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JUNE 1999 Issue

short wave

BROADCAST

Kosovo Special Feature

This month, **Graham Tanner** and **Peter Bond** bring you a round-up of the situation as of the closing days of April. It is hoped that the hostilities in the war torn area will be over by the time you read this *SWM* special feature, and that any military action in the region will be that of a peace-keeping force.

Other Features

Don't Forget – you can join the *SWM* Readers' E-mail list by sending a message to **swm_readers-on@pwpublishing.ltd.uk**

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e magazine

Other Features

COMING NEXT MONTH - FREE PULL-OUT FREQUENCY WALL CHART

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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

Time, Moving, Antennas

Working on a monthly publication, tends to modify your natural body rhythms. The passage of time seems to accelerate as life flies by. Maybe its just that I'm getting older, "time is inexorable", thank you David Byrne.

It's hard to believe I've been sitting in this chair for a year now, (not literally you understand). It has been a busy time, with lots of successful projects completed and more on the way. I hope that you all have enjoyed the result of my appointment as Editor as much as I have, even if only a tiny fraction, then I'm delighted.

I am about to face the trauma of moving house. As I write this piece, the ordeal is some two weeks away, so by the time you read these words it'll all be over, well the shifting of hundreds of boxes will. Last night I dismantled most of my radio room. There is an upside to this, however; I've now got a total of three radios in the Editorial Offices. I can now cover the spectrum from 0Hz to 2GHz from this very seat. Just a minor snag though, no real antennas - yet! And on the subject of antennas, well, why do you think I'm moving? After nearly thirty years of small gardens, I've finally managed to get a real antenna site, erm, I mean garden. In all 13 x 100m in size. Now I am going to have some fun. Look out for reports on the various projects at the Editorial Antenna Farm in a future issue.

Web

Those of you who frequent the [SWM_R] mailing list will have noticed a different URL for our web site. As I mention last month, the updating process for the widely advertised web site is somewhat broken. So as to keep the web material in step with reality, I have set up the www.pwpub.demon.co.uk site on a very temporary basis. I must apologise if it has caused confusion. Keep your browser pointing at this address till it redirects you to our main domain.

CD

I mentioned projects in the offing a moment ago, the April CD has been voted a success and the next one is now being planned. I would ask for your input as to things you'd like to see featured on the second disk. I have already had some very welcome suggestions, but please feel free to send me yours. That way I can really make sure we compile the ultimate radio accessory.

Frequency Chart

Whilst we're in a bonus frame of mind, in next month's *SWM* you'll find a free frequency spectrum wall chart that we've compiled in association with Icom UK. This handy chart can have pride of place in your shack. It will provide, at a glance, spectrum user details in a clear easy to read format. So don't miss the July issue of *Short Wave Magazine*, will you.

Competition

Featured on page 25 of this issue, you'll find another bonus, our competition with the terrific prize of both an NRD-345G h.f. receiver and the excellent ALA 1530 Active Loop Antenna from Wellbrook Communications which we featured last month. I was so impressed with this antenna that I've added one to my, soon to be extensive, antenna collection. So, don't forget to complete part one this month, and look out for the questions in part two next month so you can be one of those who have a chance to win this h.f. station. Good luck.

Kosovo Special

After many requests for frequency information in relation to the Balkan conflict, we have put together a special feature this month. Graham Tanner and Peter Bond have expertly compiled the 'Kosovo Crisis Special'. Here you'll find a round-up of events and comms up to the early days of May. You may find that by the time you are reading your copy of this magazine there won't be much to listen to. On the other hand, with the recent mis-targeting of the Chinese Embassy and resulting tragic deaths, the situation may well be more intense.

Serial Numbers

I have heard, from a few sources, that there are currently 'new' and used radios being bought and sold that appear to have had the manufactures Type Plate and serial numbers removed. I would like to warn anyone who wishes to buy **any** product from anyone, that defaced serial numbers mean one thing and one thing only - dubious origin. Be warned.

Free P&P

Finally, what better time to update your radio library, the *SWM* Book Store have thrown in **free postage and packing** for UK deliveries so you can now enjoy 'Rally Prices' by mail order. Hurry though, the offer only lasts a month.

Now just where did I pack that a.t.u.?

73

Kevin Nice

Dear Sir

First, I would like to congratulate yourself and your team for producing a great radio magazine; although my interest is with the broadcast bands, for radio and television, I always read the articles on other aspects of radio with great interest. Judging by some of the letters, you cannot keep all the people happy all the time, however hard you try, especially when you are catering for such a broad church.

The main point of my letter is the 1999 total eclipse of the sun on the 11th August, and its possible effects on radio signal propagation. I think the main effect will be a thinning of the D-layer between 0900 and 1130UTC, with a patch of hundreds of miles across. The main effects will be noticed on the medium wave band with stations normally only heard at night being heard during the eclipse period. Looking at the path of the eclipse, I would suggest listeners in the UK would probably hear signals appearing above the noise first from Northern Ireland and Iberia, then as the eclipse reaches total phase it may well be that conditions will be akin to night time, with signals from across Western Europe received. After the total phase good reception may be possible from East and Southeast Europe before the conditions return it to normal.

Of course, I may be wrong, with the path of the eclipse too narrow and rapid moving to have any noticeable effect on any of the Ionespheric layers, but for anyone that cannot reach Cornwall and for everybody if the weather is poor, it may be the only effects of the eclipse available for us to observe.

Finally, I have heard the RSGB are organising a radio watch amongst their members to study the effects of the eclipse. I wonder if there should be a *Short Wave Magazine* medium wave watch, or possible joining forces with the RSGB for this once in a lifetime event?

S.M. Hockenhull
Bristol

*Please send your reports of propagational oddities recorded during the period of the eclipse to the relevant columnist, thanks - **Ed.***

Dear Sir

SWM readers may be interested in the following radio reception phenomenon.

About ten years ago, while listening to v.h.f.-f.m. transmissions from Bluebell Hill on 103.1MHz (Invicta Radio), I noticed that the left and right stereo channels were reversed, when compared to the same programme radiated by other transmitters. This was brought to the attention of the then IBA, and the error was corrected.

Recently, I have noticed that the same programme transmissions (now Invicta FM) from Dunkirk on 102.8MHz have reversed channels, while those from Bluebell Hill remain correct.

Perhaps other readers wish to monitor the output from v.h.f.-f.m. stereo transmitters elsewhere in the UK?

Reception is best compared to an independent source, for example a CD, in order to decide which audio channels are reversed. It is important to check that all equipment used, e.g. receiver, headphones, etc., have correct left and right channel connections.

John Fuller
Kent

Dear Sir

It is a good thing that Mr. Peter Czerwinski of Sheffield (April '99 *SWM*) has his tongue firmly planted in cheek, for were it otherwise my response to his letter in the April *SWM* would most certainly be a sound thrashing with a half wavelength dipole made of wet noodles. Obviously, the reason for the "sloppiness" is that the velocity factor of wires and pipes used to make antennas varies with the situation, the installation, and the phase of the moon. Given that its magnitude would in the second or third decimal place, '300,000,000 m/s' is a reasonable approximation. Indeed, my next project will be to measure the velocity factor of different brands of antenna noodle raw material.

As to the value of G, the gravitational acceleration constant varies over the face of the Earth. I've seen 'gravity maps' used by scientists that list the constant at various values different from each other and the value given by poor, dear Peter. Indeed, one presumes that the actual value of G may depend on whether one is situated over a lead mountain or a pile of sand.

With my tongue planted ever firmly in my cheek...

Joe Carr

Dear Sir

I have just crawled out of my bunker, all bruised and battered. First of all, may I say I was absolutely amazed my letter was published at all, I myself would have thrown it straight in the bin.

I agree with all the letters published, apart from being a snob. My family fell about laughing at that one. I've nothing to be snobbish about.

I didn't intend my letter to be taken that seriously, because I think that *SWM* is 'the best'. I'm just complaining about the name, now that things have changed so much. I was hoping I could promote more articles on valve equipment.

I also decode some RTTY, FEC, ARQ and listen to Airbands and Marine on the scanner, so I'm not completely in the past.

I did manage to obtain an R1155, I make up my own p.s.u.s (those lovely valves). May I thank you for the vouchers, which I didn't really deserve, but I put them to good use; valve guide books, what else! I will still buy *SWM* and *Practical Wireless*. At least that has two pages on Valve & Vintage! I've also found the cure, *Radio Bygones*, I've been buying back issues by the dozen! I wish you all well in your endeavours, and keep taking the tablets. Yours faithfully.

Mr. V. Neale
Brighton

Well now you're out the bunker, welcome back! I believe that there is a place for history in SWM, *but its main purpose is to keep the reader abreast of what is current. Now as for the title, as a reader recently commented to me, the higher the frequency, the **shorter** the wave. Exactly! - **Ed.***

TOP QSL

Dear Sir

I had a callsign. It was G7USF. You won't have heard me. I am 40 years old, and have been a radio enthusiast since I was about seven, when I used to scan the dials of my Mum and Dad's valve receiver at home. I used to build crystal sets and wild antennas, with which I would listen to the wonders of all the communications flying around me. By the age of ten, I really wanted to be a Radio Amateur.

In my 20s I had other things to get on with, but returned to my radio hobby when I was 30. I decided to go and pass my RAE examination, and I did. It took a lot of work, but I did it. But you still haven't heard me. I'm not too interested, you see, in f.m. 'phone above 30MHz. Not that there's anything wrong with that, its just not what caught my imagination when I was young. There is this barrier, the Morse test. I **cannot** read Morse. I never will be able to. I have spent months permanently attached to Morse Tutors, I've used computer assistance, I've had lessons, read books, and I just can't make head nor tail of it. I'm sick of people who tell me how musical it is. Let me get this straight, it is **not** musical in any way. I am a professional musician with CDs available world-wide, and I play seven different musical instruments and sing. Morse means **nothing** to me at all musically. Sure, you can make Best Bent Wire sound like a kid's song, but that's not going to get you very far

Your readers in the April issue evidently have no desire to meet me on air. They feel I do not have the disciplines to join them on their patch, which is overcrowded. They have decided that use of an outmoded and redundant form of communication is a **must** to be able to join their ranks. Even the Catholic church (surely the most conservative of associations) stopped the mandatory use of Latin Mass, many years ago. Morse is a dinosaur. One of your readers justified keeping Morse as mandatory because it works when all else fails; this I can appreciate, but I want to be a radio amateur as a **hobby**, I am not claiming to be Earth's last hope in a crisis! Morse is a method of **communication**, albeit primitive. One electronic step from the talking drum. Language is a far more important thing. Versatility in language is a greater skill. I speak fluent English, French & German. These are exceedingly useful for a radio operator. How about introducing a language test, to make sure amateur operators are fluent in more than one language, and ban everyone who can't?. We'd soon see the Morse crones up-in-arms, wouldn't we? I have never had the chance to key up. My radio (h.f.) sits quietly in the corner, and listens to you all. How I wish I could talk to you all, be part of the hobby which has been with me since childhood. I am polite, know how to work on air, will discuss many varying topics with you, yet you won't let me join your club. You discriminate against me because of a disability; the simple inability to communicate in a language I cannot understand. I really have tried. I've never put my mind to anything as much as to this, I don't want to be left out for ever. I live in an area of Britain where I can only hear one other 2m station, with no packet nodes in reach. **Let me in** to **h.f.** I do not advocate a free-for-all. Let's have a practical exam based on real radio operation, on protocols, politeness and efficiency, not a mindless arbitrary test on something I will never be able to use. Surely, three languages could count for a couple of points in my favour!

Andy Tillison
West Yorks

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.

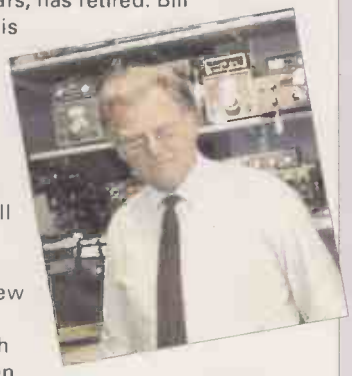
THE BEST LETTER WILL RECEIVE A £20 VOUCHER TO SPEND ON ANY SWM SERVICE.

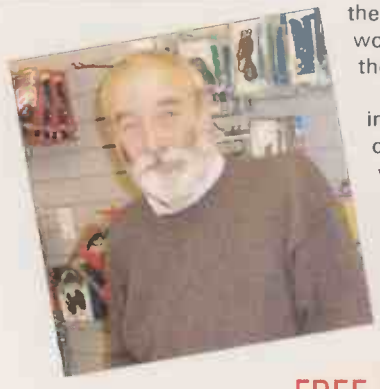
Your News

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!

No More 'News at 10' from Axminster

Bill Sargeant G0CTF, employed by Reg Ward and Co for the past 10 years, has retired. Bill was well known for his sense of humour and his special telephone phrases. His favouite signing was 'Bill Sargeant News at 10 Axminster', which will be remembered by many regular callers. During the war Bill flew in Neptunes and Shackletons with the RAF and then worked for Dimplex and Racal before joining the team at Reg Ward in Axminster.





Andy Henderson G3SXH has stepped into Bill's shoes and has the daunting task of familiarising himself with the huge and varied stocks of radio and HiFi equipment. Andy, also ex RAF, has flown in Nimrods and Vulcans and has worked for the BBC monitring service. He also brings a wealth of computer experience to the company which will be welcomed.

FREE P&P!

As a special offer for you this month, all books from the *Short Wave Magazine* Book Store will come with **FREE P&P** (UK only). But you've got to be quick, as the offer is only **open until 24th June 1999**. And don't forget to quote **SW699** when placing your order.

Digital Radio

Arcam, the UK's leading manufacturer of quality hi-fi, is pleased to announce retail availability of the world's first home Digital Radio Tuner (DRT), the Arcam Alpha 10 DRT. The AR10DRT is now in full production and will be available nationally through around 100 Arcam hi-fi dealers within range of a BBC digital transmitter.

All BBC stations are on-air now and over 60% of the UK can already receive BBC Digital Radio programmes. Rapid expansion of the network is planned and Commercial Radio goes live in October 1999.

Digital Radio is said to be the future - it will replace all current broadcasting over the next decade. There is one fixed technical standard (this is not betamax). The future is assured, even for early adopters. Existing m.w./l.w./f.m. transmitters will all be turned off within 10-15 years.

The A10DRT is a genuine world first - the first home DRT and the first to go on retail sale. This is a stand alone component, easily added to any hi-fi system, much as one would add a

Latest Version

The latest version of the ***Maplin Electronics*** catalogue, spring/summer edition, launched back at the beginning of March, is quite simply the latest, comprehensive and most widely used electronics catalogue in the UK. If you want the largest semi conductor range in the UK, or if you're looking for a range of refreshing new products, check out their latest catalogue.

With over 1500 pages, this new catalogue now contains a new product section entitled 'Optical'. **Dave Whittle**, Senior Product Group Manager for Maplin says, "The reason for the optical section is as a result of customer feedback, where the desire to locate optical products quickly was required".

The Maplin double CD-ROM is also now available, with its comprehensive search facilities, making product selection quick and efficient. Pictures, technical specification and pricing all appear on screen once you have located the item you require. To assist all customers, pricing can now be selected in Sterling or in Euros.

The companion CD includes a free copy of MacAfee anti virus software, and a free 30 day Internet trial with Demon, including software and over 1000 databases. The new catalogues are available mail order from Maplin Electronics through WH Smith or from one of the chain's 49 stores nationwide. Alternatively, call the sales line on **(01702) 554000** or visit their web site at **www.maplin.co.uk**

Out Now!

Airwaves 99 (6th edition) is now available from the *SWM* Book Store for just **£9.95**. Twelve main sections cover: Introduction, UK/Eire/European Civil and Military area radar, v.h.f./u.h.f. discrete directory, v.h.f./u.h.f. misc. frequency directory, v.h.f.u/h/f/ airfield and lower airspace radar directory, v.h.f.u.h.f. frequency directory, major world air routes h.f. directory, civil h.f. directory, military h.f. directory, h.f. frequency directory, ICAO four letter airfield codes and a total of nine maps plus transmitter site information. Order this essential edition now.

Look Out For Lowe

The new Lowe Electronics catalogue is now available. Lowe Electronics have been in the business for over 30 years, building on their reputation for service and value in everything they do. This current catalogue is sure to be of interest to many people, with information on many different products and accessories too.

In the middle of the catalogue is some

new CD player. The cost is £800, remarkable value for high performance hi-fi, incorporating radical new technology.

So, what does Digital Radio give you? Well, the crystal clear sound, utterly silent background and interference free reception delivers a new level of performance from broadcast sources. The experience of a live concert digital broadcast of a symphony orchestra is astonishing. The sound quality can transport you to the event without having to leave the comfort of your favourite armchair - truly the best seat in the house!

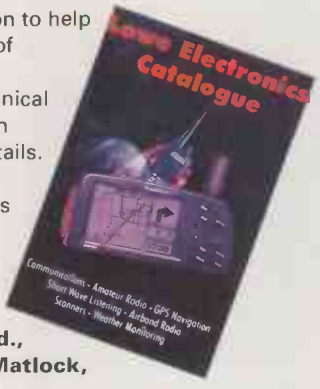
The sound is markedly better than current f.m. stereo , it is claimed by the manufacturer to "blow m.w. and l.w. into the dust". All digital programming will be in stereo (except sports commentaries). Also, existing stations go national in stereo - Virgin & Talk, currently available nationally in poor quality mono m.w., will now be available in Digital Stereo, as will Classic FM and BBC Radios One to Five.

There are many new digital only stations - the BBC is already transmitting live Parliamentary broadcasts and increased live sports coverage. Extra music programming will follow soon. From October 99, there will be seven brand new digital only commercial stations - the only way to hear them is to buy a digital radio!

A built-in display on the radio shows full text information on songs, plays, presenters, etc., and tuning is easy because all stations can be found by name.

For prices and more information on the A10DRT, check out their web site at: **www.arcam.co.uk/news/digiguid.html** or write to **A & R Cambridge Ltd., Pembroke Avenue, Denny Industrial Estate, Waterbeach, Cambridge CB5 9PB, Tel: (01223) 203200, FAX: (01223) 863384**, E-mail: **custserv@arcam.co.uk**

background information to help you, including details of product range, prices, carriage, help and technical advice, how to place an order and payment details. Very handy indeed! To obtain your copy of this comprehensive catalogue, send **four first class stamps** to cover the P&P to: **Lowe Electronics Ltd., Chesterfield Road, Matlock, Derbyshire DE4 5LE.**



Lynch Hosts Yaesu Open Day

Unlike the November 'Bash' at Martin Lynch & Sons, the Yaesu Open Day is dedicated to the entire range of Yaesu products. Members of the Yaesu UK team will be on hand to demonstrate and discuss their exciting range of products. Check out the ML&S web site **www.mlands.co.uk** for up-to-date details. The date to put in your diary is **Saturday 19th June**, starting at 10am. Don't forget it!

Field Day Night

On Monday 7th June 1999 the **Basingstoke Amateur Radio Club** are holding their club night for Field Day planning, starting at 1930 for 2000 at Gems Sports & Social Club, Lister Road, Basingstoke, Hants. More details from **Bob Brown G7PKD, QTHR** or **g7pkd@aol.com**

Wednesdays Only

The **Aylesbury Vale Amateur Radio Society** meetings will now only take place on the first Wednesday of each month, at the Hardwick Village Hall on the A413, three miles north of Aylesbury. Meetings commence at 2000. Contact the Club Secretary **James M1BXQ** on **(01844) 351688** for more details.

Radio Talk

Members of the **Hoddesdon Radio Club** are meeting up for a talk entitled 'Radio On Stamps' by Arthur Robinson G3ZYQ on Tuesday 8th June, and 'Use That Receiver' by s.w.l. John Johnson and Roy G4UNZ on Tuesday 22nd June at the Conservative Club, Rye Road, Hoddesdon, Herts, from 2000. More information about the club and its activities from **Don G3JNJ** on **0181-292 3678**.

Operation Pabay

It is hoped, all things being equal, that Pabay will be on the air again this year, using the callsign **2S0PNS**. Operation will be from Tuesday 1st June until Saturday 5th June, on all bands 160-10m, depending, of course, on conditions and antennas available.

A special stamp (carriage label) will be issued. More information from **Jeff G3LWM/2S0PNS (GM0PNS)**, packet: **G3LWM@GB7COS** or E-mail: **g3lwm@bigfoot.com**

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.

May 30: The Plymouth Amateur Radio Society are holding their rally at the usual venue, which is at the Plymouth College of Further Education, Kings Road, Devonport, Plymouth. Doors open 1030 till 1430 and admission is just £1. There will be the usual traders, plus Morse testing on demand. The venue is large and spacious with ample free car parking. The display halls have plenty of room for visitors to mingle and browse. There is also a large canteen serving freshly cooked light meals and snacks at reasonable prices. Plymouth City Centre, the Hoe, and many major attractions are close by for the family. Signposting will be from the Manadon Junction on the A38 Devon Expressway, and there will also be a talk-in on S22. More information on **(01752) 662051**, during office hours.

May 30: The 23rd East Suffolk Wireless Revival, the Ipswich Amateur Radio Rally will be taking place at the Hollies Sports and Social Club, Bucklesham Road, Ipswich. Directions to get there are as follows: From the junction of the A14 and A12 east of Ipswich, follow the A1156 for just under one mile, turn right at the ESWR sign. Grid reference TM223422. Rally opens from 1000 (0930 for disabled visitors) until 1600. Vehicles for the large car boot sale will be admitted from 0800. Talk-in on S22. For further details contact **Sam Jewell G4DDK** on **(01394) 448495** (home) **(01473) 644520** (work), or E-mail: **jewell@btinternet.com**

June 6: A Radio Rally is to be held at the Medstead Village Hall, near Alton, Hampshire. Doors open 1000 and admission is just £1. Refreshments will be available and there will also be a Bring & Buy. More information from **Derek G0NFA** on **(01420) 22018** or **Chris G0WYF**, E-mail: **chris@g0wyf.freeserve.co.uk** or check out their Web site, which will be updated with any fresh information, at **www.g0wyf.freeserve.co.uk**

June 6: The Spalding & District ARS are holding their annual rally at the Springfields Exhibition Centre, Spalding, Lincolnshire. Doors open 1000. This is a Radio, Electronics and Computer Rally and includes a 'Car Boot' area. Ample parking available on-site. Talk-in station G1DSP and refreshments will be available. Admission £1.50, overnight camping available if required. Contact **Ray Pearson G8ELV** on **(01775) 711953**.

June 13: The Elvaston Castle National Mobile Radio Rally are holding their rally at Elvaston Country Park, on the B5010, five miles south east of Derby. Further details from **Brian** on **(01332) 751412** or contact **Stuart** for trader enquiries on **(01283) 537778**.

Continued on page 9...

New Edition

Radio Stations In The United Kingdom, the 1999 16th edition, now available from the British DX Club, is a comprehensive 52 page directory of m.w. and f.m. radio stations in the UK. It covers all BBC, independent and long term restricted service licence stations and is a must for anyone interested in UK domestic radio. This year it again includes a free supplementary guide to radio stations in the Republic of Ireland, including full details of the new RTE Lyric FM transmitter network.

Price per copy is £3 sterling, seven IRCs, five US dollars or DM10. As a special offer, for UK addresses only, two copies for only £5 sterling. All prices include postage. Order yours from the **British DX Club, 126 Bargery Road, Catford, London SE6 2LR.**

E-mail enquiries should be directed to **bdxc@hotmail.com** or alternatively check out their web site at **www.umist.ac.uk/BDXC**

Novice Classes

The **Preston Amateur Radio Society**'s Novice classes are on-going and are held every Thursday at the **Lonsdale Sports & Social Club, Fulwood Hall Lane, off Watling Street Road, Fulwood, Preston**, from 1845 until 2000. Any age group is welcome.

The cost of the course, for textbooks, notes folder, course pass certificate and City & Guilds exam fee, with the cost of the Course Radio Kit also, is £40. For more information, contact **Eric Eastwood, 'Instr. 723/2** on **(01772) 686708**.

New Laser Diode

Mitsubishi Electric is announcing the introduction of an electro-absorption laser diode module for STM-64 optical fibre transmission at 10Gbits/s. The FU-641SEA-1 is designed for transmission distances up to 50km at 1550nm, which meets the ITU requirement for S64.2

The increasing demand for capacity in the trunk network has driven the development of this laser diode module to achieve a minimum performance at 10Gbits/s of 1dB power penalty at a dispersion of 800ps/nm. Thus the FU-641SEA-1 provides a cost effective alternative to existing D-WDM solutions for main trunk transmission upgrades.

By providing this source at 10Gbps, Mitsubishi is once again demonstrating its leadership in providing reproducible and stable, state-of-the-art technology. The company is now further developing the FU-641SEA-1 at selected ITU grid wavelengths for D-WDM multicolour operation to provide even more bandwidth per fibre.

Mitsubishi launches FU-641SEA-1, high power 75km laser diode module for STM-64.

The FU-641SEA-1 features a 1.55µm laser diode with an integrated electro-absorption modulator on a single chip. The device's butterfly package has an SMA r.f. input and an optical isolator. A cut-off frequency of 12GHz and an extinction ratio of 10dB at 2.5Vp-p, ensure performance at 10Gbits/s

More information is available from **Mitsubishi Electric Europe BV, Semiconductors, Travellers Lane, Hatfield, Herts AL10 8XB, Tel: (01707) 276100, FAX: (01707) 278997**, or check out their web site at **www.mitsubishichips.com**

New Commercial Manager

The **Radio Society of Great Britain** has appointed **Barry Cooper G4RKO** as Commercial Manager. Barry has previous experience in sales and marketing in the information technology industry and more recently as the General Manager of Yaesu UK.

In his new role as Commercial Manager, Barry will be responsible for developing the various income streams of the Society, including membership subscriptions, publication sales, sales of the Society's news-stand publication and advertising income.

Barry Cooper G4RKO, the RSGB's new Commercial Manager.

Speaking of Barry's appointment, RSGB General Manager **Peter Kirby** said, "I am pleased that Barry is joining us. He has excellent experience in both marketing and amateur radio and will bring an increased focus and professionalism to our commercial activities."

Barry Cooper, commenting on his new role said, "I am delighted to be joining the Society at this challenging time. There is a big task ahead to ensure that the RSGB has the income growth to fund its increasing range of membership services and I look forward to working with Peter Kirby and his team to do this."

Merlin Magic

PROsine - the new d.c. to a.c. power invertor from Merlin Equipment - converts 12 or 24V d.c. battery power to 230V a.c. mains electricity more efficiently and effectively than ever before. PROsine is ideal for operating test equipment, power tools and medical devices without the need of on-site power or a generator.

To ensure absolutely clean a.c. power with zero interference, PROsine produces a pure sine wave. Unlike older 'Modified Sine Wave' invertors, PROsine is compatible with **all** a.c. appliances to ensure a crystal clear picture on monitors and computers, perfect operation of sensitive electronics and noise free communication systems.

By drawing on the huge experience built up with the world famous PROwatt line, PROsine sets a new benchmark for performance, reliability and value. Based on a 'clean sheet' design approach, PROsine breaks new ground in form and function, distancing itself from competitive products in the quality end of the market.

Every installation is different, this is why PROsine has been designed to be as 'flexible' as possible. Heavy duty studs on the rear of the unit allow for solid, safe and reliable d.c. connections. These are insulated by two rubber boots, supplied as part of the package.

Connection to the a.c. output is possible in three ways, allowing the best installation for your application. When in temporary use, PROsine can be supplied with a standard UK socket for direct connection on single appliances to the unit. An a.c. hardwire version is available for reliable wiring to permanent installations.

Accurate monitoring of invertor status and precise control over operation is essential for today's discerning customer. PROsine's front panel is a unique combination of superb engineering and clever design. The backlit l.c.d. dot matrix display provides the user with information such as battery voltage, current and invertor output in watts. It also provides visual and audible warning of any fault.

If you wanted to be able to control your

New Range

Brain Boxes have released their new PCI LPT and RS-232 range, ideal for print server applications in the latest low cost Pentium class PCs. Four free PCI slots, plus the motherboard printer port allows up to nine printers to be connected at any one time to one PC. The PCI LPT range does away with the need for expensive print servers and allows large files to be printed directly to the printer minimising impact on network bandwidth.

The PCI Dual LPT RS-232 Two Port Card.

The two port LPT card has a LPT port and an RS-232 serial port on a bracket with another LPT and serial port on headers, brought to the outside world by means of a bracket in the next free slot. The second card in the range has one LPT and an RS-232 serial port on the bracket and a spare RS-232 port on a header.

PCI bus allows throughput to the I/O card, thus freeing the processor for other multitasking operations. Automatic configuration via true plug and play capability is combined with all the advantages of shared interrupt. The parallel port can be set to bidirectional mode for scanner, file transfers, etc.

Both cards come with sample programs, test and terminal software, all with source code. In addition, a CD containing detailed manuals and drivers for *Windows 95, Windows 98, Windows NT 3.51, Windows NT4, Windows 3.x* and *DOS*, is bundled in.

For further information, contact Brain Boxes direct at **Unit 3C Wavertree Boulevard South, Wavertree Technology Park, Liverpool L7 9PF, Tel: 0151-220 2500, FAX: 0151-252 0446** or check out their web page at **www.brainboxes.com**

PROsine remotely, the display module can be simply unscrewed and mounted up to 25' away using a simple telephone cable. A special interface panel is also available that allows you to retain the ability to switch the unit off at source.

The new PROsine range of d.c. to a.c. sinewave invertors.

As with all products supplied by Merlin Equipment, PROsine is designed specifically with marine use in mind. Therefore users are assured of peace of mind with overload, overheat, short circuit and/or high/low battery protection. Also, unlike any other invertor on the market, PROsine is fitted with Transient Spike and a.c. back-feed protection so that even the toughest a.c. loads or even severe installation error cannot damage the unit. PROsine is available in both 12 and 24V d.c. input with either a 1000W output for computers, 'scopes, lighting, etc. with the larger 1800W unit available for the frequent use of heavy duty equipment.

PROsine is just one of the many new exciting products from the market leader Merlin Equipment. Products include invertors, battery chargers, combination charger/invertors, battery monitors, cabling products and battery monitors. Prices start at just £450. More information from **The Merlin Group, Unit 1 Hithercroft Court, Lupton Road, Wallingford, Oxfordshire OX10 9BT, Tel: (01491) 824333, FAX: (01491) 824466.**

WACRAL Awards

Eighteen different awards are now available for contacting or hearing members of the **World Association of Christian Radio Amateurs & Listeners** (WACRAL). The scheme is open to members and non members of WACRAL and offers a series of attractive certificates to both A and B licensees and to s.w.l.s.

There are various Bronze, Silver, Gold, Emerald and Diamond categories, but an initial Basic Award can be obtained by working just ten WACRAL members (only five for B licensees). There is also a DX Award and a unique 'Heavenly Pilot Award' for confirmed QSOs with WACRAL 'Reverends' who may be either full time ministers, pastors or officers in the Church or Salvation Army.

