rampisham, UK **7.325** (Eng 0445-0800) 44434 at 0750 in Oxted; AWR via Forli, Italy **7.230** (Eng 0930-1000) 32222 at 0930 in Appleby; Sudwestfunk via Rohrdorf **7.265** (Ger 24hrs) 43443 at 1030 in Oadby; Vatican R, Italy **7.250** (Music prog 1415-1615?, Eng 1615-1630) SIO 444 at 1600 in Co.Fermanagh; R.Polonia (Polish R), Warsaw **7.285** (Eng 1700-1800) 43333 at 1730 in Morden; R.Slovakia Int **7.345** (Eng 1830-1857) 45434 at 1840 in Colyton; R.Budapest, Hungary **7.170** (Eng 1900-1930) 44444 at 1900 in Dudley; RCI via Skelton, UK **7.235** (Fr, Eng 1900-2200) 22222 at 1900 in Rugby; Voice of Greece, Athens **7.475** (Eng 1900-1930) 55354 at 1900 in Newry; R.Tirana, Albania **7.180** (Various 1900-1956) 35444 at 1925 in St.Mary's, IoS; Voice of Greece, Athens **7.450** (Gr 1800-2050) 55555 at 1935 in Liverpool; AIR via Bangalore **7.410** (Hi, Eng 1745-2230) 34433 at 2045 in Kilkeel; BBC via Skelton, UK **7.325** (Eng 2000-2200) 55544 at 2135 in Northampton; V of Turkey **7.190** (Eng 2200-2300?) 54544 at 2204 in E.Bristol; WHRI via Maine, USA **7.395** (Eng 0000-0300) 44444 at 0001 in Morpeth.

Also noted were WJCR Upton, USA **7.490** (Eng to E.USA 24hrs) rated 54433 at 0800 in Galshiels; R.Nederlands via Madagascar **7.120** (Eng to S/E/W.Africa 1730-2025) 44434 at 1750 in St.Austell; VOA via Botswana **7.415** (Eng to Africa 1800-2230?) 24232 at 2150 in Woodhall Spa.

Some of the many broadcasts to Europe in the **6MHz (49m)** band come from R.Canada Int via Wertachtal, Germany **6.145** (Eng, Fr 0500-0600), rated 33443 at 0519 in Larnaca, Cyprus; R.Japan via Skelton, UK **5.975** (Eng 0600-0700) 54544 at 0611 in St.Mary's, IoS; R.Austria Int via Moosbrunn **6.155** (Various) SIO 333 at 0742 in N.Bristol; Suddeutscher Rundfunk, Muhlacker **6.030** (Ger) 45544 at 0750 in Northampton; Voice of Hope via Julich, Germany **5.975** (Eng 0830?-0930) 44444 at 0833 in Woodhall Spa; DW via Julich? **6.140** (Eng Service) SIO 444 at 0900 in Co.Fermanagh & 33333 at 1705 in Truro; R.France Int via Allouis? **6.175** (Fr 1100-1200) 44444 at 1100 in Rugby; R.Nederlands via Julich **6.045** (Eng 1030-1225) 55544 at 1130 in Herstmonceux; Deutschland R, Berlin **6.005** (Ger 24hrs) 55545 at 1420 in SW.London; Bayerischer Rundfunk, Germany **6.085** (Ger 24hrs) 44434 at 1725 in Colyton; R.Sweden **6.065** (Eng 1730-1800) 54444 at 1745 in Plymouth; R.Slovakia Int **5.920** (Eng 1830-1857) 44544 at 1835 in E.Bristol; R.Vlaanderen Int, Brussels **5.960** (Eng 1930-1956) 54433 at 1947 in Oxted; RCI via Skelton, UK **5.995** (Fr, Eng 1900-2100) 55454 at 2000 in Newry; Vatican R, Italy **5.883** (Various [Eng 1950-2010]) 54454 at 2005 in Liverpool; R.Polonia [Polish R], Warsaw **6.095** (Eng 1930-2025) 44444 at 2010 in Oadby; R.Prague, Czech Rep. **5.930** (Eng 2000-2027) 43333 at 2015 in Morden; BBC via Cyprus **6.195** (Eng 2000-2300) 54554 at 2230 in Sevilla, Spain; R.Japan via Skelton, UK **6.155** (Eng 0000-0100) 43343 at 0002 in St.Austell.

While beaming to other areas the Caribbean Beacon, Anguilla **6.090** (Eng to N.America?) was 22432 at 0625 in Galashiels; WEWN Birmingham, USA **5.825** (Eng to N.America 2200-0900?) 33323 at 0815 in Stalbridge.

LIST OF EQUIPMENT USED LM&S for $ May, # June, *July '99 issues.

$ # Darren Beasley, Bridgwater: Yaesu FRG-100 + a.t.u. + 15m wire.
$ * Adam Birchenhall, Manchester: Philips D2935.
$ # * Vera Brindley, Woodhall Spa: Sangean ATS-803A or Roberts R876 + r.w.
# * Michael Casey, Manchester: Roberts RC828 + Howes a.t.u. + helical loop.
$ # * Robert Connolly, Kilkeel: JRC NRD-525 + DSP9+ filter + Datong AD370 or Sangean ATS-803 + Sony AN-1 antenna.
* Patrick Connor, Trowbridge: Yaesu FRG-7700 + r.w.
$ # Martin Cowin, Kirkby Stephen: Hitachi TRK-5854E + built-in whip.
$ # * Bernard Curtis, Stalbridge: Realistic DX-400 + rod or r.w.
$ # Martin Dale, Stockport: Grundig Satellit 3000 or Sangean ATS-803A or Codar CR70A + a.t.u. + r.w. or Capco loop.
$ Eric Duncan, St.Andrews: AOR AR7030 or AOR AR5000 or Icom IC-R8500 + 1.75m diam m.w. loop or W-Q m.w. loop or balun + 60m wire.
$ # John Eaton, Woking: JRC NRD-345 + Datong AD270 or a.t.u. + r.w.
$ # * David Edwardson, Wallsend: Trio R-600 + 2.5m X 2.5m fixed loop or 22m long trap dipole.
$ # * Stan Evans, Herstmonceux: Kenwood R-2000 + Balun + 11m wire in loft.
$ # * Martin Goodey, St.Mary's, Isles of Scilly: AOR AR7030 + 25m wire.
* Bill Griffith, W.London: JRC NRD-535 + 25m wire.
* Bill Griffith, while in Spain: Sony ICF-SW55 + 5m wire.
# * Gerald Guest, Dudley: Roberts RC818 + r.w.
$ # * David Hall, Morpeth: AOR AR7030 + Global AT-2000 + 13m wire.
$ # * Tony Hall, Freshwater Bay, IoW: Yaesu FRG-7 + 13m wire or RF-B45
$ # * Francis Hearne, N.Bristol: Sharp WQT370 + r.w.
$ # * Simon Hockenhull, E.Bristol: Roberts R 617, R817 or R876.
# Mark Holloway, while in Canary Is: Sony portable + r.w.
$ * Robert Hughes, Liverpool: ADR AR7030 + 15m indoor wire or Drake R8E + RF Systems MTA on roof.
$ # * Sheila Hughes, Morden: Sony ICF-7600DS + loop or Panasonic R48 + 15m invert L.
$ # * Rhoderick Illman, Oxted: Kenwood R-5000 + r.w. or AN-1, Sony ICF-7600DS.
$ # * Brian Keyte, Gt.Bookham: AOR AR7030 + loop or a.t.u. + r.w.
$ # * Ross Lockley, Galashiels: Realistic DX-300 + a.t.u. + 40m wire or Sangean ATS-803A.
$ # * Eddie McKeown, Newry: Tatung TMR 7602 or Sangean ATS-818.
$ # * Frank Miles, SW.London: Kenwood R-5000 + a.t.u. or Balun + 30m wire.
$ # * George Millmore, Wootton, IoW: Racal RA17L + v.l.f. converter + loop or Sangean ATS-803A + loop.
$ # * Fred Pallant, Storrington: Trio R-2000 + Howes CTU8 a.t.u. + r.w.
$ # * John Parry, Larnaca, Cyprus: Realistic DX-394 + r.w.
$ # * Clare Pinder, while in Appleby: JRC NRD-525 + a.t.u. + r.w.
# Clare Pinder, while in Glasgow: Sony ICF-SW55.
* Peter Pollard, Rugby: Sony ICF-2001D + r.w.
$ # * Vic Prier, Colyton: Racal RA17L + a.t.u. + r.w. or active vertical in loft or Capco RMA1, RMA2 active loops.
$ # * Philip Rambaut, Macclesfield, Int.Marine Radio R.700M + r.w.
# * Richard Reynolds, Guildford: Sangean ATS-803A + l.w./m.w. loop or a.t.u. + 30m 'coil' or 60m band loaded dipole in loft.
# Harry Richards, Barton-upon-Humber: Grundig Satellit 700 + AD270 or r.w. or Grundig Yacht Boy 400 or Matsui MR4099.
# Alan Roberts, Quebec, Canada: Lowe HF-225 + 49m or 31m dipole or 11m vertical dipole or r.w. Panasonic RF-B40 + whip.
$ # Robert Shacklock, Westwood, Notts; Realistic DX-394 or Yaesu FRG-7 + a.t.u. + 30m wire in loft.
# John Slater, Scalloway, Shetland: Lowe HF-150 + a.t.u. + 20m wire.
$ # * Tom Smyth, Co.Fermanagh: Sangean ATS-803A or Morphy Richards R191.
$ # * Emie Strong, Ramsey (Cambs): AKD HF3 + Watson Balun + 50m wire.
# * Norman Thompson, Oadby: Matsui MR4099 + 20m wire in loft.
# Phil Townsend, London: Lowe HF-225 + preselector + r.w. or loop.
$ # * Martin Venner, St.Austell: Matsui MR4099 or Yupiteru MVT-7100 + Global AT-1000 + 30m wire.
$ Ernest Wiles, while in Lamassol, Cyprus: AKD Target HF3 + indoor r.w.
# Ernest Wiles, NE.Bedford: AKD Target HF3 + a.t.u. + 10m Windom.
# * Thomas Williams, Truro: Gundig Yacht Boy 206 or Sharp 5454 + r.w.
$ # * Fred Wilmshurst, Northampton: Icom IC-R70 + Global AT-1000 + r.w. in loft.
$ # * Tom Winzor, Plymouth: Kenwood R-1000 or Yaesu FRG-7 + Datong active antenna.

Amateur Radio In A Virtual War Zone

Robert Connolly GI7IVX has been a radio addict for many years. Here follows his account of how he first got interested in all things radio.

I have been a radio addict for many years, in fact, since I was a young boy. In those days I used to listen to short wave radio along with my father, who had joined the Navy prior to WWII and then following the start of the war he became involved with the Special Y Service. After the war, he trained as a primary school teacher and re-settled in Northern Ireland, his birth country.

Although he did not aspire to amateur radio operation, he was very keen on all aspects of short wave listening. Every Sunday he used to switch on the radio and listen to ships' aircraft (before they used s.s.b.), amateurs and international broadcast stations. It is with fond memories that I recall his favourite broadcast station on a Sunday which used the callsign of 'The *Happy Station* (Radio Netherlands English service). That callsign and its madcap presenter with his crazy animal sounds will stay with me to the day I die.

I also recall him tuning around the world on New Year's Eve to hear the New Year in as it crossed various countries in their local time. He was also a very keen television DXer, and in his day had taken many photos of foreign test cards, etc., some of which were published in reports in *Practical Wireless*, another fascinating magazine which helped to develop my hobby.

All Things Radio

The seeds were thereby set for my interest in all things radio. Coupled with this, I knew several local amateurs who helped shape my interest in those early days. As time went by, my radio hobby developed in fits and starts, subject to available time. I had an increasing yearn to become involved in the transmit side of things and become a licensed amateur. However, time, work commitments and finance were against me.

Next came the CB revolution with its illegal operation, publicity and campaign for legality. I decided to wait for CB to be legalised and use this as a jumping off point for the transmit side of radio and if I liked it, then I would study for the RAE and become an amateur.

Legal CB

In 1981 CB became legal with f.m. mode and I purchased one of the first sets available in Northern Ireland and a licence. Being the holder of a legal f.m. CB in the first few weeks of operation in Northern Ireland was not easy. Firstly there were very few legal f.m. sets in operation, and therefore almost nobody to talk to. Secondly, the authorities here had an active campaign against illegal radio equipment, and some of them were totally unaware of the legal version of CB for several months.

In Northern Ireland, it being the country it is with the problems it has had since the early 1970s, there were police and army check points everywhere. The terrorists had also been using illegal radio equipment to set up ambushes and detonate bombs. The result was that a CB transmitter in a car was a suspect!

I recall being stopped one night at a police check point and the officer noticed the CB mounted under the dash of the car. He asked if that was a CB, to which I replied that it was. He then said those are illegal, to which I pointed out that it was a legal version and I held a licence for it. The officer then spent the next ten minutes reading and re-reading the licence document by torch-light, the first one he had ever seen!

Convinced that the document was legal, he then spent a further five minutes checking and double checking the CB 27/81 details marked on the front of the rig, with those shown on the licence, before

... SURROUNDED BY POLICE AND ARMY ...

Amateur Radio In A Virtual War Zone

allowing me to proceed. Fortunately, I had the sense to carry the licence with me in the car, or else I would have had major problems!

Studied & Passed

By 1993 I had studied for and successfully passed my RAE, however, I did not go on air for quite a while afterwards. It was my intention to learn Morse and then get a Class A licence before going on air. However, again time and work commitments were still against me.

In 1994 I decided that I would get my class B licence and operate on v.h.f. This was duly done and I purchased a new CTE 1600 2m transceiver. Shortly afterwards, I also purchased an antenna for the car and a 25W docking booster for mobile work.

Experience over the years with CB radio in the car had taught me to carry a copy of licence documents with me at all times. When you were stopped at a security force check point, the first thing you were always asked for was your driving licence, for identification, and then if there was an antenna on your car, you were asked for the appropriate licence for the equipment.

Usually the patrol assumed that it was a CB radio and asked for a licence for that. Unfortunately, when they were told that the equipment was not CB but amateur radio equipment, they sometimes seemed lost and went through a series of questions.

I should point out that at no time did I try, or even think of, making the job of the security forces any more difficult than it already was, but there were times when they seemed to have set questions to ask in a set order, despite you trying to make things easier for them by indicating what the radio equipment in the car was. I believe that there were some valid reasons behind this seemingly illogical approach.

One of these reasons, I understand, was the military had some officers who travelled around in civilian clothes and unmarked cars whose sole purpose was to ensure that a patrol asked the right questions in the right order and were not side tracked or short circuited by answers. As a result, some of my experiences with 2m amateur radio and security force patrols were slightly funny and others were serious.

The Funny Side

On the funny side, I recall being stopped by the army when I had only the 2m rig in the car and asked if I was a taxi, to which I replied no. They then thought for a moment and asked was the antenna for a mobile 'phone, to which I replied again no. After another brief delay, they then asked was it a CB, to which I replied no again. This is despite several times telling them it was an amateur radio rig.

I was then asked if I had a licence for the equipment, I said I had and produced it. I always carried it as I previously mentioned, but not just the Validation Document, but also the associated booklet which was the main part of the licence, just in case someone got officers and wanted to see the whole caboodle. After several minutes reading a few pages, they gave up and I was on my way.

On another occasion, I was stopped by the police in my local town when I had not only my CB and 2m set in the car, but also my marine v.h.f. hand-held, which I was bringing back from my boat. I was asked for full licence documentation for the radio equipment and I produced the full amateur licence booklet and Validation Document, the same for the CB, and my marine v.h.f., along with a copy of my marine v.h.f. Operators' Certificate, a pile of documents almost an inch thick, which the officer duly went through, page by page, before allowing me to proceed.

Two days later the same officer was carrying out another check point in the town, stopping all the cars. He put his hand up to stop me and then you could see him visibly remember that this guy had enough documentation for his radios and that it would take all day to read and he suddenly waved me on.

Switched On

Not all police officers or army personnel were ignorant of CB and Amateur radio. Many were very switched on and had a keen interest, and many of the army personnel that I came across on my travels were disappointed that they were not allowed to operate CB or Amateur Radio while on a Northern Ireland tour of duty.

I recall one evening coming home from work via the mountains and listening to the Isle of Man amateur repeater. It transpired that *MIR* was shortly to pass over and on this occasion, Helen Sharman, Britain's first astronaut, was on board. Apparently she was going to re-contact a school in Wales that she had problems communicating with the 2m band earlier in the day.

Not wanting to miss possibly hearing this, I stayed on high ground and pulled into a car park and selected the appropriate frequency with the squelch off. A few moments later, a joint army/police patrol pulled in and an officer came up to the car to enquire what I was doing. After a quick explanation he went back to the patrol car and within seconds my car was surrounded by police and army waiting to hear this transmission from space.

On this occasion, Helen had decided to use packet radio and of course no voice was heard, just the packet rasping tones. I was disappointed, but there were about ten very impressed police and army personnel who went away afterwards, amazed that the signal they had heard had come from space.

Terrible Interference

As I mentioned earlier, I was using a CTE 1600 2m hand-held in the car and I soon noticed that when I came close to an army patrol, there was terrible interference from their equipment. This served as an early warning system for detecting patrols and check points, and I could have documentation ready in advance. I always switched off my radios at check points as a matter of course to prevent interference to their equipment.

However, one day I was in a border town and was stopped by a joint police/army foot patrol. The police officer spotted the 2m rig and quickly identified it. I suspect that he was also an amateur, but he did not say so. However, he did, in a very pleasant manner, point out that I should not use the rig for transmit purposes when close to army patrols as this triggered their attack alarm radios which they all carried and this could lead to shots being fired by them in defence. I, like many amateurs in Northern Ireland, was aware of this possibility and would never transmit close to them anyway.

Continued on page 26...

" I soon noticed that when I came close to an army patrol, there was terrible interference from their equipment."

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Comments from John Griffiths

I have to say that I'm not a fan of indoor antennas like this as earlier desk mounted antennas tended to look like a mad scientist invention. However, I was suprised by the quality of construction of this piece of equipment and it appears to be up to the job it is designed to do. Without getting technical, the Apollo 2000 claims to be able to cover 0-1650MHz. I used it between 108-400MHz approx and was surprised by what it was able to do. It produced clean copy and there was good reproduction with very little breakthrough.

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A high performance wideband antenna offering superb performance from 25-2000MHz. Transmit range:- 6m, 2m, 70cm, 32cm & 23cm (power handling 200W). Fitted with low loss 'N' type connector. Supplied with mounting brackets.

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Comments from John Griffiths

Putting the DC-2000 up gave me a tremendous boost to all signals with the ancient AR-2000 coming alive! Signals were well received and I found that I wandered out of airband - my usual haunt - into all manner of areas that previously have been less than good here due to my location!

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Prof quality base antenna for AIR. (Civil & military). With SO-239 fitting (1.7m long). Gain 4.5/7dB.

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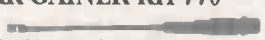

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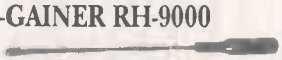

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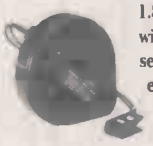

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Amateur Radio In A

...continued from page 22

"Security forces were still wary to a degree of all radio equipment, even radio pagers and mobile 'phones, as they had been used in the past to detonate bombs and set-up ambushes."

Radio Jammers

In general, licensed CB and amateur radio operators were not greatly inconvenienced by security operations in Northern Ireland. Problems did arise when the bomb squad were examining suspect devices or explosion scenes. They would use radio jammers to prevent radio controlled detonation of devices, but this also jammed CB and 2m radios with the result that radio operation was not possible.

Sometimes this would last several hours, but if it was a large device in a difficult location, it would take a couple of days to diffuse and the jammer was on for the duration. Amateur v.h.f. and u.h.f. communications was also very difficult for those who resided close to military bases. Radio jammers were used at all military bases for security reasons and this created severe QRM which could not be suppressed.

At one time I lived about 600m away from a local army base and had severe interference problems as a result of their equipment. The strength of the jamming would vary according to the risk to the base and for days would be very high. These jammers could also cause problems in the reception of medium wave, short wave, v.h.f. broadcast stations and also television reception at times, due to the wide bandspread and variable signal strength output.

Communications Monitored

One other little known fact in Northern Ireland was that all radio communications were monitored by the security forces who had a number of remote listening posts. To the uninformed, these appeared as concrete communication towers. However, I had come across similar ones previously on the West coast of Scotland, when I lived and worked there a number of years ago, which I was reliably informed, were used to monitor communications there.

As the ones I had come across in Northern Ireland were of the same design and construction, I knew what they were for. I am led to believe that these towers across the UK are fed into a location in South West England and used for various purposes, such as frequency usage analysis and security monitoring.

Large numbers of unlicensed CB equipment or even legal, licensed CB equipment, which the identification code had worn off, were regularly confiscated by the security forces and questions asked. Through time they then handed these units over to the Customs & Excise, who would, from time to time, destroy them. I know that the Customs headquarters in Northern Ireland frequently had a room which was full of confiscated radio equipment awaiting disposal.

Some customs officers felt that it was a shame that these rigs, particularly equipment that was legal to either licensed CB or amateur operators, would be destroyed when they could have been sold off to licence holders, and apart from generating some revenue for the Crown, would have to be put to good use and helped licensed operators just starting out to reduce their financial outlay.

Normal Practice

The border areas were a place where you could be assured of coming across numerous security force patrols and asked for licences frequently. It was normal practice to carry a copy with you, but the facility existed where they could quickly check the validity of an amateur callsign, even if you did not have either a copy of the licence, or you were waiting for the renewal. As long as radio equipment was in the possesion of a licence, they did not mind.

The same procedure applied to CB equipment, but this took longer to check and the facility only existed during the working hours of SSL, who issued the licence. It would seem that terrorists did not hold either Amateur Radio or CB Radio licences and in the main, their radio communications equipment was usually of an un-approved type.

However, security forces were still wary to a degree of all radio equipment, even radio pagers and mobile 'phones, as they had been used in the past to detonate bombs and set-up ambushes. Hence the signal detectors and jammers used by military bases and patrols.

Grey Area

As with the rest of the UK, scanners were a grey area, legal, but not legal. The military always had their communications encrypted so that traffic could not be intercepted, but the police used to use plain transmissions with codes for locations. In common with the rest of the UK, the majority of scanner operators used their equipment for their own interest and usually in their own homes.

Many people I know kept a listening watch on the police frequencies, especially during times when tensions in their local district were high, to keep up-to-date with riots, etc. There was a logical reason behind this, in that if a riot situation was coming close to the listeners' property, they could prepare themselves and know a safe evacuation route.

It was known that terrorists were also using scanners to monitor the police movements and prepare ambushes, etc. With this in mind, the police spent several years looking for a secure system, and about five years ago introduced new base, mobile and hand-held radios, which used variable encryption methods, similar to the military set-up. They were the first police force in the UK to have fully variable encrypted radio transmissions.

The disadvantage for the scanner user is that they cannot monitor riot situations any more for their own safety (*which is illegal in any case - **Ed.***). However, the safety of the security forces and confidentiality of their communications must come first and I am sure that police forces in the rest of the UK will eventually follow this lead.

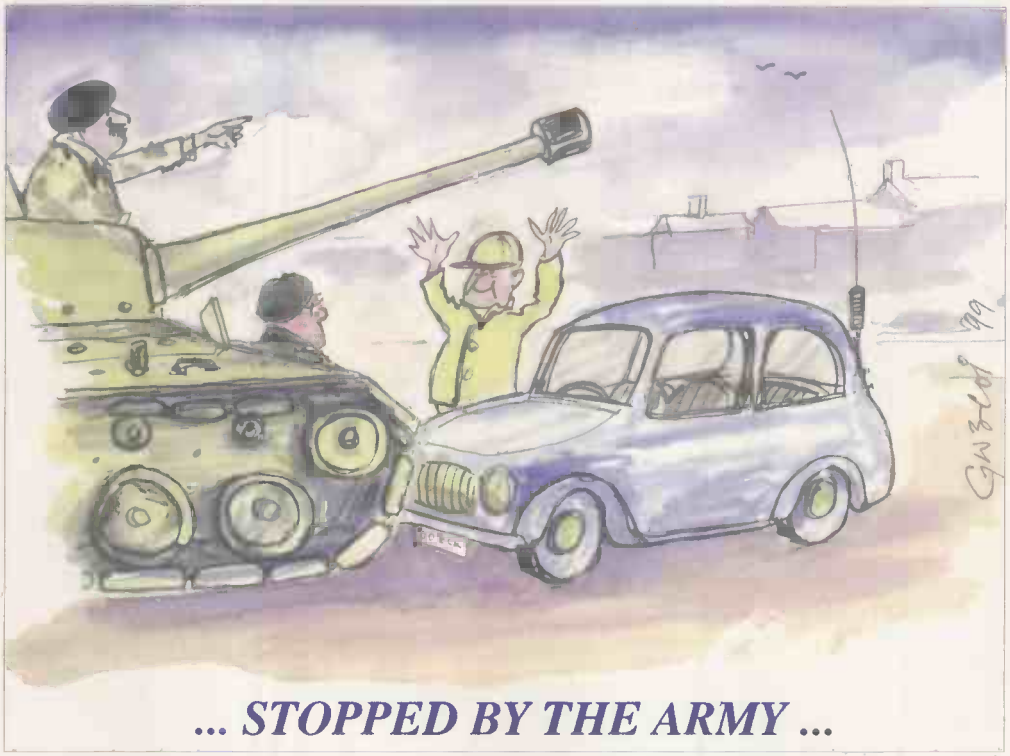
Traffic Information

As in the rest of the UK, both CB and amateur radio provided traffic information between mobile users.

A Virtual War Zone

However, in Northern Ireland, mobile users would become quickly aware of bomb alerts and civil disorder locations with the associated traffic congestion. In many cases, this saved serious inconvenience to other mobile operators in that they knew to avoid the areas referred to or even perhaps a complete town or city.

Almost everyone from the country areas who were travelling to Belfast for shopping perhaps would always be prepared to turn around and go home if traffic and news flashes on the radio indicated that there were problems in the city. There were numerous times when maybe a dozen or more simultaneous bomb alerts would affect all the main routes into and out of the city. Those with licensed radio transceivers in their vehicles, CB, Amateur and even p.m.r. had an advantage of course, in that on many occasions they would get the information much earlier than a local radio station could broadcast the traffic information.



... STOPPED BY THE ARMY ...

Radio Active

Both CB and amateur radio are very active on both sides of the Irish border and many friendships built up as a result. The authorities in the Republic of Ireland tended to ignore the license requirement for CBers, especially those visiting from the North.

However, for radio amateurs it was a slightly different story, a visitors permit and temporary callsign had to be issued. In order to get this, it was necessary to provide not only a copy of your current UK Amateur licence, but in many cases, details of locations to be visited, dates and duration of visits, equipment type, and so on. These permits were only valid for three months at a time and one was constantly renewing them, usually on the spot in Dublin.

Some Northern Ireland amateurs were fortunate to have an accommodation address South of the border and were able to get a yearly visitors licence. Fortunately, a few years ago, with the introduction of CEPT agreements, the need for this ceased. Now we can drive across the border and change from our regular callsigns to a mouthful, for example, "Golf India Seven India Victor X-ray stroke mobile" becomes "Echo India stroke Golf India Seven India Victor X-ray stroke mobile". This is, of course, assuming that we can distinguish just where the border is for callsign changes.

In the past, customs posts or a white line across the road identified the border, but a couple of years ago these were abolished and sometimes it can be difficult enough to decide, unless you see a road traffic sign which is different to those in the North or UK.

As I stated earlier, in general, legal CB and Amateur Radio operations have carried on with little inconvenience in Northern Ireland during its troubles. The security forces recognise that legal operators use common sense and that both CB and Amateur Radio can be, and in the past has been, of practical use. Despite being in an effective war zone, Amateur Radio has rapidly grown unmolested and legal CB radio has had its peaks and troughs in common with the rest of the UK, with the older CB 27/81 frequencies being the preferred operating band.

Of Assistance

There have been occasions when Amateur and CB radio has been used to assist the emergency services in their work. Following the terrible bombing of Omagh, many telephone land-lines were down, the mobile 'phone network became overloaded and the emergency services radios were being used to capacity. Although I had no reports of amateurs becoming involved with communications, it was later revealed that a hospital in Belfast was desperately trying to get information on the number and severity of injuries that were being transferred to them, but with the telephone network inoperable and the mobile 'phone network log-jammed, this was proving impossible. In this case, the television crews on scene helped out by using their television audio satellite links to relay the required information to the Belfast Hospital.

Hopefully, Amateur Radio will develop even more as peace comes about in Northern Ireland, both internally and with new blood coming in and externally with foreign visitors coming. Certainly, the basis is there with young people becoming interested, and there are a number of active Amateur Radio clubs in Province. ***SWM***

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Second Time Around

The FRG-9600

Andrew Howlett G1HBE checks out the Yaesu FRG-9600 and Icom IC-R7000 base station scanning receivers. Read his round-up on both, and maybe you could find yourself buying second-hand too.