WACRAL members in the UK can be worked most conveniently on their regular net frequencies, including 3.747MHz at 0800 and 7.047MHz at 1400 every Sunday. A full schedule of their international net times and frequencies plus the latest WACRAL Awards brochure, detailing how to win, are available from **Geoff Grundy G4YJW, 47 Northiam Road, Eastbourne, E. Sussex BN20 8LP.**

Also, WACRAL have also informed me that they have now launched their own web site, featuring information on their organisation and activities, net frequencies, extracts from newsletters and links to other Christian and amateur radio pages, including a callbook. Check it out at **www.wacral.org**

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

June 20: The Newbury & District Amateur Radio Society will be holding their 13th Annual Amateur Radio Car Boot Sale at Cold Ash playing field, near Newbury. Sellers/Traders should arrive by 0800 as the sale is open from 0900 till 1500. **Ian Trusson**, Secretary, on **(01635) 826019**, E-mail **g3rvm@compuserve.com**

June 20: The Bangor & District Amateur Radio Rally will be held at the Clandeboye Lodge Hotel (formerly known as The George) just outside Bangor. Doors open between noon and 1600, with disabled access from 1130. All the usual radio and computer dealers will be in attendance, as well as the portable station GI3XRQ/P, should you wish to try before you buy. Full restaurant (may be wise to book as it's Father's Day), bar and bar snack facilities will be available and there is ample car parking. Talk-in will be on S22 and doors open at noon. Further details available from **Keith Stevenson** on **(01247) 884635**, E-mail: **gi0ssa@qsl.net**

June 20: The Mansfield ARS are holding their annual Radio, Computer & Electronics Car Boot Sale at Debdale Lane Sports and Social Club, Debdale Lane, Mansfield Woodhouse, Notts. Open from 0930-1400, bar and refreshments and ample parking available. For more details contact **Angela** on **(01623) 429218**, E-mail: **angela@g6cuk.force9.co.uk** for the latest information, there's a Web site at: **www.g6cuk.force9.co.uk**

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. 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.**

Feature packed radio receivers to expand your horizons fro

AOR *is a radio receiver manufacturer, this is our business expertise, designed by spec*

The fantastic **AR5000** receiver, **(superior - Passport'99 says so!)** wide band all mode coverage from 10 kHz - 2600 MHz.

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

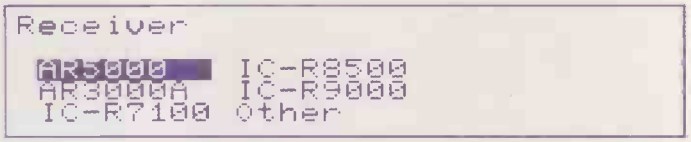
- ✓ Wide frequency coverage 10 kHz - 2600 MHz
- ✓ All mode reception: USB, LSB, CW, AM, Synchronous AM, NFM, WFM with automode tuning (any mode and bandwidth on any frequency is possible)
- ✓ Automatic Frequency Control
- ✓ Noise blanker
- ✓ High stability TCXO reference, 1 Hz NCO tuning
- ✓ 1,000 memories, 10 memory banks, 20 search banks, 5 VFOs (all twice!), alpha tag, EEPROM chip storage
- ✓ Fast scan and search rates up to 45 increments per second with extensive CPU facilities including bank link, delay, pause, voice, level, priority, autostore
- ✓ 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
- ✓ Analogue signal meter
- ✓ Clocks with timer and alarm operation
- ✓ Extensive RS232 control list
- ✓ Two aerial inputs with switching from the front panel, can be automatically switched based upon a user definable bandplan
- ✓ Audio & discriminator out as well as tape switching
- ✓ Standard DTMF decode / display with optional CTCSS
- ✓ Built-in tone eliminator
- ✓ SDU ready with IF output for spectrum display unit

AR5000 £1345 *AR5000+3 £1574*

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

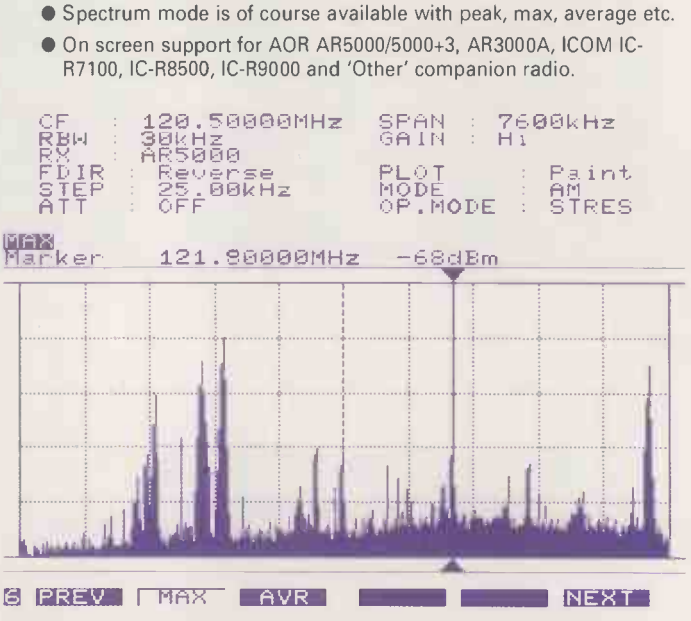
The SDU5500 is an 'all new' Spectrum Display Unit and a worthy successor to the SDU5000 (which offered practical and cost effective monitoring). Coupled to the AR5000 receiver, it provides a spectrum display of 10 MHz bandwidth anywhere between 10 kHz and 2600 MHz.

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.



Compared to its predecessor, new facilities have been provided:

- Step resolution mode, plots the wanted channel steps and ignores the gaps for more efficient analysis.
- Channel step mode, plots the wanted channels for close in use on channelised bands.
- Spectrum mode is of course available with peak, max, average etc.
- On screen support for AOR AR5000/5000+3, AR3000A, ICOM IC-R7100, IC-R8500, IC-R9000 and 'Other' companion radio.



Briefly... the SDU5500 adds a variety of features to extend your receiver's capabilities, such as visually identifying new active frequencies and taking measurements. The SDU5500 may be used with a number of receivers (which have a 10.7 MHz I.F. output) and provides a bandwidth up to ± 5 MHz in 1 kHz increments with a resolution of 5 kHz or 30 kHz.

SDU5500 £799

m LW - MW - HF - VHF - UHF : Base, Mobile, Hand-portable

*lists for the enthusiast - leading to products which bring **you** more features & facilities.*

AOR

The magnificent 7030 - *the AR7030 short wave receiver*

The AR7030 is now in its 4th year of production and we are just gearing up for another manufacturing run of this popular performance trendsetting short wave receiver. There have been many new entries by competitors since the launch of the AR7030, some feature DSP but cannot match the shear performance standards of the AR7030 for dynamic range (greater than 100dB even in AM), massive positive IP3 (typically greater than +30dBm) and low noise reciprocal mixing (better than -158dBc/Hz)... internationally and independently recognised as being in 'a class of its own'. The balance between high performance and value for money is excellent. Awarded receiver of the year 1996/97 by WRTH and consistently awarded 5 stars by WRTH and Passport to World Band Radio in every edition with Passport nominating it as the Editor's choice.

Now is your chance to own a NEW AR7030 at an even more affordable price. As we move between production runs, a small number of units fall outside of our high 'cosmetic' standards... we like to consider the AR7030 as 'a work of art'. Specifically small areas of PCB pealable mask have lifted during the manufacturing process, while this has no impact on performance or long term reliability, it detracts slightly from the beauty should you venture under the cabinet! Small mechanical imperfections exist on the case parts for these units although you would have to look very carefully to note them. Specifically there are SEVEN UNITS which must go at a bargain price, they are cosmetically **'B grade'** but performance is most definitely 'A grade'. Six are standard **AR7030 £549.00** and one is an **AR7030 PLUS £649.00**, prices include VAT and they can be shipped to a UK mainland address at no extra cost. This offer is strictly limited to SEVEN specific units only and is not available via dealers, direct orders only, no returns will be considered. They are NEW UNITS (not returns or pre-owned) and are covered by a 12 month warranty.

You are not seeing double (or seven fold), the individually measured performance figures (in our UK workshop) quoted against the pictures confirm the sets high performance and consistency. *(Usual RRP is £799.00 & £949.00 inc VAT respectively).*

AR7030: IP2 +82dBm, IP3 +32dBm

AR7030: IP2 +82dBm, IP3 +32dBm

AR7030: IP2 +80dBm, IP3 +30dBm

AR7030: IP2 +77dBm, IP3 +32dBm

AR7030: IP2 +84dBm, IP3 +34dBm

AR7030: IP2 +83dBm, IP3 +32dBm

AR8200

Probably the most full featured hand portable all mode receiver ever! *Shown here with the optional slot cards* ***£399***

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

AR7030 PLUS: IP2 +86dBm, IP3 +35dBm

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■ E-MAIL: greg@pcug.org.au

Bandscan Australia

This time I have news of the sale of national transmission facilities to a UK company, the battle to sell more of Australia's national telecommunications company, the digital television saga and more on government radio networks, including a Sydney 2000 Olympics story. I also have some news of police radios, some reception reports and a few other items of news.

Transmission Agency

I reported last time that the Government had finally pushed through legislation to sell the National Transmission Agency (NTA). The NTA network has 1700 transmitters spread over 550 transmission sites. I reported then that the sale was expected to yield $300 million (about £117 million). As it turned out, the NTA went for $650m (£254m) to a company called NTL Australia. The sale was scheduled to be completed during May 1999, at which time NTL Australia took over operations of the network. The Government says that all existing services for the Australian Broadcasting Corporation (ABC) and the Special Broadcasting Service (SBS) will continue at current levels of service. It claims that community broadcasters, emergency service operators, self help transmission groups and commercial broadcasters in remote areas will be protected by the sale arrangements.

NTL Australia is reported here to be a subsidiary of a UK parent company (*which is itself a multinationally owned organisation* - **Ed.**), which provides analogue commercial television transmission services for three of the five UK national channels. It is also reported that this company's digital television network experience in the UK will make a significant contribution to the future roll-out of digital broadcasting services across Australia.

Telecommunications

As I have reported before, the Government is keen to fully privatise what was once the national telecommunications carrier, Telstra. To date one-third has been sold, and the Government believes it can secure the parliamentary numbers to sell a further 16.6% to make 49.9% in private hands. As part of that process, the Government is promising benefits to regional and remote Australia, where people feel they will be less well served by a privatised Telstra. One such promise is the so-called Television fund of $120m (£47m), which the Government says will be allocated to improve television reception throughout Australia. This includes the promise to extend SBS services to all communities with 10000 or more people, and to eliminate an estimated 250 transmission black spots.

The latest in a series of announcements while the debate still rages, is that $10m (£4m) will provide a second terrestrial commercial television signal to broadcast self-help communities. According to the Government, these funds are to subsidise two-thirds of the cost of additional transmitter and satellite decoders. The self-help scheme was instituted to enable small communities to buy and operate their own transmitters, so they could get access to broadcasting services faster than the Government or commercial operators could provide them in remote areas. The Government says such promises do not amount to bribes to the bush to get the Telstra sale legislation passed.

Any move by the Government to sell more of Telstra is dependent upon the Australian Senate to pass the appropriate legislation. Here the Government has a difficulty. If the legislation is not presented to the Senate before 1 July this year, it will almost certainly be rejected by what will then be a hostile Senate. Before that date it has a better chance, but the passage of any legislation, even then, depends crucially on the vote of Tasmanian Senator Harradine. The Senator is well known for his strong views on the family and on the depiction of sex and nudity on television. In this situation some commentators are not surprised that the Government has begun to introduce a range of measures via the Australian Broadcasting Authority (ABA) to restrict even further the level of violence, sex and nudity which can be shown on our screens. The ABA site is at **www.aba.gov.au**

Government Networks

The sorry saga of Australian Government Radio Networks (GRN) does not seem to go away. As I have reported previously, the New South Wales (NSW) Government has chosen a GRN based on Motorola technology. In addition, the Sydney Olympic Games Organising Committee (SOCOG) has chosen a Motorola Astro system to be compatible with the GRN. However, a report in a Sydney newspaper, quoting from what it claims is a leaked report, says that the decision for this Motorola system will cost $4m (£1.6m) more than another system based on the European Tetra format that was originally under consideration. The report says that the SOCOG system will be handed over to the NSW Government on the completion of the 2000 Olympic Games, but that the existing GRN will need a $9m (£3.5m) upgrade to move it from its existing analogue format to make it compatible with the digital Astro format. The Minister responsible for the Olympics is quoted as saying that it was "the right decision regardless of what any expert says". I couldn't possibly comment on that.

The South Australian Government radio network has been in the news again. This time it has been reported that the budget had blown out a further $87m (£34m) from the original $60m (£23m). The Government has confirmed that it would need to spend an additional $60m on extra mobile terminals and training as well as another $27m (£10.5m) on contingencies. The final contract price is now $160.3m (£62.5m) and has been awarded to Telstra to design, construct and operate the system around the Motorola technology.

Police Radio

Meanwhile, the Australian Federal Police who, among other things, police Canberra and the Australian Capital Territory, have been having difficulties with their new digital radio network. Police union officials are quoted as saying that no officer has faith in the new radio system, and express concern for the safety of their members. Difficulties have included breakdowns and black-outs, and the difficulties of signals reaching all parts of Canberra's hilly terrain.

In NSW the Police Commissioner has been quoted as being concerned that police frequencies are freely available in lists which can be bought from bookshops and newsagencies or downloaded from the Internet. He is also concerned that transceivers capable of transmitting on police frequencies can be purchased in radio and electronics shops. He has called for a review of the police radio network.

Digital Television

Digital television is in the news again, with one large newspaper conglomerate complaining that the Government's approach may move Australia into a technological backwater. They argue that the Government is being pressed by existing commercial free to air broadcasters to adopt a digital standard for set to boxes which will be unnecessarily expensive and which limit the uptake and expansion of datacasting services such as the newspapers can provide.

Reception Reports

Martin Goodey from the Isles of Scilly reports that Radio Australia (RA) is reliable on 9.500MHz at around 2000UTC with SINPO up around 44544. He also reports good reception of RA on 17.750MHz at 0745UTC and 15.415MHz at around the same time. Martin can hear Radio New Zealand at 9.700MHz in the mornings, and reports pulling in the Australian domestic short wave station VL8K in the Northern Territory on 5.025MHz at 2145UTC. VL8K transmits from Katherine at 5.025MHz during local nights. Martin Goodey runs an AOR AR7030 with a 30m long wire antenna.

Rabb McArthur from Cumbria reports dragging in RA on 9.496MHz at 1920UTC at good strength. Rabb is a new listener and a new reader of *SWM*. He runs a DX-394 and a 10m long wire antenna.

Martyn Gardiner from Portsmouth has been active again, reporting strong RA signals into his part of the world and from a temporary base in Gloucester. He says that he heard good RA signals on 9.710MHz at 0800-0900UTC, 9.500MHz at 2025UTC and 17.750MHz from 0800 to 0900UTC. He says that 21.725MHz was readable from 0800-0900UTC, but weaker. Martyn also reports the 9.500MHz signal coming in later at 2000-2130UTC. He listens variously on a Drake R8E, a Lowe HF150 and a JRC NRD-535. He too favours a long wire antenna.

Other News

Australian television content. After an influx of cheaper New Zealand television programs onto Australian screens allowed under Australian content rules, the Government has moved to ensure that the trade agreements with New Zealand permitting such an influx do not extend to content from other countries as well. Australia has a 10% Australian content expenditure quota for free to air and pay television.

Radio Australia (RA) is recording about 300000 hits to its web site every month, in excess of its listening audience, according to one commentator. In particular, people are catching up with RA audio on demand or through live streaming. RA can be found at **www.abc.net.au/ra**

The ABC has been battling with 800000 fans over its decision to move *The Goon Show* from its 1210 Saturday local time slot where it has been running continuously for the past 25 years.

The company AAPT has bid $66.2m (£26m) for spectrum in the 28 and 31GHz bands. These bands are used for Local Multipoint Distribution Services for local loop services, interactive video, high speed Internet and advanced multimedia applications.

I welcome any news and comments. In particular I am interested in any s.w.l. information on Australian stations heard by *SWM* readers, so I can chase up more details and interesting snippets from this end. My address is **PO Box 3307, Manuka, ACT 2603, Australia**. For personal replies, please send two IRCs. Those with an Internet connection can get me at **greg@pcug.org.au**

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

BROADCAST

LM&S

The total eclipse of the Sun during the morning of August 11 could be of special interest to listeners in the UK who enjoy searching the long and medium wave broadcast bands, because the transmissions from some quite distant stations may arrive here during the event! Perhaps my brief description below of the propagation modes in these bands under normal circumstances will explain why this may happen.

During daylight, only the radio waves which leave the transmitting antenna at low angles can reach a point of reception. They travel over the surface of the ground, consequently they are called 'ground waves'. As they do so, they lose energy, i.e. become attenuated. Any waves that leave at higher angles travel upwards towards the Ionosphere, where they are absorbed by the lowest (D) layer, which is highly ionised by the radiation from the Sun.

After sunset, the D-layer quickly disappears to expose the next higher 'E' layer. This acts like a giant mirror in the sky and reflects the high angle 'sky waves' back towards Earth. They may land inside or well beyond the area covered by the ground waves.

The ground waves from distant m.w. stations in Europe and N.Africa are usually too weak to be received here, but if the D-layer becomes sufficiently de-ionised during the eclipse, the sky waves from some stations may reach the UK! If you intend to search for them, may I suggest that you start by making a list of the stations that you can receive before the event, e.g. at 0800UTC. You will then be able to refer to that list when you search the band during the eclipse (approx 1015UTC) and make a note of any additional stations that you receive. Repeat the search later. By 1200UTC reception may have returned to normal. The details of your findings would be very welcome here for inclusion in LM&S.

WARNING: DO NOT LOOK AT THE SUN OR THE ECLIPSE THROUGH BINOCULARS OR A TELESCOPE.

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 March.

The sky waves from the Radiotelevisione Italiana (RAI) 10kW outlet at Caltanissetta, Italy, on **189kHz**, were picked up at 2040UTC on March 31 by **Fred Pallant** in Storrington. For some twenty minutes he listened to a discussion, which involved three or four people speaking in Italian. The transmission rated SINPO 12452.

A broadcast of light classics by Rikisutvarpid in Reykjavik was received via their W.Iceland station at Gufuskalar on **189kHz** by **Simon Hockenhull** in E.Bristol at 0020UTC. The 300kW transmission from Gufuskalar was also picked up at night by **Ernie Strong** in Ramsey (Cambs). He logged it as 22242.

Medium Wave Reports

Judging by the reports from DXers, the reception at night during March of m.w. broadcasts from stations in E.Canada and E.USA was largely a non-event! Despite careful checks, **Robert Connolly** (Kilkeel) drew a blank until the 17th when two stations were heard - CHAM in Hamilton, ON on **820kHz** at 0230 (SINPO 22332) and WCMQ Maimi Springs, FL on **1700** at 0240 (22332).

The 29th proved to be favourable for **David Edwardson** in Wallsend. At 0015 he heard VOCM in St.John's, NF on **590** (SINPO 25542) with pop music and their ident 'VOCM 590'. At 0030 he tuned to CJYQ in St.John's, NF on **930** (25552) with 'Classic hits 93' and then moved on up the band to **1510**, where he found WNRB in Boston, MA (23442) with a talk and station ident. At 0626 he listened to a Frank Sinatra recording and adverts, which came from WQEW in New York, NY, on **1560** (25552). No doubt the giant (2.5 x 2.5m) fixed m.w. loop which David used ahead of his Trio R-600 receiver plus m.w. converter was a key factor in his success.

Broadcasts from some of the many m.w. stations in the Middle East, Africa, Europe and Scandinavia were received by the listeners who searched the band after dark - see chart. Reception from some stations in N.Africa was reported as 'fairly good' by **George Millmore** (Wootton, IoW).

During a visit to the Canary Is., **Mark Holloway** searched the band at night with a Sony portable plus random wire antenna. He found that BBC Radio 5 Live on **693** and **909kHz** could be received every night from about 2300UTC. Reception varied from SIO 222 to 333.

Whilst searching the band for broadcasts from distant local radio stations, **Brian Keyte** (Gt.Bookham) noticed that the early morning news service for listeners in NW.Wales via Wrexham on **657kHz** had been restored to normal (see LM&S, May '99 *SWM*).

Short Wave Reports

The propagation conditions in the **25MHz (11m)** band are being put to good use by another broadcaster! R.France International is now beaming to Africa on **25.820** (Fr 0900-1300). So far, there have been no reports to indicate how well their daily transmissions are being received in that country, but they have been reaching some areas of the UK via back scatter. They were rated 15433 at 0928 by **Richard Reynolds** in Guildford; 35333 at 1000 by **John Slater** in Scalloway, Shetland; 35543 at 1038 in Wallsend; also 25332 at 1050 in Storrington.

The broadcasts from R.Budapest, Hungary on **25.700** (Hung to Australia 1100-1200) have also been received in the UK. They were rated 22322 at 1100 by **Vic Prier** in Colyton; 15221 at 1153 in E.Bristol. Over in E.Canada, **Alan Roberts** (Quebec) received them faintly on two occasions, but at 1125 on March 23 they peaked a remarkable 45333.

Quite a few broadcasters are now using the **21MHz (13m)** band to reach listeners in selected areas. During the morning they include the BBC via Rampisham, UK, **21.830** (Eng to M.East? 0700-1300), rated 55555 at 0830 by **Bernard Curtis** in Stalbridge; R.Austria Int, Moosbrunn **21.765** (Eng to Australia 0830-0900) 34333 at 0835 by **Sheila Hughes** in Morden; R.Australia via Shepparton **21.725** (Eng to Pacific areas 0600?-0858) 24432 at 0840 in Colyton; DW via Kigali, Rwanda **21.560** (Ger to Africa 0800-0955) 23323 at 0900 by **Gerald Guest** in Dudley; RFI via Issoudun **21.620** (Fr to E.Africa 0900-1200) 43333 at 1020 by **Eddie McKeown** in Newry; RAI Rome **21.520** (It to Africa 0600-1300) 44444 at 1025 by **Thomas Williams** in Truro;

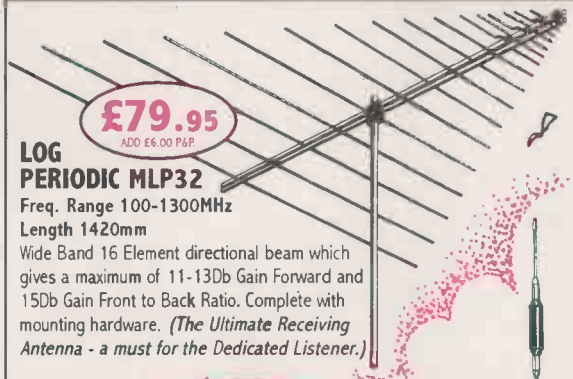
Long Wave Chart

Freq (kHz)	Station	Country	Power (kW)	Listener
153	Bechar	Algeria	1000	F,H*
153	Donebach DLF	Germany	500	A,C,D,E,F,G,H*,I,J
162	Allouis	France	2000	A,C,D,E,F,G,H*,I,J
171	Nador Medi-1	Morocco	2000	F,H*
171	B'shakovo etc	Russia	1200	A,C*,E,F,J
171	Lvov	Ukraine	500	C*,H*
177	Oranienburg	Germany	500	A,E,F,G,H*,J
183	Saarlouis	Germany	2000	A,C,D,E,F,G,H*,I,J
189	Gufuskalar	W.Iceland	150	B*,H*
189	Caltanissetta	Italy	10	F*
189	Tbilisi	Georgia	500	H*
198	Droitwich BBC	UK	500	A,C,D,E,G,H*,I,J
207	Munich DLF	Germany	500	A,B*,C,E,F,G,H*,I,J*
207	Eidar	E.Iceland	100	B*
207	Azilal	Morocco	800	F
216	Roumoules RMC	S.France	1400	A,C,D,E,F,G,H*,I,J
225	Raszyn Resv	Poland	?	A,B*,C*,E,F,H*,J*
234	Beidweiler	Luxembourg	2000	A,D,E,F,H*,I,J
243	Kalundborg	Denmark	300	A,B,C*,D,E,F,H*,I,J
252	Tipaza	Algeria	1500	C*
252	Atlantic 252	Eire	500	A,C*,D,E,F,G,H*,I,J
261	Burg(R.Ropa)	Germany	85	C*,D,E,F,H*,I,J*
261	Taldom Moscow	Russia	2500	H*
270	Topolna	Czech Rep	1500	C*,D,E,F,H*,J*
270	Novosibirsk	Siberia	150	H*
279	Sasnovy	Belarus	500	C*,E,F,H*,J*

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

Listeners:-
(A) Martin Dale, Stockport.
(B) Simon Hockenhull, E.Bristol.
(C) Sheila Hughes, Morden.
(D) Frank Miles, SW London.
(E) George Millmore, Wootton, IoW.
(F) Fred Pallant, Storrington.
(G) Tom Smyth, Co.Fermanagh.
(H) Ernie Strong, Ramsey, Cambs.
(I) Phil Townsend, E.London.
(J) Fred Wilmshurst, Northampton.

MOONRAKER ANTENNA SPECIALISTS



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LOG PERIODIC MLP32

Freq. Range 100-1300MHz
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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SUPER SCAN STICK

Freq. Range 0-2000MHz
Length 1000mm
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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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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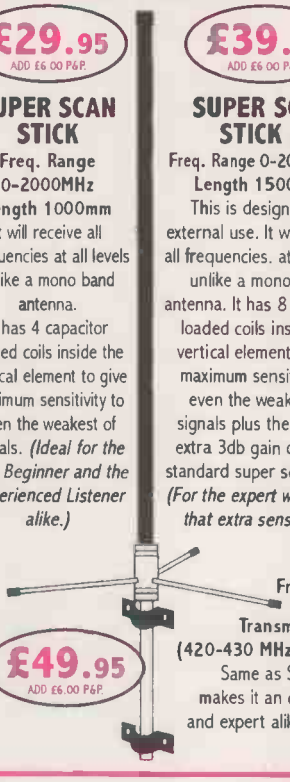
MULTISCAN STICK

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).*



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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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This Antenna is designed for external use to receive weather satellite signals. Complete with mounting hardware.

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Length 720mm
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(Ideal for Desk Top Use.)

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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.
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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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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)

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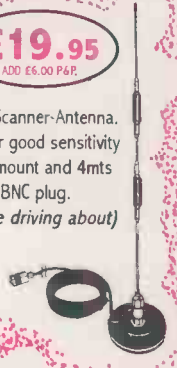

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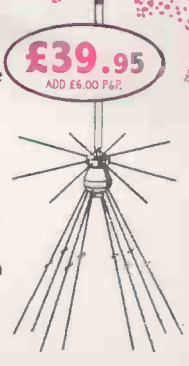
SWP 2000

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.)*

£39.95 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.)*



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.)*

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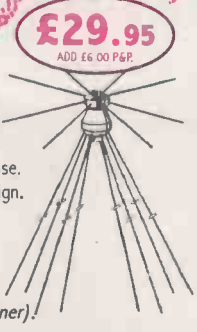

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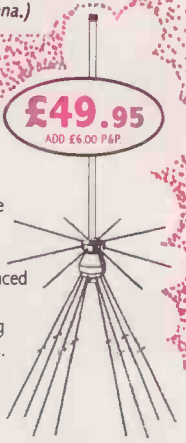
DISCONE

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



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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.)

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BSKSA Saudi Arabia **21.495** (Ar [Holy Quran] to SE.Asia 0900-1200) 44343 at 1045 by **Norman Thompson** in Oadby.

After mid-day, the BBC via Ascension Is **21.660** (Eng to Africa 1100-1700) was rated SIO 222 at 1200 by **Tom Smyth** in Co.Fermanagh; R.Sweden, Stockholm **21.810** (Eng to Australia, SE.Asia 1230-1300) 35433 at 1240 in E.Bristol; R.Portugal Int via Sines **21.655** (Port to Brazil 1200?-2200?) 23322 at 1305 in Kilkeel; UAER, Dubai **21.605** (Eng to Eur 1330-1350) 53433 at 1345 by **Stan Evans** in Herstmonceux; HCJB Quito, Ecuador **21.455** (Eng [u.s.b. + p.c.] to N/S.America 1200-1600) 45444 at 1400 by **Ernest Wiles** in Bedford; Channel Africa via Meyerton, S.Africa **21.530** (Eng to Africa 1300-1455? Sat/Sun) 44444 at 1426 by **Martin Goodey** in St.Mary's, Is of Scilly; Voz Christiana, Chile **21.500** (Sp to N.America 1100-2100) SIO 211 at 1541 by **Philip Rambaut** in Macclesfield; BBC via Ascension Is **21.490** (Eng to C.Africa 1500-1645) 44444 at 1606 by **David Hall** in Morpeth; UAER, Dubai **21.605** (Eng to Eur 1600-1640) 45444 at 1625 by **Fred Wilmshurst** in Northampton; REE via Noblejas **21.570** (Sp to S.America? 1500-1830?) 35553 at 1640 in Wallsend; WYFR via Okeechobee, USA **21.525** (Eng, Fr, Port to Eur, Africa 1600-2030) 44343 at 1703 by **John Eaton** in Woking; VOA via ? **21.485** (Port to Africa 1730-1830) 35443 at 1730 in Storrington; Voz Christiana, Chile **21.550** (Sp to N.America 2030-?) 35333 at 2129 by **Darren Beasley** in Bridgwater; R.For Peace Int, Costa Rica **21.460** (Eng [u.s.b] to Americas) 24322 at 2202 by **Rhoderick Illman** in Oxted.

The occupants of the **18MHz (15m)** band now include R.Sweden, Stockholm, Their transmission on **18.960** (Sw to ? 1030-1100, Eng to N.America 1130-1200) was rated 44444 at 1030 in Scalloway. Also noted was Christian Science Broadcasting via WSHB Cypress Creek, USA on **18.910** (Fr, Eng to E/C.Africa 1600-2000), rated 54444 at 1700 in Stalbridge.

Broadcasts from many areas may be received in the **17MHz (16m)** band. Before noon they include the BBC via Nakhon Sawan, Thailand **17.790** (Eng to Asia 0600-0900), rated 44554 at 0655 by **John Parry** in Larnaca, Cyprus; R.New Zealand Int **17.675** (Eng to Pacific areas 1950-0705) 33323 at 0658 in Morpeth; R.France Int via ? **17.650** (Fr to Africa 0600-0700) SIO 555 at 0700 by **Frank Miles** in SW.London; R.Australia via Shepparton **17.715** (Eng to Asia? 2100?-0800?) 25532 at 0706 in Wallsend; R.Australia via Shepparton **17.750** (Eng to Asia 0600-1000?) 45544 at 0710 in Herstmonceux; BBC via Ascension Is **17.830** (Eng to Africa 0700-2100) 33232 at 0900 in Oadby; AIR via Bangalore **17.387** (Eng to Pacific areas 1000-1100) 24222 at 1018 in Newry; Africa No.1, Gabon **17.630** (Fr to W.Africa 0700-1100, 1200-1600) 25332 at 1052 in Storrington; R.Pakistan, Islamabad **17.835** (Eng to Eur 1100-1120) 44444 at 1113 by **Martin Venner** in St.Austell; R.Bulgaria, Sofia **17.500** (Eng to Eur 1100-1200) 55555 at 1115 in Bridgwater; Israel R, Jerusalem **17.545** (Heb [Home Sce rly] to W.Eur, N.America 0700-1455) 44434 at 1125 in Colyton.

After mid-day R.Romania Int **17.720** (Eng to Eur, N.America 1300-1356) was 54454 at 1300 in Storrington; BBC via Ascension Is **17.830** (Eng to W/C.Africa 0700-2100) 13231 at 1420 in E.Bristol; Israel R, Jerusalem **17.535** (Eng to Eur, N.America 1400-1430) 45444 by **Tony Hall** in Freshwater Bay, IoW; WYFR Okeechobee, USA **17.555** (Eng to Eur 1600-1945?) 44444 at 1607 by **Tom Winzor** in Plymouth; VOA via Morocco **17.895** (Eng to Africa 1600-1900) 45555 at 1620 in Northampton; RFI via Fr.Guiana **17.575** (Sp to America 1600-1630) SIO 343 at 1622 in Woking; Voz Christiana, Chile **17.860** (Sp to N.America 2030-?) 34533 at 2111 in St.Mary's, IoS; RCI via Sackville **17.820** (Fr, Eng to Eur, Africa 1900-2200) 33333 at 2140 in Truro; VOA via ? **17.725** (Eng to Africa 2000?-2200?) 34333 at 2157 in Oxted.

Noted in the **15MHz (19m)** band during the early morning were the BBC via Masirah Is, Oman **15.310** (Eng to S.Asia 0300-0800), rated 25542 at 0537 in Wallsend; BBC via Skelton & Rampisham, UK **15.565** (Eng to Russia, Eur 0600-1500) 44433 at 0745 in Herstmonceux; BBC via Ascension Is **15.400** (Eng to Africa 0800-1130) SIO323 at 0800 in Co.Fermanagh; KTWR Guam **15.330** (Eng to Asia 0800-0930) 24232 at 0832 by **Vera Brindley** in Woodhall Spa; R.Australia via Shepparton **15.415** (Eng to Asia 0100-0400, 0600-0900) 34523 at 0840 in Colyton; R.France Int via Issoudun? **15.300** (Fr, Eng 0700-1900) 34433 at 0924 in Oxted; Swiss R.Int via Sottens? **15.315** (Eng, Ger, Fr, It to Eur 1000-1230) 33333 at 1000 in Truro; R.Bulgaria, Sofia **15.700** (Ger, Eng to W.Eur 1000-1200) 54444 at 1139 in Plymouth.

During the afternoon R.Romania Int **15.390** (Eng to Eur 1300-1356) was rated 54454 at 1300 by **Robert Shacklock** in Westwood, Notts; R.Romania Int **15.445** (Eng to N.America? 1300-1356) was 43333 at 1315 in Stalbridge; Voice of Turkey **15.295** (Eng to Eur, Asia, Pacific? 1330-1425) 43232 at 1334 in Newry; BBC via Seychelles **15.420** (Eng to Africa 1300-1700) 32333 at 1345 in Bedford; RCI via Sines, Portugal **15.325** (Eng, Fr to Eur, M.East, Africa 1330-1500) 55534 at 1430 in E.Bristol; VOA via Greece? **15.205** (Eng to M.East, Asia 1530-1800) was rated 43334 at 1550 by **Martin Dale** in Stockport; R.Algiers Int, via Bouchaoui **15.160** (Eng, Sp to Eur, M.East, N.Africa 1600-1800?) 45444 at 1608 in Freshwater Bay, IoW; BBC via Masirah Is, Oman **15.310** (Eng to S.Asia 1400-1700) SIO 343 at 1629 in Woking.

Later, R.Japan via Moyabi, Gabon **15.355** (Eng to Africa 1700-1800) was 33433 at 1709 in Bridgwater; Africa No.1,

Local Radio Chart

Freq (kHz)	Station BBC	ILR	e.m.r.p (kW)	Listener
558	Spectrum, London	I	0.80	B,C,E,F,G,J,M
585	R.Solway	B	2.00	A
603	Capital G,Litt'brne	I	0.10	D*,E,F,G,J,K,L,M
630	R Bedfordshire(3CR)	B	0.20	B,C,D*,E,G,J,K,L,M
630	R.Cornwall	B	2.00	A,G,K
657	R.Clwyd	B	2.00	A,E,G,J,K,L
657	R Cornwall	B	0.50	A,G
666	Westward R, Exeter	I	0.34	C,E,G,J,K,M
666	R.York	B	0.80	A,B,E,J
729	BBC Essex	B	0.20	B,E,G,J,L,M
738	Hereford/Worcester	B	0.037	B,C,E,J,K,L,M
756	R.Cumbria	B	1.00	A,E,H,K
756	The Magic 756,Powys	I	0.63	B,E,G,J,K,M
765	BBC Essex	B	0.50	B,C,E,F*,G,J,K,M
774	R.Kent	B	0.70	E,G,J,K,L,M
774	R Leeds	B	0.50	A,B,J
774	Cl.Gold 774, Glos	I	0.14	A,B,E,G
792	Cl.Gold 792 Bedford	I	0.27	B,E,J,L,M
792	R.Foyle	B	1.00	A
801	R.Devon & Dorset	B	2.00	A,B,C,E,G,J*
828	Cl.Gold 828, Luton	I	0.20	E,J,L,M
828	Magic 828, Leeds	I	0.12	B
828	Asian Netwk Sedgley	B	0.20	B,K
828	2CR CG, Bournemouth	I	0.27	G
828	Townland R, Ulster	I	0.80	A
837	R.Cumbria/Furness	B	1.50	A
837	Asian Netwk Leics	B	0.45	B,E,G,J,K,L,M
855	R Devon & Dorset	B	1.00	A,G,K
855	R Lancashire	B	1.50	A,B,K
855	R Norfolk, Postwick	B	1.50	E,J,L
855	Sunshine 855,Ludlow	I	0.15	B,C,E,K,M
873	R.Norfolk, W Lynn	B	0.30	B,E,G,J,K,L,M
936	Brunel CG, W.Wilts	I	0.18	E,G,J,M
936	Yks Dales R, Hawes	I	1.00	A,B,E
945	Cl.Gold GEM, Derby	I	0.20	A,B,E*,K,M
945	Capital G, Bexhill	I	0.75	D*,E,G,J,K,L
954	Westward R, Torquay	I	0.32	E,G
954	Cl.Gold 954, H'ford	I	0.16	B,C,E,J,K,M
963	Asian Sd, E.Lancs	I	0.80	A,B
963	Liberty R, Hackney	I	1.00	E,G,J,M
972	Liberty R, Southall	I	1.00	B,C,E,G,J,M
990	R.Devon, E.Devon	B	1.00	A,E,G
990	Magic AM,Doncaster	I	0.25	B,E,J
990	Cl.G, Wolverhampton	I	0.09	B,E,J,M
999	C.Gold GEM Nott'ham	I	0.25	B,E,J,M
999	Red Rose 9-99 P'stn	I	0.80	A,B
999	R.Solent	B	1.00	C,E,G
999	Valley R, Aberdare	I	0.30	C
1017	Cl.G, Shrewsbury	I	0.70	A,B,C,E,K,L,M
1026	R Cambridgeshire	B	0.50	B,C,E,J,K,L,M
1026	Downtown R, Belfast	I	1.70	A,I
1026	R.Jersey	B	1.00	C,G
1035	RTL Country 1035	I	1.00	C,E,G,J,M
1035	R.Sheffield	B	1.00	B
1035	N.Sound 2, Aberdeen	I	0.78	A,E*
1116	R.Derby	B	1.20	A,B,E,J,K,L,M
1116	R.Guernsey	B	0.50	A,E,G
1116	Valley R, Ebbw Vale	I	0.50	C
1152	Cl.G Amber, Norwich	I	0.83	J
1152	LBC 1152 AM	I	23.50	E,G,J
1152	Pic'ly 1152,Manch'r	I	1.50	A,B
1152	Cl.G, Birmingham	I	3.00	M,K
1161	R Bedfordshire(3CR)	B	0.10	D*,E,J,K,L,M
1161	Brunel Cl.G,Swindon	I	0.16	E,G
1161	Magic AM,Humberside	I	0.35	A,B
1161	Southern Counties R	B	1.00	E,G
1161	Tay AM, Dundee	I	1.40	E*,J*
1170	Cl.G Amber, Ipswich	I	0.28	J
1170	GNR, Stockton	I	0.32	A
1170	Capital G,Portsm'th	I	0.50	E,G
1170	Signal 2,Stoke-on-T	I	0.20	B
1170	1170AM,High Wycombe	I	0.25	D,E,J,L,M
1242	Capital G,Maidstone	I	0.32	D*,E,G,L
1251	C.G Amber,Bury StEd	I	0.76	A,B,E,J,L
1260	Brunel CG, Bristol	I	1.60	G
1260	Marcher G, Wrexham	I	0.64	B
1260	SabrasSnd,Leicester	I	0.29	B,J,K,M
1260	R York	B	0.50	A
1278	Cl.Gold 1278 W.York	I	0.43	B,J
1296	Radio XL,Birmingham	I	5.00	B,D,E,G,J,M
1305	Magic AM,Barnsley	I	0.15	A,B
1305	Premier via ?	I	0.50	E,G,J,M
1305	Touch AM, Newport	I	0.20	G
1323	Capital G,Southwick	I	0.50	E,G,L
1323	SomersetSnd,Bristol	B	0.63	A
1332	Premier, Battersea	I	1.00	E,G
1332	Cl.Gold 1332,Pt'bo	I	0.60	A,B,E,I,J,M
1332	Wiltshire Sound	B	0.30	B,E,G
1359	The Breeze,Chelms'd	I	0.28	B,E
1359	Cl.Gold 1359, C'try	I	0.27	B,E,J,M
1359	R.Solent	B	0.85	E,G,J*
1368	R.Lincolnshire	B	2.00	B,E,J,M
1368	Southern Counties R	B	0.50	B,E,G,L
1368	Wiltshire Sound	B	0.10	G
1377	Asian Sd, Rochdale	I	0.10	B,E*
1413	R.Gloucester via ?	B	?	E,M
1413	Premier via ?	I	0.50	E,G
1413	Yks Dales R,Skipton	I	0.10	A,B
1431	The Breeze,Southend	I	0.35	B,E,L
1431	Cl.Gold, Reading	I	0.14	B*,E,G,J,M
1449	R.Peterboro/Cambs	B	0.15	A,E,G,J,M
1458	R.Cumbria	B	0.50	A
1458	R.Devon & Dorset	B	2.00	A,E,G
1458	1458 Lite AM Manch'	I	5.00	B,I
1458	Sunrise, London	I	50.00	E,G,J,M
1458	Asian Netwk Langley	B	5.00	J,M
1476	CountySnd,Guildford	I	0.50	B,E,G,L,M
1485	Cl.Gold, Newbury	I	1.00	C,E,M
1485	R.Humberside (Hull)	B	1.00	B,J*
1485	R.Merseyside	B	1.20	A,B,D*,G
1485	Southern Counties R	B	1.00	E,G
1503	R.Stoke-on-Trent	B	1.00	A,B,C,E,G,M
1521	Heartbeat 1521AM,NI	I	0.50	A,B,I
1521	Fame 1521, Reigate	I	0.64	B,D*,E,G,J,L
1530	R.Essex, Southend	B	0.15	E,G,J,L
1530	Cl.Gold W.Yorks	I	0.74	A,B,D*,J
1530	Cl.Gold Worcester	I	0.52	E,G,M
1548	R.Bristol	B	5.00	E,G
1548	Capital G, London	I	97.50	E,G,J
1548	Magic AM,Merseyside	I	4.40	A,B,I
1548	Cl.Gold, Sheffield	I	0.74	B
1557	R.Lancashire	B	0.25	A,B,D*
1557	Mellow, Clacton	I	0.125	E,L
1557	Cl.Gold 1557,N.hant	I	0.76	B,E,J,M
1557	Capital G, So'ton	I	0.50	G
1584	London Turkish R	I	0.20	E,J
1584	R.Nottingham	B	1.00	B,E
1584	R.Shropshire	B	0.50	A,B,E
1584	Tay, Perth	I	0.21	E
1602	R.Kent	B	0.25	B,E,G,J,L

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

Listeners -

(A)	Robert Connolly, Kilkeel.
(B)	Martin Dale, Stockport.
(C)	Simon Hockenhull, E.Bristol.
(D)	Sheila Hughes, Morden.
(E)	Brian Keyte, Bookham.
(F)	Frank Miles, SW London.
(G)	George Millmore, Wootton, IoW.
(H)	Clare Pinder, Glasgow.
(I)	Tom Smyth, Co Fermanagh.
(J)	Ernie Strong, Ramsey, Cambs.
(K)	Norman Thompson, Oadby.
(L)	Phil Townsend, E.London.
(M)	Fred Wilmshurst, Northampton.

Gabon **15.475** (Fr to W.Africa 1600-1900) 34433 at 1800 by **Ross Lockley** in Galashiels; VOIRI Tehran, Iran **15.084** (Home Sce relay) 55555 at 1907 in Storrington; BBC via Ascension Is **15.400** (Eng to Africa 1500-2300) 55544 at 1940 in Northampton; WWCR Nashville, USA, **15.685** (Eng to N.America, Eur 1100-2200) 45544 at 2131 in St.Mary's IoS; R.Taipei Int via WYFR **15.600** (Eng to Eur 2200-2300) 44444 at 2215 in Morden.

In the **13MHz (22m)** band UAER, Dubai **13.675** (Eng to Eur 1030-1055) was 43333 at 1030 in Morden; R.Austria Int via Moosbrunn **13.730** (Eng to Eur, N.America 1230-1300) 32222 at 1230 in Truro; RCI via Sackville **13.650** (Eng to USA, Caribbean 1300-1400 [1300-1600 Sun]) SIO 444 at 1300 in Co.Fermanagh; WWCR Nashville, USA **13.845** (Eng to Africa 1400-0000) 34333 at 1658 in Oxted; AIR via Bangalore **13.780** (Eng to NW.Africa 1745-1945) SIO 444 at 1833 in Macclesfield; DW via Sines? **13.790** (Eng to W.Africa 1900-1950) 34433 at 1941 in Bridgwater; R.Havana Cuba **13.720** (Eng to Eur 2030-2130) 22222 at 2030 by **Clare Pinder** in Appleby; RCI via Sackville, Canada **13.650** (Fr, Eng to Eur, Africa 1900-2200) 55545 at 2130 in E.Bristol; R.Damascus, Syria **13.610** (Eng to N.America? 2105-2205) 44333 at 2140 in Newry.

In the **11MHz (25m)** band R.Finland via Pori **11.755** (Fin to Eur) was 55444 at 1005 in Truro; BBC via Kranji, Singapore **11.765** (Eng to Asia 0900-1100) 35433 at 1032 in Northampton; HCJB Quito, Ecuador **12.005** (Eng to N.America 1100-?) 33333 at 1100 in Scalloway; R.France via Gabon? **11.910** (Eng to M.East, Africa 1400-1500) was 44333 at 1400 in Morden; R.Australia via Shepparton **11.660** (Various to Asia 1430?-1700) 34444 at 1455 in Woking; R.Jordan via Al Karanah **11.690** (Eng to W.Eur, E.USA 1100-1730) 54544 at 1515 in Herstmonceux; R.Pakistan, Islamabad **11.570** (Eng to M.East 1600-1630) 44344 at 1606 in Freshwater Bay, IoW.

Later, R.Nederlands via Flevo **11.655** (Eng to Africa 1730-

Medium Wave Chart

Freq (kHz)	Station	Country	Power (kW)	Listener
520	Hof/Wurzburg (BR)	Germany	0.2	F*
531	Torshavn	Faeroe Is.	100	E
531	Berg	Germany	20	F*,H,L*
531	Beromunster	Switzerland	500	H,N
540	Wavre	Belgium	150/50	A,F*,G,H,L*,N
540	Sidi Bennour	Morocco	600	B*,F*
549	Les Trembles	Algeria	600	A*,B*,F*,H*
549	Thurnau (DLF)	Germany	200	A*,F*,H*,N
549	Krasnyy Bor	Russia	1200	F*
558	Espoo	Finland	100	L*
558	RNE5 via ?	Spain	?	A*,F*
567	Tullamore(RTE1)	Eire	500	A,B*,E,H,K,L*,N,O
567	RNE5 via ?	Spain	?	A*
576	Muhlacker(SDR)	Germany	500	A*,F*
576	Riga	Latvia	500	H*
576	Barcelona(RNE5)	Spain	50	A*,L*
585	Orf Wien	Austria	600	H*
585	Paris(FIP)	France	8	H
585	Madrid(RNE1)	Spain	200	A*,F*,H*,N*
585	Dumfries(BBCScot)	UK	2	F*,K
594	Frankfurt(HR)	Germany	1000/400	A*,F*,H*,N
594	Oujda-1	Morocco	100	H*
594	Muge	Portugal	100	F*
603	Lyon	France	300	B,F*
603	Oradea	Roumania	50	H*
603	Sevilla(RNE5)	Spain	50	A*
603	Newcastle(BBC)	UK	2	E,F*
612	Athlone(RTE2)	Eire	100	A,E,G,H,K,L*,N
612	RNE1 via ?	Spain	10	A*
621	Wavre	Belgium	80	A*,F*,H,N
621	Barcelona(OCR)	Spain	50	F*
630	Vigra	Norway	100	F*,H*
630	Tunis-Djedeida	Tunisia	600	A*,B*,H*
639	Praha(Liblice)	Czech	1500	A*,F*,H*
639	RNE1 via ?	Spain	?	A*,F*,H*
648	RNE1 via ?	Spain	10	A*
648	Orfordness(BBC)	UK	500	A*,C*,E,F*,G*,H,L*,N
657	Napoli	Italy	120	B*
657	Madrid(RNE5)	Spain	20	A*,F*,G*,H*
657	Wrexham(BBCWales)	UK	2	A,B,E,F* N
666	MesskirchRohrd(SWF)	Germany	150	F*
666	Sitkunai(R.Vilnius)	Lithuania	500	F*
666	Lisboa	Portugal	135	A*,F*,H*
666	Barcelona(SER)	Spain	50	A
675	Lopic(R10 Gold)	Holland	120	A*,B,F*,G*,H,K,L*,N
684	Sevilla(RNE1)	Spain	500	F*,H*,N
684	Avala(Beograd-1)	Yugoslavia	2000	F*,H*
693	Tortosa(RNE1)	Spain	2	A
693	Droitwich(BBC)	UK	150	G*,H,L*,N
702	Flensburg(NDR)	Germany	5	F*,H*
702	TWR via Monte Carlo	Monaco	300	F*,L*
711	Rennes 1	France	300	F*,H,N
711	LJB via ?	Libya	50	D*
711	Laayoune	Morocco	600	H*
720	Lisnagarvey(BBC4)	N.Ireland	10	H*,K,L*
720	Norte	Portugal	100	A*,F*
720	Lots Rd,Ldn(BBC4)	UK	0.5	E,G*,H*,N
729	Cork(RTE1)	Eire	10	A,E,F*,H*
729	RNE1 via ?	Spain	?	A*,F*,G*,H*,N*
738	Paris	France	4	H
738	Barcelona(RNE1)	Spain	500	A*,F*,G*,H*
747	Flevo(Hilv2)	Holland	400	A,B,F*,G*,H,N
756	Braunschweig(DLF)	Germany	800/200	F*,H*,L*
756	Bilbao(EI)	Spain	5	F*,H*
756	Redruth(BBC)	UK	2	A*,E,F*
765	Sottens	Switzerland	500	A*,F*,H*
774	Enniskillen(BBC)	N.Ireland	1	F*,K
774	RNE1 via ?	Spain	?	A*,B*,F*,G*,H*,N*
783	Leipzig(MDR)	Germany	100	F*,G*,H*
783	Miramar(R.Porto)	Portugal	100	A*,B*,F*,H*
783	Dammam	Saudi Arabia	100	H*
792	Limoges	France	300	H,L*,N*
792	Lingen(NDR)	Germany	5	F*,H*
792	Sevilla(SER)	Spain	20	H*
792	Londonderry(BBC)	UK	1	F*,K
801	Munchen-Ismaning	Germany	300	A*,C,F*,L*
801	RNE1 via ?	Spain	?	C,F*,H*
810	Volgograd	Russia	150	H*
810	Madrid(SER)	Spain	20	A*,F*
810	Westerglen(BBCScot)	UK	100	A,E,G*,H*,K,N*
819	Batra	Egypt	450	B*,C*,H*
819	Toulouse	France	50	C*,F*
819	S.Sebastian(EI)	Spain	5	H*
828	Rotterdam	Holland	20	F*
828	Barcelona(SER)	Spain	50	A*
837	Nancy	France	200	G
837	COPE via ?	Spain	?	A*,F*,H*
846	Rome	Italy	1200	A*,B*,F*,G,H*,L*
855	Berlin	Germany	100	A*,F*
855	RNE1 via ?	Spain	?	A*,F*,G,H*,L*
864	Santah	Egypt	500	A*,B*,C*,F*,H*
864	Paris	France	300	F,G,H,L*,N
864	Socuellamos(RNE1)	Spain	2	C,H*
873	Frankfurt(AFN)	Germany	150	A*,B*,E,F*,H*
873	Zaragoza(SER)	Spain	20	A*,F*,G,H*
873	Enniskillen(R.U!)	UK	1	E,F*,L*
882	COPE via ?	Spain	?	A*,F*,H*
882	Washford(BBCWales)	UK	100	A,E,F*,H,N
891	Algiers	Algeria	600/300	A*,C*,F*,H*,L*
891	Huisberg	Netherlands	20	F*,K*
900	Brno(CRo2)	Czech Rep	25	H*
900	Milan	Italy	600	A*,B*,F*,L*
900	COPE via ?	Spain	?	F*,H*
909	Lisnagarvey(BBC5)	N.Ireland	10	K
909	B'mans Pk(BBC5)	UK	140	G,H,L*,N
909	M'side Edge(BBC5)	UK	200	A
918	Domzale	Slovenia	600/100	A*,B*,F*,H*,L*
918	Madrid(R.Int)	Spain	20	A*,F*,H*
927	Wolvertem	Belgium	300	A*,B*,F*,G,H,L*,N
927	Nitra	Slovakia	50	F*
936	Bremen	Germany	100	A*,F*,H*
945	Toulouse	France	300	F*,L*
954	Brno (CRo2)	Czech Rep.	200	A*,F*,H*
954	Madrid(CI)	Spain	20	F*,H*
963	Sofia	Bulgaria	150	F*
963	Pori	Finland	600	F*,H*
963	Tir Chonaill	Eire	10	H*,K
972	Hamburg(NDR)	Germany	300	A*,F*,H*,K N*
972	RNE1 via ?	Spain	?	H*
981	Alger	Algeria	600/300	A*,C*,F*,N*
981	Megara	Greece	200	B*
990	Berlin	Germany	300	A*,F*
990	R.Bilbao(SER)	Spain	10	A*,H*
990	Redmoss(BBC)	UK	1	F*
990	Tywyn(BBC)	UK	1	E
999	Schwerin (RIAS)	Germany	20	F*
999	Madrid(COPE)	Spain	50	A*,F*
1008	SER via ?	Canaries/Spain	?	F*,H*
1008	Flevo(Hilv-5)	Holland	400	A*,B*,F*,H,N*
1017	Rheinsender(SWF)	Germany	600	A*,C*,F*,H*
1017	RNE5 via ?	Spain	?	H*
1035	Lisbon(Prog3)	Portugal	120	A*,B*,F*
1044	Dresden(MDR)	Germany	20	F*
1044	S.Sebastian(SER)	Spain	10	A*,H*
1053	Zarogoza(COPE)	Spain	10	A*,F*
1053	Talk R.UK via ?	UK	?	A,H,L*,N
1062	Kalundborg	Denmark	250	A*,B*,F*,H*,N*
1062	R.Uno via ?	Italy	?	F*,H*
1071	R.France via ?	France	?	F*,H*
1071	Talk Radio UK via ?	UK	?	A,L*,N
1080	SER via ?	Spain	?	F*,H*
1089	Talk Radio UK via ?	UK	?	A,H,K,N
1098	Nitra(Jarok)	Slovakia	1500	A*,B*,F*,H*
1098	RNE5 via ?	Spain	?	F*
1107	AFN via ?	Germany	10	F*
1107	RNE5 via ?	Spain	?	A*,F*
1107	Talk R.UK via ?	UK	?	A,H,N
1125	La Louviere	Belgium	20	A*,F*,N*
1125	RNE5 via ?	Spain	?	F*
1125	Ulandrindod Wells	UK	1	E,K,L*
1134	COPE via ?	Spain	2	A*,F*,H*
1134	Zadar(Croatian R)	Yugoslavia	600/1200	F*,H*,L*,N*
1143	AFN via ?	Germany	1	F*
1143	COPE via ?	Spain	2	A*,F*,H*
1152	RNE5 via ?	Spain	10	A*
1179	Solvesborg	Sweden	600	A*,B*,C*,F*,H*,K,L*,N*
1188	Kuurne	Belgium	5	F*,H*
1188	Reichenbach(MDR)	Germany	5	A*
1188	Szolnok	Hungary	135	B*,F*
1197	Munich(VOA)	Germany	300	F*
1197	Virgin via ?	UK	?	H,K,L*,N
1206	Bordeaux	France	100	F*
1215	Virgin via ?	UK	?	A,H,K,L* N
1224	Vidin	Bulgaria	500	H*
1224	Lelystad	Holland	50	F*
1233	Liege	Belgium	5	F*,H*
1233	Virgin via ?	UK	?	K,N
1242	Marseille	France	150	F*
1242	Virgin via ?	UK	?	L*
1251	Marcali	Hungary	500	F*
1251	Tripoli	Libya	500	D*
1251	Huisberg	Netherlands	10	F*,H*
1251	Dubai	UAE	600	L*
1260	SER via ?	Spain	?	F*,H*
1260	Guildford (V)	UK	0.5	M
1269	Neumunster(DLF)	Germany	600	A*,F*,H*,L* N*
1269	COPE via ?	Spain	?	F*
1278	Dublin/Cork(RTE2)	Eire	10	A*,E,F*,H*,K,N*
1287	RFE via ?	Czech Rep.	400	F*,H*,L*
1287	Lerida(SER)	Spain	10	F*,H*
1296	Valencia(COPE)	Spain	10	A*
1296	Orfordness(BBC)	UK	500	A*,E,F*,L*
1305	RNE5 via ?	Spain	?	F*,H*
1314	Kvitsoy	Norway	1200	A*,B*,F*,H*,L*,N
1323	W'brunn (V.Russia)	Germany	1000/150	A,B,C*,E,F,L*,N*
1332	Rome	Italy	300	F,H*,L*,N*
1341	Lisnagarvey(BBC)	N.Ireland	100	A*,B*,C*,E,H*,K,L*,N
1350	Cesvaine/Kuldiga	Latvia	50	H*
1359	Madrid(RNE-FS)	Spain	600	A*,F*,H*,L*
1368	Foxdale(Manx R)	I.O.M.	20	A*,E*,F,H*,I*,L*
1377	Lille	France	300	F*,H,L*,N
1386	Bolshakovo	Russia	2500	A*,B*,F,H*,L*,N*
1395	Fllake	Albania	1000	A*,L*
1395	TWR via Fllake	Albania	500	F*
1395	Lopic	Netherlands	120/40	F,H,K,N*
1404	Brest	France	20	F*,H,N*
1413	RNE5 via ?	Spain	?	A*
1413	Pristina	Yugoslavia	1000	F*,N*
1422	Heusweiler(DLF)	Germany	1200/600	A*,F*,H*,K,L*,N*
1440	Marnach(RTL)	Luxembourg	1200	A,F*,H,L*,N*
1440	Damman	Saudi Arabia	1600	F*
1449	Redmoss(BBC)	UK	2	B*,F*,H*,L*
1467	Monte Carlo(TWR)	Monaco	1000/400	F*,L*,N*
1467	Volvograd	Russia	25	F*
1476	Wien-Bisamberg	Austria	600	F*,L*,N*
1485	SER via ?	Spain	?	A*
1494	Clermont-Ferrand	France	20	B,F*
1494	St.Petersburg	Russia	1200	B*,C*,F*,L*,N*
1512	Wolvertem	Belgium	300	A*,C*,F*,H*,J*,L*,N*
1512	Jeddah	Saudi Arabia	1000	F*
1521	Kosice(Cizatice)	Slovakia	600	F*,H*,L*
1521	Duba	Saudi Arabia	2000	H*
1530	Vatican R	Italy	150/450	B*,C*,E,F*,H*,L*,N*
1539	Mainflingen(ERF)	Germany	350(700)	A*,F,H*,K*,L*,N*
1575	Genova	Italy	50	N*
1575	SER via ?	Spain	5	F*
1584	SER via ?	Spain	2	F*
1593	Holzkirchen(VOA)	Germany	150	F*,N*
1602	Vitoria(EI)	Spain	10	F*,H*,N*
1611	Vatican R	Italy	15	E,F*,N*

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

Listeners:-

(A) Martin Dale, Stockport.
(B) Simon Hockenhull, E.Bristol.
(C) Sheila Hughes, Morden.
(D) Rhoderick Illman, Oxted.
(E) Brian Keyte, Gt.Bookham.
(F) Eddie McKeown, Newry.
(G) Frank Miles, SW London.
(H) George Millmore, Wootton IoW.
(I) Clare Pinder, Glasgow.
(J) Clare Pinder, while in Appleby.
(K) Tom Smyth, Co.Fermanagh
(L) Norman Thompson, Oadby.
(M) Phil Townsend, E.London.
(N) Fred Wiltmshurst, Northampton.
(O) Tom Winzor, Plymouth.