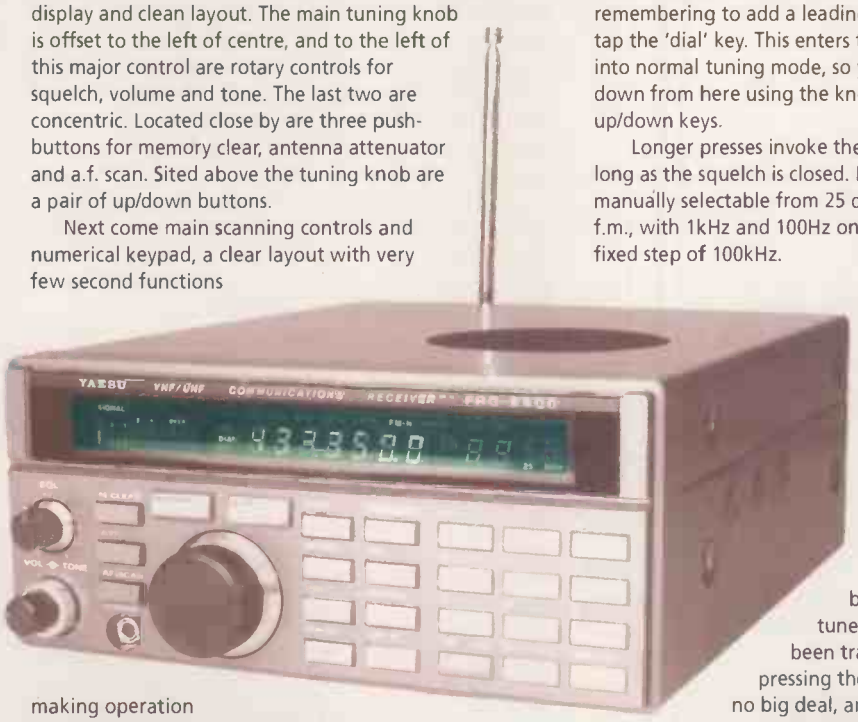
The mid '80s saw the introduction of many scanning receivers, some better than others, and one of the better ones came from Yaesu, the FRG-9600. At a typical discounted price of £450, it was a 'step up' from the cheap and cheerful earlier sets from other manufacturers and was a fairly decent performer.

With all-mode reception across its 60 to 905MHz range, (although s.s.b. was limited to below 460MHz), and a selection of tuning steps, it represented one of the best 'performance-per-pound' deals around at the time.

The Outside

Smartly presented in a dark grey steel case, the '9600's appearance is enhanced by the full width fluorescent display and clean layout. The main tuning knob is offset to the left of centre, and to the left of this major control are rotary controls for squelch, volume and tone. The last two are concentric. Located close by are three push-buttons for memory clear, antenna attenuator and a.f. scan. Sited above the tuning knob are a pair of up/down buttons.

Next come main scanning controls and numerical keypad, a clear layout with very few second functions



making operation straightforward after the usual familiarisation period. Looking around the back reveals quite an array of sockets and preset controls, including external speaker, recorder out, multiplex (for the addition of a stereo decoder), video adapter socket and computer control 'CAT' port. Obviously, sockets for the 12V supply and antenna are here too. The speaker faces upwards in the top of the set.

The Inside

Inside the case is very tidy, with a main p.c.b. carrying several vertical sub-boards. Very little wiring is in evidence, this being a sign of good planning.

The '9600 is a conventional superhet with three i.f.s, 45.754, 10.7MHz and 455kHz. Although the first i.f. may seem a little low for a wide range receiver, the track-tuned front-end seems remarkably resistant to images, and in general, the set is very clean and 'sprog-free', although strong signals 12.5kHz away from the tuned frequency can be troublesome.

As mentioned above, single sideband operation is limited to below 460MHz, this being due to p.l.l. jitter above this frequency.

In Use

Not difficult, although if you come to this receiver after a long period with, say, the Icom '7000, you may think it rather fiddly. Type in a frequency at the keypad, remembering to add a leading zero below 100MHz, then tap the 'dial' key. This enters the frequency and puts you into normal tuning mode, so you can happily 'twiz' up or down from here using the knob or short presses on the up/down keys.

Longer presses invoke the frequency search mode, as long as the squelch is closed. Frequency step size is manually selectable from 25 down to 5kHz in narrow f.m., with 1kHz and 100Hz only in s.s.b. Wide f.m. uses a fixed step of 100kHz.

To commit the displayed frequency to memory, type in the desired memory number and press the 'dial to mem' key. The only bit that may not come naturally is the reverse of this, i.e. recalling a memory and then tuning away from it.

Once a memory has been recalled, it can not be tuned until its contents have been transferred to 'dial' by pressing the 'mem to dial' key. This is no big deal, and several scanners are configured in this way, but to those of us accustomed to the 'tuneable memories' of the Icom R7000, it's a bit of a pain. There are 100 memories, in ten banks of ten.

Performance in all modes is generally good, but the audio in s.s.b. mode is rather quiet. Also, the 1kHz and 100Hz step sizes for s.s.b. and narrow a.m. are missing from the list on the right hand side of the readout, as is the 100kHz for w.f.m.

Buying

No major complaints though, and these receivers are

often to be found in the 'Trading Post' section of this very magazine, at prices from £150 to £200, being worth every penny. The 9600 has recently been re-introduced at the giveaway price of £299, a bargain if ever there was one. This will probably drive down used prices, good news for us!

However, try carefully before you buy, as there have been reports of deaf front-ends, a fault which may not be apparent on a cursory test. Also, many of these units were modified to cover up to 950MHz or even down to 100kHz (or both!), so make sure you know which version you are buying. ***SWM***

The Icom IC-R7000

Second time Around

Does your desktop scanner frustrate you with spurious responses and wall to wall breakthrough? If it's more than a few years old and didn't cost a lot of money, the chances are that it does. Stop dithering, beg or borrow £500 and get yourself a proper one, or for my money, the Icom IC-R7000.

Introduced in 1986, it was the most expensive scanning receiver on the market, fetching around £900. However, it was a matter of 'never mind the money, feel the quality', and quality was what it had, both in circuit design and construction. Its sheer weight gave one a feeling of confidence that few others could even approach, and the solid, positive feel of the keys, buttons and knobs made the Icom feel more like the real receiver it was, not some cheap 'sprog-box' in a fancy case.

The Outside

Built into the same case as the famous R71 h.f. receiver, the R7000 has a no-nonsense, classy appearance. There are far too many controls to describe individually here, as each function has its own key or switch, unlike some sets, which use awkward multi-function controls.

Briefly, the front panel is dominated by the large, weighted tuning knob and the fluorescent blue digital frequency display. Next to this is the analogue 'S'-meter, which incidentally is correctly calibrated at 6dB per division, so don't expect it to give S9 readings on signals that deserve S5. Other rotary controls are volume, squelch, memory channel and step size selectors.

The 0 to 9 keypad is at top right, scan controls to the left, and eight further buttons are grouped near the tuning knob. A proper 6mm (quarter inch in real money) headphone socket is in the bottom left corner, under the power switch.

The facia is finished in dark grey, with the keys in grey or silver and the knobs in black (although they can look dark green in some conditions) with silver skirts. The back panel carries an array of sockets including N-type antenna input, 2nd i.f. output (for accessories), cassette recorder switching and an RS-232 control port. Icom have even provided a 'spare' phono socket!

Also here we find a couple of switches which, with a little more thought, could have been included on the front, where they belong. They are the u.s.b./l.s.b. selector, and narrow/very narrow f.m. switch. Surely, the 'remote on/off' switch could be relegated to the rear, making way for that f.m. bandwidth selector?

To be fair to Icom, all s.s.b. on v.h.f. and u.h.f. is upper sideband, so the operator only needs to fiddle around the back when using the optional h.f. converter, consequently this is not a major problem. The IEC mains input socket is here too, and the built in p.s.u. runs hot, warming up the back panel quite considerably. The steel case is finished in 1980 'Icom Blue' and looks good.

In Use

First of all, where does it go and what does it do? Frequency coverage is from 25 to 2000MHz and, according to the adverts, there were no gaps! Apart from the one from 1000 to 1025MHz, that is. The reason for this is simple - the R7000 is a 25 to 1000MHz receiver with a switchable down-converter which, when active, subtracts 1000MHz from the incoming signal.

So when you dial up 1296MHz, the receiver is actually tuning 296MHz plus 1000MHz, and as there is no coverage below 25MHz, there can be no reception of the 1000 to 1025MHz range! This causes no problem whatsoever, unless you like to listen to the clicks and pops from aircraft distance measuring equipment (d.m.e.).

Any tuning step from 100Hz to 25kHz is manually selectable right across the range at any time, and this goes for mode as well. Catered for are a.m., wide f.m. (for f.m. broadcasts), narrow f.m. and s.s.b., but remember those extra switches around the back.

In use, operation comes easily and feels 'right'. Just tap in a frequency and mode followed by 'enter', then you are free to spin the tuning control in whatever steps you have selected, the 'S'-meter being switchable to centre-zero for accurate tuning.

Want to store a frequency in memory? Easy - but remember to find an empty memory first, or you'll have to use the M-Set button, which is much easier to use than it is to explain! Enter the frequency and mode as normal, then push the silver 'write' button. That's it, your frequency and mode are now safely stored in whatever memory number was displayed at the time.

Memory recall is just as easy, there being two ways of getting there. You can either click your way around the memory-ch knob (a bit long-winded), or simply type the required number (without 'enter') and then press the memory-ch knob inwards, and up pops the channel, along with the mode.

A nice feature is that the recalled memory and the v.f.o. seem to share the same register, so once a channel has been called up, you can simply twiz the tuning knob for a quick search around, there being no 'mem to dial' or 'm to VFO'

keys to remember. The memories do not store tuning step data, nor the state of the 1GHz button, which is a latching switch for manual use only.

Scanning & Searching

The IC-R7000 boasts a good range of scan and search modes, including priority, all-memory and selected-memory modes. There are one or two niggles though. Various scan delays are available, but two of them behave in a rather unfriendly manner. If you set the delay to 'off', the scan will stop on a signal and resume as soon as the signal disappears, and if the delay is set to 'infinity' the scan stops on a signal and never restarts.

These two modes make sense, but the ones marked '5' and '15' resume the scan after 5 (or 15) seconds, even if the signal is still there! Surely some mistake here, and I wonder if these were changed to the more useful 'wait a while after the carrier drops' type on the next model? Let's get these moans out of the way before heaping yet more praise on this superb machine.

Gripe number two concerns the lack of an 'open-ended' frequency search. You have to enter upper and lower limits, rather than being able to tap in an up or down command from the current frequency. I suppose Icom regarded the tuning knob as a rather nice way of coasting around the bands, but there are times when a quick 'upsearch' is handy. Finally, the priority function takes far too long, knocking great big 'holes' in the main frequency.

Back to praise now, and as a receiver, the R7000 ranks as very good. With a first i.f. of over 700MHz, image responses are very well suppressed, and the four separate mosfet front-ends are track-tuned to keep out those funny noises that lesser scanners suffer.

Sensitivity is middling to good at around 0.3µV for 12dB quieting in n.b.f.m. mode, and the selectivities of the i.f. filters seem perfectly chosen for every mode.

Some scanners come with a list of 'birdie frequencies' on which internally generated signals (harmonics from the processor or conversion oscillators) make reception impossible. Had Icom published such a list, it would have been almost empty, there being only one serious 'no-no' that I know of.

Reception above 1000MHz is guaranteed only over the amateur 1240 to 1300MHz allocation, and unless you are very well sited, you won't hear much if you don't have a decent antenna (preferably a beam) and low loss feeder. Performance outside these limits is somewhat lacking.

One clever feature that I should have mentioned earlier is the 'auto-write' search. If you start a frequency search using the 'auto' button, all active channels will be written to memory in locations 80 to 99, and no matter how many times the same span is searched, the same frequency will not be stored twice. When all 20 memories are full, the search is halted.

This is a nicely thought out feature, the only downside being that as soon as the 'auto' button is pressed, memories 80 to 99 are cleared to make way for the writing process, so don't keep your day-to-day channels in them! ***SWM***

Buying

The Icom IC-R7000 is still one heck of a nice radio. It is well designed, well built and very well thought of. It is reliable and, despite its large number of features, it is easy to use. The minor niggles that I have highlighted are soon 'worked around', and pale into insignificance in the overall quality of performance.

Do I sound like a fan? Well, I've owned one of these receivers for ten years, and I still find myself feeling proud of it. If you fancy one, you will find a steady stream of them in the readers' ads in 'Trading Post', as people upgrade to a newer model, almost certainly the latest Icom! Pay around £475 to £525 for a nice one, £600 to £700 from a dealer.

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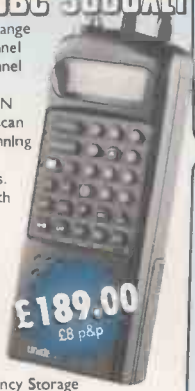

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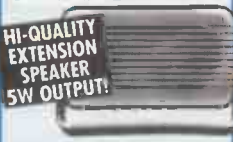

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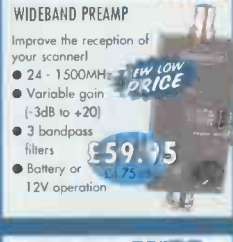

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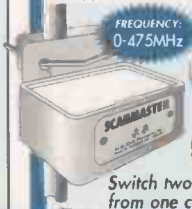

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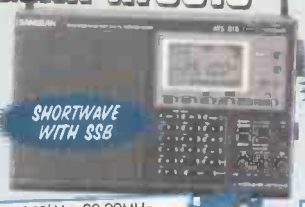

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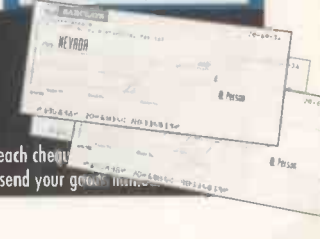


Building VHF/UHF Yagi Antennas (Part 1)

Why buy when you can build? This month our resident antenna expert Joe Carr K4IPV explains how to build a very usable and cheap beam for listening use. The ubiquitous Yagi can provide very usable gain on a budget.

The Yagi beam antenna (or, as it is more correctly known, Yagi-Uda, after the two Japanese inventors) has been around since 1929, and is the mainstay of a lot of commercial and amateur radio stations around the world. It provides gain and unidirectional directivity for both receiver and transmitter applications. Using a Yagi can cut out unwanted stations, while at the same time boosting the apparent signal level of wanted stations. It can also provide directional discrimination against a noise source. The result in both cases is a tremendous improvement in signal-to-noise ratio, which is what receiving radio signals is all about. Before discussing the Yagi antenna, however, let's talk a little bit about antenna gain.

Gain

An antenna apparently increases the power level of both received and transmitted signals. If you listen to the same signal on two identical receivers, but with one connected to a dipole and the other to a Yagi beam (both antennas pointed in the same direction), then you will note that the signal from the receiver connected to the Yagi is noticeably louder. It's as if the power of the transmitter were increased significantly. But an antenna is a passive device, isn't it? A passive device cannot manufacture r.f. power without violating some very fundamental rules of physics. So how does it happen?

The extra power seemingly produced by the beam antenna comes from refocusing the available energy. The diagram **Fig. 1.1** shows several antenna patterns. Each of these is a horizontal slice taken from a solid figure (antennas radiate in all directions, the only difference between antennas is how much in which directions). There is a concept used in antenna design called the 'isotropic radiator'. This is a theoretical construct in which a spherical point source of r.f. radiation is at the centre of a radiation pattern. As the signal radiates outward in all directions, it forms a spherical pattern. Looking at **Fig. 1.1a,** you will see a representation if a horizontal slice taken through that pattern. The power density of the signal, which is what the receiver encounters, is the power per unit of area on the sphere. In the isotropic radiator, all power is equally partitioned over the entire surface of the sphere, resulting in a certain number of watts per square centimetre (W/cm^2). The isotropic radiator is our reference point for antenna gain.

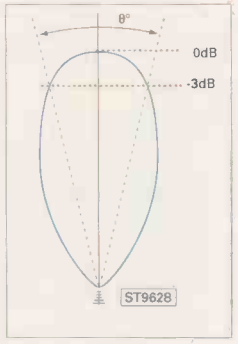
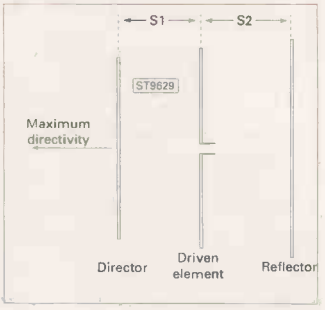


Fig. 1.2: Antenna pattern beam width is measured as the arc

The horizontal pattern for a dipole antenna is shown in **Fig. 1.1b**. This is a horizontal slice from a pattern that resembles a doughnut standing on its side. All of the power that was distributed on the surface of the sphere in **Fig. 1.1a** is now distributed on the surface of the doughnut in **Fig. 1.1b**. Because the area of the doughnut is much less than the area of the sphere, the power density is higher (more W/cm^2). The 'gain' of the dipole is basically the ratio of the power densities of the two antennas, or in terms of decibels, the gain of a dipole is 2.14dB over isotropic.

Fig. 1.3: Three-element beam.



The dipole of **Fig. 1.1b** is bi-directional, so it squirts power in both directions. The beam antenna, **Fig. 1.1c**, cuts out one lobe to become a unidirectional antenna. Now, all of the power is focused in but one direction, yielding even more gain.

The gain achievable by the Yagi depends on several factors, but in general, the following values are realised relatively easily:

No. of Elements	dBd	dBi
2	5.2	7.4
3	6.8	8.9
6	10.5	12.6

A note about notation.

Two different forms of gain are quoted for antennas: gain over isotropic and gain over a dipole. The gain over isotropic is properly designated 'dBi', while gain over a dipole is 'dBd', to keep them separate. Note that these two gains can be evaluated by adding or subtracting the gain of a dipole over isotropic as needed:

Gain Quoted	Conversion
dBi	dBd = dBi - 2.14dB
dBd	dBi = dBd + 2.14dB

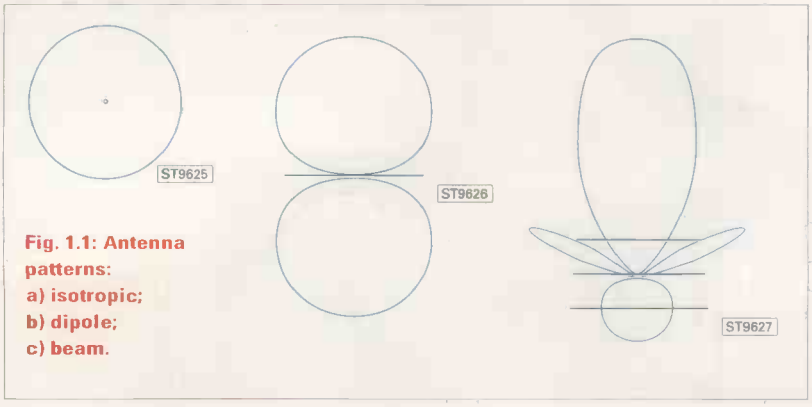


Fig. 1.1: Antenna patterns:
a) isotropic;
b) dipole;
c) beam.

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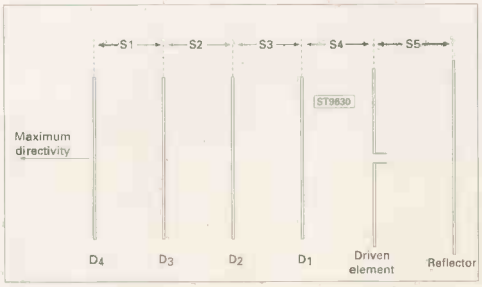

Fig. 1.4: Six-element beam.

Related to gain and directivity of an antenna is its beam width. The beam width of Yagi antennas is measured as shown in **Fig. 1.2**. The arc between the points where the power falls of -3dB from the level observed on the centre line is the beam width of the antenna.

The Basic Yagi

The basic Yagi antenna is shown in **Fig. 1.3**. Although three elements are shown here, it is also possible to build a two-element Yagi. The reason for looking at the three-element version is that it provides a look at all three classes of elements: 'driver' (or 'driven element'), 'reflector' and 'director'. The driven element is the only one that is connected to the transmission line from the receiver or transmitter. Because only one element is fed, the other elements are called 'parasitic elements', and the antenna is sometimes called a 'parasitic beam' to distinguish it from 'phased array beams' in which all elements are driven.

Table 1.1

Three-Element Beam Spacing Factors

Element	Element Length (λ)	Position X (λ)
Reflector	0.49531	0
Driver	0.48598	0.13754
Director	0.46257	0.27508

(Boom position uses reflector as reference, so sets position at zero)

Spacing (S = ΔX)

S1	0.13754λ
S2	0.13754λ

The driven element is little more than a half wavelength dipole, fed in the centre by coaxial cable. The transmission line divides the driven element into two quarter wavelength halves. The reflector and director are also half wavelength, but being parasitic elements are not fed in the centre or any other point. The parasitic elements are spaced (S1 and S2) from the driven element about 0.13λ to 0.27λ (specific spacing will be given below).

The driven element is about half a wavelength long. The reflector is a few percent longer than the driven element, while the director is a few percent shorter. In some multi-element designs, additional reflectors or directors may be added to increase gain. As with all such Yagi antennas, the directivity is towards the direction of the smallest element. In the example of **Fig. 1.3**, the directivity is from the driven element towards the director. In that direction, received signals are louder, and transmitter signals appear stronger to distant receivers.

Table 1.2

Six-Element Beam Spacing Factors

Element	Element Length (λ)	Position X (λ)
Reflector	0.49275	0λ
Driven Element	0.47719	0.15347
Director 1	0.43980	0.30693
Director 2	0.43980	0.46035
Director 3	0.43980	0.61385
Director 4	0.43980	0.76738

(Boom position uses reflector as reference, so sets position at zero)

Spacing (S = ΔX)

S1	0.15353
S2	0.15350
S3	0.15346
S4	0.15342
S5	0.15347

Two-element antennas can be made using these same basic elements. Two forms are possible: one uses a driven element and a reflector, while the other uses a driven element and a director. As with other beams, the directivity is from the longer elements towards the shorter elements.

A six-element Yagi design is shown in **Fig. 1.4**. Although any combination of reflectors and directors can theoretically be used, this antenna elects to follow common practice, i.e. one reflector is used, along with as many directors as needed to make up the required number of elements (in this case, four directors are used). This antenna can produce gains in the 10 to 11dB region, and at v.h.f./u.h.f. scanner frequencies is relatively easy to build. I've seen a 40m six-element beam, but it was a behemoth of the first order! Even a 20m six-element beam is a wonder to behold, especially if it sits on a 30m or so tower.

Element Lengths & Spacing

The calculation of Yagi elements can be a rather daunting task, especially if you want to optimise forward gain, front-to-back ratio and all the other attributes of the antenna. But our problem is really different, isn't it? Our problem is not to produce the best possible beam in the world, but rather a workable beam with decent gain, at low cost. That problem is considerably easier. If you want to try your hand at optimising a beam, then I recommend the books referenced at the end of this article.

Our simplified beam design problem is based on a simple procedure: frequency scaling. We find a beam design that meets our needs, but is at the wrong frequency, and then scale it. Scaling can be done by dividing the design frequency by the desired frequency, and then multiplying each of the lengths and spacings by this figure. For example if α is the scaling factor, we state that $\alpha = F_{design}/F_{desired}$, and then multiplying each length and spacing by α. Alternatively, we can turn to a table of factors in which this is done implicitly. The values shown in **Tables 1.1** and **1.2** are the factors (in terms of wavelength - λ) for the three-element and six-element Yagi beams, respectively.

There are some limits on the use of scaling. The tables show values that are applicable with cylindrical, not tapered, elements that are around 0.015 wavelength in diameter. At v.h.f./u.h.f. scanner band frequencies, these requirements are not hard to meet, but at lower frequencies non-tapered elements are a bit cumbersome to build.

Let's work an example using the three-element beam. We will use the metric unit millimetres because it is standard practice in radio work, and is easier to measure at these frequencies.

Example

Design a three-element Yagi beam, using **Table 1.1**, for 162.55MHz marine band frequency (i.e. the weather channel). At this frequency, one wavelength (1λ) is:

$$1\lambda = \frac{300000}{F_{MHz}} \text{ mm}$$

$$1\lambda = \frac{300000}{162.55\text{MHz}} \text{ mm} = 1846\text{mm}$$

According to Table 1, the element lengths are as follows:

Reflector: 0.49531λ = (0.49531)(1846mm)
= 914.3mm
Driver: 0.48598λ = (0.48598)(1846mm) = 897.1mm
Director: 0.46257λ = (0.46257)(1846mm) = 853.9mm

And the spacings are each:

S1 = S2 = 0.13754λ = (0.13754)(1846mm)
= 253.9mm

Don't miss Part 2 where Joe looks at the all important issue of matching your home-built Yagi to the feeder.

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PROsat For Windows LC

Lawrence Harris, our regular 'Info' columnist, reviews the latest offering from the Newmarket based satellite specialists, Timestep.

This new product from Timestep Weather Satellite Systems is the first release in their latest series of new hardware/software products for the weather satellite market. Timestep has dominated the British market for such products for over ten years, and has expanded into America in a classical 'taking coals to Newcastle' manner! Before describing the interface and its operation, for the sake of those unfamiliar with weather satellites but interested in understanding the role of this unit in decoding, I will start with a summary.

Fig. 1: External view of the decoder.

Weather Satellites - A Brief Background

Unless you have never seen a television weather forecast, you may have wondered about the origin of the pictures of Britain and Europe shown on every programme concerning short and long range forecasts. Presenters show pictures from METEOSAT or NOAA satellites, but invariably describe them merely as 'satellite' images.

There are two basic types of weather satellite (WXSAT), those located on the Clarke belt, some 36800km distance from earth, and those orbiting earth every 100 or so minutes, in high inclination orbits. The Clarke belt is 'geo-stationary' - orbits in which a satellite circles earth once every 24 hours, while the earth turns at the same time. In such orbits, satellites do not appear to move in the sky. The WXSATs in shorter period orbits have high inclinations, so pass near the earth's polar regions on every revolution, and consequently pass over every place on earth several times each day.

There is a constellation of geo-stationary WXSATs, of which the European WXSAT is called METEOSAT. America has several such satellites, of which the main two include one over its east coast, called *GOES-E*, and the other over its west coast, called (yes, you've guessed it!) *GOES-W*.

Most of the geo-stationary WXSATs transmit a standard form of weather image on the frequency of 1691.00MHz; METEOSAT also transmits 'extra' formats on 1694.50MHz. The polar orbiting WXSATs include an American constellation called NOAA WXSATs, and the Russians have three polar orbiting series - METEOR, RESURS and OKEAN/SICH - each group performing slightly different functions.

The polar WXSATs transmit on specific frequencies - 137.50, 137.62, 137.85, 137.30 and 137.40MHz, though not always continuously, and not all frequencies may be in use at any given time. WXSAT monitoring is the hobby of tuning to these WXSATs and decoding the real-time images that they transmit. It can be a very absorbing hobby, though like all technical hobbies, it can be expensive - though not unreasonably so.

Equipment For Receiving Pictures

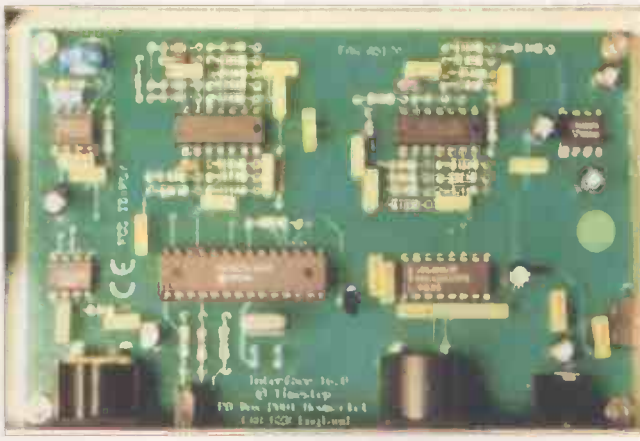
To summarise, WXSAT transmissions are found on 1691.00MHz and in the 137MHz band on the frequencies listed. It follows that WXSAT receiving stations can be set up for either (or both) bands.

For polar WXSAT reception, you require a suitable v.h.f. antenna, receiver, decoding unit and computer. Crossed dipole antennas have been standard issue for years, though other types are also popular. The receiver should be purpose designed, and will provide a de-modulated signal for subsequent computer processing.

The decoding unit can take one of several forms, but ultimately provides a serial data stream (signal) for real-time processing and display on a monitor. Until about ten years ago, the framestore was virtually the only method of image production; the technology has moved on, and now utilises the power available in the personal computer.

For METEOSAT reception (1691.0MHz), the antenna is usually a 1m dish or a multi-element Yagi, accurately pointed at the satellite. For this frequency, a low-noise pre-amp should be used to provide a virtually noise-free signal. A METEOSAT receiver (capable of being tuned to 1691.0 and 1694.50MHz) will provide an output directly compatible with the demodulated signal from a polar WXSAT receiver - and this is the reason that people who have set-up either system, subsequently choose to expand their equipment to include both types of WXSAT reception.

Fig. 2: Internal view.



What You Get

The unit used in each of the systems described, takes the de-modulated signal from the receiver, and outputs a computer-compatible signal for

Continued on page 41...

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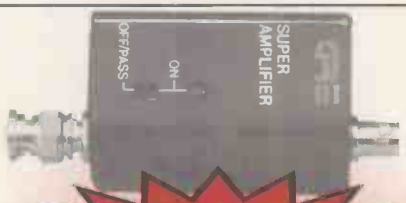

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PROsat For Windows LC

software decoding and display. Timestep's new *Windows* LC interface and software does this job.

The hardware is essentially a box of electronics powered by a low voltage supply (included with the package), with two connectors, one for the signal input from the receiver (optimised for Timestep's own PROscan receiver), and one that outputs the data stream to a 'spare' serial port on the computer. The software required to do the job (and much more!) is included. The previous system (*PROsat for Windows*) used an internal card that provided a separate port for data input.

Setting up and connecting the interface is very simple. I used the Timestep PROscan receiver to provide an a.p.t. signal input. This allows connection to one receiver (either polar or METEOSAT) at a time. The necessary cables were provided to allow connections to be made. I checked performance separately on both receivers over a period of some days.