Tropical Bands Chart

Freq (MHz)	Station	Country	UTC	DXer
2.310	ABC Alice Springs	Australia	2108	A,C,N
2.325	ABC Tennant Creek	Australia	2135	N
2.485	ABC Katherine	Australia	2119	C,L
3.210	REE via Costa Rica	Costa Rica	0100	J
3.255	BBC via Meyerton	S.Africa	2102	J,L,N
3.270	Namibian BC,Windhoek	Namibia	2102	B,J,L
3.290	Namibian BC,Windhoek	Namibia	0230	B,F
3.300	R.Cultural	Guatemala	0540	B,D
3.315	AIR Bhopal	India	0045	B
3.316	SLBS Goderich	Sierra Leone	2111	B,L
3.320	SABC (RSG) Meyerton	S.Africa	2230	B
3.335	CBS Taipei	Taiwan	1942	L
3.345	AIR Jaipur	India	1650	B
3.345	RRI Ternate	Indonesia	2134	L
3.356	R.Botswana	Gabarone	2059	L
3.365	GBC R-2	Ghana	2105	A,B,E,F,I,J,L
3.365	AIR Delhi	India	1746	L
3.915	BBC via Kranji	Singapore	2100	B,C,E,G,J,N,P,R
3.950	Qinghai PBS, Xining	China	1659	C
3.955	BBC via Skelton	England	2125	B,C,E,J,P,Q,R
3.960	Xinjiang PBS, Urumqi	China	0002	B,Q
3.965	RFI Paris	France	1947	C,E,I,J,P,R
3.975	R.Budapest	Hungary	2222	A,B,I,J,P,R
3.985	Nexus, Milan	Italy	1943	C,H,I,J,K
3.995	DW via Julich	Germany	1900	B,I,J,K,P,R
4.005	Vatican R.	Italy	1954	B,I,J,P,R
4.750	Xizang BS, Lhasa	China	2340	J
4.755	R.Educ CP Grande	Brazil	0009	B,Q
4.760	AIR Port Blair	India	2341	J
4.765	R.Rural, Santarem	Brazil	0027	J
4.765	Brazzaville	Pep.Rep.Congo	2240	J
4.770	FRCN Kaduna	Nigeria	2115	B,C,D,E,H,J,L,P,R
4.775	AIR Imphal	India	0100	B
4.775	TWR Manzini	Swaziland	0406	J
4.777	R.Gabon, Libreville	Gabon	1650	B
4.783	RTM Bamako	Mali	2133	A,B,E,J,L
4.790	Azad Kashmir R.	Pakistan	0115	B
4.800	LNBS Maseru	Lesotho	2115	B,E
4.815	R.Difusora, Londrina	Brazil	0105	B
4.815	R.diff TV Burkina	Ouagadougou	2112	B,L
4.820	R.Botswana, Gaberone	Botswana	0428	B,C,F,G,J,P
4.820	La Voz Evangelica	Honduras	2304	C
4.820	Xizang, Lhasa	Tibet	0232	C
4.830	R.Tachira	Venezuela	0010	B,Q
4.835	R.Tezulutlan, Coban	Guatemala	0120	B
4.835	RTM Bamako	Mali	2018	A,B,C,D,G,H,J,L,P
4.840	AIR Bombay	India	0210	B,N
4.845	ORTM Nouakchott	Mauritania	2016	B,J,L
4.850	R.Yaounde	Cameroon	2040	B,F,J,P
4.850	AIR Kohima	India	0029	J,N
4.860	AIR Delhi	India	0030	J,N
4.865	PBS Lanzhou	China	0110	B
4.870	R.Cotonou	Benin	2014	C,F,J,L
4.870	SLBC Colombo	Sri Lanka	0115	B
4.885	R.Clube do Para	Brazil	0320	F,L
4.885	R.Difusora Acreana	Brazil	0125	B
4.885	KBC East Sce Nairobi	Kenya	1858	L
4.890	RFI Paris	via Gabon	0419	J
4.890	R.Port Moresby	New Guinea	2011	L
4.895	R.IPB AM C'po Grande	Brazil	0558	F
4.900	Haixia 2,V of Strait	China	2121	L
4.910	Tennant Creek	Australia	2134	L
4.910	R.Zambia, Lusaka	Zambia	0600	F
4.915	R.Anhanguera	Brazil	0120	B
4.915	GBC-1, Accra	Ghana	2013	B,E,H,I,J,L
4.915	R.Cora de Peru, Lima	Peru	0325	F
4.920	R.Quito, Quito	Ecuador	0550	D,F,H
4.920	AIR Chennai	India	0031	B,J
4.930	AIR Shimla	India	1751	L
4.935	KBC Gen Sce Nairobi	Kenya	1900	L
4.950	VOA via Sao Tome	Sao Tome	2021	B,J,L,M,N,P,R
4.955	R.Nac. de Colombia	Colombia	0410	D,F
4.965	Christian Voice	Zambia	1800	B,J
4.975	R.Uganda, Kampala	Uganda	2022	B,E,I,J,L,N,P
4.980	PBS Xinjiang, Urumqi	China	0110	B
4.980	Ecos del Torbes	Venezuela	2348	B,G,H,I,J,N
4.985	R.Brazil Central	Brazil	2313	B,H,I,L
5.005	R.Nacional, Bata	Eq.Guinea	1901	L
5.009	R.TV Malagasy	Madagascar	1710	C
5.010	AIR Thiru'puram	India	0034	B,J
5.020	La V du Sahel,Niamey	Niger	2022	B,F,H,L,N,P
5.025	ABC Katherine	Australia	2135	A,L
5.025	R.Parakou	Benin	2020	B
5.025	R.Rebelde, Habana	Cuba	0615	A,B,H
5.030	AWR Latin America	Costa Rica	0125	B
5.030	RTM Kuching	Sarawak	2130	N
5.035	R.Aparecida	Brazil	2135	B,L
5.035	R.Bangui	C.Africa	2238	B,J
5.040	PBS Fujian, Fuzhou	China	2350	J
5.047	R.Togo, Lome	Togo	2037	B,C,H,I,J,L,N
5.050	R.Tanzania	Tanzania	2027	C,I,J,L
5.055	RFO Cayenne(Matoury)	French Guiana	2030	B
5.075	Caracol Bogata	Colombia	0605	B,F,H,I,J,K,N
5.100	R.Liberia, Totota	Liberia	2022	L,N
5.320	CNR 1	China	2140	C,N

DXers:-

(A) Michael Casey, Manchester.
(B) Robert Connolly, Kilkeel.
(C) John Eaton, Woking.
(D) David Edwardson, Wallsend.
(E) Martin Goodey, St.Mary's, IoS.
(F) David Hall, Morpeth.
(G) Simon Hockenhull, E.Bristol.
(H) Sheila Hughes, Morden.
(I) Rhoderick Illman, Oxted.
(J) Eddie McKeown, Newry.
(K) Frank Miles, SW.London.
(L) Fred Pallant, Storrington.
(M) Clare Pinder, while in Appleby.
(N) Vic Prier, Colyton.
(O) Robert Shacklock, Westwood, Notts.
(P) Phil Townsend, E.London.
(Q) Martin Venner, St. Austell.
(R) Fred Wilmshurst, Northampton.

2025) was 44444 at 1750 in Newry; Voice of Greece, Athens **12.105** (Gr [Eng 1840-1850] to Africa) 34333 at 1840 in Woodhall Spa; R.Damascus, Syria **12.085** (Ger to Eur 1805-1905) 44433 at 1850 in Colyton; Voice of Russia **11.630** (Fr to Eur? 1900?-2000) 44444 at 1940 in Stalbridge; R.Kuwait via Kabd **11.990** (Eng to Eur, N.America 1800-2100) 45544 at 2005 in St.Mary's, IoS; AIR via Bangalore **11.620** (Eng, Hin to Eur 1745-2230) SIO 333 at 2052 by **Francis Hearne** in N.Bristol; BBC via Ascension Is **12.095** (Eng to S.America 2000-0200) 44433 at 2251 in Oxted.

Logged before noon in the **9MHz (31m)** band were WYFR Okeechobee, USA **9.985** (Eng to Eur, Africa 0400-0800), rated 45554 at 0535 in Larnaca, Cyprus; R.New Zealand Int **9.700** (Eng to Pacific areas 0707-1115) SIO 222 at 0800 in Co.Fermanagh; KNLS Alaska **9.615** (Eng to F.East (0800-0900) 33333 at 0800 in Scalloway; Swiss R.Int via Montsinery, Fr.Guiana **9.885** (Eng, It, Ger, Fr to Australia 0830-1030) 44444 at 0852 in Stockport; R.Nederlands via Bonaire, Ned.Antilles **9.820** (Eng to Pacific 0930-1125) 33333 at 1012 in Truro; R.Mediterranee Int, Morocco **9.575** (Ar, Fr to N.Africa, S.Eur 0500-0100) 45544 at 1055 in St.Mary's, IoS; R.Nederlands via Wertachtal **9.860** (Eng to Eur 1130-1325) 55555 at 1122 in Bridgwater.

After mid-day RFI via Allouis? **9.805** (Eng to Eur, M.East, Africa 1200-1300) was 54444 at 1202 in Freshwater Bay, IoW; Polish R, Warsaw **9.525** (Eng to Eur 1200-1300) 54444 at 1230 in Morden; BBC via Kranji, Singapore **9.740** (Eng to S.Asia? 1100-2200) 43333 at 1340 in Morpeth; BBC via Skelton & Woofferton, UK, **9.410** (Eng to Eur, N/C.Africa 0300-2200) 55544 at 1457 in Northampton; R.Australia via Shepparton **9.500** (Eng to Asia, Pacific 1430?-2130) 33443 at 1749 by **Mike Casey** in Manchester; R.Nederlands via Flevo **9.895** (Eng to Africa 1830-2025) 44344 at 1834 in Newry; VOIRI Tehran, Iran **9.022** (Fr, Eng to Eur 1830-2030) 44434 at 1905 in Colyton; VOA via Morocco? **9.760** (Eng to Eur, M.East, N.Africa 1700-2200) 43334 at 1945 in Dudley; Voice of Russia **9.775** (Eng [WS]) 32223 at 2000 in Stalbridge; China R.Int, Beijing **9.535** (Eng to Eur 2000-2100) 33333 at 2019 in Plymouth; R.Cairo, Egypt **9.990** (Eng to Eur 2115-2230) was 44444 at 2200 in Galashiels; RCI via Sackville **9.755** (Eng, Fr [CBC progs] to USA, Caribbean 2200-0300) 44434 at 2305 in E.Bristol; R.Japan via Ascension Is **9.665** (Eng to Africa 0000-0100) 54444 at 0000 by **Martin Cowin** in Kirkby Stephen; R.Nederlands via Bonaire, Ned.Antilles **9.845** (Eng to N.America 0030-0125) SIO 444 at 0112 in N.Bristol.

Some of the broadcasts in the **7MHz (41m)** band are intended for European listeners. Those noted originated from R.Japan via Woofferton, UK **7.230** (Jap, Eng 0500-0700), rated 32232 at 0510 in St.Austell; AWR via Forli, Italy **7.230** (Eng 0930-1000) 44333 at 0930 in Morden; R.Slovakia Int **7.345** (Slov 1530?-1557?) 33333 at 1544 in Stockport; BBC via Skelton, UK **7.325** (Eng 2000-2200) SIO 444 at 2000 in Co.Fermanagh; VOIRI Tehran **7.215** (Eng to Eur 1930-2028) 33443 at 2010 in Manchester; AIR via Bangalore **7.410** (Hi, Eng 1745-2230) 55444 at 2137 in Northampton; R.Romania Int, Bucharest **7.195** (Eng 2300-2356, also to USA) 44444 at 2300 in Westwood, Notts.

Whilst beaming to other areas R.Nederlands via Madagascar **7.120** (Eng to S/E/W.Africa 1730-2025) was 34232 at 1752 in Newry; BBC via Kranji, Singapore **7.110** (Eng to Asia 2200-0045) SIO 333 at 2318 in Woking.

Many more broadcasts for European listeners may be found in the **6MHz (49m)** band. Some come from the BBC via Rampisham & Skelton, UK **6.195** (Eng 0300-0700, 1500-1700, 1800-2200), rated 34553 at 0545 in Larnaca, Cyprus; R.Japan via Skelton, UK **5.975** (Eng 0600-0700) 54554 at 0650 in Herstmonceux; R.Austria Int, via Moosbrunn **6.155** (Ger, Eng, Fr, Sp 0430?-2300?) SIO 444 at 0846 in N.Bristol; DW via ? **6.140** (Eng Service) 45554 at 0857 in Stockport; Suddeutscher Rundfunk, Muhlacker **6.030** (Ger) 45544 at 1030 in Northampton; R.Nederlands via Julich **6.045** (Eng 1030-1225) 55555 at 1130 in Morden; Bayerischer Rundfunk, Germany **6.085** (Ger 24hrs) 55545 at 1220 in SW.London; R.Sweden via Horby **6.065** (Eng 1930-2000) 54444 at 1930 in Newry; Polish R, Warsaw **6.095** (Eng 1930-2025) 53553 at 1940 in Bridgwater; R.Prague, Czech Rep. **5.930** (Eng 2000-2030) 44434 at 2000 in Oadby; RCI via Skelton, UK **5.995** (Fr, Eng 1900-2100) 54444 at 2000 in Dudley; China R.Int via Russia? **6.950** (Ger, Eng 1900-2157) 44444 at 2040 in Morpeth; R.Korea Int, Kimje **6.480** (Ger, Ar, Sp, Eng 1800-2200) 33233 at 2100 in Appleby; R.Pyongyang, Korea **6.575** (Eng 2100-2155) 44433 at 2100 in Galashiels; R.Yugoslavia, Belgrade **6.100** (Eng 2100-2130?) 42333 at 2105 in Stalbridge; R.Austria Int via Moosbrunn **5.945** (Ger, Eng, Fr, Sp 1800?-2300?) 44444 at 2200 in Kirkby Stephen.

Also mentioned in the reports were R.Canada Int via Sackville **5.960** (Eng, Fr to USA, Caribbean 2200-0200), rated 33333 at 2303 in St.Austell; BBC via Antigua, W.Indies **5.975** (Eng to C/N.America 2100-0800) 34433 at 0220 in E.Bristol.

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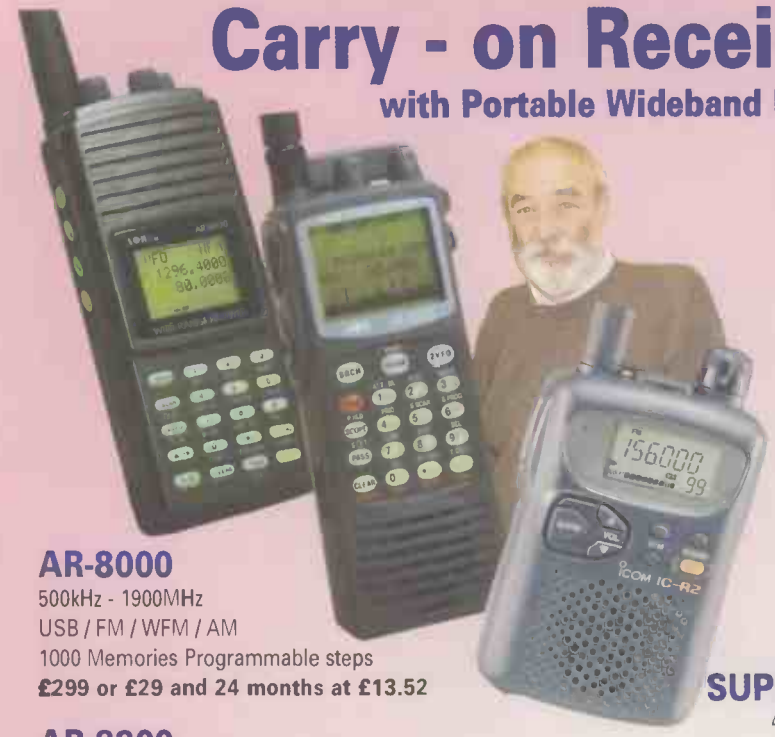

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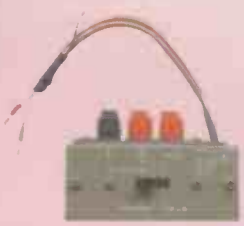

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Monitoring The Crisis

This month, Graham Tanner and Peter Bond bring you a round-up of the situation as of the closing days of April. It is hoped that the hostilities in the war torn area will be over by the time you read this *SWM* special feature and that any military action in the region will be that of a peace-keeping force.

Following, you will find details of the many active frequencies in use during Operation Allied Force - the NATO attacks on Serbia. The need for NATO to wield its big stick has brought about a huge surge in radio traffic, including a lot of h.f. s.s.b. signals. In this article I will give details of the aircraft involved, and also lists of active frequencies that have been reported so far. This was originally meant to be a short write-up, but there is so much background information that needs to be explained, it has grown a lot larger than originally planned. In the following text, all frequencies are in MHz and all transmissions are in u.s.b.

Background

During February and March, the leaders of the Yugoslav province of Kosovo met with Serbian leaders at Rambouillet in France, to try to arrange a peace deal between the Serbians and Kosovar Albanians. This was arranged by NATO, and was chaired by the Americans, however most of Europe was waiting for the outcome of the talks. NATO threatened military action against Serbia if a peace-deal could not be reached. The agreement was signed by the Kosovar Albanians, but was not signed by the Serbians, who walked-out of the meetings on the final day. NATO's threat to use force against Serbia became a reality on that day, and the first action that was noticed by most people was the launch of B-52 bombers from RAF Fairford in Gloucestershire.

Assets

There is a wide range of NATO air assets surrounding Serbia. Most of these are at Aviano Airbase in northern Italy, north of Venice. Here, there are a large number of F-16Cs of the 31st Fighter Wing, and a very large number of deployed aircraft from the USA and Europe. Since this is a NATO operation, there are aircraft from many other NATO countries. I am sure that everybody will have seen plenty of pictures on TV of the aircraft involved. The Italian Air Force are operating from their own airfields up and down the length of Italy. The German Air Force - taking part in NATO operations outside Germany for the first time - has a fleet of Tornado ECR aircraft based at Piacenza Airbase, south of Milan. The French are also playing a significant part in the military action against Serbia. They have a number of Jaguar ground-attack aircraft and Mirage 2000 aircraft for air-air combat operating from Istrana AB. The Danish and Norwegian contingent are operating from Grazzanise Airbase, while the Turks are flying from Ghedi Airbase. There are a large number of US special forces aircraft and helicopters based at Brindisi in southern Italy (these are the ones that rescued the pilot of the F-117 shot-down near Belgrade, which made world headlines), and the U-2 spy-planes based at Istres in France have now moved to Sigonella in Sicily so that they are better placed to provide 24-hour coverage of the war-zone. NATO E-3 AWACS aircraft are operating from their base at Geilenkirchen in Germany (NATO and Magic callsigns), where they have been joined by three USAF E-3 AWACS aircraft - the latter are thought to be using their Bandsaw callsigns when operating in tracking nets.

RAF forces are concentrated at Gioia del Colle Air Base in southern Italy, where there are 16 Harrier GR.7s and a small detachment of Canberra PR.9 photographic aircraft. At the start of the crisis, there were just eight Harriers, but this was quickly increased to 12 and then 16 aircraft. These are drawn from 1(F) Sqdn at RAF Wittering and 3 Sqdn and 4 Sqdn from RAF Laarbruch in Germany. Tanker aircraft for these RAF aircraft operating from Italy is provided by Tristar aircraft from 216 Sqdn (Brize Norton) which are based at Ancona Airport in Italy.

During the middle of April, the RAF increased its commitment to Operation Allied Force by operating Tornado ground-attack aircraft directly from their base at Bruggen in Germany. These have been refuelled several times during each mission, and a fleet of VC-10 tanker aircraft is also operating from RAF Bruggen in Germany.

Albania

The country of Albania borders the province of Yugoslav province of Kosovo. As recently as 10 years ago, this was a country which shunned contact with other countries. The events in Kosovo have meant that thousands of refugees have flooded across the border into Albania, and Albania has allowed relief flights to land with medical, food and shelter supplies. In a surprise move, in readiness for a possible ground forces attack upon the Serbian military, NATO has flown a number of AH-64 Apache gunship helicopters and supporting UH-60 Blackhawk helicopters into Albania. To support these helicopters, there have been a large number of transport flights into Tirana Airport (ICAO designator: LATI). This is a very small airport, not used to handling multiple flights of large military transports, so aircraft heading for Tirana have been joining a holding-pattern just off the coast of Albania, until it is their turn to land. While they are flying around, the aircraft have been communicating with each other, and with those already on the ground, using h.f. - 10.915MHz has been their primary frequency, and Jago callsigns are being used by a fleet of C-17A and C-130 aircraft operating from Ramstein AB in Germany.

Graham's report on the situation, from an h.f. monitoring perspective.

A USAF EC-130 Hercules. Although this example carries the code SB on the tail, the ones operating from Italy are coded DM. Note the odd-looking aerials under the tail. ***Graham Tanner.***

Bombers

As a leading member of NATO, the UK has played a major role in the actions against Serbia. On 21st February (a Sunday, no less!) seven B-52H bombers arrived at RAF Fairford during the morning, directly from their base at Barksdale AFB, Louisiana. They crossed the Atlantic using Havoc callsigns; there were originally eight aircraft, but one turned back soon after take-off, and eventually arrived at Fairford one day later. As they crossed the Atlantic, many listeners heard them on 5.616MHz working Gander ATC and Shanwick ATC. A deployment such as this needs a lot of support, and this was provided by two C-5Bs which arrived later the same day from Barksdale using standard Reach callsigns.

There was a two-fold purpose to this deployment of bombers - to be a visible sign of the intentions of NATO, and to be ready for

Table 1
GHFS Stations and Frequencies

Andersen, Guam	6.739, 8.968, 11.175, 13.200.
Andrews, NE. USA	4.724, 6.712, 8.968, 11.175, 15.016, 17.976.
Ascension, S. Atlantic	6.739, 8.992, 11.175, 15.016.
Croughton, UK	4.724, 6.712, 8.992, 11.175, 13.200, 15.016, 17.976.
Elmendorf, Alaska	4.724, 6.739, 8.968, 11.175, 13.200, 15.016, 17.976.
Hickam, Hawaii	6.739, 8.968, 11.175, 13.200.
Incirlik, Turkey	4.724, 6.739, 11.175, 15.016, 17.976.
Lazes, Azores	6.739, 8.968, 15.016.
McClellan, California	4.724, 6.739, 8.968, 11.175, 13.200, 15.016, 17.976.
Offutt, Central USA	6.739, 8.968, 11.175, 17.976.
Thule, Greenland	4.724, 6.739, 8.968, 11.175, 13.200.
Yokota, Japan	4.724, 6.739, 8.968, 11.175, 13.200, 15.016, 17.976.

USAF and NATO E-3 AWACS radar aircraft are flying daily missions from Geilenkirchen in Germany. ***Graham Tanner.***

Fig 1:
Strike Command Integrated Communications System (STCICS)
Callsign: 'Architect', CW: MLD or MLP.
Frequencies: Group A - 4.742, 5.714, 6.739, 9.031, 11.205, 18.018 and Group B - 4.540, 8.190, 13.257, 15.031 (group B - see below) 2.591, 11.247.
'Group A' has the QNH Broadcast at H+00 and Airfield colour-state broadcast at H+30. 'Group B' has RAF Germany airfield flying states at H+15 and H+45.

Table 2
DHM91 Channels

3.107	Alpha
3.143	Bravo
3.903	Charlie
4.721	Delta
5.687	Echo
5.717	Foxtrot
6.700	Golf
6.715	Hotel
6.730	India
6.751	Juliet
8.965	Kilo
9.025	Lima
11.217	Mike
11.265	November
13.203	Oscar
13.233	Papa
15.073	Quebec
17.973	Romeo
17.991	Sierra
18.012	Tango
23.201	Uniform
23.215	Victor
23.255	Whisky
23.318	X-ray
23.341	Yankee
23.345	Zulu
29.724	Alpha-bravo

action as required without the need to cross the Atlantic at short notice. During late February and most of March the B-52s flew regularly, no doubt as a reminder that they were still there. This deployment of B-52Hs and B-1s (see later) were titled the 2nd Air Expeditionary Group, while the deployment of aircraft to RAF Fairford is known as Noble Anvil.

On 24th March, all eight B-52s departed for the first night bombing of Serbia. This fact was widely reported on TV and radio. In fact, the aircraft flew to a launch point in the Mediterranean Sea, where they launched CALCMs (convential air-launched cruise missiles) which then flew to their targets in Serbia. The B-52s never even entered Serbian airspace. For this mission, the aircraft departed from RAF Fairford and flew to Lands End before entering the Shanwick Oceanic airspace. Their route took them over reporting points TAKAS (49°N 008°W), LASNO (48°36N 009°W) and BEGAS (45°N 009°W) and around Spain and Portugal before entering the Mediterranean Sea near Gibraltar. From there, they flew directly towards the island of Malta and then on to their launch site. Once their CALCMs had been dropped, the flight of aircraft retraced their route back to Fairford. As they passed through Shanwick's airspace in either direction, they were heard on 5.598MHz working Shanwick and Santa Maria. Just to make things a bit more interesting for the listener, the aircraft used different callsigns for the outward and return flights - callsigns heard so far are Abuse, Artic, Binge, Erwin, Gamut, Havoc, Hoyle, Laser, Litch, Lundy, Reset, Sword and Upset.

On the first night of the NATO operations against Serbia (24th March), two B-2A Spirit stealth bombers were involved, flying direct from their base in the USA as Darth 71 and Darth 72 - did anyone hear these on h.f.?

During the early morning of 31st March, many listeners heard Shanwick ATC working five aircraft heading towards the UK with the callsigns Razor 01 to Razor 05. This turned out to be five B-1B Lancer bombers of the 28th Bomb Wing from Ellsworth AFB, South Dakota, *en-route* to RAF Fairford. They were supported by two C-5Bs (Reach 5006 and Reach 6042) and a single KC-135R (Aspen 11). These B-1B aircraft did not have the luxury of a work-up period, as their first operational mission was during the night of 31st March/1st April. The routing for the B-1s has been a more direct route - down to the south coast of the UK, and across France via the VOR beacon at Rambouillet. It would appear that France has objected to these B-1B flights crossing their airspace, so I have heard that their flight-plans are being filed saying that they are KC-135s!

After a few days of bombing, several B-52s returned to the USA, but were replaced by others. There was a constant force of eight B-52Hs and five B-1Bs at RAF Fairford. On 17th April, four B-52s departed from RAF Fairford, but were not replaced, however a sixth B-1B had appeared by that time. There have been regular reports that the B-52s and B-1s are using 11.777MHz during their flights, but I have not personally heard them.

Tankers

All these aircraft flying in and around Serbia require a lot of fuel, and those flying from further afield will need several refuellings. During the middle of April, a detachment of USAF KC-135R refuelling aircraft was established at RAF Fairford. Frankfurt/Rhein-Main Air base in Germany has been very busy with both KC-135R and KC-10 tanker aircraft, while the 100th ARW at RAF Mildenhall has been supplemented by up to a dozen additional KC-135R tanker aircraft. There have also been tanker aircraft operating from France, Italy and Spain.

For Operation Allied Force these tanker aircraft have been using a range of callsigns based upon world currencies - Mark and Riyal from RAF Mildenhall, Euro from Istres in France, Gold from Moron in Spain, Gilder from Frankfurt in Germany, and Rand from Sigonella. One other currency callsign that I have heard is Dinar, but I do not know where they are operating from. After a few days of flight, it became apparent that some of these aircraft were communicating using h.f. - Raven Ops has been heard working several of these tanker callsigns on 13.458MHz, and is thought to be situated at Frankfurt/Rhein-Main Air Base. The Gold tankers at Moron in Spain have been heard mentioning Sombrero Ops, and this is thought to be using 11.226MHz. Another Command Post being used by the tanker aircraft, principally those with the callsign Riyal, is MOGAS Ops who are using 10.944MHz for h.f. communications.

Command and Control

Ever since the days of the Balkan Crisis five years ago, the US Air Force has stationed a special EC-130 Hercules at Aviano AB in Italy, This aircraft is configured for Command and Control, and carries a battle-staff equipped with dozens of radios so that they can communicate with almost anyone. These special aircraft are operated by the 42nd ACCS from Davis-Monthan AFB in Arizona. For many years they have been heard on h.f. with their familiar Bookshelf callsign, but for this campaign their callsign has changed to Moonbeam. They are often heard talking to a ground-station with the callsign Tracker. Listed elsewhere in this article is a list of their known frequencies. Tracker is the callsign of CAOC Combined Allied Operations Centre in Vicenza, Italy. Moonbeam Ops is located on the Aviano Airbase and communicates with the Moonbeam/Bookshelf aircraft, which are Airborne Command Posts onboard the EC-130s from the Airborne Command & Control Sqdn.

PsyOps

As well as bombing Serbia, NATO forces are also broadcasting radio and television programmes to the people remaining in Serbia. A pair of specially adapted C-130 Hercules (known as EC-130E Command Solo operated by the 193rd Special Operations Wing) have been operating from Ramstein AB in Germany. Each day, these aircraft have been circling just outside Serbian airspace providing a medium wave and Band II f.m. broadcast in the Serbian language. Their flight transmits an hour-long mix of Serbian language news and European pop music into Yugoslavia on m.w and v.h.f. radio frequencies. The planes do not broadcast video, but the audio-tapes can be heard on Serbian TV channel 21, accompanied by still photos, some of the Kosovo Albanian refugees. They have also been dropping leaflets which drift with the wind and land inside Serbia.

RAF Harrier GR.7 are flying from Gioia del Colle in Italy. ***GrahamTanner.***

Naval

The NATO navies have also been playing their part in the actions against Serbia. The STANAVFORMED (Standing Naval Forces

Continued on page 24...

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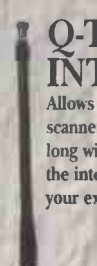

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Comments from John Griffiths

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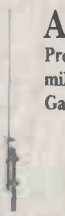

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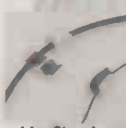

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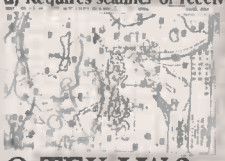

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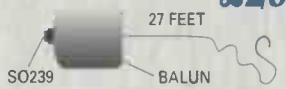

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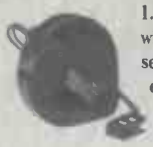

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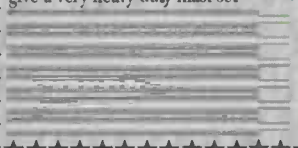

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Table 3
Canadian Forces Network

Channel	Frequency	Remarks
	3.047	CFH: Halifax Military
A6A	4.560	CFH: Halifax Military; CJX: St Johns Military, (Maritime Command)
	4.700	CFH: Halifax Military
C-1	4.721	
	4.739	CFH: Halifax Military; CJX: St Johns Military
A2B	5.198	CFH: Halifax Military (Maritime Command)
	5.684	CJX: St Johns Military
	5.694	CFH: Halifax Military; CJX: St Johns Military
	5.702	CJU: Vancouver Military
	5.717	CFH: Halifax Military; CJU: Vancouver Military; CJX: St Johns Military
D1B	5.850	CZW: Halifax Maritime Air Group
D6G	6.694	CFH: Halifax Military; CJU: Vancouver Military
	6.706	CHR: Trenton Military (wkg NATO a/c)
D3H	6.715	CHR: Trenton Military; CFH: Halifax Military; CJU: Vancouver Military
C-2	6.735	
	6.736	CFH: Halifax Military (or Chg?)
	6.745	CHR: Trenton Military
C-3	6.750	
	6.751	SIDECAR (NORAD) CFH: Halifax Military; CJU: Vancouver
	6.754	CHR: Trenton Military; CJU: Vancouver Military; CJX: St Johns Military (VOLMET)
	8.110	CFH: Halifax Military
C-4	8.968 or 8.967	
D1H	8.989	CHR: Trenton Military
	9.007	CHR: Trenton Military; CFH: Halifax Military; VXA: Edmonton Military
C-5	9.023	CHR: Trenton Military (NORAD)
	9.027	CFH: Halifax Military
C-6	11.214	CHR: Trenton Military (NORAD)
	11.232	CHR: Trenton Military; CFH: Halifax Military; CJX: St Johns Military; VXA: Edmonton Military
	11.249	CFH: Halifax Military
	11.265	CHR: Trenton Military (wkg MAGIC a/c)
C-7	13.206 or 13.207	
	13.257	CHR: Trenton Military
	15.031	CHR: Trenton Military
	15.034	VXA: Edmonton Military (VOLMET)
	17.994	CHR: Trenton Military
	18.012	CHR: Trenton Military
C-8	18.027	CFH: Halifax Military; VXA: Edmonton Military

Table 4
CFARS 'phone-patch Channels

Alpha	6.9785
Bravo	14.386
Charlie	14.460
Delta	14.463
Echo	14.4465
Foxtrot	20.9715
Golf	20.9635
Hotel	29.715
Juliet	14.454
Kilo	14.4495
Lima	20.9775
Mike	13.954
Whiskey	6.9825
X-ray	6.9625
Yankee	4.0525
Zulu	4.0235

USAF B-1s have been operating most nights, flying directly from RAF Fairford to bomb military targets in Serbia. ***Graham Tanner.***

Mediterranean) have been patrolling the Adriatic Sea with their ships and submarines. At least one Royal Navy Type 23 frigate is involved, as is a nuclear attack submarine (initially HMS *Splendid*, but that may have changed by now).

The French Navy aircraft carrier FS *Foch* is providing aircraft and helicopters, and a Royal Navy Type 22 frigate was attached to the Task Group.

Controlling all these vessels (and their support vessels) takes a lot of communications. A tactical naval net was found on 16.4424MHz just before the start of the bombing campaign. The callsigns used were typical NATO tri-graph tactical callsigns, but these soon changed to single-letter callsigns once the action started. Another two naval nets have recently been found on **6.242** and **6.723MHz**.

Frequencies

Naturally, the USAF GHFS networks have been extremely busy. The amount of aircraft traffic has increased greatly (not as much as that of the Gulf War, but still a noticeable increase), and the number of phone-patches has also increased dramatically. With the aircraft flying to all sorts of new and different airfields, there are lots of additional communications - almost all of it via the GHFS frequencies! - see **Table 1**.

Almost all the RAF communications relating to offensive flights are on u.h.f. frequencies, but support flights to-and-from Italy and Germany are regularly heard on standard RAF STCICS frequencies - the well-known Architect service - **Fig. 1**.

The German Air Force forces at Piacenza in Italy have regular support flights by transport aircraft from Germany, and these can be heard working station DHM91 on any of the frequencies in **Table 2**.

The primary frequency is channel Echo. The GAF have several ground stations in Italy, as follows - DHJ41 at Piacenza, NI81 also at Piacenza, and O5IP at Vicenza.

The Canadian Forces have some combat aircraft based at Aviano, and during April these were joined by more of the same aircraft, and also some KC-130 Hercules refuelling aircraft. With all these people in the area, they now have regular flights across the Atlantic to Italy, usually via a stop somewhere in the UK. This is usually at either RAF Brize Norton or RAF Lyneham. They have been using a mix of their usual Canforce (CFC) callsign, and also Kosovo (KSV). These flights check-in regularly with the Canadian Forces HQ via their own h.f. network - **Table 3**.

With so many Canadian personnel being stationed away from home, the Canadian Forces have their own dedicated h.f. network to allow troops to send messages back to Canada. This is known as CFARS - Canadian Forces Affiliate Radio System. CFARS stations operate amateur radio equipment to provide phone patches for service personnel to their families, details in **Table 4**.

The fleet of USAF and NATO AWACS aircraft operating from Germany are using the NATO h.f. network used day-to-day by the NATO AWACS aircraft. In this network, Geilenkirchen AB uses the callsign DHN66, while the aircraft themselves are using either Magic, Bandsaw or NATO tactical tri-graph callsigns. Tactical communications have been done exclusively on u.h.f., as all the players are operating within quite a small area, however, these E-3s have been heard talking to their base using h.f. circuits - see **Table 5**.

These designator tie-ups are quite old, but the frequencies are still thought to be correct. Some frequencies appear in the above list with both old and new designators.

The USAF ABCCC EC-130 Hercules aircraft operating from Aviano Airbase have their own little network of h.f. frequencies, **Table 6**, which has been in use for many years. The Kosovo Crisis has allowed listeners to confirm that the same frequencies are still in use, and a number of code designators have been confirmed.

Note how the designators and frequencies are both in an ascending sequence - this should help to pin-down new tie-ups. The last two other tie-ups listed above do not fit into the pattern, but as I have not heard any traffic on these frequencies myself, I cannot confirm if they are connected. The following frequencies have all carried 'Bookshelf' traffic in the past, and are worth checking from time to time for Moonbeam callsigns: 3.173, 3.178, 4.450, 4.510, 4.578, 4.789, 4.923, 5.084, 5.1035, 5.312, 5.462, 5.712, 5.788, 8.083 and 11.161MHz.

Table 5
AWACS to Base Channels

Ch.AA	6.700
Ch.AB	11.228
Ch.AC	8.971
Ch.A4	10.315
Ch.A5	?
Ch.KD	6.760
Ch.KF	6.695
Ch.NB	3.081
Ch.NC	3.225
Ch.ND	?
Ch.NE	4.542
Ch.NF	4.720
Ch.NG	?
Ch.NH	4.758
Ch.NI	6.7625
Ch.NJ	8.9865
Ch.NK	11.2705
Ch.NL	15.050
Ch.NM	17.9965
Ch.XC	6.754
Ch.XD	8.980
Ch.XE	10.315
Ch.??	12.165
Ch.??	5.691
Ch.??	6.728
Ch.??	23.2412

Table 6
'Aviano Net' Frequencies

78A	4.519
79B	5.218
80V	5.7635
81A	6.865
81B	6.9325
81V	8.0460
82A	9.1185
82B	9.2600
83A	11.173
118	15.048
154	8.087

A giant USAF B-52 Stratofortress at RAF Fairford, being prepared for its next mission to the Adriatic Sea. ***GrahamTanner.***

Conclusion

Many people are of the opinion that h.f. communications is dead, but events such as the Gulf War, and this Kosovo Crisis have proved them wrong. At the moment, it is almost possible to scan through the h.f. spectrum and simply come across military signals relating to Kosovo and Serbia.

It takes a practised ear to know whether the signals really are the good stuff, or just run-of-the-mill military flights, but with most of NATO concentrating their efforts in this area, listening to the h.f. frequencies of any of the NATO countries is bound to bring results.

Competition (Part 1)

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"...JRC have a much envied reputation for high production standards..." - John Wilson

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. Just enter part one this month and part two in the July issue of *SWM* 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*.

The NRD-345

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We reviewed the NRD-345 back in May 1997, here's what John Wilson said, "...The NRD-345 is a little honey of a receiver because it combines good performance with a logical, easy to control layout. The concept of a knob for each function is something JRC have clearly decided is to be one of their design aims and it pleases me no end...".

The ALA 1530

This active loop antenna has extremely good intermodulation characteristics and covers the range between 150kHz and 30MHz, making it an ideal companion for the NRD-345.

Part One

Find the following words in the grid below.

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attenuator
best
intermod
loop
lowe
magazine
radio
receiver
wellbrook
winner

E	N	I	Z	A	G	A	M	X	A
I	N	T	E	R	M	O	D	T	W
W	A	L	O	W	E	R	T	R	E
E	C	Z	R	X	E	E	T	E	L
P	T	F	Z	A	N	C	J	N	L
A	I	X	K	U	D	E	M	N	B
I	V	A	A	B	L	I	O	I	R
T	E	T	J	E	O	V	O	W	O
V	O	D	Y	S	O	E	L	T	O
R	L	E	Q	T	P	R	I	T	K

Highlight the words you find.

Part Two (Questions in July issue)

Answer
1)
2)
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Name: .....

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*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*.

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

Peter Bond expands his regular column to include a selection of 'MilAir' reports from the first three weeks of the air war.

MilAir Update

The 'MilAir' news of recent weeks is obviously dominated by the NATO air strikes against the Serbian Forces purging the population of Kosovo. Consequently, I have delayed other letters and E-mails to include a 'MilAir' report on the start of this conflict. As I write this, the NATO coalition is well into the fifth week of air strikes with the number of aircraft involved currently being increased to well over 1000. Targets have moved on from primary tactical targets such as SAM sites and Airfields, to logistical targets such as bridges and fuel storage sites. I have received over 30 letters and E-mails regarding the conflict, including a couple from Italy and Northern Greece, all of which make interesting reading. Some of the reports provided rather conflicting information, nevertheless I have collated them together, and what follows is, I hope, a reasonably accurate selection of 'MilAir' reports from the first three weeks of the air war.

RAF Fairford

Under the title of Operation Noble Anvil, B-52Hs from the second and fifth Bomb Wings were deployed to Fairford as the second Air Expeditionary Group. Strikes from the UK started at 1042 on the 24th March, with all eight B-52Hs taking off from RAF Fairford in three groups. Using the callsigns HAVOC 11/14/17 Flights, the aircraft routed out to the West on 283.525 and left UK airspace beyond Lands End. I have presumed from this departure route that they have tracked down the west coasts of France, Spain and Portugal, and then turned east through the Mediterranean on route to their targets.

The second mission was on the 26th March, with seven aircraft departing Fairford, only three returned as the other four flew directly back to the USA. This was the start of a regular UK/USA change round of the deployed aircraft. Three new aircraft arrived on the 27th, using the callsigns LASER 11/12/13, a further two on the 28th calling ARCTIC 11/12, and lastly three aircraft on the 29th as EDWIN 11/22/33. Departing aircraft have been noted using the callsigns AMUSE and LANDY (also noted by two correspondents as LUNDY). The B-52s regularly use the Mildenhall back-up ACC operations frequency 249.75 as Fairford Command Post, using the callsign CAJUN CONTROL.

The B-52s have also been noted using the callsigns 'RESET 11-16' for some Kosovo missions. In line with a practice noted in the past, it seems that HAVOC is the positioning callsign and RESET the mission callsign, with sometimes both being used on the same flight! (This caught a few people out, as they thought there were two sets of B-52s!)

The 1st April saw five B-1Bs from the 28th Bomb Wing at Ellsworth AFB arrive at Fairford to join the B-52s. The arrival callsigns were RAZOR 01-05. Since their arrival, they have been reported on Kosovo missions using the callsigns TITAN, TITUS and YARD (YARN). Could Titan and Titus have been the same?

B-2A Spirit

Also on the first day of strikes (24th), it is reported that two B-2As operating under Operation Noble Anvil completed a bombing mission against several targets in a thirty hour round trip from their home base at Whiteman AFB. This made the stealth bomber one of the first manned aircraft over targets in the strike zone, and confirmed that the USAF are now prepared to use it as a primary strike aircraft. An Italian reader is confident that the B-2s on the 24th March were using the callsigns DARTH 71/72. Callsigns for two B-2s on a mission on the 13th April was MINE 41/42.

F-117A Stealth

The following report caused me immense confusion as, out of eleven E-mails, seven of them seemed to contradict each other. A few telephone calls has hopefully clarified the situation, and fingers crossed that the following is correct. The 4th April saw thirteen F-117A stealth fighters deployed to Spangdahlem in Germany in support of the crisis. The callsigns were ZESTY 11-14, 21-24, 31-33, 41-42. Reports were heard on h.f. across the Ocean on 6.761 and 9.120MHz. They then crossed Scottish airspace (249.475), before routing into the Netherlands, and then on to Germany. The flight was originally planned to be 12, but the extra aircraft was deployed to replace the F-117A lost early in the conflict.

The refuelling support was provided by seven tankers (KC-135/KC-10A), using the callsigns ADOBE 53, 54, 63, 64, 73, 74 and 81. With the deployment completed, the tankers then positioned into both Mildenhall and Frankfurt. Boom frequencies were reported as follows: 282.0, 378.2, 391.0 and 317.1 - can anyone confirm this last frequency?

For reference, having picked the aircraft up on h.f., my German correspondent drove the 45km to Spangdahlem to watch the Stealths arrive, only to find the airfield was guarded like Fort Knox. The local and military police were out in force, many roads were closed, and all of the usual viewing points were out of bounds. Cameras were a definite no-no! As I went to 'Spang' early last year and spent three hours there with no problems at all, it seems that the Germans are taking their first participation in any

conflict since the Second World War very seriously.

Incidentally, my German corespondent also reports that he heard VORTEX 1-10 flight departing Laabruch on the 13th April. This is almost certainly a flight of ten 4 Squadron Harrier GR.1s making their return flight to the UK after many years based in Germany.

Air Support - Mildenhall

Mildenhall has been very busy during the first few weeks of the conflict. Up to six RC-135s have been present (an impressive sight), including an RC-135U model, which is a bit of a rarity these days. The primary RC-135 callsign has been TAHOE, with the numbers 21-24 noted in use.

Air refuelling Tankers based at RAF Mildenhall have been using DOLLAR and RIYAL callsigns, with regular missions utilising a flight of up to six aircraft. The more common GOLD tanker TDY callsign is heard regularly, and MARK has also been heard on several occasions on refuelling missions. There appears to be a money related theme for the callsigns used for the Kosovo support missions, this theory is compounded by GILDER, which appears to be flights out of Frankfurt Rhein Main. Other callsigns heard, which are presumed to be tankers, are DIME (Frankfurt?), EURO (Istres?), plus LIRE and RAND.

Incidentally, the 'DOLLAR' flights have been heard using the USAF Common Air-to-Air frequency, 'Winchester', 303.0 (also called 'Thirty Thirty'), for in-flight communications. Other UK and European Air Refuelling/Boom frequencies heard in use in recent weeks have been 258.4, 268.25, 294.8, 296.6, 298.1, 299.6, 299.7, 344.1 and 380.8.

On the 28th, three EC-130s from the Pennsylvania Air National Guard (193rd SOS) were heard over the Atlantic on h.f. 5616 and 8864 (Shanwick), and by a German correspondent inbound to Rhein Main. Callsigns were BATON 21/22/23. A later report indicates that they are operating out of Ramstein.

Deployed In Europe

Some of the military airfields in Europe hosting the eleven NATO Air Forces are currently an aircraft/radio enthusiasts' dream (not that I am recommending that you visit them, especially with a radio in hand!). It would be impossible for me to list the airfields/units in detail, but one is well worth mentioning. Aviano in Italy has never seen so much aircraft activity, at the last count there were fifteen different units deployed there, and one correspondent noted 148 visiting aircraft. Aircraft departing Aviano, Brindisi and Istrana are working Padova Military on 129.375, 235.15, 291.15 and 373.45, before being handed off to tactical Italian Military GCI or AWACS control, using the callsigns of MAGIC, BOOKSHELF and COASTLINE.

Callsign Odds & Ends

Several reports note E-8Cs operating out of Frankfurt and other airfields, using the callsigns JAKE 06/08, REPEL 03, FAIL 22 and MOAN 06. REAPER 01 is reported to be the callsign of the 492nd FS F-15C, which claimed a Mig kill on the 31st March. MOONBEAM is being used regularly by EC-130s believed to be from the 42nd ACCS.

During the first three weeks of action, the following aircraft callsigns have been heard in the airspace over the Adriatic Sea. Whilst you could make an educated guess, they have not been firmly identified: ACE 60, ALTER 21, ARROW 32/33, AUDI 22/23 and 33/34, BALL 55, BUICK 11, CANON 11 and 31, CLEAVER 11-13, CLUB 21 and 31/32, DARK 31/32, DRAGON 10, FIAT 60/61, FORD 11, LUGER 01, MACE 51, ORANGE 99, ROCK 02, ROCKET 41, SAAB 21-24 and 91-94, STEAR 11, SWAP 01, TRAP 34, WAFER 25 and 45, WEASEL 22, ZORRO 36/37. The callsign VEGA has been reported on several occasions, with both American and European pilots being heard.

USS Enterprise

One anonymous lucky reader who was on holiday in Italy picked up US Navy aircraft, operating from the carrier USS Enterprise (no frequency mentioned). With the help of some additional information, I have hopefully tied up the units with the callsigns he sent me. They are as follows:

VF-14, F-14D, Gipsy, Kilo/VFA-37, FA-18C Ragin/VFA-105, FA-18C , Canyon, Prairie/VAQ-130, EA-6B, Pulse, Zapper.

HF Interference

From early in the conflict, what is presumed to be a Serb station on h.f. on 11.175 (USAF Global), has been heard transmitting jamming tones, plus answering US Military Air Traffic with a selection of insulting comments in English. Four different sources have reported such comments as "Shut up you dirty pigs", "You dirty monkeys", "Get your hands off Serbia". The 'F' word has been heard in use several times, with the most common comment being used to tell NATO to, "Go away!" The messages have sometimes been very weak and garbled, but the gist of them was very obvious, some sources have suggested that the origin may not be from Serbia but from further East!

Show Cancellations

Because of operational requirements, the conflict in Kosovo has caused many Air Shows to be cancelled. As you will all be aware by the time you read this, Mildenhall Air Fete is the biggest casualty so far. European shows, The Tiger Meet and major exercises such as Brilliant Foil have all been cancelled. If you had planned to travel to an event, check in advance to see if it is still taking place.

So much has happened in a short time, as you will appreciate this report barely skims the surface of the airborne activity around Europe. More Kosovo information next month - our photographs this month show several of the types and units involved with the conflict.

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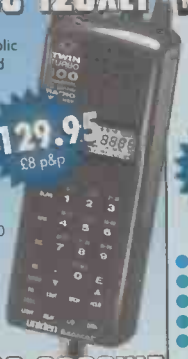

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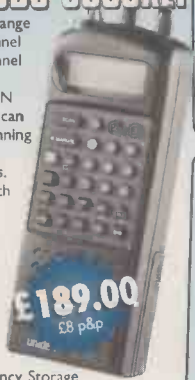

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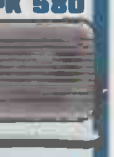

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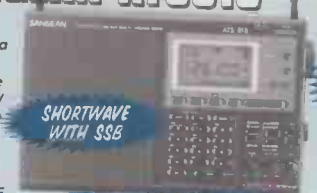

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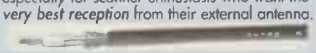

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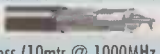

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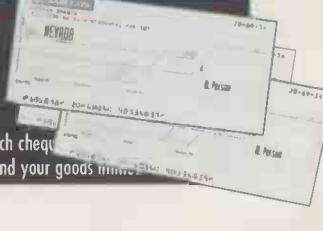
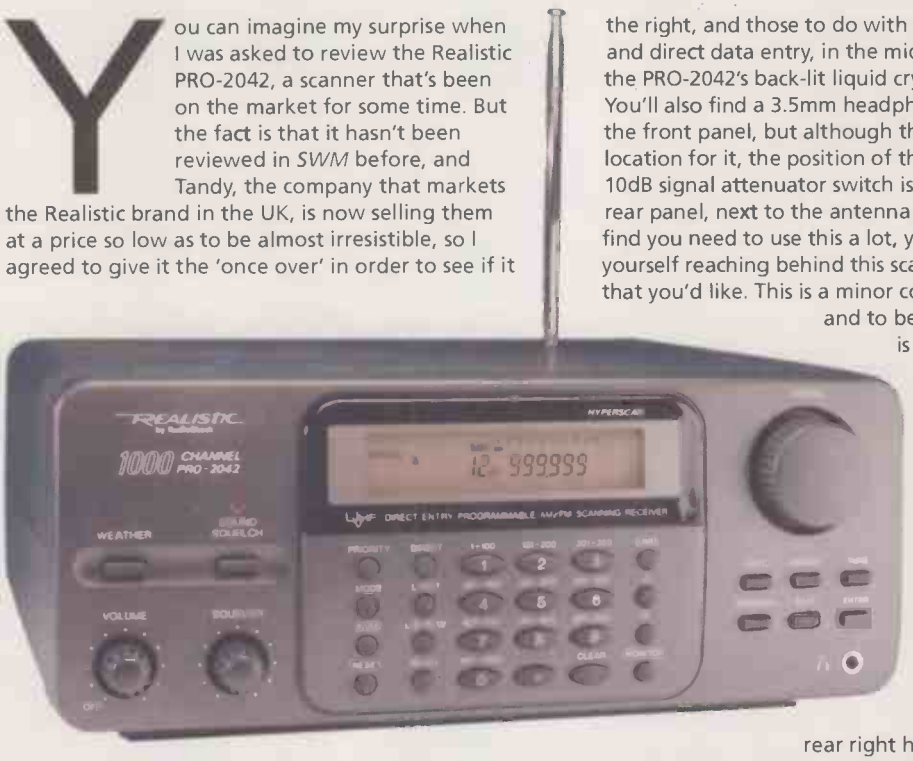


Realistic PRO-2042 - Bargain Of The Year?

Faris Raouf investigates one of the knock down price radios that has recently hit the market due to the take-over of the Tandy chain of stores by The Carphone Warehouse.

You can imagine my surprise when I was asked to review the Realistic PRO-2042, a scanner that's been on the market for some time. But the fact is that it hasn't been reviewed in *SWM* before, and Tandy, the company that markets the Realistic brand in the UK, is now selling them at a price so low as to be almost irresistible, so I agreed to give it the 'once over' in order to see if it really is the 'bargain of the year' it would appear to be at first glance.



So just what does the PRO-2042 offer? Well, it's basically a base scanner offering no less than 1000 programmable memory locations (split into 10 banks of 100), a.m., n.b.f.m. and w.b.f.m. coverage from 25 to 1300MHz (though with a big, but relatively insignificant, hole between 520 and 760MHz), and a variety of different scanning options to help you ferret out new frequencies and keep track of those you've already discovered.

As I've already said, the PRO-2042 is a base scanner, and as such it isn't particularly small, measuring a good 90 x 232 x 210mm, and weighing in at 2kg. Sensibly, almost all the unit's connectors are at the rear, and almost all its controls are at the front.

At the rear, for example, you'll find a BNC antenna socket, a 3.5mm external speaker connector (which disconnects its built-in speaker when used), a phono tape output, and a coaxial 12V power input. Surprisingly, you don't get, or need, a suitable external power supply to connect to this latter socket, as rarely these days, the PRO-2042 actually has its own built-in 240V mains power supply, complete with a captive lead and plug.

Moving onto the front of the unit, you'll find that the control panel is split into three main sections, with those to do with volume and squelch on the left, those to do with tuning and scanning on the right, and those to do with programming, and direct data entry, in the middle, just below the PRO-2042's back-lit liquid crystal display. You'll also find a 3.5mm headphone socket on the front panel, but although this is a sensible location for it, the position of the PRO-2042's 10dB signal attenuator switch is not - it is on the rear panel, next to the antenna socket, so if you find you need to use this a lot, you'll also find yourself reaching behind this scanner more often that you'd like. This is a minor complaint though, and to be fair, the problem is not unique to the PRO-2042.

There is one more physical aspect of the PRO-2042 that's worth mentioning - a small hole, about 5mm in diameter, located in the top of the case, towards the rear right hand side. This is actually the home for the rather fragile-looking telescopic antenna supplied with the unit - you just slide it in, then screw it round until it is firmly mated to a connector deep within the body of the scanner.

A brief paragraph and a table in the scanner's manual explains how you can improve signal reception by reducing the length of the antenna as you move upwards in the frequencies you are listening to - a trick you can use with the telescopic antennas supplied with some hand-scanners too, though don't expect it to work miracles!

Tuning In

The most basic way to hear a particular frequency with the PRO-2042 is to activate the manual tuning mode, something you can do by pressing a button marked 'Tune', then either entering the desired frequency using the scanner's numeric keypad, or by tuning to it using the tuning knob. Disappointingly, the tuning knob isn't a weighted, free-spinning arrangement like on some scanners, where one quick flick can have the knob rotating a few times before it comes to rest. Instead, it is simply a stop-less, 24-position rotary control, though it does have a quite pleasant feel, and is designed so that you can feel a click each time you move it between positions.

Tuning step size and receive mode are set automatically, and usually accurately, thanks to a built-in band plan, but the pre-set settings can be easily over-ridden at any time by pressing the

"Up to 200 lockouts can be stored at a time, and adding one is simply a matter of pressing a button marked 'L/OUT' on the front panel"

dedicated 'Step' and 'Mode' buttons located under the display to cycle through the available options. I've already said that the available receive modes are limited to a.m., n.b.f.m. and w.b.f.m., which is fine for most users, but I have to admit to being surprised to find that the step sizes on offer are limited to a rather disappointing 5, 12.5 and 50kHz. Still, if you find that your manual choice turns out to be wrong for the frequency you are listening to, simply pressing the 'Reset' button, located just below the 'Step' and 'Mode' buttons, returns you to the pre-set mode and step.

Any frequency you tune to can be quickly transferred to one of the PRO-2042's 100 special memory locations called Monitor memories (which are quite separate from the 1000 main memory locations), simply by pressing a dedicated front-panel button labelled 'Monitor'. Usefully, the memory location is written to automatically increment by one each time the 'Monitor' button is pressed.

What you can't do, however, is transfer a frequency you are already tuned to directly to one of the 1000 main memory locations, something I found very annoying indeed. You can very easily move one or more frequencies stored in Monitor memory to main memory, or enter and store a frequency directly into any main memory by typing it in using the numeric keypad then pressing one or two other buttons, however, which almost makes up for this omission.

As well as the manual methods of storing frequencies into memory locations I've already described, there is also an automatic write mode, activated by pressing a button marked 'Auto'. After pressing this button, you must decide which bank or banks you want any active frequencies found to be written to. This is done simply by pressing one or more of the numeric keys (1 to 0) to enable or disable any one of the PRO-2042's ten main memory banks.

You then have to enter a lower and upper limit for the search range, and override the step and receive modes if necessary, but that's about it - the PRO-2042 will then happily hunt for active frequencies until all your memory locations are used up or you press the 'Auto' button again. What's more, any active frequencies found this way are ignored if they are already in a main memory, so you never end up with hoards of duplicate frequencies when using this mode, a very useful feature indeed.

A variation on this theme is the PRO-2042's Limit search mode. Here, you can select one of ten user-definable pairs of frequencies for the scanner to search between. Active frequencies aren't automatically stored into main memory in this mode, however, and this is where the 100 Monitor memories come into their own - when the scanner pauses at an interesting active frequency, all you have to do is press the 'Monitor' button to store it temporarily. Once you've finished, you can go through the stored frequencies to check them again, then move all or some into main memory for permanent storage with a few button pushes.

Yet another alternative active frequency location mode is called direct mode, activated by pressing a button marked, would you believe, 'Direct'. In this mode, you can simply scan upwards or downwards from the frequency currently selected until an active frequency is found. Again, when you find an interesting frequency, you can store it in one of the scanner's Monitor memories, from where it can eventually be copied into a main memory location if required.

Once you have a set of frequencies in main memory, you can automatically scan through all of them, or just those in certain banks, by pressing the 'Scan' button followed by a press or two of one or more of the numeric keys to add or remove any banks you wish. Alternatively, you can browse through memory locations manually, one by one, by pressing the 'Manual' button.

Sorting Things Out

Amazingly, you can actually get the PRO-2042 to sort stored frequencies within memory banks into ascending or descending order, or simply to re-arrange stored frequencies so as to remove any 'holes' (memory locations without frequencies stored in them that are situated between locations that do have stored frequencies) in a bank. These two functions can be incredibly useful, and aren't to be found on many scanners, even ones ten times as expensive.

The PRO-2042 also has a few other interesting features worth talking about. The first is a Lockout facility, which gets the scanner to ignore selected memory locations or frequencies when it is searching or scanning. Up to 200 lockouts can be stored at a time, and adding one is simply a matter of pressing a button marked 'L/OUT' on the front panel when the offending frequency of memory location is being listened to. Stored lockout frequencies and memory locations can also be reviewed and deleted at will.

Another interesting feature is the PRO-2042's Priority mode. This is similar to most other scanner's Priority function, and simply allows you to select a memory channel to be monitored every two seconds, no matter what. Finally, there is a 'Sound Squelch' feature, activated through a dedicated button. When activated, this prevents the PRO-2042 from stopping when it comes across an open carrier or other un-modulated signal when scanning.

In Use

I've now covered just about all of the PRO-2042's features, which may be a tad more limited compared to the number of scanning and searching permutations available on some scanners, but certainly cover all the basics and then some. But although there is nothing really to complain

The eagle eyed amongst you may be wondering what on Earth the button marked 'Weather', located near the volume and 'Sound Squelch' controls on the left hand side of the PRO-2042, might be for. Well, unfortunately this button has no real use if you use the PRO-2042 in the UK, as it is designed to instantly tune the unit to one of the ten weather report frequencies used extensively in North America - but not over here. It's a shame Realistic couldn't re-program the frequencies to something more useful for us Brits, but I suppose it would have been a relatively difficult process, and one that would have added considerably to the price of the unit.

about from the features point of view, there is an awful lot to complain about in terms of ease of use.

Part of the problem stems from the PRO-2042's manual, which doesn't really explain the scanner's operating as well as it could, and part of the problem stems from the fact that it requires too many key-presses to achieve certain results. Going from main memory scanning mode to manual tuning mode requires you to press two keys, when it could so easily have been programmed to happen with one key press, for example.