Computer Requirements

The testing phase provided some quite unexpected results, and lead me to do some detailed checks on my own computers - and to realise the need for an upgrade! Timestep kindly sent me an early production unit. I had expected to be able to test it within a few days and to produce an early review. Timestep recommend a 486DX2/66 as the minimum computer specification, with higher speeds including Pentium 2 processors preferred. The platform must be *Windows 95, 98* or *NT4*, with other specifications nominal; 16Mb RAM, 20Mb free hard disk space, a spare serial port, Super VGA display (800x600 or bigger with 256 or more colours).

As befits a new product, I connected the interface to my main computer; this has a motherboard running a 200MHz Cyrix processor. To my horror, although the images were essentially perfect, their production and close examination in real-time (the main benefit of the new software) caused various image decoding errors to occur, mainly non-synchronisation and line slip.

I have known Timestep long enough to know that they do not issue untested software to the market, so I immediately did some tests on the Cyrix processor, while advising Timestep of the initial peculiar results. My own tests quickly revealed that the Cyrix processor appeared to show great deficiencies in its floating-point arithmetic calculation speed, and made very heavy weather (unintended pun) of such software. The realisation of this in-house problem convinced me of the need for a serious upgrade for my own computing facilities - but that is another story!

My queries to Timestep regarding the anomalies, were frequently made during the weekend by E-mail. Invariably, replies were received an hour or so later. Timestep can be commended on this considerable help during a difficult test phase. It was only the Cyrix processor that initially prevented the software from performing properly.

Testing & Configuration

I have two other computers available for product review tests, one with a 120MHz Pentium processor and the other an Amdahl 100MHz chip. Tests were moved to the Pentium computer. The process of moving the system from one computer to another has been enormously simplified by the new interface and software. No internal card has to be configured; the software had to be re-installed, and that takes just a few minutes. Most fortunately, the interface does not require the ubiquitous dongle - a great improvement! All that had to be done was to unplug the connector from the serial port on the 'main' (Cyrix) computer, and re-connect it to a serial port on the second (Pentium) computer.

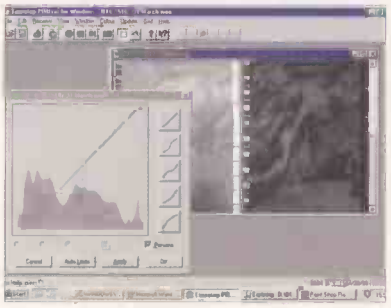

Fig. 3: Contrast adjustment one shows raw image.

The new software, together with sample images that enable one to experiment with the various processing possibilities, comes on four standard floppy disks. If you are familiar with previous Timestep software, the user interface may at first appear identical, however, the usual menu options now include more file handling choices.

With hardware configuration completed (a three minute job), the next process is to configure the software to receive data from the serial port. Computers are usually configured to have two serial ports - communications (COM) port 1 is normally reserved for a mouse, and COM 2 is used for high speed data transfer - such as an external modem. Other ports can be added - if required - using an interface card.

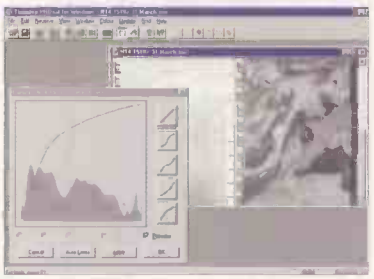

Fig. 4: Contrast adjustment two shows enhanced image.

Previous versions of *PROsat for Windows* have used an interface card that incorporated its own input connector for the data stream. This required the computer to recognise the new COM port - usually COM 3. The new version requires 'a spare serial port', so having the mouse permanently fitted to COM 1, I used COM 2 (usually used by an external modem), for these tests.

It is fairly easy to fit an inexpensive serial card in the computer, should you wish to add more ports. The software includes a 'port test' option; select this and the program tests each recognised port for the presence of the interface. The result identifies (confirms) the port receiving the interface feed.

Fig. 5: *NOAA-14* 1458UTC 23 February.

Set-up & Optimise

Initial testing was done by connecting the LC interface to a METEOSAT receiver, because new images are received almost continuously 24 hours per day. With earlier systems, the input signal level from the receiver was adjusted using a tiny potentiometer on the exposed back of the interface card - a little tricky, but rarely done more than once.

The new operation is sheer simplicity; the presence of a signal is indicated by an l.e.d. on the box, and a second l.e.d. indicates the instantaneous level. When receiving a valid signal, the option Receive/Set level provides options to automatically set the input level, or one can make a small manual adjustment using the mouse. Although the levels can be stored, they can also be optimised on later occasions if you choose.

The process takes a few seconds from the keyboard, and results are instant. Levels can be set for each type of satellite; I set them for METEOSAT, NOAA, OKEAN, METEOR and RESURS. Setting the level correctly ensures that the widest dynamic range of

Continued on page 44...

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The NRD-545 would be welcome in any listener's station. It is a sheer delight to use, well proportioned and with very pleasing styling and appearance.' Nuff said then. I appreciate that £1595 is a lot of money but then the best never came cheap.

RRP £1595 + £199 (NRD-545 & Speaker) ML&S price £1599 for both, or £90.48 deposit & NOTHING to pay until December 1999, then 48 x £45 p/m.

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For those who would like a top range receiver but like the layout and feel of a transceiver, the new "DGE" specification of the TS-570 with enhanced DSP features should not be passed by. ML&S disconnect the transmit capability, making the unit safe for receive only use. Ask for a copy of the John Wilson review. Don't forget the optional SSB narrow filter and matching SP23 speaker. They really do make a difference!

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Mast diameter	30-50mm can be fitted
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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
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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
Dimensions	Length 450mm. Diameter 90mm
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PROsat For Wind

...continued from page 41

Fig. 6: MS images *NOAA-14* 1510UTC 31 March.

grey levels are extracted from the incoming data for display on your monitor. For individual images, some later adjustments may be preferred - see image processing.

The Software

The program comes as a suite of two parts: *Track II* is a fully fledged satellite tracking program, previously reviewed by me a few years ago, and the main program - *PROsat for Windows 'i'* - comprises both satellite decoding and a highly configurable satellite tracking program, similar to *Track II*, but intimately bound with reception operations.

The menu displayed depends on the current active window; if you have the tracking window selected, options concerning image processing (that are not relevant to tracking matters) are not shown - and this greatly helps reduce screen clutter. Click on an image window and the image processing options become available. The program can therefore be divided into three sections: basic (starting mode), tracking and reception.

Fig. 7: *NOAA-14* visible-light image pre-interpolation.

Basic

Before a selection is made, menu options are basic, providing various 'start' functions. Additionally, a row of icons provides 'click' access to several useful commands. A tracking display can be opened (or started from scratch); an already received image can be opened, animation sequences can be opened (or created), or file management options set. A new configuration file can be created, though this is really an advanced concept best left for the user when familiar with the program's facilities.

Fig. 8: After interpolation.

Tracking & Configuration Files

As with the previous software version, configuration files can be set up. Each is a tracking window displaying your selection of satellites. For automatic image acquisition you select receive, schedule, polar, automatic and can then program those satellites whose transmissions you wish to be recorded during a period of absence (or presence!). Various settings such as minimum elevation passes for recording, and priority for satellite passes where one or more coincide, can be optimised. Finally, the process is activated using receive, autosave, polar and automatic.

The software's author appears to have covered every possibility that can be anticipated. The only bizarre default settings that I saw were the METEOR and RESURS frequencies that came up set for 137.50MHz; settings are adjustable (satellites may change frequency), so each parameter should be carefully set before leaving unattended operations. As well as automatic scheduling, manual scheduling can be set to capture individual passes.

Every configuration file can have individual satellite combinations, so the software is extremely flexible. The basic LC interface does not control the receiver's frequency; this function requires an optional extra unit.

Animation

Images of identical areas taken at different times by METEOSAT can be automatically animated by the software. As I write this review, in late April, I have the European D2 format animated to follow a deep depression crossing Britain. This is not just for 'fun'; a film crew is waiting to film my astronomy antics for a summer broadcast of hobby suggestions, and the presenter is a local weatherman whom I know well.

The gales and rain have so far prevented filming for several consecutive days, and the weather system is moving slowly. However, for most people, the facility may provide greater interest when animating other regions from METEOSAT. Facilities include specifying the animation length and the required mask (colour or no overlay).

Image Processing - Real-Time

This has been significantly advanced. Images can, of course, be viewed in real-time, but zoom and contrast adjustment can also be done in real-time. New to the menu bar is a selection of six options for use under the appropriate circumstances. When receiving, the additional options allow zoom-in, zoom-out and contrast adjustment.

The first stage of setting the system optimally - see 'Set-up & Optimise' - involved adjusting the incoming signal (modulation) level to obtain the best grey scale resolution (also known as optimising the dynamic range). There will, however, still be big variations between images; a late winter visible-light image will need contrast enhancement - and this is now available in real-time. While the NOAA visible-light image is displayed - building up line-by-line - we can zoom in and then click on the contrast icon.

By changing the region examined, the contrast level can be changed instantaneously by merely clicking on the icon. Further enhancements can be made after the pass by right-clicking and dragging the mouse to produce a rectangular 'box'; selecting the contrast icon optimises the content of this box. The real-time image does not scroll automatically; you need to press either a cursor or page key. After the pass, this can be optimised further, and saved.

The precision of post-pass contrast adjustment is much improved over previous versions. Selecting the

ows LC

first option provides access to a series of standard algorithms widely used in the field of astronomical image processing. Apart from linear adjustment, four other types are available for instantaneous use - but one can vary individual effects to an infinite extent by dragging any or all of the four points visible along the adjustment line - see **Fig. 3** and **Fig. 4**. This type of adjustment cannot be done in real-time - neither is it necessary to do so; this is a fine-tuning adjustment for the best quality finished image. This is a precision adjustment - and is extremely simple to do.

This latter works best after zooming in two levels - remember, the use of the automatic level adjustment (done at the beginning) means that the contrast level should already be fairly satisfactory. If you zoom into a dark or bright region, it can be immediately enhanced by clicking the mouse on the slope bar - the symbol for contrast adjustment.

After the image has been received, detailed enhancement can be achieved using a second adjustment option that has very powerful features that I normally see only on astronomical image enhancement software. This option allows comprehensive selection of the contrast stretching at various points along the pixel brightness curve. It is simplicity itself to use and is powerful.

Colour In WXSAT Images

The weather satellites do not transmit colour information, but it is eminently possible to add artificial colour to almost any WXSAT image by attributing appropriate colours to bands of grey scales. Conventionally, we can make dark greys (sea) blue, light greys (land) green, and leave whites (cloud) as white. By adjusting the colour demarcation zones (sea - land and land - sky), a fairly realistic colour rendition can be achieved.

Perfection is not usually possible because there will always be a 'wrong' grey level found somewhere, resulting in a patch of blue 'sea' in the middle of the desert, or something similar that spoils the final image. METEOR and RESURS images can also be modified in this manner, though I do not usually do this.

Multi-Spectral Images

This refers to a method of processing NOAA a.p.t. NOAA day-time telemetry formats, including two images from different wavebands - visible and infra-red. The multi-spectral option on the colour menu combines the images (where appropriate) to produce improved colour rendition. The result is much better than merely substituting colours for grey scales. By making a further contrast adjustment, some highly effective colour images can be obtained - see **Fig. 5** and **Fig. 6** (winter and early spring images).

By selecting the Window/interpolation option, the appearance of all zoomed images is significantly improved. The software interpolates adjacent pixel levels, a process that largely minimises the chunky 'pixellated' appearance of highly zoomed images - resulting in an almost high-resolution - style result - see **Fig. 7** and **Fig.8**! I believe that these two features alone justify the release of this software.

Results

As mentioned, my initial results with the Cyrix processor were puzzling. After I transferred operations to the Pentium computer, and to the Amdahl, the interface and software behaved as designed. METEOSAT images can be displayed in the same manner, as with the earlier version of the software.

Options are numerous: you can have one large or two small display windows, and colour masks can be attributed to whatever combinations of spectral images you wish. You can have visible-light images displayed with a colour mask, and infra-red and water vapour images in ordinary grey-scale, or you can have colour for all - or none. Scheduling is available for both METEOSAT channels, with automatic switching and frame saving.

Many of these facilities were provided with the previous release of the software. The prime new facility is real-time zoom and contrast adjustment. With a suitably fast processor, selecting F9 increases the zoom right up to pixel level, and the contrast can be adjusted as you view. And it works!

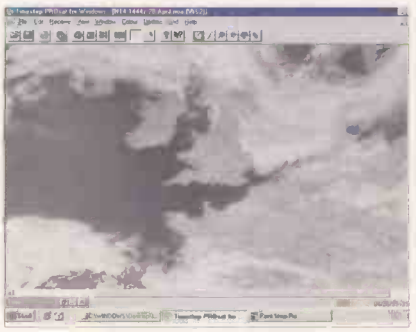


Fig. 9: *NOAA-14* 1444UTC 28 April.

Fig. 10: *METEOSAT-7* C02 format 2 May 1430UTC.

Conclusion

The operation and power of this unit and the accompanying software means that it is highly portable. I was able to transfer operations between computers whenever it was prudent to do so. The only problem that I encountered was the lack of an audio (speaker) output for METEOSAT, but that should be provided via the receiver - earlier in the chain of components. Full manuals are included with the product.

This is the basic unit; it works with both polar orbiter or geostationary satellites - but not simultaneously. For the price, Timestep seem to have another best-seller in their shop window! The system works well - but make sure your computer is up to the job, and avoid 'cheap', non-standard processors!

Other Software Facilities

The software incorporates many features not detailed here. To summarise:

- Image files can be saved in file or bitmap (BMP) format (for later importing into graphics programs). They can also be printed directly.
- Temperatures can be read from infra-red images, and assigned colours for display.
- Examination of individual animated images can be done at all resolutions.
- Rise-set sounds can be activated to advise of satellite footprint arrival and departure.
- Windows can be arranged in any combination.
- 3-D projection is available for METEOSAT images.
- Colour palettes can be generated and saved.
- For image processing, various filters can reduce the appearance of noise and country outlines.
- Gridding is available for polar images, as long as Kepler elements are available. These can be easily obtained. The grid and outlines can be manually adjusted to correct errors.

Pricing

The product is available off-the-shelf for £120 inc. VAT. Timestep can be contacted at **Timestep, PO Box 2001, Newmarket CB8 8XB, Tel: (01440) 820040** or **FAX: (01440) 820281.**

My thanks to Timestep for the loan of the review equipment.

SWM

Old Lessons, often repeated for the beginner

JW investigates what was a quantum leap at the time of its launch, and is still a fine piece of kit some 20 years on.

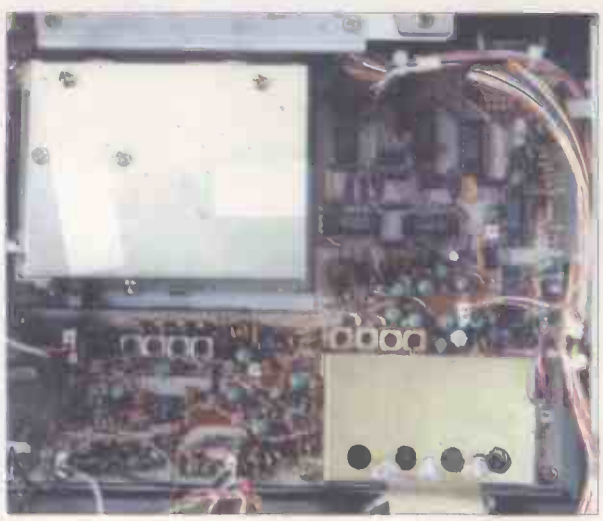
In my experience there is still a very healthy market for second-hand receivers, but how do you find out how good or bad these elder statesmen really are. Here's where I come in, because I'm going to do a short series of retrospective reviews of the classics, at least those I know something about, and I can't think of anything better with which to begin than the Trio R-1000. When I dug out the service manual and started to read the circuits again I was simply astonished at how advanced it all was, since here we have a receiver which hit the market as long ago as 1979, but which can still hold up its head in today's exotic company.

The immediate predecessors to the R-1000 were the QR-666 and the R-300, and the less said about these beauties, the better. Representing really old ideas about how h.f. receivers should be designed, they were no more than solid state versions of the dear old 9R-59, with all the vices and few of the virtues, so I'll draw a discreet veil over them and send them off in a burning long ship to their respective Valhallas.

Staggering Improvement

The R-1000 was a staggering improvement and took all the other manufacturers by complete surprise. It's true to say that the R-1000 dominated the short wave receiver market for several years, and we sold thousands and thousands of them, most of which are still in use today.

Unless you have struggled with a general coverage receiver using a wide range tuned oscillator and a bandspread dial, you can have no conception of what it meant in 1979 to be offered a receiver with digital frequency read-out and at last have the ability to tune to 8864kHz u.s.b. and know that you were actually on the right frequency for transatlantic air traffic control; or set the receiver on to Radio Nederland and know that you could get on with something else whilst keeping an ear open for Media Network.



Added unexpected features of the R-1000 included real time clock(s) and the facility of pre-timed switching external equipment such as a tape recorder. Let's first of all take a look at the engineering design, and since I'm listening to Delius as I write this, it may well be a walk to the Paradise Garden for the signals from the antenna as they progress through the receiver.

Engineering Design

Three antenna inputs were provided; one coaxial and one wire input for the short wave frequency range from 2 to 30MHz, and a separate wire connection for the frequency range below 2MHz. **Figure 1** shows the detail of the input arrangements and you can see that impedances were fairly carefully matched by the use of transformer coupling, which also gave d.c. isolation between the R-1000 and the outside world.

Low impedance coaxial antennas were fed via the antenna selector switch (located on the rear panel) to a switched 50Ω attenuator giving 0 to 60dB attenuation in 20dB steps, and then via T3 to the switched input band-pass filters covering 2 to 30MHz. With antenna selector switch set to 'wire antenna', a separate high impedance short wave antenna could be connected

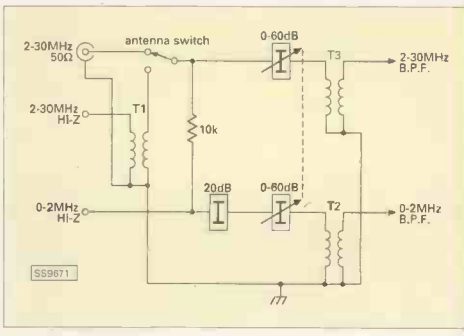


Fig. 1: R-1000 input circuit.

via T1, which gave an impedance step down and then to the same switched attenuator as the low impedance input used.

T1, by the way, was the forerunner of all the so-called 'Magnetic Balun' devices which eventually proliferated, and despite what anyone may claim in advertising, all 'Baluns' on the market contain little more than the little toroidal transformers used by Trio in the R-1000. Medium wave (below 2MHz) signals were fed from a separate input terminal to a fixed attenuator, (which many people shorted out), to a similar 60dB/20dB step attenuator ganged to the short wave attenuator switch.

The attention to design detail by Trio is demonstrated by the fact that the medium wave attenuator was designed for a higher impedance (about 1000Ω) than the nominally 50Ω short wave section. A further matching transformer T2 then fed two band-pass filters covering the 0 to 2MHz tuning range.

A 10K resistor bridged the short wave antenna inputs to the medium wave antenna input so that the receiver would still hear something below 2MHz, even though you hadn't connected a separate low frequency antenna. Did they think of everything? Probably, yes.

From the band-pass filter bank, which as you all know from my previous scribblings gives the R-1000 respectable out of band second order intermodulation performance, the signal went via a 30MHz low-pass filter to a dual gate a.g.c. controlled m.o.s.f.e.t. r.f. amplifier and single source follower to the first mixer, configured as a push pull pair of 3SK74 f.e.t.s with oscillator injection on paralleled gates. The local oscillator was generated by a p.l.l. synthesiser with a range of 48.055 to 78.055MHz to give a 48.055MHz first i.f. for the input signals of 0 to 30MHz.

I have to say that in the search for high sensitivity, which is not actually needed on the h.f. bands, but which at the time was seen as a major sales feature, the overall gain between the antenna and the first i.f. filters was much too high and the receiver would probably have performed rather better without the r.f. amplifier. Similarly, using gate injection on the first mixer meant that oscillator injection levels could be kept low, and high level mixing with a quad f.e.t. mixer would make some improvements - but I'm saying this some twenty years on from the original design, and like everyone else I am a great hindsight engineer. At the time, the R-1000 was leading edge design in the hobby market, and it's still a good receiver.

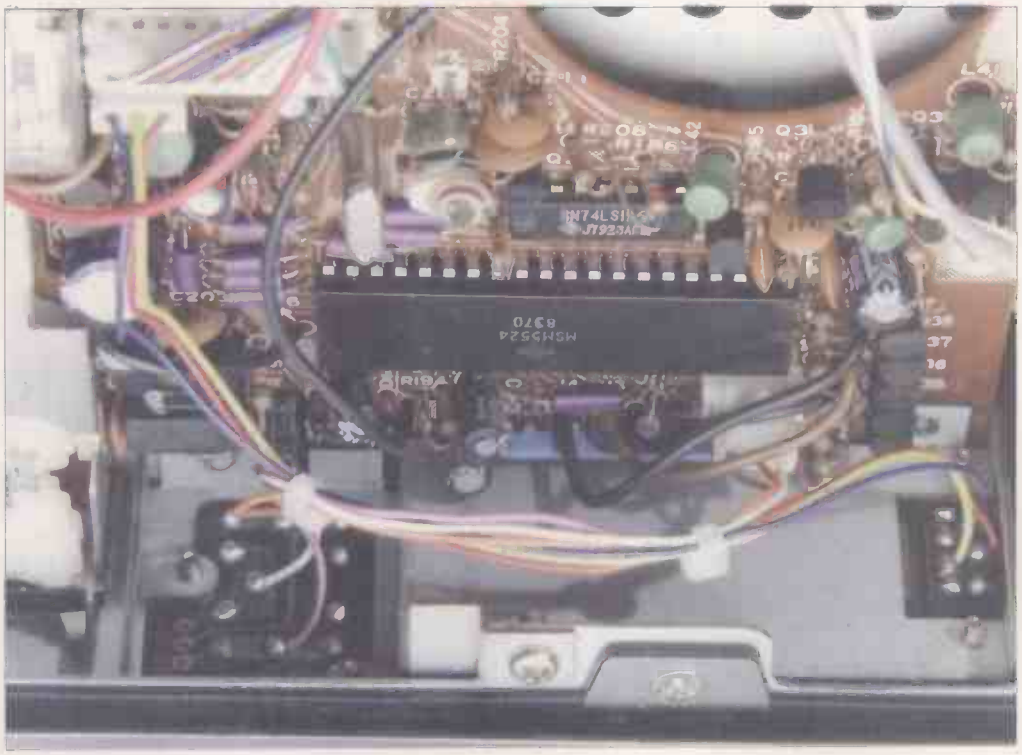
Filtering at 48.055MHz was by a matched pair of three pole crystal filter elements, with tuned impedance matching between sections, the output feeding the second mixer, again a push pull pair of 3SK74 f.e.t.s with parallel gate local oscillator injection at 47.6MHz to give the second i.f. of 455kHz. The 47.6MHz signal was generated by a crystal oscillator in the synthesiser which also mixed with the main tuning v.f.o. as described later.

Before any selectivity was introduced at 455kHz, the i.f. signal was fed to the noise blanker system, which generated narrow switching pulses to be used in a push pull diode gate to 'punch holes' in the i.f. signal and eliminate short impulse noise spikes before they entered the main i.f. amplifier chain. For the time of design, this noise blanker was very effective, although the blanking threshold was preset by an internal control and not available on the receiver front panel.

The i.f. selectivity was provided by three multi pole ceramic filters of the same type as used in receivers today. In the first production runs of the R-1000 the filter widths were 12kHz for a.m. (wide), 6kHz for a.m. (narrow) and 2.7kHz for s.s.b./c.w. Experience in the market and comments from R-1000 users prompted Trio to realise that the 12kHz bandwidth, although right for strong a.m. medium wave stations, was too wide for short wave broadcast listening. A second version of the receiver came out in which the user could change the position of a multi connector on the receiver main r.f. board to give either the original choice of selectivity or make a.m. (wide) use the 6kHz bandwidth and the a.m. (narrow) and s.s.b./c.w. use the 2.7kHz bandwidth, thus giving the user a better choice of facilities to suit his or her needs. For those who want to know, this change took place at serial number 009001.

The 455kHz i.f. amplifier was fairly conventional, using two stages of dual gate m.o.s.f.e.t. amplification to provide the necessary gain, but with a little tweak between them in the form of a diode/transistor gain reduction switch which was energised whenever either of the two low frequency front-end band-pass filters was selected. I never did figure out why there was this design emphasis on reducing overall receiver gain for frequencies below 2MHz, but Trio were not alone in doing this.

The final 455kHz amplifier fed three separate



"The built-in loudspeaker was a little beauty and, although mounted in the top face of the cabinet, still managed to produce pleasant sounds given the right signal to play with."

detectors; one for s.s.b./c.w. with carrier injection being provided by two crystal oscillators at 453.4 and 456.6kHz for sideband switching; a second detector for a.m. being a simple diode fed by an emitter follower, and a full wave a.g.c. detector from the same emitter follower. The a.g.c. system was very well designed, with little clever touches like taking a negative d.c. supply derived from the inverter used for the main frequency display, so as to ensure that the a.g.c. line could have the necessary negative swing to give a sufficiently wide control range over the various a.g.c. controlled stages.

Suitable a.g.c. time constants were automatically selected by the push button mode switch as each mode was selected, but Trio (in my opinion) rather mixed things up and selected a long time constant for a.m. and short for s.s.b./c.w. I remember many folk modifying the R-1000 to change this over. The 'S'-meter had its own driver with separate adjustments for zero and S9 settings. As a result the 'S'-meter was genuinely useful in logging signal strength, and of course it was a true analogue moving coil instrument. The moving coil reads, and having read moves on, nor all thy piety nor wit shall lure it back to cancel half an 'S' point. (With apologies to Fitzgerald).

Switched outputs from the detectors were taken to a pre-amplifier which fed both the audio power amplifier and the fixed level record output on the front panel. A simple audio tone control was provided at the input to the audio amplifier, and the overall response was also adjusted by switched shaping when a.m. (wide) was selected, presumably to take account of the 12kHz filtering in the i.f.

The built-in loudspeaker was a little beauty and, although mounted in the top face of the cabinet, still managed to produce pleasant sounds given the right signal to play with. Another neat design trick which was introduced for the first time (I think) on the R-1000 was provision for plugging in either stereo or mono headphones without caring which, the necessary parallel feed for the stereo phones being taken care of in the headphone socket wiring.

Two things remain:-

1) The synthesiser, which was a deceptively simple design using four separate v.c.o.s to cover the 48.055 to 78.055MHz range in 1MHz sub ranges. The intermediate tuning was done by using a true v.f.o. covering a range of 4.545 to 5.545MHz injected into the phase locked loop. At this time in their history Trio were expert in designing and producing high stability v.f.o. units, and the R-1000 design was no exception.

Using a v.f.o. in this way meant that the tuning resolution was infinitely small whilst the actual synthesiser needed only to produce signals at 1MHz increments, making loop filtering easier and helping the phase noise performance overall. No; it doesn't have the phase noise performance of the AR7030 or RA1792, but even today it's not bad and at its introduction the R-1000 was outstandingly better than anything else on the market.

The 1MHz increments were generated by using a programmable divider controlled by direct d.c. inputs from the 'MHz' switch on the front panel. A second section of the same switch drove the MHz digits in the frequency display, and both of these switch sections carried out the necessary encoding for their respective functions. This meant that the switch was very much a special part, and I'll come back to this later on.

The 1MHz reference signal came from a 10MHz crystal oscillator divided by ten, so the overall receiver stability actually depended on the tuneable v.f.o. An analogue tuning scale was provided rather elegantly by having a 0 to 1000 dial around the main tuning knob. This seems to have been produced by spark erosion techniques on stainless steel, and is most effective both in appearance and function, particularly with green backlighting showing through the etched slots.

Sharp eyes will notice that the analogue dial isn't quite linear, reflecting the difficulty of designing an analogue v.f.o. to have exact linearity over a wide range, but it's hard to spot unless you count the exact turns of the tuning knob for each 100kHz section, and who cares anyway - the digital read-out will tell you the truth won't it? That's a trick question (here he goes again) because I've told you many times that a frequency display driven by a microprocessor may or may not be telling lies, whereas the earlier receiver systems such as that used in the R-1000 do show you the true frequency:- on to point 2.

2) The frequency read-out and clock/timer functions in the R-1000 were all carried out by a single chip device known as the MSM5524. This was presumably designed for general purpose applications for moderately expensive radio receivers and is undoubtedly a clever piece of electrickery, containing as it does a true frequency counter which can add or subtract an i.f. offset so that measuring the local oscillator frequency will result in the i.f. being included in the calculations to show the receiver frequency, together with a real time clock and a timer with programmable on and off times for recording programmes when you are not around. This device as used in the R-1000 drives a nice 'easily read at a distance' green display which also serves to show the time and timer settings. Simple and straightforward and most satisfactory, although I think that the current black on orange displays as used by Icom and Yaesu are even better. However, it should also be said that later displays than the R-1000 on such devices as the Kenwood TS-850S are infinitely worse, being almost unreadable in any incident light greater than one candle power, so the passage of time does not always mean continued improvements. How philosophical.

The Externals

That concludes a brief skimming of the R-1000 internal design, so take a quick look at the externals. The front panel is quite perfect in its layout, and every detail was made to be part of an overall plan to make the receiver accessible to beginner and expert alike. Even at the rear panel, the case was deliberately sloped so that if you needed to look over the top to connect an antenna or change the antenna impedance, you could look right down on the connectors without having to turn the receiver around.