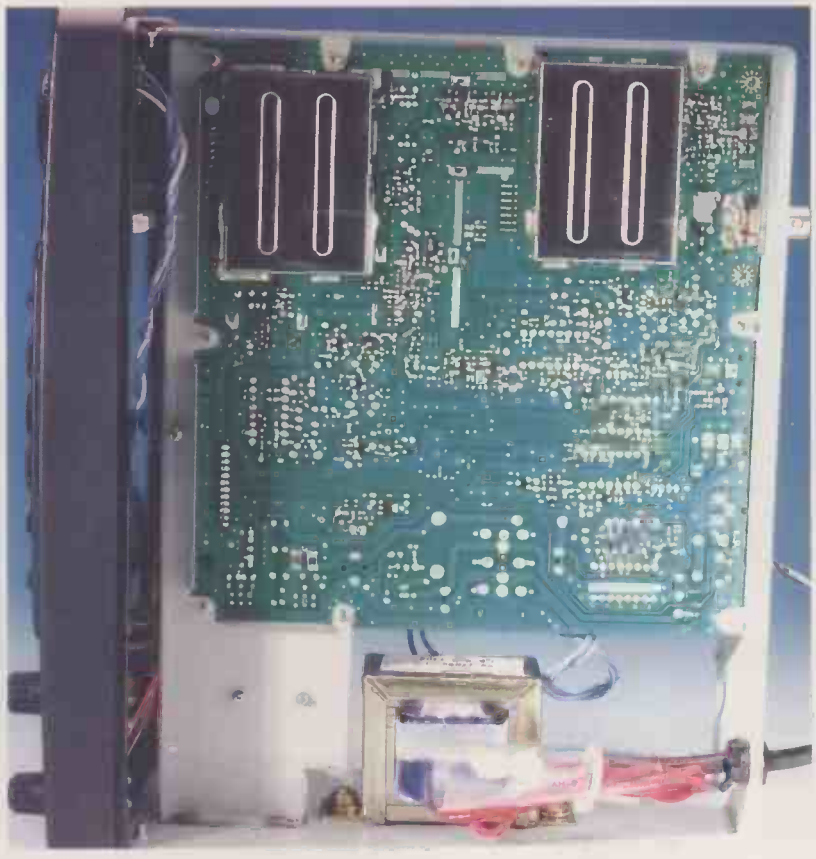
The end result is that I found myself getting infuriated with the PRO-2042 at times, and at its manual at others, especially at its lack of an index. Still, the PRO-2042 does only cost £149.95, so I can forgive it for all these little foibles. What I can't forgive this scanner, despite its low cost, is its lack of an 'S'-meter of any sort. Yes, you heard me - **there is no 'S'-meter on this scanner.**

But putting this unforgivable omission aside, once I began to understand its little idiosyncrasies, I managed quite well with the PRO-2042, and I picked up local and even some quite far off transmissions using its supplied telescopic antenna. Much, much better results were to be had by connecting a more competent antenna, such as my simple SkyScan indoor desktop discone, which did wonders to its signal catching abilities.

But, at the end of the day, no matter which antenna I used, I have to admit that I felt just slightly disappointed in the PRO-2042's sensitivity, which didn't seem to be any better than any of my hand-held scanners, though it did seem to be a tad more immune to the likes of strong local pager signal breakthrough.

The Bottom Line

So should you buy one? This is a really difficult question to answer, but at the end of the day I'd have to say 'yes'. It's amazingly affordable price just makes up for most of its faults, and while I think its lack of an 'S'-meter is a criminal offence, in truth most users won't care that much, and some won't even notice it isn't there.



So while I don't think I can quite call it the 'bargain of the year', though it does come so very close, it most certainly isn't a 'dud of the decade', and I can heartily recommend this as a great 'first scanner', or as a basic, but still very serviceable, supplemental scanner for those who already own one.

Thanks to **Mike Haydon** of **Haydon Communications, 132 High Street, Edgware, Middlesex HA8 7EL, Tel: 0181-951 5781/2, FAX: 0181-951 5782** for supplying the review sample. Mike has bought what seems to be the last stocks of this scanner in the UK. ***SWM***

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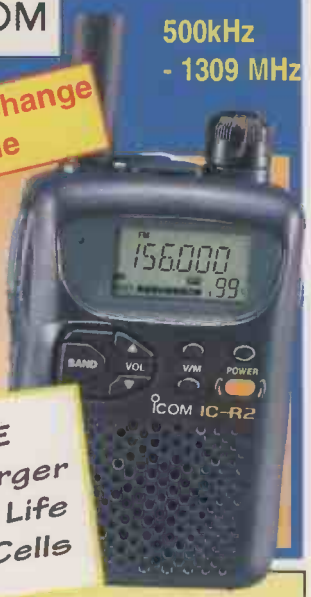

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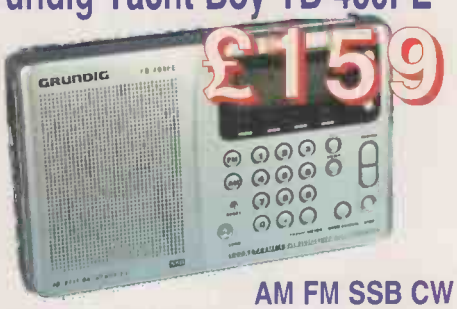

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What Are The Wild Wav

From whatever direction, the weather that we experience in the UK arrives via surrounding sea areas. For information on what weather we may expect, Philip Mitchell explains how essential it is that our forecasters be in possession of as much data as possible on what is happening in real time.

To expand the available weather-related data from the ocean, some 13 moored buoys have been installed in the waters around the UK, 12 of which since 1987, when in October of that year, the sparsity of ocean weather data resulted in the great storm of that month not being accurately forecast, much to the embarrassment of the Meteorological Office.

Prior to 1987, only one observational buoy provided information on barometric pressure, temperature, wind and humidity per day. Today, the 13 buoys, costing in the region of £350000 each, provide nine different weather-related measurements taken during a 20 minute period, prior to being transmitted every hour in a 24-hour period. The buoys operate in extreme weather conditions, and all systems therein are designed to operate in a temperature range of -20°C to +50°C.

Ocean Data Aquisition System

For many years, two weather ships, the *Cumulus* (callsign GACA) stationed to the west of the UK, and *Polar Front* (callsign LDWR) stationed to the west of Norway, provided weather observations of the North Atlantic ocean and Norwegian sea respectively. *Cumulus* was withdrawn from service by the Met. Office some three years ago, but the Norwegians still operate *Polar Front*. Weather reports from the latter can be received in the World Met. standard RTTY transmissions from Hamburg Meteo. (s.s.b. mode 4.583MHz and 7.646MHz).

For those decoding these transmissions with the popular *Hamcomm* programme, look out for weather report type BBXX with the ship identification heading of LDWR as shown in **Fig. 1**. *Cumulus*, the running cost of which was in the region of £500000 per annum, relayed the observed North Atlantic weather data back to the Met. Office, Bracknell, a task that is now performed more cost effectively by the moored unmanned data buoys network.

Data for processing compliments other sources of information in the compilation of weather forecasts and is also used for archival purposes for climatic research. Information on weather states and forecasts in sea areas around the UK is also made available direct to the public via the Met. Office *MetFAX* service.

Fig. 1: An RTTY met. report from Norwegian weather ship Polar Front. 11/06/98. Transmitted from Hamburg meteo. DH7 7.646MHz. Decoded with Hamcomm.

```
09:02:14  BBXX    [SHIP]
09:02:14
09:02:15  LDWR    [ship id]
09:02:16  11094   [day:11 UTC:0900] [Wind speed obtained from
                  anemometer (knots)]
09:02:17  99625   [latitude:62.5]
09:02:18  10036   [longitude:3.6] [latitude north, longitude east]
09:02:20  41397   [manned] [cloud height:200-300m]
                  [visibility:10km]
09:02:20  80223   [cloud cover:8/8] [wind dir:20 deg, speed:23]
09:02:20  10072   [air temp:+7.2]
09:02:21  20055   [dew-point temp:+5.5]
09:02:22  49996   [pressure at sea level:999.6hPa]
09:02:23  52040   [pressure:increasing] [change in 3h:4.0hPa]
09:02:24  76166   [past wx: rain]
09:02:25          [wx now: Rain, not freezing, continuous,
                  slight]
09:02:25  8772/   [low clouds:7/8 fractostratus or cumulus fractus
                  pannus]
09:02:28          [mid clouds:altostratus opacus or nimbostratus]
09:02:28  22272   [ship direction: NW, speed: 6-10 knots]
09:02:28  04082   [sea-surface temp: 78.2]
09:02:28  10606   [wave period:06 seconds, height:2.75-3.25m]
09:02:29  70028   [wind wave height:2.8m]
09:02:30  =
09:03:55  20008   [minimum temp:+0.8]
09:03:56  69939   [precipitation:0.3mm during last 15 hours]
09:03:57  =
```

Instruments

Weather instruments installed on the data buoy measure the following variables: wind speed, wind gust, wind direction, barometric pressure, air temperature, sea surface temperature, humidity, wave height and wave period. In addition to this instrumentation, there is an interface with the Global Positioning Satellite (GPS) to enable any buoy to be accurately located, also radar reflectors are attached to the buoy to prevent the likelihood of possible collision by a moving vessel.

Met. Office ODAS (Ocean Data Acquisition Systems) moored weather buoy. ***Crown copyright.***

All the variables mentioned above are connected to sensors that enable movement or a variation in electrical resistance to be converted into a modulating signal prior to transmission. Other sensors in the buoy monitor operational performance, as listed in the last 10 variables of **Fig. 3**.

The assembling of this data is performed by the Data Acquisition and Processing System (DAU), and this system is designed to operate unattended for a period of at least 18 months, provide an interface with the weather instruments mounted on the buoy and format the extracted data into a meaningful code, as in the top part of **Fig. 3**.

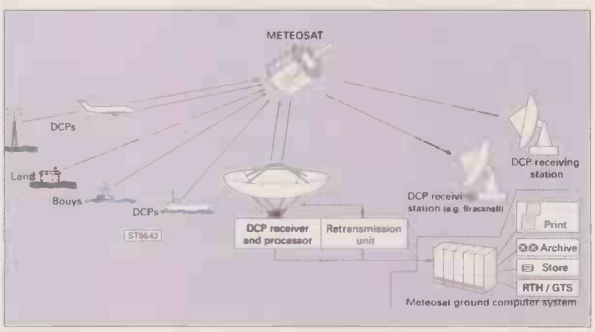


Fig. 2: METEOSTAT Data Collection System.

All instrumentation in the DAU is duplicated and the data thus obtained is passed to a Data Collection Platform (DCP) installed within the buoy prior to transmission. The diagram **Fig. 2** indicates that other DCPs for weather observation purposes are installed in aircraft, ships, and at remote world-wide land sites.

Data Transmission System

The weather data from the DAU is in serial ASCII format conforming to World Meteorological Organisation standards and is transmitted by the DCP to the geostationary *METEOSAT-5* weather satellite. The message, as illustrated at the top of **Fig. 3**, will be in coded five number block format, and will be familiar to those whose interest lies in the decoding of RTTY weather messages.

The key to this code is given in the second part of **Fig. 3**, but up to now, no report has been recorded of the reception and decoding of these signals by amateur decode enthusiasts. The data within this table is transmitted in f.m. mode by a 25W crystal controlled transmitter fed via an omnidirectional antenna to the geostationary *METEOSAT-6* weather satellite

es Saying?

(positioned at 0° longitude) within the allocated weather satellite band of 401 - 403MHz.

An internal clock in the transmitter will ensure precise transmission timing of the data, within an allotted time slot. Since there is a time limit on traffic to and from the satellite's communication system, the duration of transmission from buoy to satellite is fixed at one minute duration within this time slot. This is quite adequate for all the weather information that the buoy has gathered, to be transmitted prior to each synoptic hour.

The transmitted signals from the buoy DCP to the satellite are allocated to one of 66, 3kHz spaced reporting channels within the frequency range of 402.00250 to 402.197500MHz to an accuracy of ±100hHz. The signals are then fed via a 200kHz bandwidth transponder to be converted to 1691MHz for retransmission from *METEOSAT-6* satellite to the European Space Agency ground station at Odenwald, Germany.

From this ground station they are then relayed to the nearby European Space Operations Centre, Darmstadt, where the processed data is transmitted back to Meteosat, thence by downlink direct to the Met. Office, Bracknell, UK, for compilation of forecasts and distribution to users. By utilising the Meteosat satellite data collection system, near real time transfer of observed weather data is achieved from the ODAS buoy to Bracknell UK.

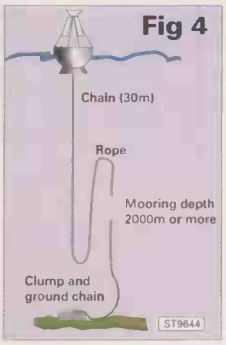


Fig. 4: Met. Office ODAS weather buoy mooring. ***Crown copyright.***

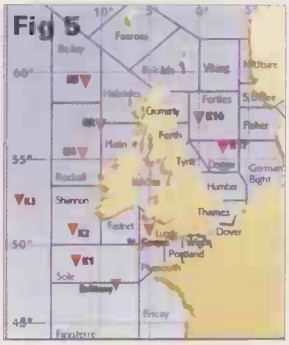


Fig. 5: Location of ODAS moored weather buoys within the UK sea areas. ***Crown copyright.***

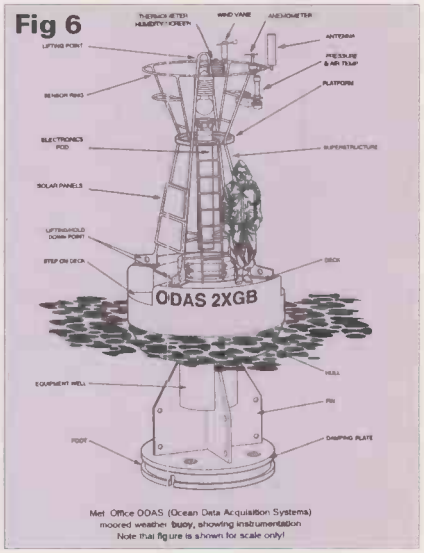


Fig. 6: Met. Office ODAS (Ocean Data Acquisition Systems) moored weather buoy, showing instrumentation. Note that figure is shown for scale only! ***Crown copyright.***

05DDD 07DDD 10DDD 11DDD 12DDD 13DDD 14DDD 15DDD
18DDD 19DDD 22DDD 23DDD 35DDD 36DDD 50DDD 51DDD
52DDD 53DDD 70DDD 71DDD 72DDD 73DDD 74DDD 75DDD or 8DDDD or 9DDDD

Address	Variable	DDD Decode Units	Notes	Default Value
05	Station Ident	xxx*		000
07	Wind dir	Deg (T)	10 min average	999
10	Wind speed	Kn	10 min average	999
11	Max gust	Kn	3 sec gust	999
12	Air Temp	Deg (C)	Average over 10s	999
13	Sea Temp	Deg (C)	Average over 10s	999
14	Humidity	%		000
15	Pressure	hpa	Average of 10s	999
22	Time	Hr Min	GPS Ob Time	999
23	Time	Min Sec	GPS Ob Time	999
35	Wave Period	Sec	Over 17.5 min average	999
36	Sig Wave Ht	m	4xRMS 17.5 min average	999
50	Latitude	Deg	GPS Position	000 (999)**
51	Latitude	÷10 min	GPS Position	000 (999)**
52	Longitude	Deg	GPS Position	000 (999)**
53	Longitude	÷10 min	GPS Position	000 (999)**
70	Pod Humid	%		000
71	Flash Mon			500
72	Tx Counter			999
73	System Volts	Volts	System on load	999
74	A-D Ref		2.5V Source	999
75	Pod Temp	Deg (C)		999
76	Hull State		Sys'1 Higher Sys'2 Lower	500
77***	Current Used	Ah		
8****	'I' Discharge	mAh	max 9999mAh	77999
9****	'I' Charge	mAh	max 9999mAh	77999

*xxx refers to the electronics pod (pod), and system number, e.g. 271 is pod '27' system '1', 272 is pod 27 system '2'.

** 000 - GPS has failed to locate a position.
999 - GPS has failed.

*** Current used.

**** Hourly currently charge or discharge.

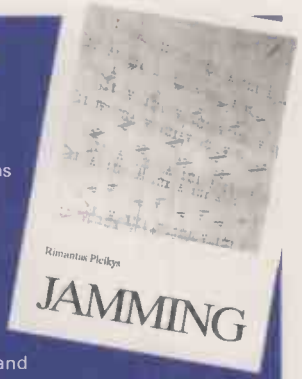
Fig. 3: ODAS buoy message format. Top shows transmission format. Actual values of observed weather will replace DDD as listed in 'DDD Decode Units' column. ***Crown copyright.***

Thanks To

My thanks to **Ian Tebbutt** of **Space Technology Systems** and the **Meteorological Office, Bracknell**, for information supplied for this article. ***SWM***

Book Profile

Jamming By Rimantas Pleikys



To someone like me, who is not 'technically' minded, this book at first appeared to be of very little interest, with its rather uninspiring black and white cover and unfamiliar subject matter. However, I always like to approach books with an open mind! The 164 pages are about the practice of 'jamming' radio station broadcasts during the last 50 years. 'Jamming' was the governments' method of censoring 'delicate' information - or "dangerous ideas", by transmitting other sounds, such as 'white noise', over original broadcasts, and was employed by the governments of parts of Asia, as well as areas of central Europe, such as the former Soviet Union and Poland.

Despite the cover, the book is illustrated throughout with diagrams, photographs and maps (although black and white!), and does succeed in grasping the reader's attention. It is always interesting to know about government censorship, and to know that it takes place not only during wars, and is not necessarily confined to the past.

Although the book covers such issues, I did not feel it made the most of a potentially fascinating subject. It is clear that Pleikys has spent much time researching the material and gathering sources, and the book is certainly very informative. However, the reader does feel somewhat bombarded by statistics. While these facts and figures are relevant and important, Pleikys remains objective, when the account could be livened up a great deal with a few of his own opinions. Many readers may, of course, prefer this approach. Indeed, for those who have a previous particular interest in government jamming of radio stations, this book offers a clear and concise history. Towards the end, in the interesting section entitled 'Polish Polka', Pleikys finds many of his quests for information to be fruitless, yet succeeds in drawing some good conclusions, and a structured argument, from the sources he has uncovered. This final section focuses on jamming in Poland, where the government used 'pop music' rather than 'white noise' to block radio broadcasts, possibly in an attempt to disguise the fact they were jamming at all.

For anyone who already has a background knowledge of jamming and would like to discover the specifics, I recommend this book.
For more information, visit **www.is.lt/ratekona/2/knygos/jamming.htm** ***Alison Frith***

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In My Experience

Old Lessons, often repeated for the beginner

Following on from last month's review, John Wilson G3PCY is back with the promised performance figures of the Icom R75, a look at d.s.p. in general and automatic filter set-up. Here goes...

I left off last month in my review of the most excellent Icom R75 receiver promising to give you the measured performance figures, but in browsing through the articles I have previously written in *Short Wave Magazine*, I came across the one entitled 'What constitutes a landmark', in which I set out my own views on what I thought a good short wave receiver should have in the way of design features and performance. As I read it, I realised that this article virtually described the R75, so it is little wonder that I fell in love with the receiver and found it so rewarding.

I would have loved it even more if I had realised that buried in the mass of shredded paper which Icom UK had used to cushion the R75 on its journey through the parcel carrier system (we guarantee overnight delivery, but we didn't say anything about it arriving in one piece), was a complete selection of all the accessory filters which I never found...read the delivery note next time!

What I did find, because they were actually in the receiver carton, were the two 250Hz c.w. filters which I tested in the review receiver. Assuming that the filters I didn't find were as good as the ones I tested - and I see no reason to suppose otherwise - then the R75 should satisfy my every need, and yours as well if you decide to have one.

As I said in the review, the measured performance was in line with what we might expect, so for those who like comparing nought to sixty times, rather than just enjoying the driving, here they are. Because of the extended frequency range of the R75, coupled with the filter options and the d.s.p. option, I ended up with a lot of results, some of which caused me to press further into the causes of apparent anomalies. **Table 1** shows the sensitivity expressed in dBm for 12dB SINAD in s.s.b./c.w. Measurements in a.m. for 12dB SINAD are taken with 60% modulation at 1kHz, and f.m. with 1kHz modulation at 3kHz deviation.

Several things are shown by the results in **Table 1**. Firstly that the sensitivity all the way from 1.8MHz to above 30MHz is extremely constant, a feature of all the Icom receivers I have tested, including the PCR1000. For me, the -119.4dBm is absolutely the right level of sensitivity for a good h.f. receiver, and I always normalise my other measurements to -117dBm to allow direct comparison.

The instruction manual implies that the front-end r.f. filtering changes at 1.8MHz, but the sensitivity results suggest that changeover occurs at 1600kHz since the sensitivity seems to be rolling down a filter slope at 1610kHz, dropping sharply just 20kHz away at 1590 and coming back a little by 800kHz. It's all a bit academic really, because in the medium wave band, sensitivities close to 0.3µV are not needed. I checked at 60kHz to see if I could hear Rugby, and found that the measured sensitivity had fallen to -100dBm.

Tuning the receiver from 500kHz downwards showed that the internal noise started to rise at about 250kHz to give audio increase of 6dB at 103kHz, 12dB at 80kHz and 20dB at the end of the tuning range at 30kHz. I suppose most listeners will not be too concerned about this, but if you are a v.l.f. enthusiast, you should take it into consideration. Actually, the real v.l.f. enthusiast would probably be using an AR88LF or a mighty B40/41 in any case, and many receivers exhibit this rising noise pattern to a greater or lesser degree.

Sensitivity at 56MHz was down by about 6dB, but Icom have fitted a switchable pre-amplifier for frequencies above 30MHz, which restores some of the sensitivity but not completely, as I'll explain later.

Sensitivity on a.m. using the fitted 6kHz bandwidth followed the identical pattern to that on s.s.b. but at 10dB lower (-109.9dBm instead of -119.4dBm). The 'normal' selectivity settings for a.m. use a three-pole crystal filter at 9MHz and a 6kHz ceramic at 455kHz, whereas s.s.b. gets a 2.4kHz filter at 9MHz with the

Table 1: Upper side band sensitivity.

Frequency (MHz)	Bandwidth (kHz)	Sensitivity (dBm)
56.000	2.4	-113.9
28.000	2.4	-119.4
22.000	2.4	-119.4
14.200	2.4	-119.4
6.500	2.4	-119.4
1.800	2.4	-119.4
1.610	2.4	-118.3
1.590	2.4	-114.3
0.800	2.4	-116.4
0.60	2.4	-100

In My Experience

CFJ455K5 2.4kHz multi element excellent filter at 455kHz, hence my previous remarks in the review about my wish to have a really good 6kHz crystal filter option for a.m.

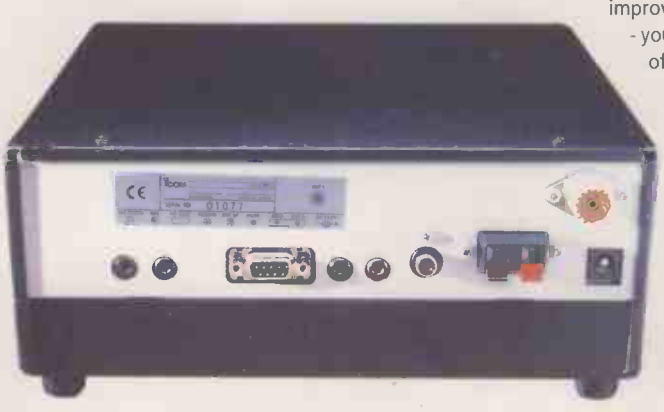
With the 250Hz filters, c.w. sensitivity is as good as you would ever want, and f.m. is equally satisfactory. However, take a look at what happens when you use the switchable pre-amplifiers and the measured sensitivity does not improve by anything like 10dB or 16dB. In fact, on c.w., the 10dB pre-amp shows a sensitivity increase of about 5dB at 14.200MHz and 8dB at 28.000MHz.

This is not an effect peculiar to the R75, far from it, it simply demonstrates that when you add a pre-amplifier to a receiver which is already very good, you have to ensure that the pre-amplifier is considerably better in its noise performance than the receiver itself, and without going for liquid nitrogen cooling of the amplifier you are up against fundamental laws of physics. Look up 'Boltzmann' in your reference encyclopaedia for further information.

Table 2: Sensitivity c.w. and f.m. Modes.

Frequency (kHz)	Mode	Bandwidth	Sensitivity (dBm)
14.200 (no pre-amp)	c.w.	250Hz	-127.4
14.200 (10dB pre-amp)	c.w.	250Hz	-132.6
14.200 (16dB pre-amp)	c.w.	250Hz	-136.7
28.000 (no pre-amp)	c.w.	250Hz	-125.9
28.000 (10dB pre-amp)	c.w.	250Hz	-134.4
28.00 (16dB pre-amp)	c.w.	250Hz	-135.9
27.000 (no pre-amp)	f.m.	Narrow	-114
27.000 (no pre-amp)	f.m.	Wide	-112.8
27.000 (10dB pre-amp)	f.m.	Narrow	-122.4
27.000 (10dB pre-amp)	f.m.	Wide	-121.4
27.000 (16dB pre-amp)	f.m.	Narrow	-124.4
27.000 (16dB pre-amp)	f.m.	Wide	-123.6

Enough of this prattling; you at least have the ability in the R75 to switch in the pre-amp if you want to, but don't be surprised if there is not the sensitivity improvement you expected - you can always switch it off again. I recall with some amusement the number of people who used to say that Drake receivers were obviously insensitive because they were so quiet compared to, say, an Eddystone 940. Poor misguided fools that they were; they just didn't realise that the 'quietness' of the Drake actually indicated the inherent design quality, whereas the mighty rushing wind of the Eddystone showed that the designers had got the gain distribution completely to pot. Old lessons, oft repeated, eh?



Signal performance at 14.200MHz u.s.b.

No nonsense here, just the facts. The R75 coughed up a dynamic range of 99dB and a third order intercept point (normalised to -117dBm) of +16dBm. For a receiver of the price class, this is a good result, but remember that the performance will be degraded when the pre-amplifiers are used. However, as I have already said, the 'normal' sensitivity of the R75 is absolutely perfect for h.f. listening without the need for pre-amplification.

Reciprocal mixing measurements, which give a good indication of synthesiser cleanliness, gave results of 84dBc/Hz at 10kHz spacing, rising to 130dBc/Hz at 100kHz spacing. The close-in measurements indicated the presence of low level unwanted synthesiser noise 'spurs', which in normal use would probably not be noticed, but there are some receivers at a slightly higher price level which nevertheless demonstrate that it is possible to get a very clean h.f. receiver synthesiser chain, and the difference is obvious when tuning close to a strong signal.

Signal strength metering checked again at 14.200MHz was accurate at S9 with each 'S' unit representing a 5dB change rather than the usual 6dB. The S9 point was level from 1.8 to 30MHz, but fell off by 2dB at 40MHz and 4dB by 55MHz. At the low frequency end, the S9 point had fallen by 4dB at 250kHz and continued to fall off as the tuned frequency went lower. This is in line with the measured sensitivity fall off, so it's probable that the 'S'-meter is actually correct and it's the receiver sensitivity which is changing. Not significant to most users of course, and across the main h.f. range, it's all up to normal Icom high standards of accuracy.

Finally, going back to sensitivity measurements, I checked the effect of using the noise reduction facility of the d.s.p. option to see if it could improve the ability of the R75 to dig signals out of the noise. Bearing in mind that I was asking the receiver to perform at its ultimate sensitivity threshold, and that using d.s.p. on a single tone is not the same as using it on a speech signal, it nevertheless demonstrated a 2 to 3dB improvement in signal recovery over the non-d.s.p. mode. I was not surprised to find that in a real signal situation, whilst there was a clear improvement in speech intelligibility in noisy conditions, the resultant audio sounded quite 'different' to normal speech. Given the choice, if I were buying an R75, I would certainly have the d.s.p. fitted - and that's quite an admission from me!

Once again, Icom have not disappointed in producing the R75, and it's a fine contender in the competitive mid price receiver market.

And so to other things...

A close friend commented to me that despite my apparent dislike of the audio produced by d.s.p. systems as used in, for example, the NRD-545, the fact remains that other reviewers have issued glowing reports on the same receivers. It's an interesting point, and having read some of these other reviews in detail, I want to make one observation which might explain the apparent difference between results, and that is that in the case of the more enthusiastic reviews, they have been carried out on the basis that the receiver under test is first and foremost an h.f. 'communications' receiver and the reviewers have conducted their listening and evaluation tests mainly on the amateur bands.

Well, I couldn't agree more that the Watkins-Johnson

HF-1000 or the NRD-545 perform well on communications speech, but keep in mind the fact that amateur radio s.s.b. transmissions are being produced for the most part by solid state r.f. amplifiers having third order distortion products no better than 30dB down on the carrier, and probably also employing some speech processing, nowadays often in the digital domain, to add to the 'punch' of the signal.

Utility transmissions, such as h.f. aircraft signals, are even more heavily processed and 'tailored' to get the maximum intelligibility across. With signals such as these, and I have to include c.w. signals as well, there is no doubt that the extra noise cancelling abilities of a d.s.p. system can get even more signal out of the noise, and that was my experience in using the Icom R75 on such signals. My own approach however, is to remember that many short wave listeners are keen broadcast monitors, and it is on the a.m. broadcast stations that the d.s.p. systems implemented in the receiver i.f. as a replacement for conventional crystal and ceramic filtering really do fall down and produce rotten sounding audio.

Read my review comments on the a.m. detection system using d.s.p. in the NRD-545 if you want to know about trying to re-invent the wheel...if you see what I mean. For my own part, I think that Icom got the balance between conventional and d.s.p. filtering just about right in the R75.

Writing now as a person who has been actively (**very** actively) involved in the h.f. hobby market for longer than most people reading this magazine have been living, and a radio amateur for some 40 years, it is my opinion that radio amateur reviewers often forget that short wave listeners outnumber amateurs by a factor of thousands to one, and the skill and ability of the good general listener are without compare.

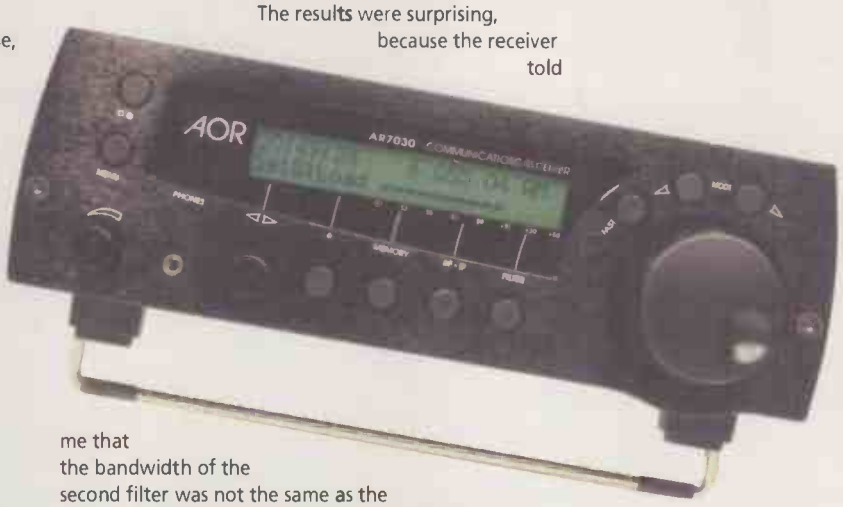
The short wave listener can get the most amazing results from equipment which many radio amateurs of my acquaintance would dismiss as not worthy of consideration because it wasn't the latest Japanese digital diddly doo dah costing as much as the family car. Just take a look at the results obtained, and the equipment used in the reports columns of the *Short Wave Magazine* to see what I mean. Ponder this: why did I choose not to advertise our (at the time) HF-225 and HF-150 receivers in the pages of *RadCom*?

Perhaps I might also be displaying extremist tendencies in my apparent fixation on recovered audio quality, but I review general coverage receivers in truly general terms, and try to cover every aspect of their performance, not using them to simply listen to the bottom end of 40m after dark during a contest and assessing the overall quality in comments such as "It's the best amateur receiver I've had in my shack". It may be true, but it's not what the real listener needs to know.

Back at the daily grind, I finally took delivery of our latest receiver from Rohde & Schwarz, the ESMI, which costs as much as a decent house (in Devon, not Knightsbridge). Having taken some time to become familiar with this rather delectable device, I watched it carrying out its complete self calibration routine during which you can observe each i.f. filter being checked, aligned and centred up completely automatically. I thought to myself "I've seen this before" and remembered that AOR had incorporated the same feature in the AR7030.

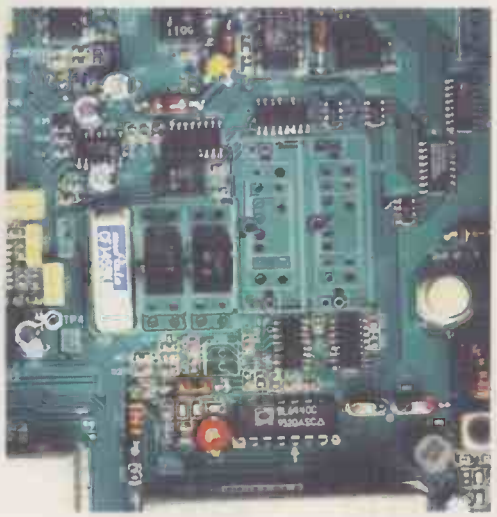
Now I'm not saying that John Thorpe was influenced by Rohde & Schwarz, but I do recall that I bought an FSA spectrum analyser from R & S for JT to use in development of the 'HF' series of receivers and the ESMI receiver is clearly based on the FSA backbone.

So I borrowed an AOR AR7030 and reminded myself of how advanced its facilities are compared to the rest of the pack. Given the fact that even high quality i.f. filters display a spread of passband characteristics (yes, even Collins mechanical filters have acceptance 'windows'), having the built-in ability to precisely align carrier reinsertion frequencies in exactly the right place for perfect s.s.b. demodulation is an astonishingly powerful facility, and as far as I know, only the AOR AR7030 has this feature. As an experiment, I changed one of the filters for another sample and set the '7030 to self align.



The results were surprising, because the receiver told me that the bandwidth of the second filter was not the same as the original, even though they were ostensibly the same filter. However, because the receiver had realigned the carrier insertion to match the new filter, the recovered audio was perfect, even when switching sidebands on an a.m. signal-carrying music - one of the ultimate tests for u.s.b./l.s.b. switching, and one which many high priced receivers cannot accomplish.

So, all you AOR AR7030 owners out there should be jolly grateful if the receiver tells you that your filter is different to the one fitted in your friend's '7030, because what it is really indicating is the fact that each receiver is aligned to perfection, and it's all built-in.



Still can't help commenting that I saw a magazine advertiser saying that the AOR AR7030 is not "a beginner's receiver", but you can't expect a newly qualified car driver to belt out behind Michael Schumacher in a Formula 1 Ferrari, and for those who want what must be close to ultimate performance in a receiver, it's worth taking the time and effort to get to grips with the AOR AR7030 layered menu system - you will be amazed at what has been provided for you behind that deceptively simple front panel. Am I biased? Frankly, yes, because I've known the designer since he was at the local Grammar School and having sponsored him through Cambridge and seen him become a leading authority on electronic design I can't help being biased. Sometimes idiosyncratic, often infuriating but always (blast him) right in what he says, John Thorpe commands the same respect for his abilities as one might have for Monet as a supreme artist or Beethoven as a composer, and owning one of his h.f. receivers is something everyone ought to have at least tried. Now John, can I please have an old man's version of the AR7030 with a 19in front panel and more knobs for the controls? *(Here here to that one - **Ed.**)*.

Happy listening! ***SWM***

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A very compact desk/mobile all mode receiver covering 100kHz-2000MHz. Ideal for hobby/commercial applications.

RRP £699 or NO DEPOSIT & NOTHING to pay until August 1999, then 38 x £25 p/m.

ML&S £699

AOR AR-5000

A superb follow on from the very popular AR-3000A, the new AR-5000 has already found its way into many government listening stations throughout the world. Covering an unbelievable 10kHz-2600MHz, all mode capability and PC control. Available in two specifications; the standard "A" and the +3, offering AFC, Sync AM and noise blanker.

ML&S £1299

AR5000 RRP £1345 ML Price £1299 or £5.17 deposit & NOTHING to pay until August 1999, then 58 x £35 p/m.

AR5000+3 RRP £1574 ML Price £1499 or £5.28 deposit & NOTHING to pay until August 1999, then 59 x £40 p/m.

SDU-5500

An all new Spectrum Display unit that features a high resolution white & blue screen which can show a full 10MHz bandwidth anywhere between the 10kHz-2600MHz range of the AR5000. The unit may also be connected to a PC, downloading the display data for detailed analysis.

RRP £799 or £1 deposit & NOTHING to pay until August 1999, then 46 x £25 p/m

ML&S £799

AR-8200 "package"

Probably the best selling hand held scanner of 1998, the new AR-8200 will continue the trend throughout 1999. Still the only receiver to offer 8.33kHz step size for the new airband frequencies, its little wonder AOR are THE receiver design specialists. We have put together a package deal to save you money and wet your appetite!

AR8200 "package" + CC8200 PC Control software & lead + SC8200 case.

ML&S £CALL

RRP £486.85 ML Price £469 or £11.86 deposit & NOTHING to pay until August 1999, then 22 x £25 p/m. (AR-8200 by itself £call)

MVT-7100

Been around so long its growing a beard! 530kHz-1650MHz, all mode.

Only £199.95

MVT-9000

When this first came over to the U.K. we thought EEK!! They've left the PC interface off!! Hasn't made a blind bit of difference though. You might not be able to control this scanner from a PC (who bloomin' well cares) but it shows the others where to get off when it comes to performance. And build quality. And ease of use. And.. and! Just ask Graeme or Jez our TWO resident Scanner junkies!

Only £339

or £34.15 deposit and 12 x £28 p/m

Yaesu FRG-100

Starting in Short-wave listening and want a receiver that retains its value and is respected in the world of Radio? Enter the FRG-100. 30-kHz-30MHz, SSB/CW & AM, FM optional.

RRP £479 ML&S £399, or £13.08 deposit & 18 x £25 p/m

ML&S £399

JRC NRD-545DSP Receiver

ML&S SPECIAL

PLUS FREE MATCHING JRC NVA-319 BASE SPEAKER WITH FILTERS - WORTH £200!

If you actually take a look around at the receiver market and compare with fifteen years ago I'm sure you will notice there isn't quite the choice of equipment available today. Never mind. With startling performers like the new NRD-545 who cares? A summary? John Wilson paid the ultimate tribute, saying:

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 August 1999, then 60 x £40 p/m.

Kenwood TS-570DGE-RX

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!

RRP £999

£56.17 deposit & then 60 x £25 p/m.

ML&S £999

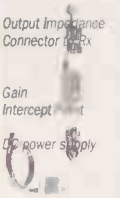
New at ML&S

dressler active antennas

The full range of dressler antennas are now available from ML&S.

ARA 40

Technical performance

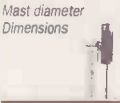


Frequency range	40kHz-40MHz at full performance 40MHz-108MHz 2.3dB gain
Output impedance	50-75 ohm coaxial
Connector to Rx	PL comes as the standard. Other standards can be fitted upon request
Gain	5dB +/-0.2dBs
Intercept point	+45dBm IP 3rd order (10MHz/12V)
DC power supply	11.5-13 volt DC at 70mA typ. (230V mains adaptor for 12V DC is supplied with the antenna)
Mast diameter	30-50mm can be fitted
Dimensions	**ARA40** 115cm total length with glassfibre whip. Antenna tube 40mm x 140mm **ARA40 TEL** 125cm total length with telescopic whip extended. 45cm minmum length. Antenna tube 40mm x 140mm
	Ideal for portable radio

£139

ARA 60

Technical performance

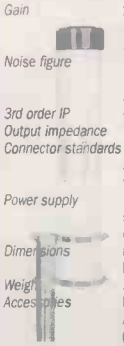


Frequency range	40kHz-60MHz (full performance) 60-120MHz 2-3dB less gain
Output impedance	50-75 ohm coaxial
Connector to Rx	PL type delivered as standard. Other standards can be fitted on request
Gain	10dB +/-0.2dBs
Intercept Point	+50dBm IP 3rd order (10MHz/12V)
DC power supply	11.5-13 volt DC at 80mA typ. (230V/12V DC stabilised mains adaptor is supplied with the antenna)
Mast diameter	30-50mm can be fitted
Dimensions	115cm total length. Antenna tube 50mm x 160mm
	Ideal for base stations

£169

ARA 2000

Technical performance



Frequency range	50-2000MHz
Output impedance	50-75 ohms coaxial
Gain	19dB -1000MHz 18dB -1400MHz 16dB -2000MHz
Noise figure	1.5-2dB -1000MHz 1.8-2.5dB -1500MHz 2.5-4dB -2000MHz
3rd order IP	+35dB typical
Output impedance	50-75 ohms coaxial
Connector standards	N type connector at the antenna. BNC male connector to the receiver
Power supply	12V DC at 160mA DC. Power supply for 230V AC is delivered comes with the antenna
Dimensions	Length 450mm. Diameter 90mm
Weight	2kg
Accessories	Mains wall plug adaptor (230V A/12V DC). Interface unit (remote supply unit) 12m coaxial cable and mast mounting clamps

£169

This outstanding range is ideal for use with all base station receivers, the ICR-8500, AR-5000, PCR-1000, NRD-545, FRG-100 & more! Beautifully constructed and designed in Germany - we are pleased to be appointed for this range of products.

A SHORT WAVE RADIO BUDGET PLAN - THAT WORKS!!!

The Martin Lynch & Sons SWL "Budget Plan"

A simple solution to spreading the cost of buying equipment without huge deposits and massive monthly payments. We can even buy your part exchange for CASH and you can still walk out with a new NRD545 for under £50! (Actually £47.94)!

Take a closer look at the ML&S A.R. Budget Plan - many of you already have. Call the sales desk today for any product listed in this magazine. If its available and approved by my buyers the Sales team will quote you a monthly repayment package suited to you.

DON'T FORGET!!

You can pay off the loan much quicker if you like and even send a lump sum one month if you wish. Trade-in your old gear or add to the minimum deposit, reducing the amount of monthly repayments. You tell us what you can afford per month and we'll tell you the deposit you require.

Just call for an instant quotation!*

** Budget Plan requirements: Full time employement (or disabled/retired), over 18 and below 71, Current bank account (or building society). For instant finance please ensure you have UK driving licence and cheque guarantee/credit card or Electricity/Gas/BT bill with your current name and address. Finance subject to status. APR 21.9%.*

FINANCE EXAMPLE

All examples do not include P&P.

Cash Price	Deposit	53 Months@	Total Credit	APR
£1295	£30.40	£35.00	£1885.40	21.9%

Written quotations available on request

MLandS.co.uk

Martin Lynch can also offer finance terms up to 60 months. Deposits from a minimum of £25. We welcome your part exchange against any new (or used!) product, provided its clean and in good working order. Call the Sales Desk today. APR: 21.9%. Payment protection is also available up to 36 months. All units are brand new and boxed and offered with full manufacturers RTB warranty. All prices quoted for cash/cheque or Switch/Delta card. No additional charges for credit cards. Martin Lynch is a licensed credit broker. Full written details are available on request. Finance is subject to status. E&OE. £10 p&p on all major items.

The Many Faces Of SMC

Dealer Profile

This month we start our look at the various radio dealers who inhabit the length and breadth of the UK. We commence the tour with SMC.

Many readers know of SMC as an amateur and s.w.l. equipment supplier. Indeed, when you compare their advertising with those of other retailers, you'd be forgiven for thinking that they just have a couple of shops with a few people in each, together with their all important service department. But there's a lot more to SMC, and even just a quick glance at the faces shown here will hopefully give you an idea of the size and diversity of SMC.

Commercial & Military

If you fly off to Palma this summer, don't be surprised if it's an SMC-supplied radio system, including the mast and antennas, that's used on the ground to communicate to your aircraft. SMC equipment is also being used for peacekeeping communications by the UK military in Europe, as well as by aid agencies, including Save The Children and the Red Cross, in developing and disaster-stricken countries. Take a look at the SMC web site **http://www.smc-comms.com** for photos of their work in helping refugees in Rwanda as an example, where the SMC team installed a country-wide h.f. and v.h.f. radio network. While you're there, why not take a look at what else we do, you might be surprised.

Hi-Fi & Scenery

For instance, if you're thinking of upgrading your hi-fi system, did you know that the Axminster branch also stocks a wide range of hi-fi equipment with the latest offerings from Sony and Kenwood, as well as ready-made leads to connect it all together with. SMC suggest that you could pop in on your way to or from the West Country, or even make a day out of it to this beautiful area (there's an excellent home-baked pasty shop in the same street as well!). Rodney, Mand, Andy and Ken will give you a warm welcome. Equally so at Chandler's Ford near Southampton, where Geoff, Derek, Andy (another one!), Marilyn and Colin are on hand to serve your needs. For the family there's a lovely woodland walk just five minutes stroll away with deer and squirrels to see, a ten minute woodside footpath walk will also take you to a great family pub.

The manufacturing facility at Southampton.

Not Just In Person

If you can't go along in person then don't worry, we're just a 'phone call away. SMC have been sending radio equipment around the world to meet urgent requirements for years. Like 30 programmed

Chandlers Ford HQ.

The newly appointed branch in Axminster.

Hilomast pneumatic towers ready for shipment to Spain.

and ready-to-go hand-helds complete with 60 charged NiCad batteries in a deadline of just a few hours, following the Monserrat disaster. If you need a lead made up to couple your FT-847 to a 9600 baud Sprit-2 packet TNC, or any other rig and TNC combination, then Graham in the Radio Production department can often instantly make one for you so you'll get it in the post the next morning. Or if you'd like an automatic 13m pump-up mast made and fitted to your Range Rover, have a word with Tony in the Commercial Sales team. Peter in the Engineering workshop then gets on the job and will make sure you're happy with your new mobile DXpedition mast!

Manufacturing Too

Did you know that SMC also manufacture the Hilomast range of pneumatically-operated telescopic masts for quick-deployment fixed, portable, and mobile operation? They are manufactured in SMC's own workshops which are right behind the amateur retail store located at the main site in Chandler's Ford.

In the recent past SMC also commenced manufacture the Lowe HF-150 short wave communications receiver, which has been acclaimed around the world for its superb performance, as well as the AEL range of commercial h.f. transceivers, and many types of antenna systems. It goes with out saying that they're ISO9000 registered for quality control to ensure customer satisfaction, SMC beleive that they were probably the first amateur radio company in the UK to have achieved this.

Here To Stay

SMC has been providing its customers a service for over 41 years, and there's no sign of this declining, even though a number of amateur radio businesses have come and gone while they have been trading. SMC is a 'family firm', everyone works together to make sure that their customers are totally satisfied. Whether they are supplying a simple antenna insulator, coaxial plug, or a country-wide police communications system - yes, thay have supplied a number of these! give them a call, "the team are there to meet your needs".

South Midlands Communications Limited can be contacted at **SMC House, School Close, Chandlers Ford Industrial Estate, Eastleigh, Hampshire SO53 4BY, Tel: (01703) 246222** and **Reg Ward & Co. Westminster House, West Street, Axminster, Devon EX13 5NX, Tel: (01297) 34918.** ***SWM***

A selection of used stock.

LOWE ELECTRONICS

The World's Premier Short Wave Dealer

JRC NRD545

JUNE SPECIAL

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 £1595.00

ICOM R75

NEW

Icom's latest receiver combines analogue and digital technology to bring you a receiver with excellent performance at an excellent price.

With expanded frequency coverage from 30kHz right up to 60MHz it will truly expand your listening horizons.

On the technical side, it features a high stability receiver circuit and better than 100dB dynamic range. Synchronous AM detection,twin passband tuning and optional IF filters help to reduce distortion and interference and at the audio stages, an optional Digital Signal Processor unit adds noise reduction and notch filtering. Operation is easy with several tuning step sizes and direct frequency entry complimenting the tuning dial and FM is provided as standard. For those who need them, there are 101 memory channels that can also be named and optional computer control will extend many of the functions. The May 99 Short Wave Mag said it all - "little I could not resolve, even in poor conditions" ... "remarkably easy to programme"... "I can't praise it too highly" ... Need we say more?

FROM £699.00

ICOM ICR2

The Icom ICR2 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

£139.00

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.

FROM £699.00

SANGEAN ATS909

NEW

Portable short-wave receivers are always popular and if there's one with Long Wave, Medium Wave and VHF coverage as well, we can guarantee it will be popular. That's why the AT909 caught our eye. It has over 300 memory channels and will also auto-scan, looking for stations. It has narrow and wide filters for AM reception and also has SSB facilities with a superb "slow tuning" rate in this mode. We've had nice reception of Shanwick and Volmet but don't expect miracles on 80m! The FM section also has RDS built-in so you can identify stations on the large clear LCD screen

Check out Lowe's Price! £129.00

MAIL ORDER - 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

MATLOCK

Chesterfield Road
Matlock
Derbyshire
DE4 5LE
Fax 01629 580020

Tel 01629 580800

BRISTOL

79 Gloucester Road
Patchway
Bristol,
BS12 5QJ
Fax 0117 931 5270

Tel 0117 931 5263

NEWCASTLE

Unit 18B
Airport Industrial Estate
Newcastle upon Tyne
NE3 2EF
Fax 0191 214 0761

Tel 0191 214 5424

MVT7100

Still our best selling scanner and no doubt about it! Okay so it may lack computer control but that's hardly a problem when 99% of the time you'll probably be in a situation where it's hardly practical to lug around even the lightest of palm tops. Let your fingers do the walking over the back-lit keyboard to access the 503kHz to

Now £199.00

AR8200

Less like a scanner and more of a highly portable communicati ons system, the AR8200 will leave you breathless! A highly sophisticated receiver on its own, there are a wide range of options such as a bar antenna and a memory enhancement module to increase facilities. Available ex-stock with most accessories also in stock - ask about our package deals on this first class scanner and options.

£369.00

GPS RECEIVERS AND ACCESSORIES

If you walk, sail, ride or drive, there's a Garmin GPS just for you! As a Garmin main distributor, you'll find a complete range of GPS receivers and accessories to suit your outdoor activities, including some of our own custom-made items like our world-famous low-cost magnetic mount GPS antenna!

Pop in to one of our showrooms now to see the latest models and get a full demonstration of their accuracy and capabilities. Check out how you can combine your computer with a GPS receiver and Personal Navigator Professional software to give you full route planning and tracking with local hotels, restaurants, pubs, places of interest and even filling stations.

GPS Receivers from £149.00

DAVIS WEATHER STATIONS

Weather still plays an important part of our everyday life, as well as having a great effect on short-wave listening. Everyone stops to listen to or watch a weather forecast and it is still the favourite topic of discussion. It affects the way we dress, if we walk to work or get the car out and many other aspects of our lives. With a Davis weather station, you'll be able to watch even closer as you can monitor local temperature inside and out, pressure, humidity, rainfall, wind speed and direction. This will build up a local picture of weather patterns over a period of time, give you a greater insight into weather reports. As well as being a great tool for planning short-wave listening periods, this will allow you to better plan lots of activities including gardening, outdoor pursuits and even help save money on central heating bills! Ring now for more details.

FROM £149.00

JPS DSP FILTERS

We still have a small number of JPS DSP filters we'd like to offer special deals on. Give us a ring if you are interested!

PHONE

JRC 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.

£549.00

RADIOMASTERS NEW

Just in are a new range of antenna products designed just for the short-wave listener. First to arrive is the P30, a passive short-wave antenna that can be used indoors and out. It's just 4m long and complete with dacron hanging cord and has 4m of coaxial cable complete with PL259 plug, ready to hang and go! There's a built-in matching transformer so you don't need an ATU and it is just £40.00. Also in is the A50, a wideband active antenna with a low noise floor and frequency range of 30kHz to 50MHz. Again designed for indoor or outdoor use, it is just 1.1m long and complete with 10m of coax and clamp so will be unobtrusive in all situations. Technical spec is good, with up to 10dB gain and a 3rd order intercept point of +25dBm. The A108 model is similar but specified up to 108MHz. Ask for details!

P30 £40.00, A50 £123.00 & A108 £142.00

NEXCELL NEW

Check out our new NEXCELL batteries and charger! A pack of 4 AA size rechargeable batteries with an amazing 1.35Ah capacity. Will give longer operating time on scanners and all sorts of equipment and as these are NiMH cells, there's no memory effect like NiCADs.

Matching charger is just £9.95

NEXCELL £8.00

AIRMASTER 2000

The latest software package for decoding ACARS traffic on the airbands. Lowe AIRMASTER was the original ACARS decoder and continues to lead the market. AIRMASTER 2000 is a complete system comprising of a demodulator (built into a shielded 25-way D-type plug) and software running under Windows 3.XX or Windows 95. Multiple windows will show Live Data, Aircraft List or Data Review and has numerous features including "Alert Text" which allows you to monitor for flight numbers or aircraft registrations and other topics of interest. Call in for a demonstration today!

AIRMASTER 2000 £89.95

POOLEYS 98

Last year's Pooleys now available for all aviation enthusiasts. Get yours now before we run out!

£5.00 + P&P

GREAT SECOND-HAND BARGAINS

Why not look at our great range of pre-owned scanners and receivers? We often have current product available at well below RRP so you make a great saving and with our full workshop inspection and warranty prior to sale, you'll have no worries

Ask for free second-hand list!

MAGNETIC LONGWIRE BALUN

The original RF Systems MLB! Beware of cheap imitations. Buy this first time, not to replace a competitor's!

Now just £33.00

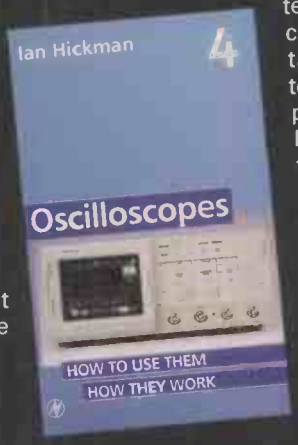
Book Profiles

15% DISCOUNT + FREE POSTAGE (IN THE UK ONLY)

We have a real treat for all our readers this month. We have teamed up with Newnes, a division of Butterworth-Heinemann, and have eight exciting titles for you to choose from. As an extra special treat, all eight titles carry a 15% DISCOUNT and FREE P&P (UK only). However, orders must be placed by July 31st 1999. So get ordering now!

Oscilloscopes - How To Use Them; How They Work

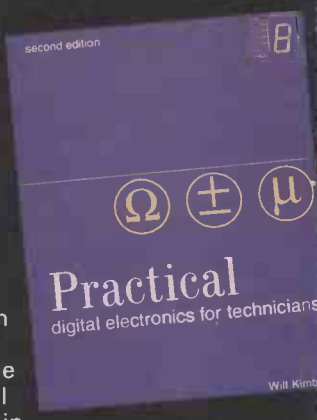
Ian Hickman.



Oscilloscopes are essential tools for checking circuit operation and diagnosing faults, and an enormous range of models is available. But which is the right scope for a particular application? Which features are essential, which are not so important? Ian Hickman's guide is now the standard reference which tells you not only what to look for, but how to get the most from your 'scope. This new edition also covers the latest improved models, including digital storage oscilloscopes, digital sampling oscilloscopes, time domain reflectometers for use on metallic and optical transmission systems and ultra high speed single shot event recorders. This book is bound to be in great demand!
Usually £17.99.
Discounted price £15.29.

Practical Digital Electronics for Technicians

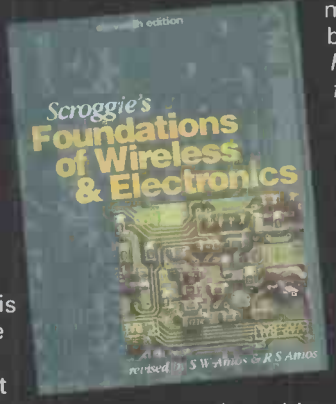
Will Kimber.



This popular book not only provides an accessible introduction to digital electronics, but also supplies all the problems and practical activities needed to gain hands-on knowledge and experience. The emphasis on practice has made the first edition of this book, and its companion, *Practical Analog Electronics for Technicians* extremely popular college texts. Will Kimber's two *Practical Electronics for Technicians* books together provide a complete electronics course designed for students with little prior knowledge of the subject.
Usually £12.99.
Discounted price £11.04.

Scroggie's Foundation of Wireless and Electronics

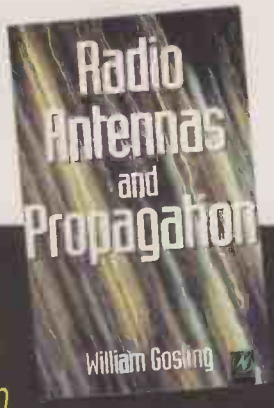
SW Amos & RS Amos.



Now in its 11th edition, this is a classic text for anyone working with electronics, who needs to know the art and craft of the subject. Based on experience since the dawn of the electronic age, and updated in regular editions over 60 years, it covers both the theory and practical aspects of a huge range of topics from valve and tube technology, and the application of cathode ray tubes to radar, to digital tape systems and optical recording techniques. This latest edition provides much more than just the basics - it remains true to the tradition of clear, concise, readable explanations of the world of electronics, and is sure to be on the top of the pile of books in any workshop! *(No one reading this should be without one! - **Ed.**).*
Usually £19.99.
Discounted price £16.99.

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.**

FREE P&P
(IN THE UK ONLY)



Radio Antennas & Propagation

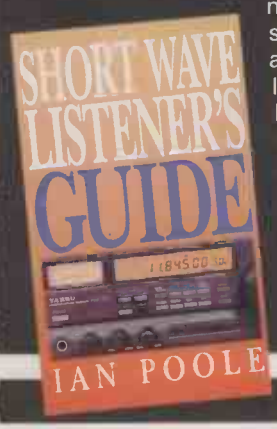
William Gosling.

This book is the most modern, comprehensive and system-oriented text on radio engineering in print, by a pioneer in the field. Engineers and students need to use this book, which covers the physics of radio systems from a quantum mechanical point of view and offers a unique insight into radio engineering by showing not only how, but why radio systems work. This is the finest introduction to radio antennas and propagation available and is a book that should be on the shelf of anyone serious about radio. Just a few of the chapters include Radio frequency energy; Simple antennas; Describing the earth's atmosphere; The troposphere; Sky wave propagation and heaps more.
Usually £19.99.
Discounted price £16.99.

Short Wave Listener's Guide

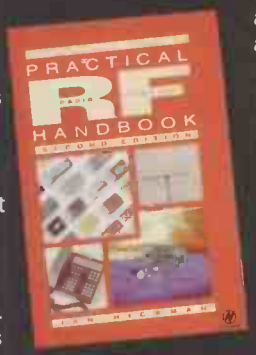
Ian Poole.

Ian Poole, one of the leading writers on radio, is the author of this complete practical guide to short wave listening. It explains exactly what short wave listening is, how radio waves travel, what equipment is needed to receive a signal, how to set up and run a short wave listening station and how to obtain an amateur radio licence. Each topic covered is clearly explained and illustrated. The practicalities of short wave listening are discussed, from buying new or second-hand radio and making and erecting an antenna, to selecting ancillary equipment to enhance the operation of receivers and antennas.
Usually £14.99.
Discounted price £12.74.



Practical Radio Frequency Handbook

Ian Hickman.



Now in its second edition, this book is a practical introduction to modern r.f. circuit design. The content is aimed at those learning to design r.f. circuitry and users of modern r.f. equipment, such as signal generators and sweepers, spectrum and network analysers. Pressure on the r.f. spectrum has never been greater and it is people with knowledge and skills of r.f. design who are now in demand in the electronics industry to design, produce, maintain and use equipment capable of working in this crowded environment. This new edition covers antennas and propagation in more detail, has new appendices giving useful addresses and contacts, plus details of frequency allocations.
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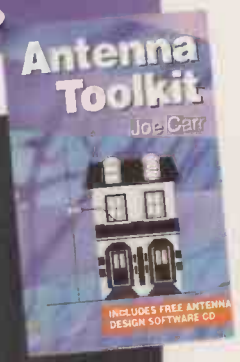

Basic Radio: Principles and Technology

Ian Poole.

Assuming a basic knowledge of electronics, this book aims to provide an introduction for future radio engineers and should be useful to those on BTEC and similar courses as well as radio amateurs wanting to deepen their knowledge of the topic. Some of the chapters include topics such as Radio Today, Yesterday and Tomorrow; Radio waves and propagation; Capacitors; Inductors and filters; Modulation; Receivers; Transmitters; Antenna systems; Broadcasting; Satellites and Personal communications.
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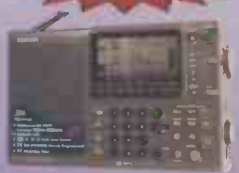

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Amateur Bands

Modern rigs have up to fifty little buttons to press and usually have instruction books leaving something to be desired in the way of clarity, without even a circuit diagram. When I think of my old KW2000B and its controllability compared with the rigs I at present own...! Designers, **please** invent rigs for normal sized fingers, write a decent instruction book for it and then get a different person to check! Surely, a rig that goes in a shirt pocket, but can't be operated by a normal human, is sales and marketing gone mad - and as for saving a few coppers by making no provision for cutting the a.v.c. line - the mind boggles.

Conditions & Propagation Modes

As ever, in a month we go through a full cycle of solar conditions from the quiet side round to the more active one and back again. The bands reflect this to an extent - more sunspots equate to openings on higher bands, but of course events on the sun can have negative consequences too, SIDs (Sudden Ionospheric Disturbances) for example.

What is bad for h.f. s.w.l.s may be good for those who listen to v.h.f./u.h.f. At h.f. weather is negative, usually in the form of that annoying S6 rain static, but at v.h.f., the effect of a high-pressure system can yield a decided 'lift' in band conditions. Repeater addicts may notice co-channel QRM, but v.h.f. 'chasers' will look for longer-distance contacts around the west and north of a 'high' on the weather map.

Aurora is another mechanism again. Radio and visual aurora may not coincide in time, but crank your beam north to NE, and listen for the strange sound of an aurora for another experience altogether. Incidentally, while sideband is just about copiable by aurora and c.w. is pretty easy, if you copy a.m. or f.m., it'll be a blooming miracle!

Another two interesting modes are meteor scatter and earth-moon-earth; both are c.w., but if for instance you have the know-how to receive an E-M-E signal, as a listener you can tape the signal and decode it at leisure. MS is also a bit demanding on the listener, so before you start you should read up on how an MS QSO goes, and if possible talk to an operator who uses MS. An old multi-speed tape-recorder is handy - record at the highest speed and play back at the lowest.

Your Mail

An E-mail addressed to me during the past few weeks has, alas, come to a grinding halt. The mail system at the Editorial Offices turns the incoming message into a FAX. Due to the number of junk FAXed-ads, I switched the FAX off - the junk saw off a roll of paper one weekend! So, the upshot is, I'm withdrawing the E-mail address for the time being.