The carrying handle clicked into place to act as a lift-up leg or could be folded right out of the way, and it never slipped or shifted position when in use. The receiver could be powered from an external 12V d.c. supply so the caravan, boat or car owner could

take the radio along without any problems.

Rugged? I should say so. I have a battered example in my possession which was destined for the rubbish skip after long exposure to salty sea air in Jersey made it completely inoperable. With nothing to lose, I took off the outside covers and high pressure hosed it with plain tap water, followed by a good drying out with a hair dryer. It still didn't work, but replacing a few of the small r.f. and i.f. transformers in which the salt had completely corroded the fine wires made the set burst into life, and although it still teeters on the edge of complete disaster, it nevertheless continues to work.

I 'restored' the case by stripping the salty paint off with a rotary sanding wheel, and re-sprayed it using a metallic grey cellulose paint from the range of car finishes carried by my local Halfords store, and it still looks presentable. Rugged? I should say so.

Improvements

Now although I am clearly enthusiastic about the R-1000, I have to accept that it is getting on for twenty years old, so there must be areas in which improvements could be made and potential drawbacks to owning what is almost vintage equipment - not many, but some. Casting my mind back over the servicing history of the R-1000, two things are worth mentioning.

Firstly, the 'Megahertz' switch is a special component and relies on mechanical wiping contacts on the two switch wafers to manage the encoding function. If the switch fails completely, I don't know if replacements are still available, although with a little care, the switch can be de-soldered from the board and disassembled for cleaning, but this takes good eyesight and a steady hand. I don't intend to imply that the switch is of poor quality, I'm just mentioning that it may cause a problem should it fail. If anyone cared to work out the coding from the switch, it would almost certainly be possible to replace the switch completely by electronic logic, using 'up' and 'down' buttons rather than a rotary switch to select the MHz settings.

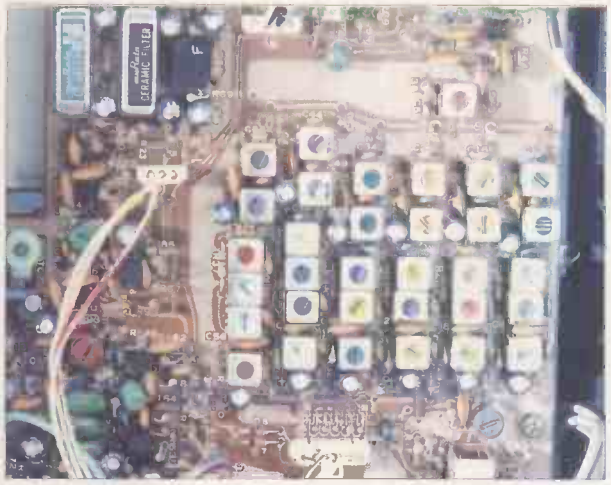
The other item which might cause some head scratching is the single i.c. which provides the frequency read-out and clock/timer functions, the MSM 5524. If this were to fail, you would lose the digital frequency read-out, although of course you still have an analogue dial on the main tuning knob, and the 'Megahertz' switch is mechanical so the receiver would still work as before.

What I don't know is if the i.c. itself is still available as a replacement part. Once again, this comment is not intended to suggest that there is a history of failure - far from it, but if I were the owner of an R-1000 I would like to have a spare MSM 5524 tucked away just in case. I believe that the MSM 5524 was also used in the Yaesu FRG-7000 and/or the 7100 so the same comment applies to owners of those receivers.

As with the 'Megahertz' switch, I'm sure that the read-out could be restored fairly easily by use of one of the more recent clever programmable logic devices, but I'm going to leave that to someone else to produce.

Faults In Service?

Very few indeed, apart from radio amateur owners of the R-1000 who, particularly if they were working on 160m, had a habit of blowing up the front-end matching transformers. No problem with replacements here, because the little toroids are easily rewound, and Toko produce a wide range of suitable r.f. transformers which would pop right into the board.



The rest of the receiver is made up of readily available discrete components, and the semiconductors are still in the lists of many companies. I use Grandata Ltd. (0181-900 2329) for things like the 3SK series f.e.t.s, and their catalogue contains hundreds of Japanese linear i.c.s for service support - and their prices are reasonable. They don't, however, stock the MSM 5524!

Modifications

What would I do to tickle the R-1000 to my fancy - remembering always the dictum that modifications, however worthy, will seriously lower the resale value of the equipment? I would like to see what effect bypassing the r.f. amplifier would have on the overall r.f. performance. I have a feeling that there would still be enough gain in the receiver to make it perform, and the first mixer would have a much easier life.

As for the mixer, perhaps changing the push-pull f.e.t. devices for a double balanced ring mixer and increasing the synthesiser drive level by slotting in a low cost single chip wide band amplifier between the synthesiser and the mixer would make another worthwhile improvement. The receiver would benefit from an r.f. gain control, and the a.g.c. system is so well designed that it must be possible. I often suggested to Trio that the front panel tone control should be used instead for controlling r.f. gain but the suggestions sank like the *Titanic*. Perhaps now is the time to raise it again.

The i.f. filtering was always quite good, but there have been newer versions of the s.s.b. filter with better performance, and again due to the excellence of the original design, it would be quite easy to put better specification filters in place of the a.m. wide and narrow units. One final thing to do would be to replace the 0 to 60dB front-end attenuator by one having a 0 to 30dB range, using 10dB steps rather than the overstated 20dB steps of the original. Since the attenuators are made up of discrete resistors, this would be a really easy and useful modification to any R-1000.

Hard To Beat

The main reason for thinking that a twenty year old receiver is worth all this, is that the design was brilliant in the first place, and for the general listener who wants good r.f. performance and ease of use, the R-1000 is hard to beat. Admittedly it doesn't offer the memory storage and recall facilities of more modern receivers, but it was always a delight to use, and at its current value on the market is well worth considering as a basis for modification.

However, *caveat emptor* as always, and don't lose sight of the fact that the Yaesu FRG-100 is currently available at extremely attractive prices and it doesn't need modifying to bring it up-to-date. A difficult decision to make, but if you already own an R-1000 you should treat it with tender loving care; it truly was a landmark design. ***SWM***

"The main reason for thinking that a twenty year old receiver is worth all this, is that the design was brilliant in the first place"

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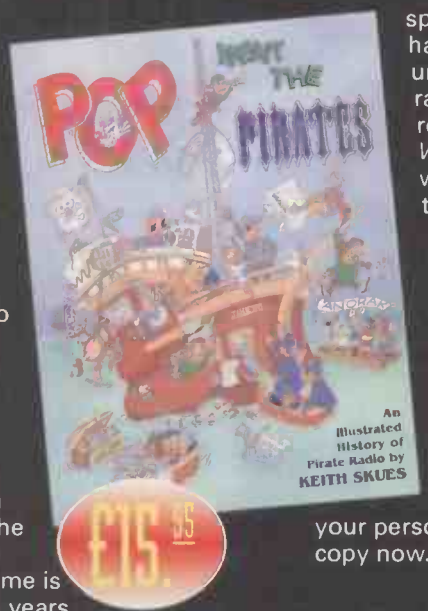

Pop Went The Pirates sets out to produce the definitive history of pirate radio ships, with a comprehensive account from the earliest pirates in the 1930s up to the present day. This outstanding volume is the product of 30 years of painstaking research by the author, who has been involved in sound broadcasting throughout the period. The informative text is fully illustrated with 230 black and white photographs, many of which have never previously been published.

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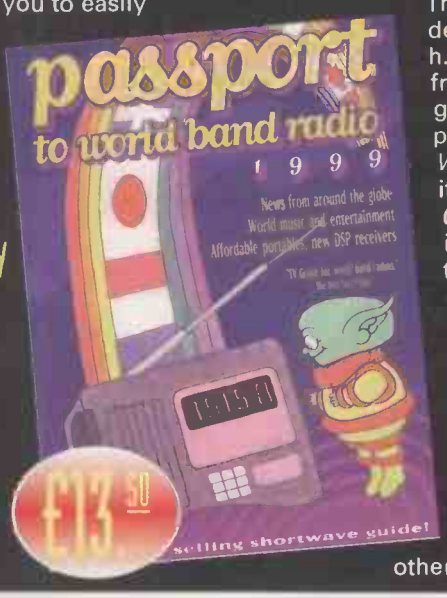

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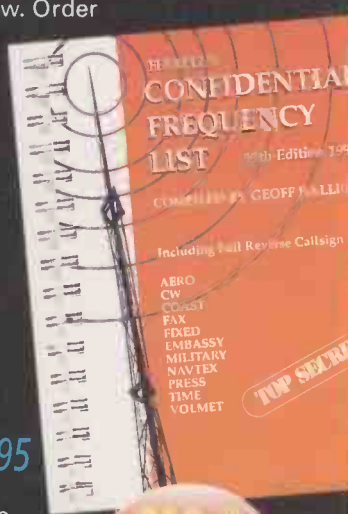

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See pages 78 & 79 in this issue or visit **www.pwpublishing.ltd.uk/books/** for lots more information on radio-related books. **Internet users can order on-line.**

Book Profiles

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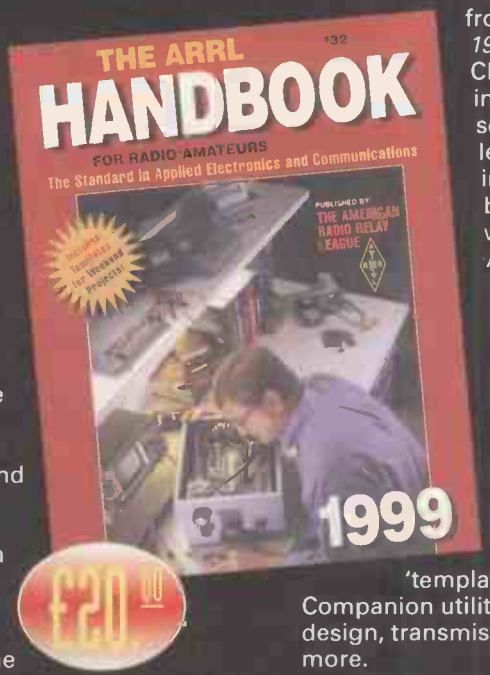

This book means many things to several generations of amateurs, engineers and technicians. To the technically minded, it's an unimpeachable source of reference data, project ideas and electronics theory. To the operator, it's an overview of what amateurs do and how they do it, to the newcomer, it's a primer on the modes and equipment amateurs use, and basic theory. To the technician, and engineer, it's an invaluable supplement to the reference books and data sheets that are always nearby.

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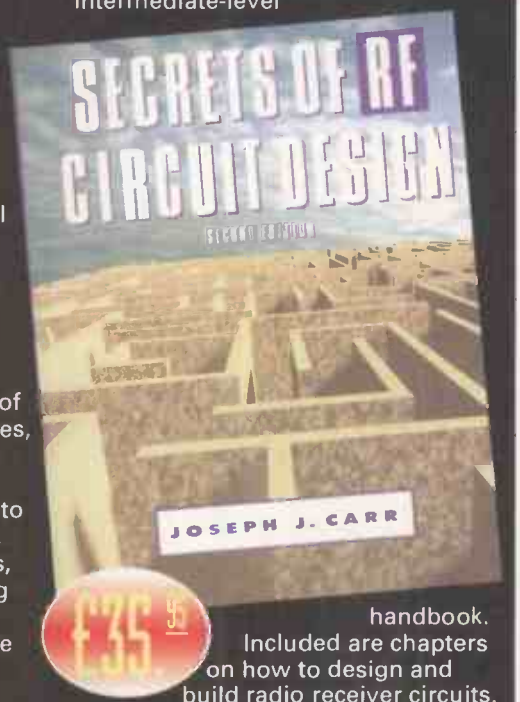

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Amateur Bands

The junk stowed up in the loft divides into 'archival' to the left, and 'come-in-handy' on the right. I don't recall touching either pile till now - but a query sent me up there for a reference.

I found a box of reel-to-reel tapes, some of the prehistoric paper-based sort, plus some more recent ones. Out came my old recorder, to see what I'd found. On one of the 'oldies' I'd taped the 14MHz band, around 1949/1950 judging by the callsigns. All a.m., so every station had a carrier, and every carrier beat with every other carrier to produce whistles while the receiver would try to demodulate the signal against the biggest carrier.

Signals were weak too - when we turned our 2 x 807s or 2 x 6146s from a.m. Class C to sideband Class AB1 the received audio immediately came up by 9dB - and of course as the a.m. signals disappeared, so did the carrier whistles. How we ever managed to log anything Lord only knows! If we wanted DX we listened at the c.w. end - and the tape showed I'd wound the BC348 down there, probably on the same day - that end of the band was probably nicer then than now, save for the various stations sporting fiendish clicks and chirps.

As for the man-made noise level, the books of that era said 'above 10MHz man-made noise disappears'.

As for the BC348, it was bought from G2AK's shop in Dale End, Birmingham, and carted home by bus to start my serious listening career, though my very first interest was sparked by some receiver plans bought by my father in the Twenties. The tape-recorder, though, was my very first project completed and made to work! Just so!

Letters

Let's start with a celebration. **Ted Trowell** in Sheerness mentions (18MHz) HV4NAC; (24MHz) P49M, 5A1A, S79YL, all on sideband! After that rush of blood to the head, the first for many years, Ted mourned the passing of the RSGB *DX News Sheet*. As he says, a useful document. However, people nowadays use the Internet to find their DX, so the circulation of *DXNS* fell drastically, below an economic level. I certainly miss it, because it has landed on my mat every week since the mid-1960s, first from Geoff Watts, and since Geoff's passing by G4DYO and then G4BUE. So Ted went back to c.w. to log UA9FBK on Top Band and 9V1ZB on 10MHz at 2100z.

On 14MHz there were JA4AHV, 5A1A, JA5PL, BY1DX, TF3DX, JH4UYB, VO1MD, TF1MM/9 and JM3APP with CN8WW and 5B4AGC to adorn 18MHz. For 21MHz we find VQ9DX, TA2IJ, TA3D, 3B8/DL6UAA, OD5SB, XX9TEP, JT1Y, 5N99MSV, ZS6CEV, YC1CF, 3B8/DL2HZM, PT2DMS, FR5BT, PY4AR, CN8WW, JH3AIU, 4X6PT, JY9QJ, S79GT and J28BS. For some of the period at least - though not as I write!

It was worth looking on 24MHz to log 5N99MSV, J28BSD, V21CW, E4/G3WQU, JY9QJ and 3B9R. There was even activity on 28MHz, by way of PY1ARS/4, ZS6AVP, J3/K3LTA, PW8FCL, 3B9R, PY2OW, PY1AFB, ZS1/RA3DQ, 7Q7LA, PY7CM, LU4FC and ZS6SA.

Propagation

We seem to have dropped into something of a hole flux-wise, as I write. This is hardly surprising, but the pundits' prediction that the peak will be late in year 2000 holds. While there is a rough co-relation to an 11-year cycle, any individual event such as a sunspot occurs at random. Hence the prediction of the time when a cycle will peak or bottom is largely a matter of educated guessing; even the 11 years is not sacrosanct - as short as eight and as long as 15 year are on record! We really don't have reliable data on enough sunspot cycles.

More Mail

Now we turn to **Dennis Sheppard** who lives in Nuneaton. On 28MHz Dennis mentions A41KJ, A71MA, A92GF, BV2RS, BV4ME, C56EL, CX4HS, CX8CP, E44/HA1AG, HS0IKF, J37VG,LU6ETB, OD5RN, P43P, PT7WA, TR0A/P, UA9FGR/MM, VK6EWI, VU2JPS, YC0ROY, ZF2YB, ZP6ZA, PZ1GPB, YZ7EM, ZS6BBP, VP5/IK2SGC and VQ9CV. 24MHz stumped up with P49M and ZD7BG, while 21MHz was full of JAs, HL3ERM, JJ8UTK on Hokai Is and VK9NS from Norfolk Is. There was a SES for the Melbourne Grand Prix, VR3GP, plus KH6LEM. Finally, on Eighty Dennis found loads of VKs and JAs - and he even logged Yours Truly!

Many of you will be aware of the closing-down of the Coast radio stations and the various amateur markings of the event. Up in Caithness, overlooking the Pentland Firth, **John Eden GM0EXN** and **Les Thomas GM0TKB** set up GB0GKR at the Dunnet Head Tea Room in Brough village where John GM0EXN lives. Les did most of the operating and the station made some six hundred-plus contacts. A fast QSL can be obtained by E-mail - **john.farnorth@btinternet.com** or try **www.btinternet.com/~bandb** farnorth. Incidentally, for a different sort of holiday, a run up to John O' Groats and visit GM0EXN's Tea-room - but if you want to stay with them you do need to book ahead (and mention your interest in amateur radio!).

Pressing on, we find **Colin Dean** in Barnsley; he looked at 7MHz and found FM5BH, HB0/DL1RWB, HO3A, JA8BOF, JT1Y, NP3X, P3A, VK1MJ, VK6BPX, YC5XIP, ZB2FX, 5B4/RV0AR 5Z4GS and 9G1MR. On 14MHz Colin logged AP2YHM, A41LZ, JT1CO, KL7IDA, OH0M, P51BH, 3B9R, 3C1GS, 4F1JUX, 4S7BRG and 6A1A; then a tweak to 18MHz for EP2HR and HZ1AB.

The 21MHz crop showed DS4NSE, DU1COO, DU6AIS, E41/OK1DTP, FM5FJ, HC1HC, HS0/G4UAV, JT1Y, OD5NH, SU9ZZ, TI2OY, VP5/IK2SGC, an assortment of YBs, 3C1GS, 4S7AB, 5A1A, 5R8FL, 5R8FU, 6W1RB, 7P8HH, 7Q7RM, 9G1HK, 9J2BO, 9M2TD, 9V1WW. Finally, 28MHz for FH5CB, FR5DX, HC8A, P40N, P43W, VP5N, V51BP, ZD8BDD, 8P2K and 9G1MR. All were s.s.b. signals.

John Collins in Birmingham is a late-night 7MHz addict, and he offers UA6LCQ (Bureau), LY3BX (via UA7A), US2IES (Bureau), EI6FM (Bureau), RA9MA in Siberia (either via the Bureau or direct to the CB address), ZP2CW (Bureau), E93B (Bureau), SU3HM (Bureau) and 1X1AU (Bureau), but being seriously jammed - which implies a question. Probably Slim again; a call beginning with '1' has never to my knowledge been allocated by ITU, though at least two such were accepted as DXCC entities. John notes no stations were heard from Belgrade even in the contest, these having been made QRT. This info. John heard from at least two sources.

Letters Again

We have two from **Paul Goodhall** this time, and there is so much we'll have to stick with the first one - sorry Paul! On 28MHz he found Ws, 5Z4RL, RK3XWD working ZP2BKA, PA2O knocking off a pile-up of mainly Ws, KF7G, N4NFF, KF4ZZY, before switching to 21MHz X1YQQ was working a pile of Europeans, as were a string of East Coast Ws, UR0EF, VE3OXQ and VE3ST. N3EON RZ9MY, K8MY working G3IDG who was for long a contributor to this column, YU7KMN whittling down a pile-up of Yanks YX8ZQT sorting out a heap of Europeans, VK6MHT and UA9CS in QSO at 1408UTC.

As ever the pay-dirt tends to be on 14MHz where Paul found EA7BA working VK2SB, ZL1TB working GW3TMP, K1UQV working G8PX, ZL3HM working GW4SLZ, ZL1BD, VK4DAN and GB99SET with a great pile including RZ1AZ, OK1NS, RW4NJ, IK7MIW, OK1AOG and DL7VRL. At 7MHz a brace of QRP ops, GM3VQJ and G0ADL, plus, around 0300, HK3BZO working US1HT, IK3GBN, RU3ZG, RA6AAW and HJ6PPN with UZ1HT.

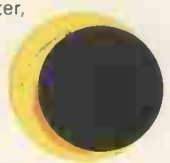
For Eighty, again around 0300, we note N6KT working HC8A and HI8HCJ working OK2BJJ. Finally, we seem to have missed out 18MHz where Paul mentions 9T/G0BXK/P, K2MQ, W8EGB, N4NZ and W8ITS working W8AJQ, KT4IFR nattering with VE3PXU and K2EAX attending to G3ACQ again around 0300 UTC.

Finale

Your letters and comments please, to reach me at **PO Box 4, Newtown SY16 1ZZ**, by the first of the month as usual. Thanks!

Eclipse

Don't forget the Solar Eclipse. Any of you who can get on, from two hours before, and log carefully what goes on until two hours after, will be helping us to learn more about propagation.



QSLs

We've already noted those from John Collins, and Ted Trowell adds BY1DX, via OH2BH; CN8WW via DL6FBL; 5N99MSV via OK1JR; V21CW via K2ACW; J28BS via F6KPQ; S79YL via DL7AFS; 5A1A via I3ZAW; JT1Y via I0SNY and HV4NAC goes to IK0FVC.

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Kosovo Update

Last month's issue of *SWM* contained a feature concerning h.f. signals heard during the ongoing Operation 'Allied Hope'. As I type these words in early May, the actions are still continuing, and I have no way of knowing if they will still be in progress by the time this particular issue reaches you. The original article was hastily written over a weekend, and I have since noticed a few errors had crept in; I also have a few updates and a little bit of additional information to pass on.

In the section dealing with Tankers, I said that the ground station at Moron in Spain was using the callsign 'Sombrero Ops', but this should have been 'Bolero Ops'. Some more tanker aircraft have now arrived at various airfields in Europe, and are using new 'currency' callsigns. USAF KC-135 aircraft operating from RAF Brize Norton have been using the callsign 'Baht' (Thai currency) and 'Drachma' (Greek currency), while aircraft operating from an unknown airfield have been using 'Rouble' (Russian currency). I have included a list of these 'currency callsigns' heard so far, along with details of where the aircraft are thought to be operating from.

I also mentioned the 'Kosovo' callsign was being used by Canadian Forces aircraft. It now appears that the 'Kosovo' callsign (flight prefix 'KSV') is being used by relief flights into the region, and it is being used by several nations. I have personally heard Canadian, French, German and American flights.

Antennas

Ian Sharman writes from the Midlands to ask why I have never mentioned the 'antenna farm' at Chelveston in Northamptonshire. If you want to find this place on a road map, it is just to the east of the main A45 road, to the east of Wellingborough. Ian says that 'the Americans have been there for years' which came as a surprise to me, as the proper name of the installation is RAF Chelveston.

This site is part of the RAF 'Architect' network, and according to *Eavesdropping on the British Military* it is one of the transmitter sites for that service. The site used to be an airfield with USAF fighters and bombers. In 1963, Project 'Clearwater' halted large scale rotational bomber deployments to Britain, RAF Chelveston was one of several airfields returned to the Air Ministry, and it subsequently became part of the RAF Architect network.

Ian also mentions the large circular antenna array at RAF Chicksands in Bedfordshire. This was the well-known circular 'elephant cage' antenna; there is a similar one near the US Army heliport at Gablingen just outside Augsburg in southern Germany. Other similar antennas were built in Italy, Japan, the Philippines and several in Canada and Alaska.

The base (Chicksands) continued to be operated by the US Air Force until September 1995 when a combination of modern technology and the lessening of East-West tensions made the facility redundant. The circular AN/FLR-9 antenna, known affectionately locally as the 'elephant cage', was dismantled during 1996. Chicksands has now been acquired by the Ministry of Defence as a Joint Services Base with personnel moving in from late 1996.

This FLR-9 (or 'Flare-9') antenna was built by the United States Air Force at Chicksands in 1963 and came into use in 1964. It is a direction finding antenna, one of five of the FLR-9, circular array antennas built around the world for the interception of strategic communications. In the days before signals could be sent via satellite, it received signals from over the horizon which were bounced off the ionosphere.

The antenna is composed of a central, circular brick building which housed the receiving equipment, around which are two concentric rings, or arrays, of lattice-work towers, the inner of timber the outer of steel. These in turn stand within two concentric arrays of steel, cylindrical antennas. The diameter of the whole antenna is 368.6m and the tallest element, the steel lattice-work array, is 36.6m.

There is an extensive write-up about these antennas, which are known as 'Wullenwebers', available on the Internet at **http://users.neca.com/cummings/wullen.html**

Letters

G. Grundill from Cumbria writes to ask if I have a frequency for RAF Mildenhall in Suffolk. He says that he often hears USAF crews on 11.175MHz mentioning Mildenhall, but says that he cannot trace any h.f. frequencies for the base. Well, Mr. G, one of the reasons for the USAF to have the GHFS system is so that each individual airfield does not need to have its own frequency. There are now only three active-flying USAF in the UK, but I can remember a time when there were seven, and I am sure that other readers will remember many more - if they each had their own h.f. frequency, they would each need antennas, radio operators, antenna-riggers, and so on. With the GHFS stations handling all the air-ground communications, they are able to connect the aircraft into the telephone system (the famous 'phone-patch') and the crew can talk directly to Mildenhall or whoever.

Having said all that, and explained why Mildenhall does not have its own frequencies, I can now contradict myself, and explain that they do have their own h.f. frequencies. There is a special unit based at RAF Mildenhall, known as the 352nd Special Operations Group, who have a number of discrete h.f. frequencies. The 352nd SOG is a 'special operations' unit which operates a mixed fleet of C-130 Hercules and MH-53J helicopters. Elsewhere on this page I have listed all the known frequencies for this unit, however the only one which is regularly heard is the one listed as '352ndSOG Primary'. A lot of the communications on this frequency are 'in the clear' but use code-words, so although you can hear and understand what they are saying, you have no idea what they are talking about!

352ndSOG, RAF Mildenhall, h.f. frequencies (all u.s.b.)

MHz	Comments
3.1660	
5.2045	352nd SOG primary
5.7320	
6.7290	
8.0260	
9.0170	
9.0180	
10.270	
11.180	
11.228	
13.102	
13.207	
15.738	
18.027	
21.095	
23.271	

Currency Callsigns

Callsign	Base
Baht	RAF Brize Norton
Buck	RAF Brize Norton
Cent	Istres, France
Dinar	Frankfurt, Germany
Dinero	Mont de Marsan, France
Dirham	Budapest, Hungary
Dollar	RAF Mildenhall
Drachma	RAF Brize Norton
Euro	Istres, France
Franc	?
Gilder	Frankfurt, Germany
Gold	Moron, Spain
Mark	RAF Mildenhall
Money	Mont de Marsan, France
Nickel	Frankfurt, Germany
Quarter	Mont de Marsan
Rand	Sigonella, Italy
Rouble	?
Riyal	RAF Fairford (originally RAF Mildenhall)

A USAF KC135R about to depart from RAF Fairford on 3 May as "Riyal 31". The 'MO' tail-code signifies that the aircraft is operated by the 366th wing based at Mountain Home AFB in the USA.

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ICOM IC-R72E	As new condition £425
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KENWOOD R-5000	+ VHF. Great value £499
LOWE HF-150	Great beginners set ..... several from £199
LOWE HF-225	+ key pad £249
REALISTIC DX-394	Ex-demo £110
REALISTIC DX-394	2 weeks old £90
ROBERTS RC-818	Portable, boxed £90
SONY 2001	Great set £210
SONY 2001D	Mint condition £170
SONY ICF-7600D	As new portable £65
SONY SW77	As new, unwanted gift £199
TRIO JR-310	+ speaker £95
WIN RADIO DELUXE	PC receiver, as new £335
YAESU FRG-7	Good condition £90
YAESU FRG-7000	Fantastic value £175
YAESU FRG-7700	Great condition ..... several from £195
YAESU FRG-8800	Several to choose from ..... from £250
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AOR AR3000A	Boxed, as new £599
AOR AR5000	4 weeks old £950
AOR AR5000+3	Ex-display, new £1125
ICOM IC-R10	Ex-demo £220
ICOM IC-R10	Boxed, as new £199
ICOM IC-R7000	VHF/UHF base £510
ICOM IC-R7000	VHF/UHF BASE £625
REALISTIC PRO-2006	A1 condition ..... several from £139
SIGNAL R-532	De-luxe civil airband £169
WIN-108	Civil airband, hand-held £90
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YUPITERU MVT-7000	Un-boxed, complete £119
YUPITERU MVT-8000	Mobile scanner ..... several from £145
YUPITERU MVT-9000	As new, great saving £239
YUPITERU MVT-9000	Ex-demo £289

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GRE SCANNER	Pre-amp £35
HAMCOM INTERFACE	..... £20
KENWOOD SP-430	Speaker for their S000 ..... £40
MFJ-462B Decoder	Ex-display £110
SCANMASTER SP-55	Pre-amp £49
TIMEWAVE DSP-59+	De-luxe DSP filter £159
TIMEWAVE DSP-9+	Latest version, as new £115
TIMEWAVE DSP-9+	Latest version, as new £115
TIMEWAVE DSP-9+	Latest version, as new £115
YAESU FRT-7700	ATU £50
YAESU FRV-7700	VHF converter ..... choice of 8 £45

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KEITH HAMER & GARRY SMITH, 17 COLLINGHAM GARDENS, DERBY DE22 4FS

DX Television

April was a fairly typical month for long-distance TV reception. There was a noticeable increase in Meteor-Shower (MS) activity, and some Sporadic-E (Sp.E) openings were also reported. The month concluded with a tropospheric opening which brought in strong, steady signals from various Benelux transmitters in Band III and u.h.f.

Reception Reports

There were at least two Sporadic-E openings. A Norwegian station on Channel E3 was noted here in Derby during the afternoon of the 25th. It was only a brief display of activity, but it was a welcome reminder of better things to come. Via **Ian Milton** (Ryton), comes the news that there was also a sustained Sporadic-E opening into Spain and Italy.

An intense tropospheric opening occurred on the 28th, 29th and 30th, with several Benelux stations identified. **Stephen Michie** (Bristol) reports strong French and Dutch signals on April 28th. At 2115, **Peter Barber** (Coventry) saw adverts followed by 'Journaal' from the Belgian VRT TVI Wavre outlet on Channel E10. Over on Channel E8, co-sited RTBF-1 were showing subtitled film reviews. In Stockport, **Martin Dale** received colour pictures from RTE-1 (Éire) on Channel E from the transmitter at Kippure.

During the evening of the 29th, Dutch signals were strong enough to wipe out local relays in the Derby area.

High-level signals from Tacolneston began providing good-quality Anglia ITV programmes. Digital signals on Channel E48 reduced BBC-1 from a local relay to a screen full of noise. The most likely source was Sudbury (the D3 MUX), but the analogue channels could not be resolved due to local digital transmissions from Sutton Coldfield. Efforts at recovering the D3 MUX from Sudbury failed, probably due to the local analogue broadcasts sharing the same frequency. Hopes of digital DXing are fading fast!

Fig. 1: The Spanish GTE Test Card which can still be seen terrestrially via TVE-2 at the crack of dawn. This photo was taken last March at 0558!

Fig. 2: News programme opening logo from Syria.

Reception Log For April

The compilation log includes reports supplied by Peter Barber and Stephen Michie. All times shown are in UTC.

Day	Log
15	Unidentified Meteor-Shower signal an Channel E3 at 0648.
25	Norway E3 via Sporadic-E.
28	France Canal Plus L5 (Lille), L7 (Rouen) and L9 (Caen); Belgium VRT TV1 E10 (Wavre); RTBF-1 E8 (Wavre); Netherlands NED-1 E4 (Lopik), NED-2 E27 (Lopik) and NED-3 E30 (Lopik). All signals via tropospheric reception.
29	Netherlands NED-1 E4 and E29 (Goes), NED-2 E27 and NED-3 E30. All signals via tropospheric reception (1900-2300).
30	Belgium VRT TV1 (E10) and RTBF-I (E8); Netherlands NED-1 E4, E5 (Roermond) and E7 (Markelo). All signals via tropospheric reception (0545-0915).

Fig. 3: One of the regular newsreaders to be seen on Syrian TV.

Irish Band I Closure

Band I transmissions from the Gort RTE-1 transmitter on Channel B have finally been axed. The channel was commonly received in Europe but in the UK it was harder to DX, due to the relatively short skip distance. Sharing the same vision frequency as the Italian 'A' channel, it was easy to miss unless the sound channel was being monitored; i.e. 6.0MHz spacing, as opposed to Italy's 5.5MHz. Using equipment with i.f. bandwidth reduction (for example, a D-100 converter, etc.) the transmissions could be detected almost daily, occasionally hovering above the noise, even in parts of central England.

The only other Band I outlet listed was Glanmire on Channel 'C' with its 50W e.r.p., but we have never heard reports of this one being received. There was a Channel 'A' frequency allocation but, as far as we know, there were no relays operating on this channel. However, during one Sporadic-E opening in the Seventies, a weak PM5544 test card materialised around 45MHz, but its origin was never identified.

Fig. 4: Identification caption radiated by Syrian TV.

Just for the record, the Band I frequencies (MHz) used by RTE-1 in Éire were as follows:-

Channel	Vision	Sound
A	45.75	51.75
B	53.75	59.75
C	61.75	67.75

Incidentally, **Chris Howles** (Erdington) tells us that Band III antennas can be found along the Welsh coast, beaming towards Dublin.

More Interference

Frequencies on v.h.f. are often used to distribute cable TV due to lower losses. This is especially true in older cable systems. We recently discovered that such a system in Luton actually uses 48.25MHz (Channel E2) for distribution! Chris Howles (Erdington) has suddenly become aware of the QVC satellite channel appearing in Band III, maybe due to local cable leakage.

After a gap of about 18 months, cable TV interference has re-emerged at Peter Barber's QTH in Coventry. The signal used to peak to the north-east, but is now arriving from due-east and coincides with Channels E5, E7 and E10. An occasional encrypted signal also affects Channel L7. Now Peter has the pleasure of Channels E2 and R1 being disrupted thanks to a baby alarm being used as a crude burglar detector fitted to a nearby garden shed.

Simon Hockenhull

Fig. 5: Slow-Scan TV (SSTV) picture received by George Newport in Canterbury.

Fig. 6: This month's nostalgia spot. Does anyone remember seeing this ATV logo in the late Fifties or early Sixties?

(Bristol) is also suffering from these 49MHz pests. A signal level of 57dBmV is present *after* a notch filter. No wonder most DXers have given up trying to receive Channel R1!

Analogue Power Loss

Mike Gaskin (Cornwall) comments on a reduction in signal level from his local Caradon Hill transmitter, since digital broadcasts began towards the end of last year. Mike suggests that both digital and analogue signals are being fed into the existing antenna stack, as no new installations have been observed at the site. If this is so, the combiner will reduce the analogue power levels by at least 4dB, possibly more. This will not be noticeable in primary service areas, but in extreme fringe areas the pictures will become noticeably weaker.

Spanish Test Card

The good news is that the Spanish GTE test card is still aired terrestrially. The bad news is that it is confined to the TVE-2 network and since the Santiago E2 outlet closed a couple of years ago, this rules out Sporadic-E reception. If you are on holiday in Spain this summer, don't forget to terminate your clubbing activities a little earlier than normal. The test card is only shown before programmes commence at six in the morning!

Band I Radio Link

Peter Barber recently discovered a radio link operating close to Channel E2. During the week ending April 18th, there was an audio feed on 48.420MHz from the roof of the Britannia Hotel in Coventry, beaming 300m to a temporary transmitter mast erected in the Transport Museum car park. This was used to feed a 1W RSL three-day broadcast on 1.404MHz. Both transmissions came through loud and clear, approximately 5km away. According to information broadcast on the last day of transmission, the installation was to be transported to Leicester to be in service again on May 1st.

FM DXing

Tim Bucknall (Congleton) has temporarily ditched his rotatable u.h.f. array, due to the increasing intrusion of digital signals. A brand-new 5-element wideband array covering 45-110MHz now dominates the skyline. Tim has already explored certain Band II frequencies such as 87.60MHz, and reports several Meteor-Shower successes including Sweden, Norway, the Czech Republic and an Arabic station. Tim tells us that the frequencies NATO are using for their airborne broadcasts over Yugoslavia are 102.5, 87.9 and 106.4MHz, so these may provide some interesting DXing possibilities. The Channel E3 TV transmitter at Kapaonik is now inactive.

Service Information

Netherlands: There are plans to establish a fourth TV network in the Netherlands.

Slovak Republic: With the introduction of DAB transmissions in the Slovak Republic, transmitters using Channel R12 are to be closed. The STV-1 outlet at Velká Javorina is already off the air.

Our thanks to **Gösta van der Linden** (Netherlands) for this month's Service Information.

Keep On Writing!

Please send reception reports, photographs, news and information, to arrive by the 1st of the month, to:- **Garry Smith, 17 Collingham Gardens, Derby DE22 4FS**

Competition (Part 2)

You can win more than £668 worth of HF station.

Win!

Do you only have a scanner or an all band portable? Here is a chance to win an h.f. station. Even if you do currently have an h.f. receiver, a second set is always handy. So don't miss this chance!

JRC, via Lowe Electronics of Matlock and Wellbrook Communications, have both kindly contributed the prizes for our free two-part competition.

Both a Japan Radio Company NRD-345 worth £549 and an ALA 1530 Active Loop Antenna worth £119.95 can be yours. Answer the three questions this month and fill out the answers on the entry form from Part One (page 25 June issue), and send the completed entry form* and corner flashes to the address on the entry form.

All entries will be entered into a draw, the first correctly answered entry drawn from the 'hat' will be the winner.

The Editor's decision is final and no correspondence will be entered into.

Closing date for entry is 22 July 1999, no submissions will be accepted after this date. The winner will be drawn on 3 August 1999. Notification of the winner will be announced in the September issue of *SWM*.

Part Two

Questions

1) **Who reviewed the NRD-345 in *SWM*?**
2) **Who makes the NRD-345?**
3) **What is the frequency range of the ALA 1530?**

NRD-345/ALA 1530 Comp.
PW Publishing Ltd
Arrowsmith Court
Station Approach
Broadstone
Dorset
BH18 8PW

*Photocopies of the entry form are acceptable but are void without the original corner flashes from both the June and July issue of *Short Wave Magazine*.

June back issues are available from the *SWM* Book Store.

■ PETER BOND c/o EDITORIAL OFFICES, BROADSTONE
■ E-MAIL: milair@pwpublishing.ltd.uk

MilAir

Kosovo Continues

The 'MilAir' news this month is once again dominated by the Kosovo crisis. The air campaign continues, with NATO air-arms flying several hundred missions a day, and Serbian ground forces in Kosovo are now being regularly targeted. If I was a Serbian Tank Commander, and thought that A-10s, armed with the GAU-8 Gatling, and Apache helicopters armed with Hellfire missiles were about to be unleashed, I think I would be resigning my commission!

Fairford

Fairford has continued to see a lot of activity, and the B-1Bs and B-52Hs have continued to rotate, with the following callsigns being noted in use by mid-May:

B-52H	2nd Bomb Wing, ARCTIC/AMUSE/ BORG/DOOM/GAMUT/HOYLE/JAMBO/TIGER
B-52H	5th Bomb Wing, BINGE/EDWIN/ LUNDY/NAPPY. The callsigns, HAVOC and LASER have been used by both B-52 units.
B-1B	28th Bomb Wing, BONE/CHISEL/RAZOR

Several tankers from the 347th wing at Mountain Home are now also based at Fairford. They arrived in mid April, using the callsigns ASPEN 21/BLUE 11, and 12/BOBBY 51 and GOLD 08. For missions they have adopted the Mildenhall 'currency' callsign, RIYAL. Other tanker currency callsigns are as follows: DRACHMA = Brize Norton, DIME, DINAR and GILDER = Frankfurt, EURO = Istres, MARK = Mildenhall, RAND = SIGONELLA. LIRE, ROUBLE and DIRHAM remain unidentified. DOLLAR has not been heard for a while and NICKEL is believed to be used out of Frankfurt.

Lakenheath

Whilst the 48th Fighter Wing F-15s have been deployed to Europe in support of the Kosovo campaign, backup at Lakenheath has been provided by the welcome arrival of six Alaskan based F-15Cs. The aircraft, which are normally based at Elmendorf, are from the 54th Fighter Squadron of the third Wing/USAF Pacific Air Forces. They arrived on the 14th April using one of the standard deployment callsigns, RETRO 11 - 16. Incidentally, the 493rd Fighter Squadron, currently deployed from Lakenheath to Cervia, has been given the temporary title of the 493rd Expeditionary Fighter Squadron.

Too Much Information

I have had several E-mails from readers in both Italy and Northern Greece, which list quite a selection of u.h.f. frequencies noted in use over the Adriatic. These included a number of Air-to-Air, Tactical and Operations frequencies. I have elected not to include these for two reasons; firstly, these frequencies would not be within the reception range of most of the readers of 'MilAir', secondly, and most importantly, I am sure everyone would agree that it would be wrong of us to publish frequencies which could in any way compromise the NATO air-arms. I am quite certain that Serb Communications experts will have already identified many of the frequencies in use by the NATO forces, but I for one do not intend to help them; whilst perhaps unlikely, who is to say that President Milosevic does not read *Short Wave Magazine*?

Whilst you may argue that frequencies used in the clear are unlikely to contain information of use to the Serbs, the Americans have already admitted that such a compromise has already happened. The difficulties were highlighted by a report in the *Washington Post* in early May. The main problem being that with aircraft from several NATO air-arms flying together, if just one aircraft is not equipped with secure communications then all the others have to transmit in the clear! US Intelligence reports have indicated that ground targets were being moved after targeting information was transmitted in the clear between NATO aircraft. The other conclusion that can be assumed from this is that the Serbs also have a good knowledge of NATO target code-words!

To quote the communications expert at the Pentagon; "When the planes without secure communications take part in operations, pilots in other aircraft must speak on unsecured radio frequencies that NATO knows is being monitored by Yugoslav forces **as well as civilian radio enthusiasts**".

The subject of security brings me to what several readers have written in about, and what I suppose I could call the Moral Dimension - the current conflict, added to others in the recent past, may ultimately affect the future of 'MilAir' listening. If you think back to the Second World War and the intense secrecy that surrounded communications systems (Enigma and all that), the information that is available in the public domain now, would have given nightmares to the people responsible for wartime security. In fact, the information available in the modern era would not have been conceived as possible just 20 years ago.

The advent of satellite television with portable uplink systems has meant that news-crews can be broadcasting from anywhere in the world, within minutes of their arrival at the scene. This consequently meant that the Gulf War in 1991 was the first time that we could literally watch a war take place live on television. Who can forget the CNN reporter commenting on the cruise missile heading down the high street past his hotel in Baghdad! Whilst current television reports coming out of the former Yugoslavia are censored for content, we are still receiving an amazing amount of up-to-date information, compared to other conflicts in the past.

So, what is my point? Well, add news reports to the power of the information on the Internet and the ever increasing sophistication of radio receivers, and in the end it means that modern Air-Arms within NATO (and other countries) may soon look to new ways of providing uniform secure communications. Whilst I am fully aware that such communication systems already exist, will it ultimately mean that the experience gained from recent joint NATO operations may ultimately mean that **all** MilAir communications may be made secure in the future, especially in a conflict scenario? With the technology already available, I suspect that it is only budget restrictions that are theoretically stopping the introduction of such radio equipment today.

RAF Unit Changes

As previously mentioned in the April 'MilAir' column, some RAF unit changes have now taken place. The 1st April saw the formal disbanding of 17 Squadron at RAF Bruggen. Confirming last month's report, 4 Squadron re-located to RAF Cottesmore on the 13th April, with 3 Squadron scheduled to move from Laabruch during May. Flying at Laarbruch is to cease on the 31st May, and the airfield is to be handed back to the German Government at the end of 1999. Any reports of Operations or Air-to-Air frequencies in use by 3/4 Squadron would be welcome.

An EC-130H from the 355th Wing, who are currently deployed at Aviano.

■ FARIS RAOUF c/o EDITORIAL OFFICES, BROADSTONE
■ E-MAIL: scanning@pwpublishing.ltd.uk

Scanning

I have to admit being a little taken aback about the number of readers who have sent me E-mails or letters about *Trunker* - I didn't think so many people would be interested. Unfortunately, most people seem to be utterly confused as to how exactly to get it going, so I'm dedicating this month's column to a step by step guide on how to get it all going.

The Basics

First, start with the basics - get the latest version of *Trunker* from **web2.airmail.net/lblant1/dfw/digital.htm** As I write this, the latest version is 3.7g, but undoubtedly it will have gone up a version or two by the time this gets into print.

Of course, you'll also need a *Hamcomm*-type interface, a basic scanner (to monitor the control frequencies and whose audio or preferably discriminator output is sent to the *Hamcomm* interface) and a computer-controllable scanner supported by *Trunker* to actually track the conversations. Technically, you'll also need a PC, at least a 486, with **two** serial ports, one to attach the *Hamcomm* interface to, and the other to attach the computer controlled scanner to. You can get away with using just one serial port, but that's another, and way too technical, story.

Next, create a new directory (or Folder in *Windows 95/98*-speak) on your hard disk, and call it TRUNKER. Unzip all the files from the Trunker file you first downloaded into this. Now, create a batch file in this directory. Call it TRACKENV.TXT, and put the following lines in it

```
TRACKSLICERPORT=COM1
TRACKSLICERPIN=CTS
TRACKSLICERMODE=INVERT
TRACKSCANPORT=COM2
TRACKSCAN=R8500
TRACKSCANPARK=854.0000
```

I'm assuming that your *Hamcomm*-type interface is connected to your first serial port, called COM1. If it is the second serial port, COM2, then change COM1 to COM2 in the TRACKSLICERPORT= line. Similarly, I'm assuming yours is on COM2. Change COM2 in the TRACKSCANPORT= line to COM1 if it is not. Finally, change the R8500 in the TRACKSCAN line to match the computer-controlled scanner you have. Now create another text file. Call it TRUNK.BAT, and put the following lines in it.

```
SET TRACKENV=C:\TRUNKER\TRACKENV.TXT
TRUNKER
```

So, to run *Trunker* and to give it all the information about your set-up, all you need to type is 'TRUNK', then hit the ENTER key.

Control Frequency

Now, tune your basic scanner to a control frequency. You'll find one or more of these by scanning through and around the frequencies used for the trunked network's voice frequencies. You'll also find a listing of the ones used in the London area at **www.g7hid.freeserve.co.uk/431e.htm**

If your scanner does not have a discriminator output, you may have trouble getting *Trunker* to work, but on my Yupiteru MVT-7100, which still lacks a discriminator output as I've not yet undertaken the modification I mentioned last month, I found it works happily as long as you crank the volume up almost to the highest setting.

Run *Trunker*

Now it's time to run *Trunker*. Leave it to run for a minute or two. If all is well, you should end up with a load of 800MHz-ish decimal numbers jumping around on your screen, and a message saying 'DX Rvc' or 'Hi-Qual' in the top right hand corner. If all is not well, however, you'll find that *Trunker* displays 'sig?inv', 'wantCTS', 'wantDSR' or 'wantDCD' instead.

If this is the case, check your audio connections from the scanner monitoring the control channel, and turn up the volume if necessary. If this doesn't do any good, exit *Trunker*, using the Q key, then modify the TRACKSLICERPIN=CTS line in TRACKENV.TXT. First try changing CTS to DSR and try running *Trunker* (by typing in TRUNK) again. If this doesn't work, try the DCD option instead.

If none of this works, change and TRACKSLICERMODE=INVERT line to TRACKSLICERMODE=NORMAL, and go through all the CTS, DSR and DCD options again. If none of this works, I'm afraid you probably won't be able to get *Trunker* to work with your set-up at all, and you'll have to go out and buy an Optoelectronics Optocom or similar. Just remember that *Trunker* is a DOS program, and isn't designed to work from *Windows*, or even a DOS Window within *Windows*.

Having managed to get *Trunker* to display those 800MHz frequencies I was talking about, leave it running for a good two or three minutes and then press the Q key to save and quit. At this point, *Trunker* will have created a file called xxxxSYS.TXT. The xxxx depends on which trunked network you are listening to. In London, for example, the file will be called 431ESYS.TXT. Ignore any files where xxxx is 1234. This is just a default file and of no earthly use to you.

Gets Complicated

OK, this is where things get complicated. Edit the xxxxSYS.TXT file, and get rid of any of the lines with 800MHz frequencies in, and change the line that says PLAN=8 to read PLAN= 0. This tells *Trunker* you aren't in the US, and want to track non-800MHz or 900MHz trunked networks.

Run *Trunker* again, and let it go for at least five minutes, and exit it again using the Q key. Now you need to look for files called xxxxRnn.TXT, where nn can be anything from 0 on up. These files are basically the same as the xxxxSYS.TXT files, but refer to specific cells within a trunked network, each cell having a different control channel frequency.

You should, therefore, either have no xxxxRnn.TXT files if your network is relatively small, and only one if you stick to one control frequency. If you do have xxxRnn files, edit them as explained for the xxxxSYS.TXT file to get rid of any frequencies and to change the PLAN= line to PLAN=0. Run *Trunker* once again for a while, and the xxxxRn.TXT or xxxxSYS.TXT files will fill up with hex numbers.

Exit *Trunker* using the Q key and edit the SYS or Rnn files once more. This time, wherever you see hex numbers, change them into decimal frequencies. You'll find a *Trunker* hex to decimal frequency conversion table in a link from **www.g7hid.freeserve.co.uk/431e.htm** Alternatively, if you live in London, all the files xxxxSYS and xxxxRnn files you need can be downloaded by pointing your browser at **www.g7hid.freeserve.co.uk/431e.zip** Just unZip them and copy them to your TRUNKER directory.

These files can also serve as good examples of how things should look for users who aren't in London, so are well worth a download wherever you live too. In some networks (including London), you'll find two hex numbers per line (ignore any 'ffffff' entries). How to deal with these is actually covered ery well in the *Trunker* documentation, and again you can use the conversion table to find the necessary frequencies to use.

That's All

And that's all you have to do. Running *Trunker* now will result in your computer-controlled scanner tracking the trunked conversations to your heart's content, various key-presses telling the program who you want to listen to, and how to deal with them. Just remember, no matter how innocent your intentions are, listening to radio transmissions you aren't licensed for can lead to fines, confiscation of equipment and even imprisonment. You have been warned!

■ 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

During late April and early May I experimented with a newly built quadrifilar helix antenna. No, I didn't build it myself. Although I had been collecting together some of the essential components, the preparation of material for an exhibition in Plymouth about the forthcoming total eclipse have limited my opportunities. An offer from a *SWM* reader to supply a QFH for test was therefore irresistible, and the antenna was delivered a few days later. The results that I found will be described in next month's column.

Fig. 1: *METEOR 3-5* 1549UTC 13 May.

Current WXSATs

Coming northbound out of the morning darkness over the western Atlantic on 13 May, *METEOR 3-5* started transmitting a.p.t. (low resolution pictures). It was approaching the North Pole while still above my horizon, after being re-activated the previous day while I was out. Close examination of **Fig. 1** - received later that day - shows that line jitter remains present. The left side of the image is perfectly synchronised, but image errors are visible. Meanwhile, *RESURS 01-N4* has continued transmissions during sunlight, and for at least the latter part of night-time passes.

Fig. 2: *FENG YUN-1C* first satellite image courtesy National Satellite Meteorological Centre.

Clear skies over Britain during early May brought more fascinating images from the NOAA WXSATs. *NOAA-15* produced some superb 'sun-glint' pictures. Night passes during late spring and early summer bring dramatic imagery of the solar illumination of the North Pole. Both METEOR and RESURS can be heard transmitting a.p.t. when they reach the northern terminator, though images need enhancement to show the detail actually present. *NOAA-14* passes southbound around 0230UTC, and during the first part of the pass, is transmitting visible-light channel data. After a minute or so, the switch to near infrared occurs, from when we see the usual night-time infrared channels.

A few transmissions from *SICH-1* and *OKEAN-4* (1-7) have added spice to the 137MHz band. Although I caught a few of these passes, I did not see the image showing the classic 'piano-key telemetry' reported by one reader. Images from these oceanographic research satellites rarely last for more than a few minutes, and usually include multi-spectral image sections - somewhat like NOAA imagery but only lasting a short time. Sometimes they carry a number sequence along one edge, and sometimes - as in this instance - show the symbolic 'keys'.

Fig. 3: *NOAA-14* over India in January.

NOAA-15 Problems

People monitoring *NOAA-15* high-resolution image data have noted increasing noise and data dropouts in the S-Band HRPT transmission from *NOAA-15*. The problem has been analysed by NOAA and NASA, and they conclude that there is a problem with cracks having developed in the connections to the antenna.

The problem is most noticeable on the morning southbound orbit as the satellite emerges from shadow into sunlight, and the resulting thermal stresses on the antenna structure. The expectation is that the problem will worsen with time, so NOAA is considering alternatives for the continued operation of *NOAA-15*. Low-resolution (a.p.t.) users are not affected.

METEOSAT-5, -6 and *-7* Kept Busy!

The European METEOSATs continue a productive schedule. *METEOSAT-5* supports the Indian Ocean Experiment (INDOEX) from longitude 63°E, providing a stream of images both by direct transmission in Primary Data format, and via re-transmissions from *METEOSAT-7* (see later feature). Some WEFAX DTOT images are also transmitted during ranging (distance) monitoring. Limited fuel supplies now prevent the correction of the satellite's orbital inclination, which is now slowly increasing.

METEOSAT-6 is located near longitude 9°W, and kept in readiness as the stand-by satellite in case of failure of *METEOSAT-7*. Weekly imaging sessions are held to monitor quality. From August to November, the satellite will be involved with the Mesoscale Alpine Programme (MAP) in which six 'mini-scans' will be made of the Alpine region every 30 minutes.

METEOSAT-7 continues full operations from longitude 0° where it provides both WEFAX (low resolution) and PDUS (high-resolution) images.

METEOSAT Second Generation - *MSG-1* WXSAT

The current plan for *MSG-1* calls for routine operations to commence around mid-2001. Two new all-digital channels - Low Rate and High Rate Information Transmission (LRIT and HRIT) - will replace WEFAX and Primary Data image provision. User stations are to be referred to as LRUS (LRIT User Station) and HRUS (HRIT User Station).

MSG-1 image data will include both 'home-scanned' images, together with those from foreign meteorological satellites. Additional information from data collection platforms and bulletins will be included. Data compression will be used to maximise information flow from each channel.

EUMETSAT point out that a prime objective is to deliver data to meteorologists as quickly as possible. Unfortunately, data will continue to be encrypted. For potential manufacturers of user stations, and for anyone interested in studying

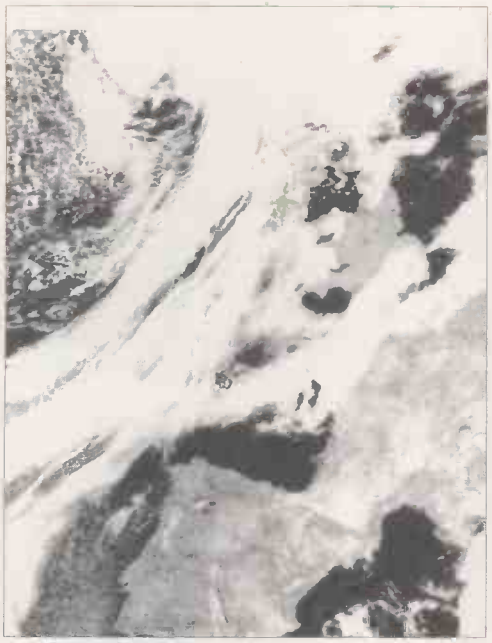

Fig. 4: *NOAA-14* 9 April 1999 1506UTC from John Jardine.

equipment specifications, EUMETSAT has published detailed design documentation packages in PDF format.

A detailed look at the planned data flow from *MSG-1* will be looked at in a forthcoming column. EUMETSAT web site: **http://www.eumetsat.de** User services: **http://www.eumetsat.de/en/area3/topic1.html** Data retrieval: **http://www.eumetsat.de/en/area3/topic2.html**

New *FENG YUN-1C* WXSAT

China has a space program that calls for the operation of two WXSAT constellations - geo-stationary and polar satellites. The polar series is called *FENG YUN-1* and the geo-stationary series *FENG YUN-2*. *FY-1A* (launched in 1988) and *FY-1B* (launched 1990). Both ceased operations some years ago, but the decision was taken to launch more satellites.

The China Meteorological Administration (CMA) advised the World Meteorological Organisation (WMO) that China was planning to launch *FY-1C* on a CZ-4B vehicle from Taiyuan Satellite Launch Centre during the period 10-15 May 1999. Launch took place around 10 May into a 868 x 849km polar orbit having a period of 102 minutes.

Although both *FY-1A* and *FY-1B* provided a.p.t. transmissions, *FY-1C* does not. High resolution picture telemetry - see **Fig. 2** - is transmitted on 1700.5MHz with 1704.5MHz as back up. Signal polarisation is Right Hand Circular (also standard for NOAA).

The Multichannel Visible and IR Scan Radiometer (MVISR) sensor provides 10 channels. These comprise four visible-light bands, three near infrared, one short-wave IR and two long-wave IR. Ground resolution at the nadir is 1.1km. My thanks to **Mike Kenny** of Satellite Engineering, Bureau of Meteorology, Melbourne, Australia, and to the Chinese National Satellite Meteorological Centre.

INSAT-2E Launched

The first meteorological image from India's latest multi-purpose, geo-stationary satellite *INSAT-2E* was obtained when its Very High Resolution Radiometer (VHRR) was activated around noon on 14 April. The scanner examines three spectral regions (visible-light, thermal infrared and water vapour), and provides a maximum resolution of 2km. Telemetry is not encrypted.

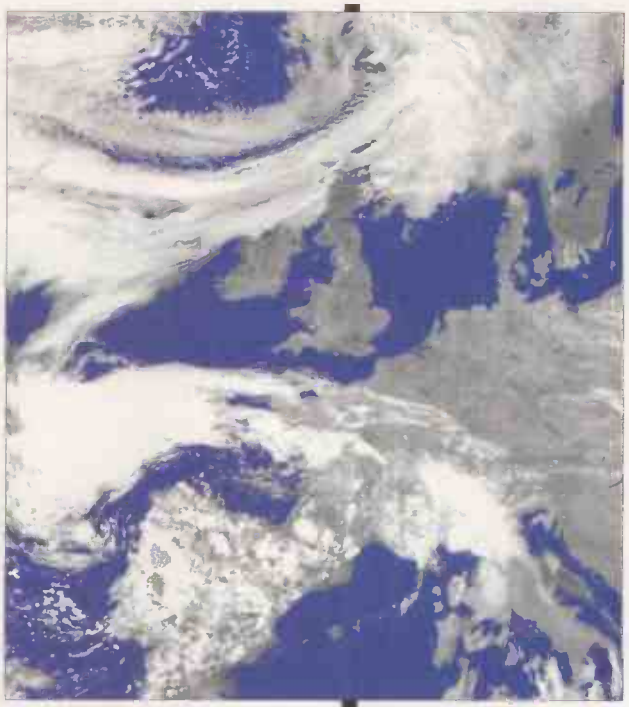

Fig. 5: *NOAA-15* early May image from Duncan Edwards.

Correspondence

Alastair Campbell GM3NKG E-mailed me from Jamnagar, north India, where he is currently living, and monitoring the polar WXSATs. Alastair sent several images, including **Fig. 3**. Not often do we get to see a *NOAA-14* image from this part of the world! I have slightly enhanced the visible-light part of the NOAA image for clarity. His images were received with a crossed-dipole and reflector, feeding an Icom PCR-1000 receiver, processed

Fig. 6: 1.8m PDUS/WEFAX dish in my back yard. Although mainly used for Primary Data, the output from the pre-amp can also feed a WEFAX receiver for processing all images.

Frequencies

NOAA-14 transmits a.p.t. on 137.62MHz.
NOAA-12 and *NOAA-15* transmit a.p.t. on 137.50MHz.
NOAAs transmit beacon data on 137.77 or 136.77MHz.
METEOR 3-5 transmits a.p.t. on 137.30MHz.
OKEAN-4 and *SICH-1* use 137.40MHz.
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.
MIR (Russian space station) uses 143.625MHz for voice.

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using *WXSat* version 2.4, running on a Toshiba Laptop PC. Alastair has been a reader of *SWM* for the last 45 years!

John Jardine wrote from Leicester and enclosed more pictures from his Maplin system - previously described here some time ago. A change of residence and a re-positioning of the antenna have added some valuable extra minutes to John's reception. Maplin's system limits the duration of continuous data to 781 lines, so most passes have to be split into two sections by saving the first and re-running the program to capture the remainder.

Maplin did not respond to my invitations some years back to provide a system for review, so I am not aware of the scope of the software. **Figure 4** shows a *NOAA-14* afternoon visible-light image from 9 April with a succession of weather fronts crossing Britain. John has used a bubble-jet printer for the final result, after adjusting contrast and brightness.

John wondered what a 'top ten' listing of amateur WXSAT equipment and software might look like. Such data is notoriously difficult to collect because it requires assembling records of names and addresses together with the hardware details - and would be limited to those who sent in information.

Duncan Edwards of Ilfracombe sent some images, of which **Fig. 5** is from *NOAA-15*, received during one of the many clear days experienced in early May.

Primary Data From METEOSAT

A PDUS Image Review - Part 2

Last month I started a section designed to provide more information about Primary Data images from *METEOSAT-7*. My aim is to enable WXSAT hobbyists to understand what is freely available - and what is not - in the comprehensive flow of image data from this European geo-stationary WXSAT.

For PDUS reception I am using a 1.8m C-band petal-type dish - see **Fig. 6** - feeding a Timestep P-HEMPT pre-amp, receiver and software; the resulting images are noise-free. I am submitting a separate review of the PDUS software shortly, following a recent upgrade. In the first episode I covered the transmissions starting around midnight, up to 0054UTC, the infrared *GOES-E* image slot. This format is transmitted every three hours throughout the day, and when appropriate, is followed by the equivalent visible-light image.

At 0056UTC, the first I-XI format, an infrared image taken by *METEOSAT-5* (in its INDOEX status) located over the Indian Ocean, is transmitted. This format is available at least hourly, and followed - when appropriate - by the visible-light image.

Figure 7 clearly shows the Gulf region where the warm waters of the Red Sea and Persian Gulf mix with the Arabian Sea. I carefully examined and enhanced the region of Saudi Arabia, and found that considerable land detail became visible, causing me to check my atlas. The features are apparently higher altitude steppes showing thermal differences against the surrounding desert - see **Fig. 8**.

Home-produced images from *METEOSAT-7* return to encryption for most formats. The 0058UTC European format BIW slot is encrypted, as is the following AIW (full disc infrared and water vapour). The next slots are WEFAX formats: LY, LR and ITOT, followed by a further set of half-hourly encrypted BIW and AIW formats.

From the average user's point of view, this is one of the 'quiet patches' when no meaningful (that is, unencrypted) PDUS data is received. The four slots from 0146UTC bring us back to earth (!) with transmissions from the Japanese GMS WXSAT followed by *GOES-W*. The 0146UTC slot is J_XI/XVH - a full-disc, half resolution infrared image, followed by the equivalent visible-light image. Frankly, I believe these are spectacular. The visible image - see **Fig. 9** - shows Australia and the Far East.

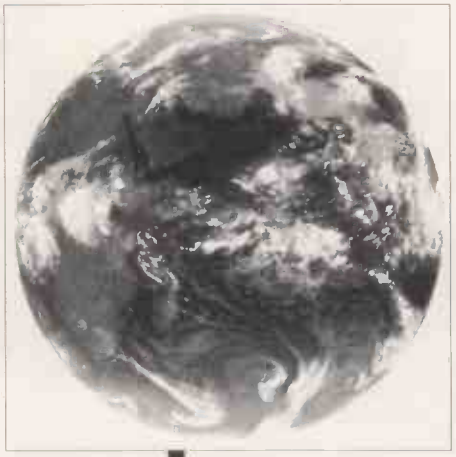


Fig. 7: I-XI INDOEX (*METEOSAT-5*) infra-red image from 0057UTC 13 May 1999.

Next Month

I report on the results of my tests with the quadrifilar helix antenna, together with contact information, and part 3 of the PDUS item.

Shuttle Launch Schedule

STS-93 *Columbia* - scheduled launch no earlier than 22 July 1999 at 0528UTC carrying payload Chandra X-ray Observatory (formerly AXAF). Orbital inclination 28.45°.

STS-99 *Endeavour* - scheduled launch 16 September 1999 at 1347UTC carrying payload Shuttle Radar Topography Mission (SRTM). Orbital inclination 57°.

A comprehensive listing of all Shuttle flights and payloads, together with information about all frequency transmissions, 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

1) 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 printout is included that identifies NASA catalogue numbers for the WXSATs. The disk file is ideal for automatic updating of tracking software.
2) I also send monthly Kepler printouts to many people. To join the list please send a 'subscription' of £1 (secured, plus four self-addressed,stamped envelopes) for four editions **to the address at the head of the column**. Transmission frequencies are given for the operating satellites. This data originates from NASA.

Fig. 8: Saudi Arabia in infrared - a zoomed extract from above image.

Fig. 9: J_XVH Japanese *GMS-5* visible-light Primary Data At this time, *GMS-5* is still in morning sunlight so the western limb of earth is unlit. Many land details can be seen in Australia that matches those in my atlas - somewhat reassuring!

■ 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.

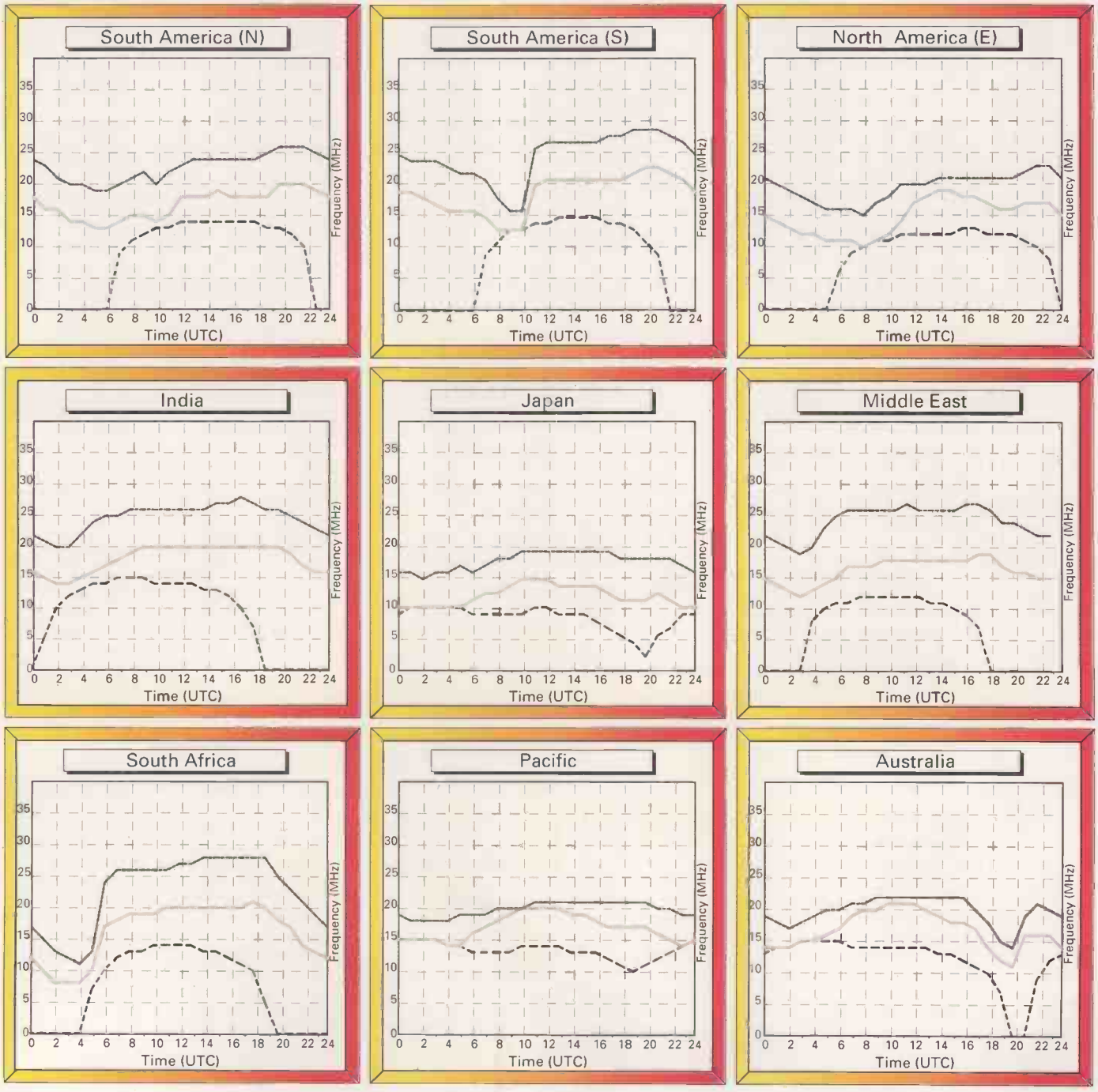
The middle line indicates the optimum working frequency (OWF) with a 90% probability of success for the particular path and time.

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.

July 1999
Circuits to London

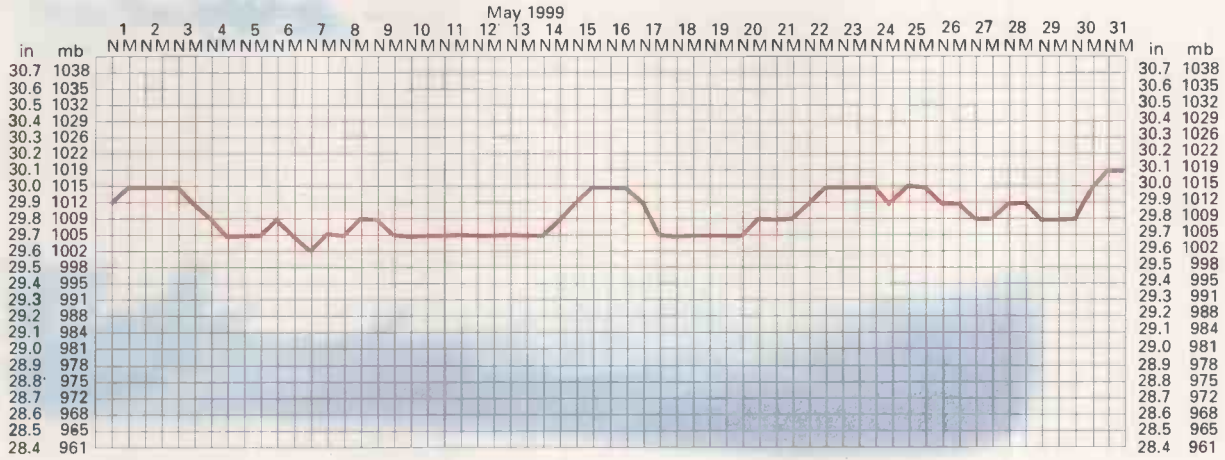


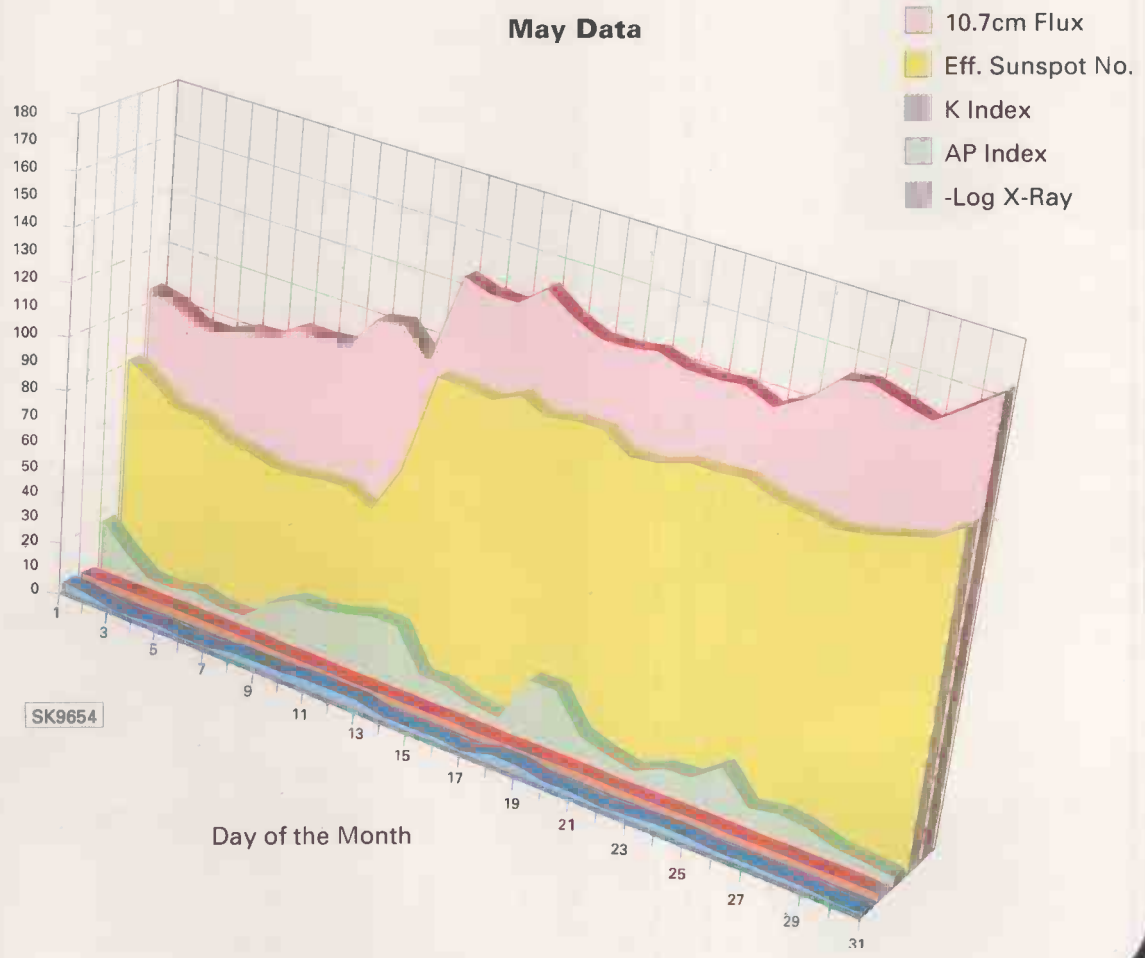
SK9653

■ 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, May 1999.





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.

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

Airband

Abbreviations

AIC	*Aeronautical Information Circular*
AIP	*Aeronautical Information Publication*
ATC	Air Traffic Control
a.t.i.s.	automatic terminal information service
ATZ	Aerodrome Traffic Zone
CAA	Civil Aviation Authority
cm	centimetres
FL	flight level
g	grams
GASIL	*General Aviation Safety Information Leaflet*
kHz	kilohertz
kt	knots
MHz	megahertz
Mil	Military
n.d.b.	non-directional beacon
nm	nautical miles
NOTAM	NOTice to AirMen (includes AirWomen)
s.s.b.	single sideband
v.o.r.	very high frequency omni-directional radio range

Soon after this issue of *SWM* is published, the Popular Flying Association will hold its annual Rally at Cranfield Aerodrome, Bedfordshire. Over the weekend of Saturday/Sunday July 3/4, during the event, there will be more aircraft at Cranfield than probably anywhere else in Europe!

According to *AIC* 47/1999 from the CAA, frequencies (MHz) for the event will be 130.675 (hard runway) and 134.925 (grass) control, 122.85 (arrival) and 121.875 (departure) a.t.i.s.

Also topical is the British Grand Prix at Silverstone around Saturday/Sunday July 10/11. *AIC* 48/1999 gives the controlling frequencies as 121.075 (Silverstone) and 122.175MHz (Turweston).

If all goes according to *AIC* 55/1999, you will be able to see formation jet aerobatic teams such as the *Red Arrows* in June (dates in brackets) at: Biggin Hill & Waddington (26/27) and Tain (30). In July, displays are scheduled for Marham (8), Exmouth (10), Silverstone (11), Shrivenham (16), East Fortune & Yeovilton (17), East Fortune & Donington Park (18), Culdrose (21), Fairford (24/25), Blackpool (26), Lyme Regis (27), Lowestoft (29), Bournemouth & Cranwell (30), and Middle Wallop & Silverstone (31). On August 1 there's a display at Greenock.

There's never a guarantee that weather or operational factors won't prevent a display from taking place. In the case of the '*Reds*', remember that they are an operational squadron and we live in troubled times. After 1900, the night before (local time), 'phone (0500) 354802 (free of charge) to hear a recorded message listing airspace restrictions for displays due to take place the next day.

Aerobatic CAP 222.
Christine Mlynek.

In the last few weeks, I have seen an airship in 'Goodyear' markings operating over Oxford and mid-Buckinghamshire. Does anyone know where it's based or what it does?

Follow-Ups

Going back to May's 'Airband' and **John Weir's** (Edinburgh) enquiry ('In the Air' section) there is a reporting point called SUGOL. It was located by **Ken Holliday** (Norwich) and **Malcolm Joyce EI8FH** (Dublin). It's on the approach to Amsterdam Airport, 31nm out on the 115° radial to the Schiphol v.o.r. I'm going there on holiday but haven't received my charts yet!

Beechcraft Bonanza.
Christine Mlynek.

As mentioned in May, **Len Woolley** (Bude) makes his flight database available on floppy disc and now tells us that you need *Microsoft Works® 4.0* to read it. It helps elucidate callsigns which have a letter suffix such as those used by Brymon. Len looked up some of John's enquiries (also in the May issue) and found Speedbird 71L to be inbound to London. As the 71M is outbound to Atlanta, does that imply the 71L is the return from that destination? **Albert Davis G3MGL** has the route as Houston-Gatwick. Len says that KLM 9107 routes Amsterdam-Chicago. Also, if John would write in with the times for American 9581/2, Len might be able to track that one down as well.

New information from Albert explains Deutsche BA callsigns. He tells us to delete the first digit of the BA flight number then place H (Hamburg) or M (München) at the end. Callsign is Speedway.

Watch Your Airspeed!

Unlike when driving a motor vehicle, allowing an aeroplane's speed to decay will cause loss of control. Excess speed can also cause damage due to the force of the airflow.

There are also speed limits for traffic control purposes and **Martin Sutton** (CAA) would like me to elaborate on the mention that I made of these on page 72 of the July 1998 'Airband.' In uncontrolled airspace below FL100, a limit of 250kt (indicated airspeed) applies so that pilots have time to see and avoid each other. Where regulated procedures are in force, the 250kt limit enables controllers to assure separation between flights on the same route, and prevents aircraft making too wide a turn and straying from their assigned flightpath.

Communications

Not with aircraft, but communications with me. First an apology to **Pablo Moreda** (who works in ATC at Madrid). Although you E-mailed your Christmas Quiz entry to the Editor, it never reached me. However, *Correos Español* successfully delivered your latest message to me directly! It must show something.

No, I'm not on E-mail. What readers might not realise is that most authors are freelance. I've never been near the Editorial Offices since starting to write for *SWM* 12 years ago! All my copy is posted on disc. So there's little point in E-mailing me there, certainly not from within the UK and probably not Europe.

Should I equip myself with E-mail? I'll be quite blunt: it's a luxury I can't afford. I'd need to wire a 'phone socket near to the computer, buy a modem/software and pay regular bills for an E-mail account plus the 'phone calls. I've always found conventional mail satisfactory and will put off going over to E-mail until the day that it becomes cost-effective.

You are quite correct, Pablo, I **do** rely on readers' contributions and feedback and so I'm sorry that your E-mailed quiz entry never reached me. But, remember that there is about a six week lead time from preparation of this column to publication. Ordinary post will do, the speed of E-mail simply isn't needed.

Frequency & Operational News

Information is from various sources, including *GASIL* 2 of 1999, *AIC* 39/1999 and Martin Sutton (all from the CAA).

Aerodromes: Lantisilo, near Wrexham, is a new gliding site. Manston no longer needs its Military ATZ and gliding ceases here. Another lost aerodrome is Shipdam where, possibly, the owner has something better in mind

for the land. Syerston now has gliding. As mentioned last month, Wyton is now operational with Approach 134.05MHz.

Beacons: A new n.d.b. is at Tatenhill (TNL 327kHz) which, as it is planned to operate continuously but at low power, offers a new object for the propagation enthusiasts to desire.

Controlled airspace: A new significant point is SKINA, south-west of the Trent beacon. Birmingham's OLIVE 1D STAR is revised to OLIVE 2D. I point these details out because your charts might show the old procedure, but if a controller refers to the new designation then you'll know that there won't be a major difference.

Radar: For full details of the Lower Airspace Radar Service (LARS, up to FL100) and Military Middle Airspace Radar Service (also available to civilians, FL100-245) see *AIP* pages ENR 6-1-6-3/4. A courteous request at your local aerodrome or flying club will often gain you access to what is otherwise an expensive document. Currently, Warton's LARS frequencies include 336.475 as well as 129.525 (changed from 124.45MHz). Initial contact frequencies for the Middle Airspace Radar are Scottish Mil 134.3, London Mil 135.15 (west) and London Mil 135.275MHz (east). These services assist pilots outside controlled airspace in the way that I described last month.

Information Sources

As useful now as when I first discovered them 30 years ago as a lad, *Civil Aircraft Markings* and *Military Aircraft Markings* are available in their 1999 editions, priced at £6.99 each, from our very own *SWM* Book Store.

Pablo recommends the UK Aeronautical Information Service web site at **http://www.ais.org.uk** as it includes latest NOTAMs, etc. and could be a cheap source for anyone who already has Internet access and wants selective information (about their local airport, for example).

The range of charts produced by Aerad has changed since they started to work in conjunction with RAF 1 AIDU Northolt. The address for ordering is on my updated *Airband Factsheet* (Issue 10). The *Factsheet* is free of charge, **not** from me **but** from the Editorial Offices at Broadstone. Send a reply-paid self-addressed envelope to hold two A4 sheets.

The main change is that a range of charts replaces the old ones. Aerad will send a free coverage chart on request so you can see what you need to order, but the British Isles would be well covered by UK(L)SP1, UK(L)2, EU(H)SP1 and UK(H)6. The *Legend Booklet* is replaced by a *Legend Card* which I gather will still be supplied free if requested with your first order or can be purchased on its own.

Reader Offer

A generous reader gave me a quantity of recently out-of-date aeronautical information to give away to readers and I've some surplus material from the Museum to add as well. It's first come, first served, so send me a pre-paid (for 500g, that's £1.20 UK second class), self-addressed reply envelope capable of holding a book 20mm thick, 150 x 270mm overall. One condition applies: being out-of-date, this material is for the interest of enthusiasts but you **must** agree **never** to use it for actual flight planning.

I can't promise what you'll receive but I will try to send a frequency list and an airway chart to each reader while stocks last. Express your preference for civil/military frequencies, and for UK/European airways and I'll do my best. But no promises, my decision is final and no correspondence will be entered into.

When you send your envelope to claim your goodies, why not write to me at the same time? Now's your chance to have your question considered in this column, or to contribute some information for all to share.

To **Richard Cooke G7PMB** (Wigan): you appear to have sent me the specification for an s.s.b. voice system, but I'm not sure why! Please write again, stating which issue and section of 'Airband' you are referring to.

Next month I have some more readers' letters to answer (sorry, out of space this time), and information on Shanwick Oceanic procedures. The next three deadlines (for topical information) are July 5, August 2 and September 7. Replies always appear in this column and it is regretted that **no** direct correspondence is possible.

JOHN HODGKINSON - ALRS, c/o *SWM* EDITORIAL OFFICES
E-MAIL: aas@pwpublishing.ltd.uk

All At Sea

The Maritime And Coastguard Agency (MCA)

As a signatory to the Convention on the High Seas 1958, the Convention on Safety of Life at Sea (SOLAS) 1974, the Maritime Search and Rescue Convention 1979 and the Convention on International Civil Aviation, the United Kingdom is required to provide a maritime and civil aviation Search and Rescue (SAR) organisation. The Government body responsible to undertake this task is the Maritime and Coastguard Agency, otherwise known as the MCA.

The Coastguard section of the MCA is organised into six Search and Rescue Regions (SRRs), subdivisions of the United Kingdom SRR, each under the authority of a Regional Controller operating from a Maritime Rescue Co-ordination Centre (MRCC). Each Coastguard SRR contains several Maritime Rescue Sub-Centres (MRSC), each centred on a HMCG district and under the authority of a District controller. The organisation is based upon a constantly manned communications watch system at 21 MRCC/MRSCs, which together give full coverage of United Kingdom coastal waters. All MRCC/MRSCs keep 24-hour radio, telephone and telex watch, and also have a v.h.f. direction-finding facility.

Under the rules and regulations of the Global Maritime Distress and Safety System, each station keeps a 24-hour watch on Ch. 70 (156.525MHz) and 2.1875MHz for distress, urgency and safety traffic. Although no longer required by law, a 24-hour watch is also maintained on Ch. 16 (156.800MHz) and 2.182MHz. MRCC Dover, which is also the headquarters of the Channel Navigation Information Service (CNIS), operates Radar surveillance of the English Channel vessel traffic separation scheme, and keeps a constant liaison with its French counterpart at CROSS Gris-Nez, to monitor the traffic flow through the Dover Strait. MRCC Dover and MRSC Portland are also 'reporting in' stations for vessels operating the 'Ship Movement Reporting System' (MAREP). The primary v.h.f. working channel for CNIS operations is Ch. 69 (156.475MHz) with Channel Information broadcasts on Ch. 11 (156·550MHz). CROSS Gris-Nez primary working channel is Ch. 13 (156.650MHz).

MRCC Falmouth, in addition to its normal regional duties, has an additional important role in the GMDSS, of being the UK link into the International SAR Satellite System and, as such, maintains links with foreign MRCCs to resolve SAR incidents, which occur world-wide. Such an example happened a couple of years ago, involving the cruise vessel *Achille Lauro*, which developed a serious fire off the coast of Somalia. Because the old distress system was still in force, a distress call was made by Morse code on 500kHz, which was picked up by a tanker close by. The tanker immediately made a satellite distress relay call to Falmouth MRCC, who alerted the shore authorities in Somalia by landline, and then continued to co-ordinate distress working from many thousands of miles away. This incident came to a happy conclusion with the passengers and crew safely evacuated and the fire eventually extinguished!

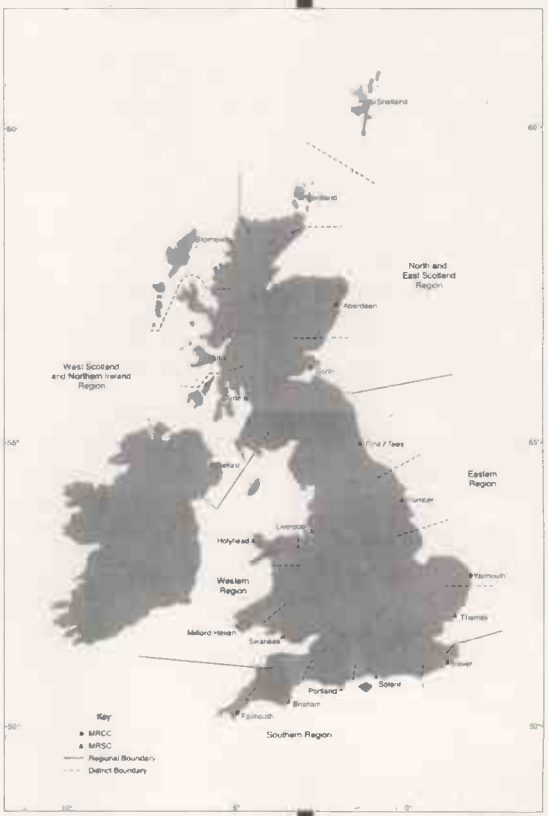
From midnight on June 30th this year, the UK Coastguard take on further responsibility with the transfer of Maritime Safety Information (MSI), broadcasting from the British Telecom Coast Radio Station Network to the Coastguard Network, together with the transfer of the Radio Medical link call service. A seamless transition has been planned with minimum disruption intended to the mariner. Again under the rules of the GMDSS, this service is not a mandatory requirement as it has been catered for in Sea Areas A1 and A2 by the provision of NAVTEX broadcasts on 518kHz. R/T weather and navigational warnings will still be provided for non-GMDSS vessels such as pleasure craft and small fishing vessels. An m.f. frequency previously used by the adjacent BT coast radio station will be utilised as the main broadcast channel with a prior announcement made on 2.182MHz. Frequencies are shown in the accompanying table. This primary working frequency will also be used for simplex radiotelephone calls to connect vessels with medical emergencies to a doctor ashore.

UK Coastguard MSI MF Broadcast Frequencies

Coastguard Station	Frequency MHz
Clyde	1.883
Yarmouth	1.869
Solent	1.641
Shetland	1.770
Stornoway	1.743
Falmouth	2.226
Tyne Tees	2.719
Holyhead	1.880
Aberdeen	2.226
Milford Haven	1.767
Humber	2.226

Broadcasts on v.h.f. will also take place on Ch. 10 (156.500MHz), and Ch. 73 (156.675MHz) from all stations. Times of transmission do not follow a regular pattern and the broadcast channel is not selected until just before the scheduled broadcast time, so the best idea is to monitor Ch. 16 and wait for the announcement.

For aircraft emergencies, there are two areas, North and South, each with a Maritime Headquarters/Rescue Co-ordination Centre (MHRCC), these being Edinburgh (RAF Kinloss) and Plymouth respectively. A separate MHRCC at Shannon covers the Republic of Ireland and the sea area immediately to the West. Frequencies used for aeronautical SAR missions, usually by Nimrods, are 3.023 and 5.680MHz, v.h.f. 121.5MHz, 123·1MHz. If the casualty is maritime, Ch. 06 (156.300MHz) can be used. Communications between UK Coastguard stations and SAR helicopters are usually on Ch. 0 (156.000).



On a final note, hot off the press is an announcement from British Telecom that Portishead Radio will finally, most definitely, absolutely, unequivocally and without a doubt close at the end of August! This also applies to the v.h.f. commercial service with the m.f. service to close on 31 March 2000. BT will continue to operate the NAVTEX service until January 2000, when HM Coastguard will take on the message handling function, with transmissions continuing through the existing stations at Niton, Cullercoats and Portpatrick.

After saying this, things may still change, believe it or not. A quote from a former colleague of mine who shall remain nameless; "**Indecision is final!**"

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Decode

Weather FAX Charts

One or two readers have written to say that the NOAA Web link I published a few months ago is out-of-date. You're quite right, as NOAA have been re-organising their site. I've now taken another look and the place to go is **http://weather.noaa.gov/fax/graph.shtml** This takes you to the main page where you can select the full range of FAX charts that are sent for the maritime communities and the national forecasting centres. All the files are in TIFF format, so you need to make sure you have an appropriate viewer.

Brilliant New CW Program

A recent E-mail from a reader has led me to a couple of really good programs that I'm sure will interest Decode readers. The first, called *Cwget*, has been written by **Sergei Podstrigailo UA9OSV** and is one of two programs specifically designed to aid the transmission and reception of Morse code.

The second program is called *Cwtype*, and as the name suggests, is all about the transmission of Morse. As it's the reception that interests Decode readers, we'll take a close look at *Cwget*. The program has been written for *Windows '95* but also tested with *Windows NT 4.0 SP4*. It should also work okay with *Windows '98*.

One of the great attractions of the program is that all you need is a PC, this program and a receiver - there's no hardware interface needed. The program is packed as a standard '.zip' file and in its packed form is just under 300kb, so it's very quick to download. To install the program all you have to do is unpack the files into a directory of your choice. Although it doesn't boast the sophisticated installation program of many modern software packages, you do at least know where all the files have gone, which makes removal dead easy!

With the software installed, all you have to do is connect an audio lead between the mic. or line input on your sound card and the line or speaker out on your receiver. In addition to a PC loaded with *Windows '95*, you will need a sound card that supports mono, 16 bits with a sample rate of 11025Hz. This basic functionality is available in just about every *Windows '95* compatible sound card, so you shouldn't have any problems here.

To start decoding, you just click on the *Cwget* icon and you are presented with a decoding screen with four sections. The very top section is a fairly standard menu bar with the various program options displayed. Directly below this is a very neat spectrum analyser display that's used to spot the frequency of the desired c.w. signal. Immediately below this is the main text window where the decoded messages are displayed.

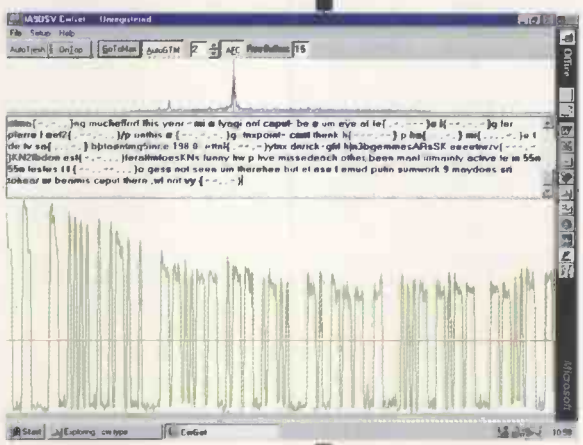
The final window at the bottom of the screen shows an oscilloscope type display of the incoming signal. If you next tune into a suitable Morse signal you should see a peak appear in the top display and the lower display moving in sympathy with the Morse signal. The trick to actually decoding the signal is to get the vertical red line to sit on top of the signal peak of your signal. If you want the program to do this automatically, you just press the 'GoToMax' button on the menu bar. This causes the program to automatically align the red line with the strongest peak in the band.

Now in some cases when the band is very busy, your signal may not be the strongest peak. In this case you set 'GoToMax' to off and just place your cursor over the peak and click. This instantly moves the red line to the cursor position - neat!

The next action for successful decoding is to take a look at the level threshold setting. Because Morse is an on/off mode, the program needs to somehow be able to decide when the wanted signal is present and when it's not. This is the purpose of the threshold setting in the bottom window. If you look carefully you will see (and hear) that there's an increase in noise in the gaps between characters. The trick is to adjust the horizontal red line so that the noise is below it and the signal above!

As with the frequency setting, there are two ways to do this. The first and easiest is to hit the 'AutoTresh' button on the menu bar. When you do this you will see that the horizontal red line moves up and down with the signal trying to achieve the best balance between the noise and the signal. As with the frequency setting I described earlier, this can be a useful feature, but occasionally works against you.

If you're having problems, you can revert to manually setting the threshold. First turn-off the 'AutoTresh' and then just put your cursor at the required level and click - the horizontal red line will move to the cursor position. These two controls add tremendous flexibility to an already powerful program, but there's more!



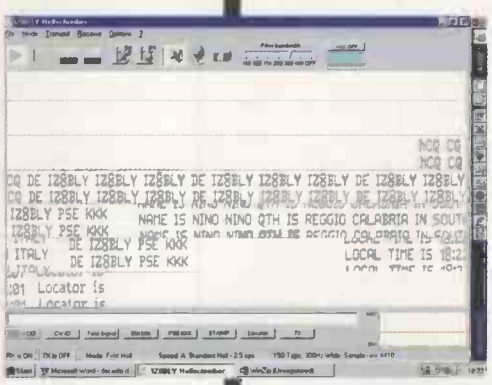
***CWget* Morse Decoding Program.**

Once you've found your wanted signal, you then need to be able to cope with any frequency drift or errors between two stations. This is catered for with the AFC (Automatic Frequency Control) button on the menu bar. With this activated, *Cwget* will automatically track your signal over a limited range, this range being set by the number field next to the AFC button. Here the numbers correspond to a capture range of around 5Hz per step, i.e. a setting of 3 = 15Hz range. Using this facility with 'AutoGTM' set off will make sure the program tracks frequency changes of the selected station without being distracted by other strong signals in the band.

I've shown a screen shot of the program so you can see what it looks like when it's decoding a live Morse signal. The program is distributed as 'donationware', which basically means it's free, but the author would appreciate a donation if you find the program useful. I thought this was one of the best Morse decoders I've come across, so please make that donation if you use it. To get your copy visit Sergei's web site at **http://ua9osv.da.ru**

Antique Modes

The first response from last month's request for old or unusual modes comes in the form of some new Hellschreiber software from **Nino Porcino**. Rather like the c.w. program mentioned elsewhere, Nino has written this new program to run with *Windows '95* using a standard sound card to both send and receive this fascinating mode.



Hellschreiber v1.8.

Before I take a look at the program, let's give you a refresher on just what Hellschreiber is. The system was first developed back in the 1930s by a German engineer called Rudolf Hell, hence the name Hell Schreiber, which I think roughly translates to 'Hell's writer'.

The system really came into its own during the war where it was used for test transmission over landlines and radio links. Rather than the digital coding systems used by RTTY and Morse code, the Hellschreiber system has a greater similarity with FAX as it effectively sends an image of the text. In the original electromechanical system, this was done by starting

Continued on page 76.

with a page of typed text which was fed into the Hellschreiber. The machine would then scan through the document in vertical columns, starting from the bottom left-hand corner using on/off signals to represent black and white.

At the receiving end, the receiver would carry out a similar scan on a blank sheet, but with an inking system that tapped a marker against a moving paper in response to the on/off signal. This simple action enables the original text to be recreated with remarkable accuracy.

To keep the systems in alignment, both the transmitter and receiver have to use the same column rate which, in the common Feldhell variant, is 17.5 columns per second. The real neat trick comes from the way in which the system repeats each column, this provides a very simple error correction system as you can always find one column intact. The system used by the German Army in World War II achieved an effective rate of around 2.5 characters per second, or approximately 25 words per minute.

However, modern, computer based, Hellschreiber systems provide a simulation of the original system, by taking text messages and generating the same type of signal output that a real Hellschrieber would have generated with the same text. Here's a run-down of some of the modern variants.

Concurrent Multi-Tone Hellschreiber: Often known as C/MT-Hell, sends the dots of each row of pixels in a character using a different frequency. This ingenious systems enables the sending of more than one character dot at a time, simply by sending more than one tone. This system provides much higher resolution and greater speed than the basic Hellschreiber.

Sequential Multi-tone: This has similarities with the previous C/MT-Hell, except that either 5 or 7 tones are used and only one tone is sent at any one time.

FSK Hellschreiber: This is very similar to the original Feld-Hellschreiber except that two tones are used instead of the basic on/off keying. This provides more reliable decoding.

Slowfield Hellschreiber: This is an experimental system developed by **Lionell Sear G3PPT**. It uses the standard Hellschreiber fonts, but transmits at very low speeds, typically 0.5, 1 or 2 characters per minute. Lionell's program operates under *Windows '95* and uses a standard sound card for the audio processing. Advanced FFT processes are used with a 2048 sample FFT running at 5512.5Hz to decode the 2.5Hz wide channel. To avoid the need for a receiver that can accurately tune to within 2.5Hz, the software uses a neat processing trick to achieve lock-on within 26Hz.

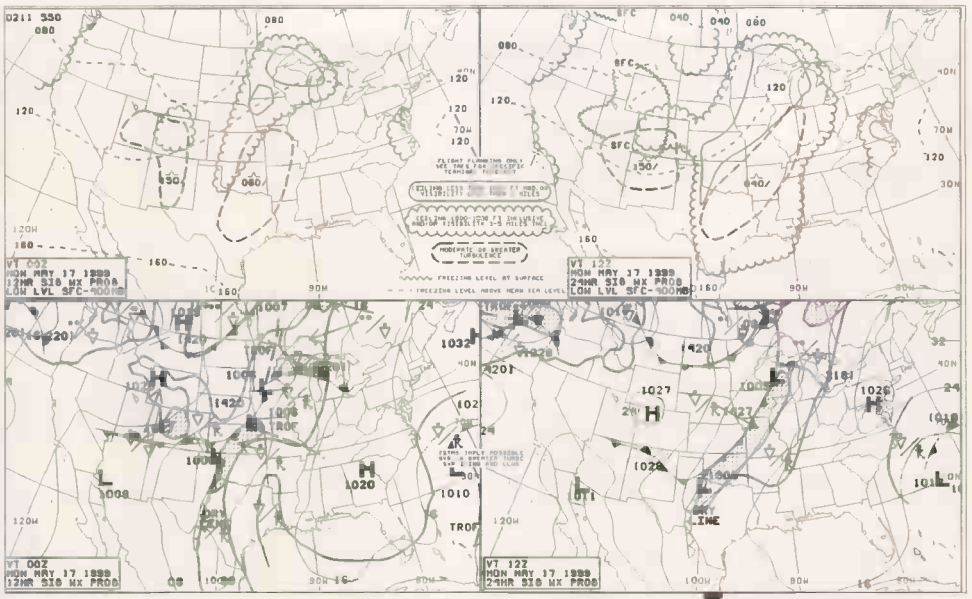
If you want to have a go at this unique mode, a good program to start with is *Hellschreiber v1.8* from Nino Porcino IZ8BLY. This program runs on the *Windows '95* platform and uses a standard sound card to process the audio from the receiver. Installation of the program is dead easy thanks to built-in installation routine and when installed, the program occupies a relatively modest 1Mb of disk space.

Once you're installed, you just have to find a suitable signal and you can start receiving. Good places to start looking are 14.060, 14.061 and 14.062MHz. If you get really hooked, you might like to subscribe to the Hellschreiber mailing service. This is an E-mail based service that can be of great assistance to keep you up-to-date with the latest news and any skeds that are being set-up. To subscribe, just follow the following link to the listserver:

http://www.onelist.com/subscribe.cgi/Hellschreiber

The program includes a very good range of different modes so you should find you can resolve most of the Hellschreiber modes including Feld-Hell, C/MT-Hell, S/MT-Hell and FSK Hell. There are also some pretty advanced options to change the receive fonts and the filter selections. Whilst it's good to experiment, you will probably find that the original Feld-Hell font is by far the most effective, especially when dealing with noisy signals.

Where you can probably make some useful improvements through experimentation is with the filtering. The program comes with 13 different filter types and you can try these to see how they can improve the overall image. One thing to watch is the 'auto-save' check on the 'Options' menu; if this is set 'on' you can find that your hard disk starts to fill up quite quickly as screen images get dumped to disk.

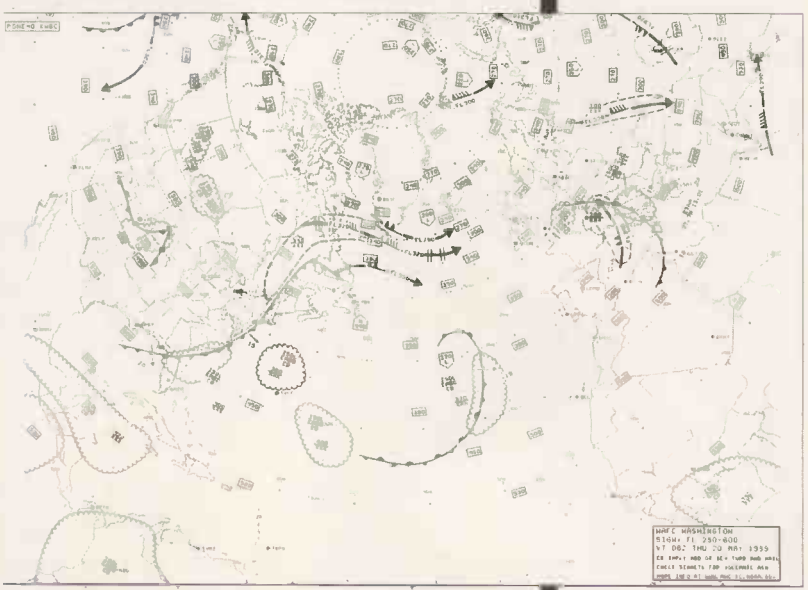


Sample NOAA FAX Chart.

Using the program was really very straightforward and was helped by the comprehensive, html based, help file. I've included a screen shot of the program running so you can see what it looks like. If you want to try a copy of this excellent freeware, take a visit to Nino's Web site at **http://ninopo.freeweb.org**

Software For Macs

I know I don't usually have much news for Mac users, but **Tom Davies** from South Africa has come to the rescue. Tom reports that Multimode is a very well specified decoding program that's just been released in version *2.1.1*. The program is designed for both the transmission and reception of a wide range of modes as follows: c.w., RTTY, SITOR-A, SITOR-B/FEC/NAVTEX, ACARS, PSK31, DTMF, CCIR, EIA tone modes Hellschreiber. There's even an audio spectrum analyser display to help get the tuning right.



Sample NOAA FAX Chart.

This is a pretty impressive range of modes by anyone's count, so I'm sure it will prove very popular with 'Decode' readers. I haven't had a chance to try it myself, but I'd be pleased to hear from anyone who's used it. If you want to get a copy, pay a visit to the MultiMode Web site at **http://www.blackcatsystems.com/software/multimode.html** My thanks to Tom Davies for the information.

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RCA RECEIVING TUBE MANUAL (Original Publishers Radio Corporation Of America). Re-published by Antique Electronic Supply (Arizona)	384	£10.50
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TUBE SUBSTITUTION HANDBOOK.	150	£15.50

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ShackWare

Hello, and a warm welcome to 'ShackWare'. I'm devoting this instalment to your letters and, as there's lots to get through, let's press on without further ado.

Mailbag

Though highly popular in all other spheres in the UK, Commodore's Amiga always seems to be last in the queue when it comes to capable radio-oriented software. And, over the years, I've had to disappoint more than one Amiga-owning 'ShackWare' correspondent who has enquired after suitable software to couple their computer to their receiver. **Anthony Johnson** of Loughborough writes, "Having been an s.w.l. for some time and enjoying the hobby very much, I would like to progress a little further, and decoding the data modes is attractive...", seems fair enough, Anthony, but he continues; "the only problem is that my computer is an old Amiga 500 with an upgrade to 1Mb, and at the present this is all I can afford. I've tried to get some information on using the machine to decode the simple data modes but I've drawn a blank. I believe that using an older computer is still a good idea for a first time try at the data modes, and I will be buying a PC in the future. My equipment consists of an FRG-8800, FRG-7700, Amiga 500 1Mb RAM, second disk drive and a Citizen printer."

It's a great shame, Anthony, because given your equipment and the excellent capabilities of the Amiga, it should be perfectly possible to have a crack at many of the data modes. The trouble, as you've found, is one of finding software, and it's a problem that has been the death of many fine and potentially very popular computers over the years. However, just recently I've managed to find several interesting sites on the Internet devoted to things Amiga and radio. Your first stop should be the Amiga Amateur Radio User Group at **homepages.enterprise.net/pwhatton/index.html** which features lots of links to software and comprehensive guides to using the Amiga for RTTY and packet reception. Well worth a look. Also, check out ftp sites **ftp://wolfen.cc.uow.edu.au** and **ftp://athene.uni-oaderborn.de/** both of which feature a selection of Amiga radio-oriented software (when you can get logged on!). Happy hunting.

After mentioning **David Holdsworth's** recent BBC acquisition in the last instalment, a number of correspondents have contacted me to say they might be able to help. **R. Fish**, also of Loughborough, has sent a letter to David which he'd like me to pass on. However, I've lost David's original letter and now no longer have his address! If David would care to write again, I shall certainly pass on this letter (and I apologise to you both).

Via E-mail, **Colin Wellard** of Scratby, Norfolk (near Great Yarmouth), also wants to help David and writes "AEA provides its *Fax3* software on 5.25in disks as well as on the now more normal 3.5in variety. Unfortunately, you have to use the AEA demodulator and I have not managed to get the software to work with a comparator-type interface such as the *Hamcomm* one. David Holdsworth is welcome to the software disks but I can't help him with the demodulator." Colin offered his 'phone number, which I hesitate to publish but which I'll be pleased to pass on to David if he writes again. Many thanks both to Colin and Mr Fish.

Further to the recent snippet detailing my quest for one of those mini active antennas (intended for use with pocket TVs but excellent in a wide variety of s.w.l. applications), **Chris Daw** E-mailed me with an interesting description of his experiences with one. "I've used one for three years," writes Chris, "with excellent results. Noise can be a problem but, with careful positioning, it is possible to get rid of most of the locally-generated rubbish. I bought mine at the Mildenhall Air Show where it was being demonstrated by no less a person than Paul Wey of PROMA fame. It cost about £19.99 but came with the correct connector for my scanner. I've used it in all sorts of locations and it's especially useful when I have limited space in the car for my 'toy box' but want to take a convenient portable antenna system with me." As I replied to Chris, the device is one of the hobby's best-kept antenna secrets, which is now - hopefully - a secret no more.

Also by E-mail comes this interesting question from **Martin Swan G4LDG**; "I've been following your column and have had my interest roused by some of the older computers that have been featured. In the past I've been a QRP enthusiast, building and using some very simple transmitters, and I like the idea of getting these old beasts to perform seemingly high-tech functions. I've just been given an old Philips PCL230 notebook computer which is around 10 years old. It's got 2Mb of RAM and a 60Mb hard drive and runs DOS. I would like to beef up the RAM a little and get it to run *Windows* or get hold of some DOS applications, but I understand that up-grades for computers of this age would have been custom made - is there a source of up-grades for these old machines?"

A nice acquisition Martin. As it stands, the machine will provide competent decode of all the 'simple' data modes via *Hamcomm* and *JVFAX*, if you build or buy a comparator interface and attach it via the serial port. A RAM quotient of 2Mb is fine for both of these programs and even today, DOS is the preferred operating system of many (most?) radio-oriented PC programmes, because it enables complete control of the machine's resources such as I/O ports, interrupts and the like. There's a vast quantity of software for all kinds of applications available free for the taking from various well-known FTP sites on the Internet. Try the well known Walnut Creek **ftp://ftp.qrz.com/** and the UCSD Ham Radio Archive at **ftp://ftp.ucsd.edu/hamradio** as good starting points.

Unfortunately, *Windows 95/98* will not run in 2Mb but legacy *Windows* (ie *3.1* and *3.11*) will work fine, albeit slowly. As for upgrading the memory I'd probably need to see the machine to advise the best way forward, though your assertion that it might require a proprietary RAM device is probably accurate. Use your favourite search engine to look for the PCL230 on the 'Net and see what you come up with - someone, somewhere will have one and will have published its specs.

Given the machine's age, I should think that the battery technology will be of more concern to you. It's possible to 'refurbish' old proprietary batteries by carefully splitting open their cases and replacing the usually standard NiCad AAs within, with new examples - or NmH types, for an even longer life. Alternatively, a small sealed lead-acid battery of, say, 2.3Ah could make a useful exterior plug-in power source - if you don't mind lugging around an extra box.

Regular readers may remember **Tony Ward** of Bridgewater, Somerset, who passes many a happy hour decoding packet data transmissions on European CB frequencies. Tony wrote again recently to update me on his activities, and they certainly make for interesting reading. Take it away, Tony...

"To update you on some developments and frequencies, I have monitored illegal packet radio on 26.840, 26.830 and 26.810MHz l.s.b., with 26.840MHz being the main forwarding frequencies for Europe. Germany has two more legal packet frequencies on 26.915 and 26.925MHz (their channels 76 and 77), and Denmark uses 27.345MHz, also legal f.m. All these are at 1200 baud.

"I have also monitored c.w. on 27.500MHz quite often, sometimes with SSTV signals appearing, and very common and strong is SSTV on 27.700MHz which is becoming the main SSTV frequency, although this falls within our legal f.m. CB band. SSTV stations mainly use the Martin1 mode.

"Recently the RA and the BCBC (British Citizen's Band Confederation) have got together to propose packet data use on UK CB frequencies. Their progress can be seen at the BCBC web site at **www.bcbc.u-net.com** Non-Internet users can join the BCBC at **BCBC, PO Box 5826, Basildon, Essex SS16 5FQ**."

Thanks for that excellent and interesting information Tony, and I'm sure that many more s.w.l.s will soon be trying their hand at decoding packet on CB. Readers interested in decoding these particular transmissions may be intrigued to note that Tony uses nothing more than an old 286 Minisport laptop computer and a Baycom TU, both of which cost £30, together with an old CEPT FM Harrier 40-channel CB, the like of which is available for perhaps £15 or so at any radio jumble – that's a complete niche decode station for less than £50!

And Finally...

There's just space to mention one or two interesting snippets I've found on the 'Net recently. *Tracker* is an 'add-on' program for the highly popular *WXSat Windows*/sound card a.p.t. decode program, which adds convincing country boundaries to pictures decoded by *WXSat* - useful for those times when there's a lot of cloud cover! The program isn't quite ready for general download yet, but the author would like beta-testers. Contact him via the h.f.-FAX website at **http://ourworld.compuserve.com/homepages/hffax**

GM4JJJ is a keen computer enthusiast as well as a radio amateur, and has written lots of software over the years including a FAX program for the Atari ST and Kantronics TNC, and a really interesting real-time moon-tracker for EME transmissions which runs on - wait for it - the Tandy Model 100/102 and NEC PC-8201A laptops! These venerable and very capable machines feature built-in BASIC, and GM4JJJ's web site features downloadable BASIC scripts for both machines. Well worth a look, even for the listen-only non-transmitters among us. You can find it at **http://www.braeside.demon.co.uk/index.html**

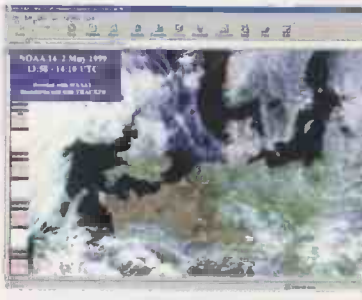
That's it. Until next time, good listening.

Extra Terrestrials

Want to tune in to some really exotic data modes? SETI (the Search for Extra Terrestrial Intelligence) is so bogged down in the amount of data from its radio telescopes, it's come up with the idea of 'distributed processing', in other words, your computer analyses little chunks of their live data, downloaded over the Internet! In this way, SETI gets masses of extra computing power, and you might get to be the first to hear communications from extra-terrestrials. Here's what SETI says about the project on its website:

"SETI@home is a scientific experiment that will harness the power of hundreds of thousands of Internet-connected computers in the Search for Extraterrestrial Intelligence (SETI). You can participate by running a program (actually, a screensaver for *Windows* PCs or Macs - JG) that downloads and analyzes radio telescope data. There's a small but captivating possibility that your computer will detect the faint murmur of a civilization beyond Earth."

If that sounds like your kind of listening, point your browser at SETI's website and download the relevant software. Beware though, there's a big demand! The address is **http://setiathome.ssl.berkeley.edu/**



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

Satellite TV News

It's now May and the conflict across the Balkans continues ever onwards. The costs to broadcasters of maintaining satellite uplinking facilities in the region is rising and economies are being made to reduce costs whilst maintaining adequate media coverage. Of the earlier received frequencies tucked away in my digital receiver memory, few seem to carry any activity, and there's now a degree of transponder lease sharing between the different broadcasters.

Gone is the permanent Kukesi 'locked off camera shot' showing the refugee columns entering Kukesi main square, instead, the satellite is now only fired up when there is something to report - we're in a sort of media 'Phoney War'. If a land war commences, then it's likely that the media fleet will be wheeled out once more. There are many feeds still carried as and when needed and the past few weeks have been useful in collecting other enthusiasts' reports with satellite link technical details.

Other than the favoured *Eutelsat II F3* @ 36°E bird, feeds have also been seen on *Kopernikus 2* @ 28.2°E, *Eutelsat W2* @ 16°E, *Hot Bird* @ 13°E and, rather surprisingly, *Telecom 2D* @ 5°W. A selection of the European sourced feeds (or 2-ways) are often carried via *NSS-K* (New Skies-K) 803 at 21.5°W intended for American consumption - or White House reports East bound on the same bird. All are in Ku and/or *Telecom* bands and the majority are digital confirming that the SNG camp (SNG = Satellite News Gathering) have now mostly embraced the developing MPEG technology.

I only wish to comment on two news feeds from the Balkans this month. At 2200 hours on April 22nd there appeared on the APTN (11.678GHz-H, SR 5632; FEC 3/4, 36°E) feed, shots of a floodlit helicopter landing in darkness and unloading two walking wounded and a third foil wrapped stretchered soldier who were driven away in a white ambulance. A broken English 'explanation' from a military type (French flag epaulette) mentioned a minefield. These pictures were never carried (to my knowledge) on UK TV, unusual perhaps, as any NATO wounded would normally command close interest.

Further information has been received that confirms the soldiers were French Legionaires and the incident plus helicopter unloading aftermath wasn't broadcast since it would have been useful as propaganda for the Serbians. This clearly illustrates the importance and manipulation of broadcast propaganda as a tool within the war process and on both sides, a process that dates back to at least World War II.

Once the present conflict has ceased, I'll tell you the real background to this night-time helicopter flight! And May 13th saw a UK SNG unit active in the Serbian capitol Belgrade! Checking out *Eutelsat II F3*, 36°E, and on the 11.062GHz-H digital memory up came 'SIS 15 UKI-38 Reuters Belgrade' at 1800. Some minutes later, a news package was played out from the ITN edit remote covering the civilian casualties/damage across Serbia/Belgrade estimated around 1200 dead from NATO bombing - perhaps co-incidence that the President of the Irish Republic - Mary Robinson - was in Serbia this day on a fact finding mission!

From the war front to the home front, *Telecom 2C*, 3°E satellite is a good one to check out from 1700 onwards as several UK feeds are generally seen early evenings feeding into teatime magazine programmes. The 12th May, for instance, carried a couple of analogue programme inserts, one via 'UKI-120 DGSP' (11.644GHz-V) featuring Hilary Clinton on her European visit and just up the band, the Scottish 'BBC-UKI-234' (11.687GHz-V) was offering a live one way programme insert into BBC Scotland's 1830 local magazine programme.

Incidentally, I checked out *2C* a couple of days earlier at the same times and again we had the BBC's UKI-234 on 12.687, with a live Scottish MP feed plus a further BBC (North?) football insert from Bradford centre concerning their City Football Club, this via 'UKI-190 Brad' - 12.603GHz-V. The late spring Cannes Film Festival featured each morning from May 12, with live inserts into the UK's GMTV breakfast epic using digital capacity via *NSS-K* @ 21.5°W on the Reuters lease. 'UKI-149' was sited on high ground overlooking the older parts of the town and harbour - check out soon for the annual trip by GMTV into Spain for early morning beach romps, they always use 21.5°W for their live feeds back into the UK.

Some remarkable news footage was carried via the Reuters digital leases on *NSS-K* May 3rd, with twister film showing the damage caused when the tornado hit the Oklahoma region. With much of the video footage resembling the 'Twister' feature film, I wasn't expecting to see shots from a helicopter tracking along with the twister! The news material feeding into the European networks was courtesy of KFOR-TV Oklahoma.

The third nail bomb that exploded in a London (Soho) pub April 30th killed three people. Unfortunately, it seems that for news hacks, bad news for them is good news, it sells the papers and in 1999 bad news pictures get the viewers. A couple of readers noted live pictures digitally uplinked out of the area, difficult with the high buildings restricting sky access to suitable birds.

Eutelsat's 36°E was in use at 2130 onwards outside the 'Acute Care for the Community University Hospital' (UCL), Central London, where many of the seriously injured were transported. Several live inserts into ITN were made against a hospital window backdrop, with the occasional ambulance flashing by to heighten viewer tension. This is in US parlance a 'Wild News Feed' rather than a prepared and planned OB feed, seen at 11.080GHz-H, SR 5632; FEC 3/4.

Another one-off sighting by **Cyril Willis** (Anglia) was also on 36°E, and that from 'SIS-05 UKI 30' on April 29 using 11.080GHz-H - the usual SR 5632; FEC 3/4 of course - was to cover the arrival in the UK of an aircraft with Kosovon refugees at the Leeds/Bradford airport, feeding into the post 1810 evening news magazine programmes.

Roy Carman (Dorking) checks out the Clarke Belt with both analogue and digital and sent in a very long and detailed log recently...a few of his sightings make for interesting comments. *Sirius-2* at 5°E was seen carrying the TV-4 Swedish local news in digital - 12.590GHz-V at SR 6111; FEC 3/4. April 19th and *Eutelsat W2* @ 16°E (SNG-29, 12.527GHz-H, SR 5632; FEC 3/4) saw the German Upper House (the Bundestag) relocate back to their old location in Berlin tight on the as-was Berlin Wall some 100m from the Brandenberg Gate, an historic day for Germany.

The Irish sports channel Setanta moved to *NSS-K* 21°W and is running encrypted digital as from May 1st last 11.609GHz-V and is remaining on *Telecom 2C*, 3°E, in analogue/Videocrypt until early July, so reports **Hugh Cocks** down in the sunny Algarve. He also comments that the BBC are active with non-MPEG (i.e. analogue) feeds on 36°E within the 11.580-11.620GHz-H, their MPEG Moscow feed back into the UK is often 'up' at 11.597GHz-H.

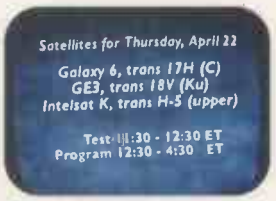
Over in the Isle of Wight, we find **Jim Scofield** and he suggests a check out on the THOR satellite group (*Thor 1, 2, 3*) at 0.8°W. He found the following digital signals that aren't detailed in my own lists and running unusual digital settings. TV Finland+radio channels 11.630GHz-V, SR 8053; FEC 7/8; TV1/ORT 11.664GHz-V, SR 7377; FEC 3/4; Eurosport 11.691GHz-V, SR 4340; FEC 7/8.

Jim also comments on the many analogue signals available on the *PAS-3R/6* slot @ 43°W in the *Telecom* band slot. There always seems to be considerable activity late afternoons with sports, news feeds, Spanish TV OB links and bullfights, not forgetting the traditional 'EBU New York' news distribution circuit @ 12.698GHz-H. The latter signal was always a feature of the *Intelsat* bird at 27.5°W for many years until it disappeared down the digital drain, good to see it resurrected once more in analogue.

Kukesi Square, Albania, showing refugees arriving from Kosovo, coaches arriving centre RH fill up and drive away. This a digital feed with receiver showing memory (149), ident flag, audio info and time (BBC continuous feed).

Associated Press Television News colour bars feeding into the USA with NTSC pictures.

The medical corp logo for the 'Counter Terrorism' gas alert programme transmitted into Europe from the USA via 36°E.



Devious satellite linking route taken by the 'Counter Terrorism' programme though it doesn't include *Eutelsat II F3* at 36°E.

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Continued from page 81.

European distribution used to be carried in SIS analogue via the 7°E Eutelsat (SIS = sound in syncs) for many years until the long threatened digital change-over actually happened in '98. Thence MPEG 4:2:2 was wheeled out for the EBU feeds, the result of the new technology was many more active frequencies, all completely invisible!

The 7°E bird, however, isn't without analogue action since various visiting outside broadcasters are still using its capacity. As an example, April 14 and mid evening showed at 11.139GHz-H a test pattern 'EST.1 Torino', audio at 6.60MHz, which was an Italian OB feed. A co-incident timing revealed more colour bar tests at 11.174MHz-H, tone again @ 6.60MHz though this cut carrier at 2000 without any indication of source.

Tracking to its neighbour *II F2* @ 10°E and for keen propaganda watchers tune into the Serbian TV output - 'RTS-SAT' - @ 11.596GHz-H analogue to watch their side of the war and the repeated military promos (showing their land, sea and air forces) to encourage and fortify the Serbian nation. Interesting to compare the video offerings of both the NATO and Serbian authorities, somewhere in between is undoubtedly the real story (see report in 'Radio & TVDX News' re 'Allied Voice Radio and Television').

RTS-SAT news 2200 on May 14 showed video footage (dated May 13) of an unmanned reconnaissance drone (surveillance craft) fluttering down to (Serbian) earth, close-ups of the fairly intact wreckage showed a mass of technical equipment for info-transmission, US markings and titles of air group, equipment serial plates, etc. The craft had the characteristic shallow 'V' tail that was seen last year on an unscrambled *Intelsat K* feed showing flight tests of this type of surveillance plane.

In the Autumn of 1998 I reported on a medical programme - 'Counter Terrorism' that was aired on the then *Intelsat K* @ 21.5°W bird, an 'instructional' marathon from the US military covering both demos, studio discussions, 'phone-ins and demos of the correct diagnosis and reaction to chemical attacks in time of strife. April 18th saw this repeated once more over two nights, distributed across the 'States, the Atlantic and onwards across Europe (destined I suspect for the Balkans military).

Significant I feel, were the comments that a problem might well occur in the States should there be a leak in 'the stockpiles of gases' held in storage on military bases there. A very busy period for both analogue and digital watchers.

Orbital News

The Kurd broadcaster MED-TV has lost its appeal against the ITC ban and has now gone off-air. The ITC banned the transmissions, commenting that it wasn't in the public interest to operate such a service from the UK mainland that would 'incite people to violence'. Meanwhile the Kurd operator 'KTV' continues to operate in clear analogue via *Eutelsat W2* @ 16°E, 11.163-H.

The satellite operator Globecast Northern Europe has just launched a video distribution service for corporate and media users that will allow fast communications transfer of material between the main commercial centres of the world, including London, New York, LA, Sydney, Milan, Hong Kong and Singapore. The satellite communication company, Kingston Communications, have bought out the Teleport London International to form Kingston TLI, and will offer global communications from three UK teleport sites.

Kingston have just bought a linear (tape) Sony editing package to offer more facilities to their corporate clients who seek video editing expertise at competitive pricing levels. News agency Reuters Television have opened new offices in Stockholm, Vienna, Amsterdam and Warsaw to improve and intensify its news gathering operation.

And a new NTL teleport is to be constructed at Morn Hill, 2.4km east of Winchester city centre and adjacent to the M3 motorway from London. Some 21 dishes will be erected, together with a technical educational centre ('Intech') and a hotel.

Lots of commercial action in the digital PAY-TV market. RAI has bought a 10% share of the Canal+ 'Telepui' Italian PAY-TV digital platform, leaving Fininvest with 10% and Canal+ with the remaining 80% share. Canal+ may shed more of its share holding later this year in paying court to Italian/Spanish bankers, intending to gain a media foothold across the Iberian region.

RAI, the Italian national broadcaster, will provide a further six thematic channels into the Telepui bouquet. Meanwhile, down the road, Canal+ is trying to buy into the Italian 'Stream' digital package and has offered nearly £M70 up front. If Canal+ is successful, Stream will continue to operate 'independently' and not showing a Canal+ association, despite the majority of programming being sourced from Canal+.

New satellite channels for Canada with 'Chum-TV' preparing an entertainment channel 'Star! The Entertainment Channel' and the education/documentary 'Canadian Learning Channel', both of which will air from September '99. The Learning Channel will operate over 24 hours and be aimed at an adult market.

New channels have arrived across Indonesia with Nickelodeon operating on cable 'TV Kabel' and DTH satellite via C-Band in the 'Indovision' package. Nickelodeon has already established a service across the Pacific rim (Japan, Philipines) when it initially launched Autumn 1998.

Not so happy news for Rupert Murdoch, since the Chinese authorities have banned use of domestic satellite dishes for watching satellite TV, including the News Corporation's 'Phoenix' satellite channels (Mandarin language). And the Indian government is still holding out against ISKYB bringing DTH satellite programming across the Indian continent. The hoped for April '99 launch has been postponed pending the government sorting out relevant legislation, though Murdoch will continue to employ important already recruited staff lest the ISKYB project receives the go-ahead shortly.

The 87°W *GE-3* satellite lost stability 0400UTC March 12, so reports industrial press releases, the result was the loss of all radio/TV service downlinks for several hours pending the isolation and overcoming of the problem. One of the three active on-board gyros failed, though a 4th spare was brought into use and stability was restored within three hours. Cause is thought to be 'solar activity'.

Press releases advise that Intelsat are to move towards complete privatisation, which is hoped will lead to a more efficient and leaner structure, now that competition is being felt from undersea fibre optic cabling and price rivalry. Late April and the new *Eutelsat W3* satellite reached its new slot at 7°E slot to replace the incumbant *II F4*. The *W3* will carry an increased workload at higher powers of TV, data and telecommunications reaching from Central Asia, Middle East, Europe and North Africa using up to 24 Ku-band transponders in both fixed and spotbeam formats.

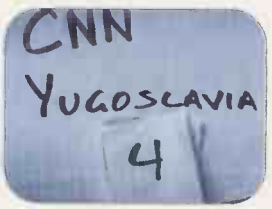
The *II F4* bird will be moved onwards to another slot, thought to be the new Atlantic Gate position at 12.5°W. The Atlantic Gate position will provide North American-communication pathways for video, data and corporate information. Reuters have already leased capacity for news and financial service contributions.

The new *AsiaSat-3s* is now in-slot at 105.5°E allowing an eventual retirement of the earlier *AsiaSat-1* series. The new craft has 28 x C-Band and 16 Ku-Band transponders and should be operative until 2015. But not good news for commercial satellite operators in SE Asia, PanAmSat have intimated that an eventual satellite transmission digital standard would make use of a higher FEC (forward error correction) of 7/8th in digital transmissions. This would mean that for achieving a known equivalent carrier/noise figure a higher gain system will be required - the higher the FEC rate the higher the threshold for digital reception also increases. This forces the cable or home user to buy a much larger dish system - the advantage for PanAmSat is that they can squeeze a few more services into a given channel bandwidth.

In the midst of the Balkans conflict, NATO celbrated its 50th anniversary, the EBU provided an analogue feed of proceeding ex New York via *PAS-3R/6* @ 43°W.

KFOR-TV provided dramatic footage of the violent twister that devastated that area May 3rd, carried via *NSS-K* 21.5°W.

An unknown sourced religious programme feed that appeared on *Arabsat 2B* @ 30.5°E April 16, 4.078GHz RHC, there's Arabic type script lower LH corner + 'TV', can anyone identify please?



Basic but effective means of a VTR countdown 'clock', one of a series running from 10 to 2 preceeding news packages

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For Sale

All Racal receiver spares, 1770, 1780, 1792, 6790 series. Contact: **ra1792@pavilion.co.uk**

AOR AR8000 scanner, all-mode 500kHz - 1.9GHz, current model, good condition, with manual and power supply, £180 o.n.o. Steve, Coventry. Tel: (01203) 722396.

AOR AR8200 scanner and case, plus Optoelectronics Mini Scout, reaction lead, charger, DB 32 antenna, all as new, boxed, new April 1999, cost £580, selling for only £400. John, South London. Tel: 0171-622 2820.

Code Master CWR 610E c.w, RTTY and ASCII terminal with 9in Crofton monitor, excellent condition, with manual, very easy to use, with auto speed and printer port, £110. Bill Johnston, Bournemouth. Tel: (01202) 430043.

Drake R8E Wavecom 4010 decoder, monitor, p.s.u., £850. JRC NRD-535, Universal M-900 decoder, monitor, p.s.u., £950. Antenna, m.w. and l.w. loop, £15. Insect filter, £15. All v.g.c., cash only, buyer collects. Jim, South of Wigan. Tel: (01942) 718382, after 1500.

Drake SW8 500 - 30MHz, f.m., airband, l.s.b., u.s.b., 70 memories, clock handbook, battery or mains adaptor included, £300,

cash only. Rankin, Wirral, Cheshire. Tel: 0151-334 5501.

Grundig YB 400PE, only few months old. IC-R75 forces sale. Good, nay, excellent performer for portable, £100, 24 hour delivery. Tel: (01754) 762359.

Hammerlund SP-600, first class condition, £250. Yaesu FRG-8800 plus v.h.f., like new, £275. Eddystone 1837/2 solid state digital v.g.c., very stable and sensitive, £300. Kenwood Trio 9R59, v.g.c., £50. Tel: Heathrow 0181-813 9193.

Icom IC-751 h.f. transceiver, all band amateur coverage, general coverage receiver, integral p.s.u., just realigned by Icom, receipts, fitted FL232 c.w. filter, boxed with manual and circuits, immaculate, £325 o.n.o. Ken, London. Tel: 0181-455 9931, any time.

Icom IC-R71E with every option, service manual, original box, immaculate, £495. MF10 SDU/TV demod for Icom scanners, very rare, 'phone for full specs, £300. Adrian G4JBH on (01288) 341454.

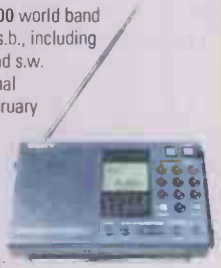
ICS FAX 4 weather FAX decoder, as new, £140. Martelec MSR 50 weather satellite receiver, JVF2 interface, p.s.u., leads, software, manuals, unused, £150. Tel: (01904) 658928.

Kenwood R-5000 with v.h.f. converter, original box, instruction manual, etc., superb condition - very little used, any trial, can

possibly deliver, £550 o.v.n.o. Tel: Peterborough (01733) 709811.

SEM Transzmatch 1kW a.t.u. with ezitune, £70. Pakratt 232 (PK232), all leads, manual and software, £70. Toyo wideband 200W dummy load, £15. All as new. Chris G4KWH, Bedford. Tel: (01234) 356139.

Sony ICF SW7600 world band receiver, s.s.b., l.s.b., including AN71 antenna and s.w. handbooks, original packing, new February 1999, only used twice, mint condition, £100 o.n.o., buyer collects. E. Brumby, Peterborough. Tel: (01733) 709811.



Universal M-1200 receiver decoder card, PC ISA slot, c.w., RTTY, ARQ, SITOR, c.t.c.s.s., DCS, AX25 and more. Boxed with software and manual, £100 plus postage. Richard Perzyna, Bromley, Kent. Tel: (01689) 602948.

Universal M-7000 decoder, version 7.2, boxed with manual and guide. 19 modes, excellent performer with NOVEX 11in monitor. May exchange or part exchange for good receiver, or sell for £550. W. T. Johnston, Bournemouth. Tel: (01202) 433561.

Universal M-800 digital decoder, with full upgrade, will decode 23 digital modes, as new, cost £1200, asking £600. Alex on (01334) 828342.

Universal M-8000 decoding terminal, latest version seven, ACARS, etc., no computer required, still under guarrantee, as new, with Dell 13in VGA colour monitor, £695 o.n.o. Tel: Warwicks (01926) 854556.

VT-125 II Airband scanner, new charger case, £100. Realistic DX-394 s.w. receiver, barely used, £50. MFJ-956 tuner, £10. Bryan, Herts. Tel: (01223) 207716.

Yaesu FRG-100, immaculate condition, only used for two hours, as I cannot understand instructions; I am partially blind and 78, bored with instruction book. A real bargain, at £280 including power pack. Buyer collects, f.m. option fitted, only four months old. Tel: (01327) 842285, anytime.

Yaesu FRG-100 short wave receiver, global coupler AT-2000 antenna matcher, boxed, full instructions, seven months old, hardly used, £300. Tel: 0161-724 8161.

Yaesu FRG-100, as new, boxed, manual, warranty, unregistered, with p.s.u., bargain, at £300. FRG-7 with digital readout unit, manual, £100. John, Eastbourne, East Sussex. Tel: (01323) 460128.

Yupiteru MVT-7000 scanner, 8 - 1300MHz, all accessories, charger and manual, original box, excellent condition, hardly used, £100. Tel: Wigan (01942) 728531.

Wanted

Grundig Satellite 700, in good condition. John Hodgson, 34 Wellington Court, Tyne and Wear NE10 OBN, Tel: 0191-264 9015, or 0191-469 2332.

Icom RC-12 remote control system. Icom EX-310 voice synthesizer, both for IC-R7000 receiver. Also TV unit for same. Richard Perzyna, Bromley. Kent. Tel: (01689) 602948.

Meccano radio crystal set, model RS1 or RS2, or No. 10 Meccano set, geared roller bearing, steam engine, electric motor and other spare parts, the older the better. Collection possible! Peter, Surrey. Tel: (01372) 454381, or (0374) 128170, anytime.

Racal RA978 - 900. v.h.f. airband antenna, the ones that are on the top of the control tower at RAF bases, good price paid. Tel: Nottingham 0115-960 5040.

Sony CRF-320, for spares. Tel: Heathrow 0181-813 9193.

Sony SW1 digital short wave receiver. Must be in good condition. Tel: Droitwich (01905) 772501.

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ICOM

IC-R75

Revealing a Remarkable Receiver

Icom are proud to announce their latest radio receiver - the IC-R75. This dedicated HF+50 MHz, all-mode unit has frequency coverage stretching from 30kHz to 60MHz in USB, LSB, CW, RTTY, AM, FM and S-AM. In addition to an extremely sensitive receiver, the twin PBT, 2-level pre-amp, selectable Auto-Gain Control (AGC) and noise blanker help to capture and clean up DX signals, whilst the RF attenuator reduces interference from strong local stations. The IC-R75 also has a Synchronous AM detection circuit to prevent audio distortion while receiving AM broadcasts.

A comprehensive range of features can be found in this extremely compact radio, measuring only 241(W) x 94(H) x 229(D) mm. These small dimensions give complete installation flexibility however you choose to operate, as a base or mobile.

The user-friendly front panel has a large, clear, alphanumeric LCD display. This shows the frequency or '6+2' character channel name. The panel also has a numeric keypad to allow direct frequency entry or memory channel selection. The SQL control may also be configured to adjust RF gain and/or squelch threshold. The large, front-mounted speaker provides clear audio, even at the maximum level of 2 watts.

Other features include a bar graph-style, digital signal meter, 99 memory channels, 2 programmable scan edges, an internal clock with ON/OFF timer functions and three speed-selectable scan functions; (program scan, memory scan and priority scan).

This superb receiver is designed to suit a range of market sectors from the demanding 'decoder' to the interested SWL. The IC-R75 incorporates Icom's leading edge technology and offers a range of features that make it exceptional in many ways. It sets a new standard for performance and value, and will become a popular choice for SWL's everywhere.

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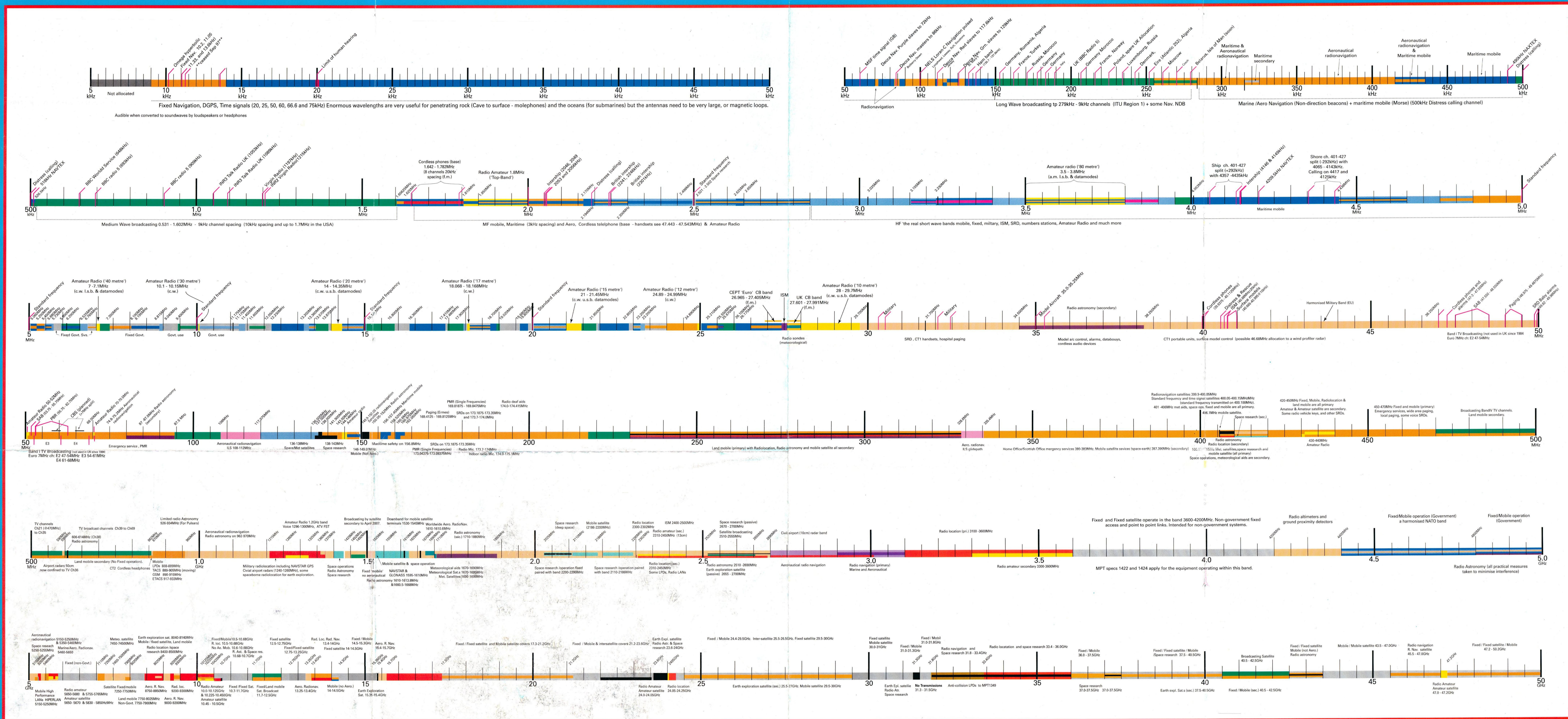
Short Wave Magazine UK Frequency Spectrum Chart

Covering ranges from 5kHz to 50GHz. Presented free with the July 1999 issue of *Short Wave Magazine*



Icom Receivers covering these ranges – and what *SWM* said about them...

IC-R75

'Wide frequency coverage and innovative features'
0.03 - 60MHz Modes: (S-AM, AM, FM, SSB (USB, LSB), CW, RTTY)

Reviewed by John Wilson in May 1999 *SWM*

"The R75 carries the reputation of Icom a further step along a well trodden path. In one smallish package you get a receiver covering 30kHz to 60MHz, with all mode reception, and extreme ease of use. Used in anger whilst in my hands, there was little I could not resolve, even in poor conditions, and I did direct comparisons with my own favourite receivers to verify this. The R75 deserves to sell in its thousands, and I can't praise it too highly. Well done Icom". **JW.**

IC-PCR100

'Cruise the Airwaves with your computer'
0.01 - 1300MHz Modes: (WFM, FM, AM)

Reviewed by Faris Raouf in May 1999 *SWM*

"In use the PCR100 proved to work very well with its standard long wire antenna, picking up signals as well as my MVT-7100 and AOR AR8200 hand scanners when used with their standard antennas. I have to admit I was a little annoyed to find that it isn't possible to scan through selected memories located in more than one bank, and rather dismayed to find that it isn't possible to change the size of these banks either. But these are the only real drawbacks, and considering the PCR100 costs less than £200, ones I think can be lived with. In fact, I think this is a super little radio". **FR.**

IC-PCR1000

'Bring Another World to your Computer'
0.01 - 1300MHz
Modes: (WFM, FM, AM, SSB, CW)

Reviewed by John Wilson in October 1997 *SWM*

"In the PCR1000, Icom have used their experience and judgement to produce a general purpose receiver which will satisfy large numbers of enthusiasts. The wide frequency range from 10kHz to 1300MHz is impressive, as is the provision of all mode reception, whilst a synthesiser which will tune down to 1Hz increments at any frequency in that tuning range is a dream come true. The IC-PCR1000 should be a winner". **JW.**

IC-R9000

'Expand your horizons with Icom's top of the line, advanced world-wide receiver'
100kHz - 1999.8MHz
Modes: (WFM, FM, AM, SSB (USB, LSB), CW, FSK)

Reviewed by Geoff Arnold in April 1989 *SWM*

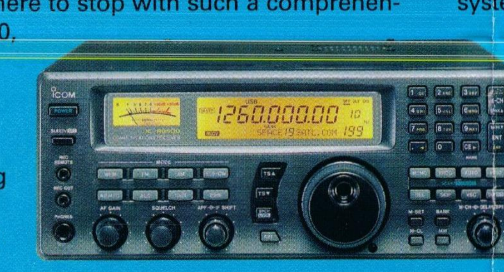
"The R-9000 has a total of 1000 memory channels, in 10 banks of 100, each store frequency, mode and tuning step increment information, plus a reference note of up to eight characters. A memory editor allows memory contents to be moved, copies or deleted at any time. Scanning options include 10 scan ranges, 100 channels capable of automatically memorising frequencies and times of signals received". **GA.**

IC-R8500

'Discover a World of Information and Intrigue' 0.1-2000MHz
Modes: (WFM, FM, AM, SSB (USB, LSB), CW)

Reviewed by John Wilson in September 1996 *SWM*

"It's hard to know where to stop with such a comprehensive unit as the R8500, because the manufacturers seem to have thought of everything. Quite frankly I loved having the R8500 in my hands, even for such a short time, I was impressed by everything about it. It looks like, and handles like a classic h.f. receiver, but has this capability of receiving everything from 100kHz to 2.000GHz. Above all, it was easy to use and get to know, and for the real listening enthusiast, or indeed the listening professional, the R8500 allows you to dispose of every other receiver and simply have it all in one stylish box". **JW.**

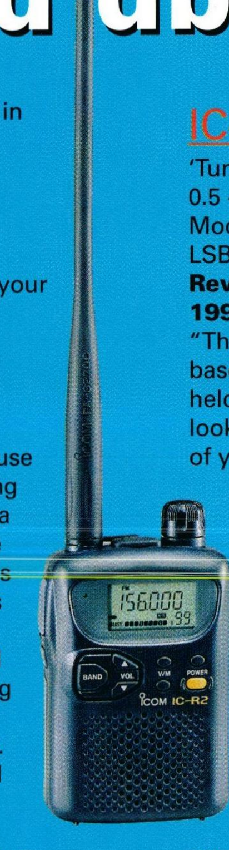


IC-R2

'A 'world' of listening that fits in the palm of your hand'
0.495 - 1309.995MHz
Modes: (WFM, FM, AM)

Reviewed by Alan Gardener in January 1999 *SWM*

"In practice I found the unit relatively easy to use once I had mastered the basics of the operating system, and to be fair, I have found this to be a problem with many of the radios I have recently reviewed. Listening to various signals with the R2 gave good results on frequencies above 88MHz, this is mainly due to the size of the supplied antenna, which is already about as big as Icom could reasonably get away with, given the small size of the radio. I would consider the R2 to be an ideal buy for people wishing to use radio in conjunction with another hobby interest such as airband or sailing, newcomers to the hobby or those of us who already have one scanner, but would like another small radio which is light enough to carry in the pocket". **AG.**

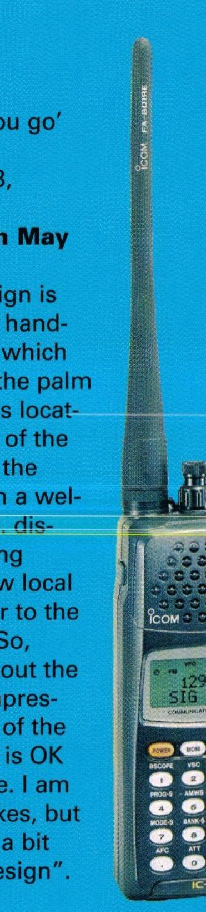


IC-R10

'Tune in to the world wherever you go'
0.5 - 1300MHz
Modes: (WFM, FM, AM, SSB(USB, LSB), CW)

Reviewed by Alan Gardener in May 1997 *SWM*

"The IC-R10 looks great - the design is based on Icom's current range of hand-held Amateur Radio transceivers which look very sturdy and fit nicely in the palm of your hand. The power button is located in the top left hand corner of the keyboard, pressing it causes the operator to be greeted with a welcome message on the l.c.d. display. Further button pressing allowed me to receive a few local signals before I had to refer to the handbook for more clues. So, what did I actually think about the R10? Well, I have mixed impressions. I really liked the feel of the radio and the performance is OK for the size and selling price. I am sure this radio will sell like hotcakes, but I just wish that Icom had worked a bit harder on some aspects of the design". **AG.**



Legend of colour usage

- Radio Navigation Maritime and aeronautical
- Maritime Fixed and Mobile
- Aeronautical fixed and mobile
- Land fixed and mobile
- Generic mobile
- Radio location
- Radio Astronomy
- Amateur radio and Amateur satellite
- Broadcasting (all types)
- Space operations
- Space research
- Meteorological

Broadcast (primary) Maritime (secondary) — When two (or more) users exist within a band, and their colours are split horizontally then the upper colour refers to the 'Primary' user and the lower colour to the secondary user.

Maritime, land & aeronautical of equal status — However, if colours are overlaid, but with different line thickness, then all users are considered to be of equal status.

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