Emrys Griffiths in Caernarfon wrote last time to pass on ZD7VC's QSL Manager, K1WY, so I wrote in reply - which netted me an unexpected benefit in brochures for both ZD7 and ZD8, which are now 'open' for holidays. ZD7 would make a very pleasant - and different - change from the usual run. And, because ZD7 is an island, the ambience and the people are so much nicer.

The next one we opened was a jiffy-bag from **Theuberger Verlag Gmbh, Box 73, D-10122 Berlin,** enclosing a CD-ROM of their QSL-Routes 1999 - we understand the book version will have appeared by now. $14.95 is fair enough for access to some 96000 QSL addresses/routes plus screen shots. It comes out annually and they do accept credit cards.

Talking of islands, **Martin Goodey** lives on St Mary's in the Isles of Scilly. Martin logged E44DX on Top Band then moved to 14MHz for V51ED, V63KU, 3B8GD, V51GP, TL5A, DS5RNM, VK4BU, ZL3KIM, 9G5JE, A45XU, 5A1A, TN7OT, HK6ISX, TJ1PD, PT7BZ, 4U1ITU, XT2OW and ZD7BG. For 18MHz, the score was EL2WW, 9K2RA, JQ1QNH, HP9AFC and V26RA. Up again to 21MHz and here the scalps included 4F1GNR, 9G1YR, 5Z4LI, 5Z4NU, E44DX, FM5GU and PP1BG. Surprisingly, Martin didn't bother with 24 or 28MHz in contrast to **Ted Trowell**, below.

Another islander - and Morse addict - is Ted Trowell, who lives on the Isle of Sheppey. On Top Band, the c.w. came from HZ1AB, and on 3.5MHz E41/OK1DTP. 7MHz showed with VK6HD, VK6VZ, 5B4AGC, C56SW, VY2SS, HS0VGC and on going up to 10MHz EA8CN and 9H1FN appeared. Up again to 14MHz for HS4BPQ, 9H3ZV, S79XB, HH3RK then on 18MHz KL7HF, C56SW, YB5QZ, and VQ9DX came in. 24MHz produced KF7MD, ZS6AVP, ZS5RON, VQ9QM, K5BK, N7DM(New Mexico), K6HWT, S79XB, LU1DZ, C56SW, KP2AD, YB0FMT, 5N3CPR, ZF1WD, JH3CJM, JH3CNM, JA1TAA, HK6KKK, TI8DF, VE7SFF, HP3XUG, A92GE, and VQ9VK.

Finally to 28MHz and LU8MFF, A92GE, P43JB, FR5BT, LU9GBR, 8P6GO, PY2TN, VP2EHL, PT2VEK, ZP6CW, LU1JA, ZS1ZI, KP4TF, LU5FC, CE0AA, ZF1WD, KG4TO, HK3TAS, K6PWP, CX3JE, ZS5MF, LU9HRP, PY2WDM, 9K2MU, FM5/F2PI, C56EL, VP5/RA9CO, CP4BT, C56SW, 3B8/G3PJT, VQ9QM and HP1AC.

Next we come to the letter from **John Collins** in Birmingham who listened to EI0RTS coping with a 7MHz pile-up from Dublin on St Patrick's Day. John says they have an award for EI counties - you need 26 - and so far John has nailed seventeen of them. On a different angle, John comments that though RTE were running a programme about shipping and the demise of Morse, he still hears plenty going on on 2.182MHz!

Close-down!

We have a news release from Arfon Repeater Group. Increase in site rentals by NTL has caused the close-down of GB3AR and GB7AR after some twenty years on site. The group has two alternatives sites in mind; near Criccieth south of Snowdonia and the other at Waunfawr. More word on this one in due course. No doubt about it, the NTL action will be a body-blow to some repeater groups.

Another loss is BARTG's Sandown Park Rally - there won't be one this year, as the committee have decided that the cost of the venue is too great. Against that, plans are already in hand for a new format rally in the year 2000.

To set against that, BARTG have launched an award for the latest datacomms mode - PSK31. The requirement is to work or hear PSK31 signals from 40 countries (why 40 - BARTG's 40th anniversary!). No crossband or cross-mode contacts, no single-band endorsements, any amateur band. All claims to include a list of verified QSLs which **must** state that PSK31 was the mode used, confirmed by two other amateurs. The cost is £6 or ten US dollars or 30 IRCs.

This month we again had the pleasure of reading the ILA's *Just Listening* magazine. For details on ILA, contact them at **1 Jersey Street, Hafod, Swansea SA1 2HF**.

Next we come to **Colin Dean** in Barnsley; on 28MHz Colin noted A41LZ, A45XU, ET3AA, HC6CR, KP2/VE5RA, PZ1/PB7RK, Z21CS, 5H3US and 9K/SQ5DAK for an oddity. 21MHz showed with AP2JZB, C6AFV, D44BC, FY5KE, JW6AP, JY5HX, J37VG, KG4VL, TG9/IK2NCJ, TI7/N4MO, V26AY, V47KP, ZF2DR, 7P8MB, and 9J2A. 18MHz yielded KH6LEM, while on Twenty Colin copied E44/OZ1CAB, KH6/W7GMH, FR5ZQ/T, T30R and V63KU.

The favourite band is 7MHz where A45XU, A92FZ, A92/ON4CFI, BV2RS, EX2T, E44/JA4RUZ, E44/OZ6DTP, FM5GU, HZ1RT, JAs 1-0, PZ5JR, RA0FA, UN0N, VU3PRA, VK1MJ, YB2LAB, YC5XIP, ZL1BMW, ZL4BD, 3C1GS, 4L1AE, 5N9EAM, 5T5U, 5Z4GS and 9N7RN were noted. Finally, on 3.5MHz, Colin logged HS0/IK4MRH, VK3ATN, VK3DZM, VK3EW, VK4BER, YB1, YB4, YB0, 3V8BB, 4L1BR, 5B4/RA9JX, 5B4/RA0AM and 5B4/RZ3TX.

News

Marion Island ZS8D should be back on by now; the rhombics have been taken down so the operator has had to take all his own antennas. Cards go to **Chris Burger ZS6EZ, Box 4485 Pretoria 0001 South Africa.**

Malawi: 7Q7RM, 7Q7JL, 7Q7LA and 7Q7HB are all about, and all their cards go via G0IAS.

JX7DFA will be back in Norway by the time you read this, and it is understood there are not likely to be any more stations QRV from Jan Mayen Is this summer.

From India, KR4ZY has received VU3TOM including RTTY after a very long wait. Cards to his home callsign, and from Nicaragua, K4IM has just started a tour of duty at the US Embassy and hopes for a YN1 call soon.

Finito

That's it for another issue. As usual, I want to see all your letters, whether to
PO Box 4
Newtown
Powys SY16 1ZZ
to reach me by the start of the month.

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

Scanning

I'm well aware that not everyone reading this column will be interested in tracking trunked radio networks, but before I go on to cover more general issues, I need to talk a little more about Trunker, which I mentioned in last month's column, in order to alleviate some confusion that might have arisen.

If you didn't read my last column, Trunker is a totally free DOS-based program that lets you, with the aid of a couple of scanners and an inexpensive *Hamcomm*-type PC interface, track Motorola SmartNet-type trunked radio networks with ease. It works so well, in fact, that it blows the current crop of hardware-based trunk trackers out of the water in terms of accuracy and reliability.

The problem is that last month I said you should avoid the release version of the program, which wasn't up to much, and stick with the latest beta-test version instead. Unfortunately, since penning (or rather typing) those words, Trunker's author decided to promote the beta version I mentioned to full release status, and killed off the old release version. This means that anyone trying to follow my original instructions will have found no sign of a beta version, and will undoubtedly have become very confused indeed.

So if you are interested in Trunker, and have a suitable PC and pair of scanners, ignore what I said last month. Instead, go to **http://web2.airmail.net/lblant1/dfw/digital.htm** click on the Digital Signals and Applications hyperlink, and download the current version of Trunker (called '3.7 Final' on this page, but also known as '3.7a'). Incidentally, this page also has some excellent digitised audio samples to help you identify the various types of trunked network control channels, and the main page is a good launch pad into the world of digital transmissions, both in terms of information and the hardware and software required.

Discriminator Output

A lot of you have been asking why you need discriminator outputs on scanners in order to use applications like Trunker and POCSAG, or to trunk track using hardware add-ons like the Optoelectronics OptoTrakker. Well, the answer is simple - the audio output that comes out of a scanner's speaker or standard tape output is electronically filtered in order to make standard voice transmissions clearer. Unfortunately, in doing so, the scanner also tends to filter out parts of the audio spectrum that are used by certain types of data transmission.

This means that although you can hear the digital transmission, it doesn't contain enough of it for the likes of an OptoTrakker, or the *Hamcomm*-type interface used by programs like POCSAG and Trunker, to decode the signal. You can think of the situation as being like standing next to someone listening to a Walkman on the bus - you can hear the odd note, and especially the beat, but you probably won't be able to identify the song.

Higher-end scanners and receivers therefore have a dedicated discriminator audio output, which is basically connected to the audio signal path just before the filtering stage, to allow them to be used to receive digital transmissions of this type. But if you don't have such expensive equipment, all is by no means lost, as with a little modification, a discriminator output can be added to many inexpensive scanners.

My Yupiteru MVT-7100 is amongst those that can be modified, for example, and the process is so simple I thought I'd mention it here. Basically, unfiltered audio output appears on pin 9 of a chip marked 'TA31136' on the scanner's i.f. circuit board, though I'm told it is best to tap it at the other end of the 56KΩ resistor, which takes this signal to pin 8 of another chip, this one marked '4066'. What's more, by changing from f.m. to a.m. or s.s.b. modes when using this discriminator output, you can get better decoding results for certain types of higher-speed signals, even though they are being transmitted in f.m. mode. *(So it's not actually the discriminator output then, but a common unfiltered audio take-off point. - **Ed.**)*.

I should point out that the circuitry within any scanners or receiver, hand-held ones in particular, is very delicate and of course sensitive to electrostatic charges. So, although I intend to give this modification a go, I don't recommend you try it, or any other modifications you might come across, unless you are very confident with a soldering iron, have at least a basic grasp of electronics, and don't mind risking irreparable harm to your radio.

My Correspondence

On to some more general correspondence now. I've received an E-mail from **David Jones MW1DUJ** in Llanelli who has some suggestions to help Mr Lincoln, whose plea for help in listening to Amateur activity on his local 70cm repeaters I mentioned a month or so back. Basically, David suggests that Mr Lincoln makes sure he is listening to the **output** frequency of the repeater, 433.275MHz in the case of GB3HN, for example.

David also comments that if the correct frequency is being monitored, you should hear its identification letters transmitted in Morse every ten minutes or so. Finally, David suggests Mr Lincoln might consider becoming a licensed Amateur radio operator himself in order to make up for any lack of activity! I think this is an absolutely splendid idea, and not just for Mr Lincoln but for the rest of us too.

How better to gain as good a grasp of our hobby than by learning about its fundamentals, both on theory and in practice, by studying for and sitting the RAE? Of course, not everybody will have the time nor the money required for such an undertaking. But if kids as young as six or seven years of age can pass, far younger than most readers of this column, then the exam can't be that difficult, can it? So why not give it a go? I, for one, intend to take David's advice, starting with the purchase of some appropriate books from the *SWM* Book Store.

On a different subject, **Derrick Hine**, from Andover, sent a letter asking for some advice on which computer-controllable hand-held scanner would be a good choice for airband listening, and also brings up the question of 8.33kHz spacing and whether it is possible to monitor transmissions using this on scanners without the appropriate setting. Other than commenting that the AOR AR8200 is currently the only scanner on the market that I know of offering both 8.33kHz spacing and computer-control, this is more of a question for Godfrey Manning, *SWM*'s Airband supremo, and I've passed your letter on to him.

But I will tackle your question about monitoring 8.33kHz-spaced frequencies. Yes, in principal you will be able to monitor these frequencies on any scanner, as long as it allows you to set a step size of 0.01kHz in the appropriate frequency range. Without an 8.33MHz step size option on your scanner, however, you won't be able to easily scan through frequencies to find transmissions very easily. You can, of course, get around the problem by simply storing a list of frequencies you want to monitor into your scanner's memories.

And Finally

That's all I have space for this month, I'm afraid, so I'll have to leave you at this point with my usual warning - listening to transmissions you are not licensed to receive is illegal, and if you are caught, can result in substantial fines, confiscation of equipment, and even imprisonment. Don't say I didn't warn you!

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Optocom, R11
Radio Shack
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Attention-123!

Single Letter Transmissions (MX)

No discussion of mystery stations is complete without mentioning these, which must still be familiar to most s.w.l.s. As their name implies, they do little more than send (in i.c.w.) a single Morse letter continuously, often 24 hours a day for many years. They have been with us now for at least 35 years, and for many of them, we're no nearer to understanding their purpose; they use the Cyrillic Morse alphabet.

Nearly all originate from Russia and the CIS republics, and there have been many 'explanations' offered, under such misleading titles as 'SLHF Marker Mystery Solved - At Last!'. The truth is not that simple! So many s.w.l.s fall into the trap of lumping them all together and assuming they all have the same purpose. In fact, if their habits are closely followed, it becomes clear that they can be classified into at least four categories, each with its own purpose.

Number One

The oft-quoted 'Russian Naval Marker' explanation may apply to one of these groupings, as they originate at Naval sites - but it still tells us nothing useful about their purpose. Marking channels for what? Nobody has answered this. This group is better described as the 'Short Duration SLT', for this is one of their characteristics. They rarely spend more than half an hour or so on the air at a time, and often end with a short burst of hand-sent Morse (including a Russian Naval callsign) and a short burst of 50 baud f.s.k. They have many favoured frequencies, but can be found almost anywhere between 3 and 8MHz, often two in parallel. The letters sent are now usually P or C, and are often strong signals.

Number Two

The 'Continuous Solitary' group; 'traffic' never sent. There are four of these audible in Britain which have been active continuously for at least six years; 'R' on 3.196MHz, 'L' now on 3.339MHz having recently moved after many years on 3.091 (after a brief spell on 3.096), and another 'R' which has been on 3.323 for the past few years, after moving all the way from 7.452. The newest 'R' hides under all the mush on 4.325MHz. Peculiarities include the ever-present pronounced chirp of 'L', and the occasional periods of 'R's sending prolonged dashes. Both of these quirks would seem to be deliberate.

Possibly in a category of its own is the 'Wandering V'. These tend to wander about the h.f. bands, often spending quite long periods on one frequency, then suddenly moving somewhere else, often several MHz away, e.g. 9.162 to 3.174MHz. There is usually at least one to be found somewhere - often very weak. They are less stable than the 'R's and 'L', and may or may not be related. There may be two types of these, for some send their Vs irregularly, with varying intervals. This, again, happens so often that it hardly seems accidental.

Number Three

The 'Cluster SLTs'; 'traffic' never sent. These operate continuously in narrow 'cluster bands' - at present around 3.595, 4.556, 5.154, 7.039, 8.495, 10.872, 13.365, 17.015 and 20.991MHz (the last three remain unchanged since the 1960s) using at least 45 transmitters.

During the Cold war, ten or more different transmissions occupied each 4kHz wide cluster spaced as little as 100Hz apart. Nowadays, they have shrunk to five or six, only three being easily audible in Britain: 'C', 'S' and 'P' ('P' having been reintroduced a couple of years ago).

Number Four

'K' and 'U'; these no longer operate, having ended soon after Soviet jamming of broadcast stations ended. They were unique in that they used f.s.k. (1kHz shift) sending continuously, breaking for the occasional RTTY message. These are the only ones whose purpose is now known - thanks to Rimantas Pleikys' book *Jamming* (see page 37 - **Ed.**) - linked to monitoring stations and sending instructions to Jamming Control Centres. There were large numbers spread throughout the h.f. bands. Other short-lived SLTs exist.

Activity In The Far East

We have already looked at E4 ('Cherry Ripe'), a British numbers station which transmits from Guam to agents in the Far East, however, there are other special services at work in that part of the world. With good conditions and patience, some of their transmissions can be heard here.

Identifying the agencies involved is more difficult due to the distance and languages used; Morse stations remain undiscovered. Two countries at least are very busy: N. Korea and Taiwan. Activity from mainland China remains unidentified.

V13

A station believed to be located in Taiwan can be regularly heard in Europe. Nicknamed 'New Star Radio', it is rather upbeat for a Numbers Station, so much so that announcers actually sound enthusiastic! Music is included to lighten the load of copying down endless groups. All this is presented by a team of live announcers; a change to the modern trend towards 'sampled' robotic voices.

The Mandarin broadcasts have been translated, and after a musical introduction, an announcement follows giving three-figure groups; "We are sending telegrams to the following units..." "We are sending a telegram from unit 123 to unit 456, in Japan. Unit 456, please prepare to receive. Your telegram contains ten groups" (ten paired 4-figure groups follow). Then, after other messages: "This concludes our broadcast! Thank you for receiving our telegrams! Good health and best wishes to you all!"

V13 operates on five channels each carrying different traffic and announced as: "This is Channel (1 - 5) Broadcasting Station Taipei". Transmissions start on the hour or half-hour with the musical introduction. Best times here are 1200-1600 and 2200. Clearest frequency is 8.300, the others being 9.725, 11.430, 13.750 and 15.833MHz.

V15

N. Korea is quite blatant about its involvement in 'Numbers' traffic, and even broadcasts messages over its national Korean Central Broadcasting Station, and international service, Radio Pyongyang (some numbers transmissions are preceded by the well-known Pyongyang announcement). These messages, as well as s.w., use at least five m.w. frequencies. The best listening time for s.w. is during European afternoon/early evenings on 3.320, 4.770, 5.872, 6.200, 6.400, 6.600 and, less regularly, 5.450, 5.715, 6.215 and 6.715MHz.

Transmissions commence on the hour with five minutes of martial music (it seems longer!) followed by a female announcer reading number groups. Jamming (by S. Korea?) sometimes occurs. Transmitters are switched off immediately at the end.

Other 'Oriental' stations operate, but tracking their schedules is difficult at such a distance.

Morse

In the December *SWM* we read a letter from **C. F. Goodhall** (Cheltenham) who claimed that "Morse is as dead as the Monty Python parrot", and, "there is no longer any professional Morse code out there". All we can say is that he must avoid Amateur and Fixed allocations, and even the RAF's hourly transmissions from MKL. The vast bulk of Numbers traffic uses Morse, and new stations keep on appearing. Far from being dead, this has always been the preferred mode for the **most serious** professionals, i.e. covert-communications - and **still** is. As the number of Morse literate s.w.l.s declines, the less opportunity there is to monitor these transmissions, which is bad news for ENIGMA, for we cannot keep up with the sheer quantity of Morse activity out there! It already takes up 90% of our monitoring/analysis time. If any of you know of ex-military or amateur Morse operators who may be interested in helping, we'd like to hear from you.

The highly secretive Stay Behind Networks, exclusively used Morse throughout the Cold War (and after), and their successors could still do so. We are collating information on Stay-Behind communication networks and exercises throughout Europe, and would be grateful for any help from ex-British Stay-Behind operators. If you are one yourself, or know of anyone who could have been, please get in touch. Many thanks to **James** of Swindon who provided us with such interesting historical information on the Scottish sites.

Hans (Leipzig) asks about our booklet. We are determined to have *Part Two* ready before our next *Newsletter*, however, we may need to send out a *Part Three* after that! It has proved a far longer process than we imagined. **Carl** (Kent) asks about S17 - yes, one parallel has moved to 6.945MHz (the other remains on 8.190). S17 still appears daily between 1250 and 1256UTC.

That's all for now. Keep on listening and writing in.

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

All At Sea

Maritime Safety Information (MSI)

Weather FAX

Continuing along the theme of Maritime Safety Information from previous 'All At Sea' columns, the next edition of Safety of Life at Sea (SOLAS) regulations (April 2000) will include, for the first time, reference to facsimile as a recognized method of obtaining any type of MSI information for the world's shipping. In line with this, the next edition of the *Admiralty List of Radio Signals* (ALRS) *Volume 3*, Radio Weather Services and Navigational Warnings, due to be published this summer, has been restructured to include a dedicated radio-facsimile chapter, providing a full frequency and weather product cross-referenced listing for weather FAX stations world-wide.

Receiving Equipment

Weather facsimile equipment installed on all merchant vessels consists of a dedicated self-contained receiver, much the same as a NAVTEX receiver. Operation is extremely simple, with pre-programmed frequencies and the ability to idle in the corner of the bridge and switch on automatically when required. On the other hand, the short wave listener will usually need his receiver to monitor a variety of transmissions, and will almost certainly have a computer, so a weather FAX facility can be added, using a simple interface and appropriate software. FAX pictures can then be displayed on screen with the facility of printing out or saving to disk.

The quality of results obtained with an installation of this type depends on the quality of the receiver, its installation, the software in use and, to a lesser extent, the quality of the computer. Any good quality communications receiver will suffice, as long as it has the ability to resolve single side-band, have fine tuning increments of not more than 100Hz, good stability, sensitivity and selectivity.

Tuning The Equipment

FAX signals are best received using the s.s.b. filter. Usually upper side band (u.s.b.) is used, although the lower side band (l.s.b.) is just as good, except that the picture will appear reversed; i.e. white on black, instead of black on white. Most software allows the colours to be reversed later if required. The actual frequency set on the receiver is likely to be slightly different from the one quoted in a frequency list. On u.s.b. it will be 1.9kHz below the published frequency, and a similar amount above if set on l.s.b. In practice, it is better to tune around the frequency to obtain the best picture quality rather than set it spot on, as transmitting stations tend not to be too particular about frequency accuracy. If you are using good quality software that includes a spectrum display, it should be fairly easy to tune the signal more or less exact.

Receiving Weather FAX Signals

The majority of weather FAX stations are located on high frequency (h.f.) bands between 4 and 20MHz, although there are a dozen or so stations operating from v.l.f. through 2 and 3MHz, making them good DX targets! FAX stations normally transmit a frequency shift keyed (f.s.k.) signal. On simple charts, this includes black lines on a white background, the transmitter switching between a pair of frequencies spaced 800Hz apart (300Hz apart on l.f.). The upper frequency of the pair corresponds to the white area of the chart, whilst the lower represents the black area. Some stations also transmit satellite pictures, in which case the various shades of grey are represented by frequencies between the black and white extremes. A weather chart will take between eight and 20 minutes to transmit and, in addition to the body of the image, will include up to five audibly distinguishable parts as follows:

Start Tone: This is formed by fast, regular switching between the black and white frequencies, and is used to start certain types of automatic receivers.

Phasing Signal or Sync Pulse: This follows after the start tone and is heard as a repeated blip. On screen, it appears as a solid rectangular block that marks the beginning of the scan line, and should be positioned at the extreme left hand corner in order to receive a correct picture.

Image Body: The chart itself.

Stop Tone: Very similar to the Start Tone to indicate to the receiving equipment that the FAX is complete. Some stations carry on transmitting a continuous black tone signal after the FAX is complete.

ALRS Volume 3 contains FAX Broadcast Schedules, an example of which follows. This is a typical example that one will find, detailing all necessary information to identify any chart which is received. The columns are explained as follows;

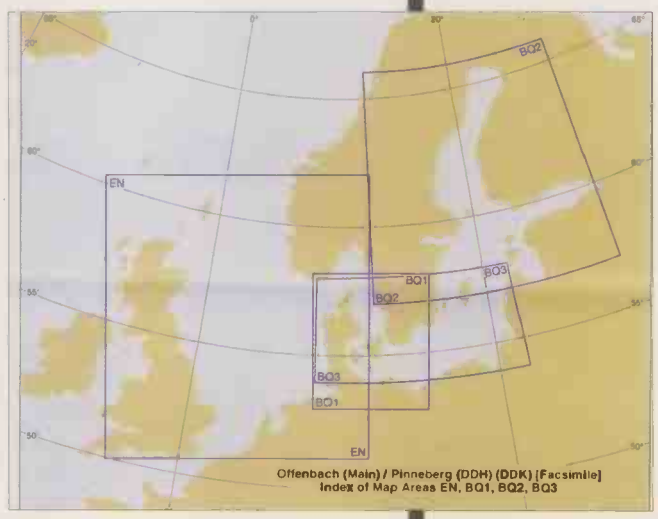
Column 1 gives the Map Area covered by the chart, and is usually indicated by an accompanying graphic.

Column 2 details the product that is transmitted, e.g. Surface Analysis or Surface Pressure, etc.

Column 3 gives the time of transmission in Universal Co-ordinated Time (UTC), the two figures in parentheses 1050 (06) giving the validity time, i.e. Surface Analysis transmitted at 1050, valid at 0600UTC.

The final column details the drum speed and the IOC, which are very important with regards to receiving a clear picture. On early weather FAX transmitters, the chart was attached to the outside of a cylindrical drum. With the chart's length running parallel to the axis, the drum was rotated at a constant speed, usually 120r.p.m. A light sensor was arranged to pass slowly along the drum axis and hence along the length of the chart. With each rotation, it scanned a single narrow line along the width of the chart, its output used to produce an audio tone of either 1.5 or 2.3kHz, depending on whether it was passing over a black or a white section of the chart.

Area	Product	Time	Speed
	Surface Chart 1050 (06) 1600 (12)	0430 (00) 0525 (00)	
EN		2200 (18)	120/576
	30h (EMV) Surface Pressure 1832 (12)	0512 (00) 0730 (06)	
	12h & 24h (EMV) 500 hPa H & T, Surface P	0546 (00)	
	Surface Pressure Analysis with Plotted Data	0745 (00) 1810 (12)	



FAX chart areas.

Instead of a drum, modern FAX transmitters use a flat bed scanner, although the term 'drum speed' is still employed. Most stations use a drum speed of 120, some Russian stations use 60 or 90, so in order to obtain an image that looks correct, it is very important that the equipment is set to receive at the correct speed! Another parameter affecting the appearance of the received image is the index of co-operation (IOC). This refers to the scan line density and, if set incorrectly, results in an image that is vertically stretched or compressed. Again, most stations use an IOC of 576. Popular European FAX stations are listed with frequencies as follows:

Northwood (UK)	Bracknell (UK)	Offenbach (Germany)	Skamlebaek (Denmark)	Rota (US Navy) (Spain)
3.652	2.6185	3.855	5.850	7.595
4.307	4.610	7.880	9.360	9.050
6.4525	8.040	13.8825	13.855	10.542
8.3315	14.436	17.510		
	18.261			

Once the avid FAX station listener has become adept at setting his equipment correctly, then the DX chasing can begin, with such exotic stations as Taipei, Pretoria, Tokyo, Kodiak and Darwin. That is, assuming that you wish to know what the weather is like on the other side of the world!

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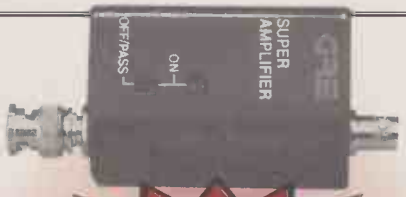

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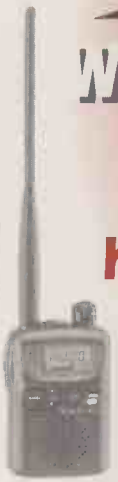

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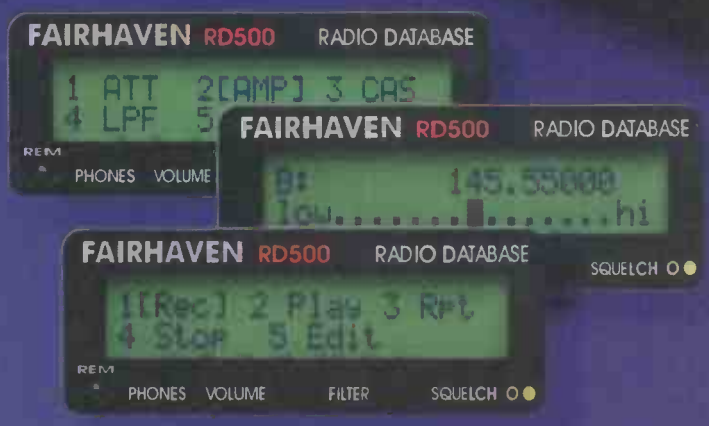

Its massive memory can store information equivalent to several scanning directory books. Any word such as "Fire', "Air", "Voice Of America", or even your local town can be searched for. It can hold 54,682 entries, each with 20 characters of text, mode, and frequency.

A 45 key TV style remote is provided for text entry and control, and a PC keyboard can be plugged into the receiver.

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We include Windows software to make it easy to gather information from document scanners, the Internet and other sources. The RD500VX can be linked to your PC to backup or download information, and a database is loaded into the receiver before shipping.

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Maritime Beacons

Long Wave Maritime Radiobeacon Chart

Freq (kHz)	C/S	Station Name	Location	DXer
279.0	SI	Simiutaq	Greenland	I*
284.0	VN	Capo Vaticano	S.Italy	I*
284.5	LZ	[D] Lizard Lt	S.Cornwall	A,E,H,I*,N,P
284.5	MA	Cabo Machichaco	NE.Spain	A,B*,C,D,E,F*,G*,H,I*,K,N*,O*,P*
284.5	PR	Porkkala	Finland	I*,N*
285.0	NP	Nieupoort W.Pier	Belgium	A*,I*
286.0	TR	[C] Tuskar Rock Lt	Co.Wexford	A,E,H,N
286.5	FI	Cala Figuera	Majorca	A*,F*,H,I*,N*,P*
286.5	FT	Cap Ferret Lt	SW.France	A,B*,C,E,G*,H*,I*,N*,O*,P*
286.5	PZ	Cozzo Spadaro	Sicily	A*
287.3	HA	Haifa Lt	Israel	A*
287.3	IB	I.Berlenga	Portugal	I*
287.5	DO	Rosedo Lt	France	A*,I*
287.5	FR	Faerder Lt	Norway	A*,H*,I*
287.5	IB	I.Berlenga	Portugal	A*
287.5	MD	Cabo Mondego	Portugal	A,I*
288.0	HH	Hoek van Holland	Holland	A,C,I*,L
288.0	KL	Sklinna Lt	Norway	H*,I*
288.0	DH	[C] Old Hd Kinsale	Co.Cork	A*
288.5	CT	Pt de Combrit Lt	France	I*
288.5	FI	Cabo Finisterre Lt	N.W.Spain	A,B*,E,G*,I*,N*,P*
288.5	UD	Cabo Salou	S.Spain	I*
288.5	YM	Ijmuiden Lt	Holland	A,C,H,I*,M,N
289.0	BY	[C] Baily Lt	Co.Dublin	A,E
289.0	RN	[C] Rhinns-Islay	Is of Islay	A,E,H
289.5	SN	Ile de Sein NW Lt	France	A*,B,C,E,F*,H,I*,K,N,P
290.0	AV	Aveiro	Portugal	I*
290.0	FD	[C] Fidra Lt	F of Forth	A*,H
290.0	MR	Montedor	Portugal	A*
290.5	DY	[C] Duncansby Hd	NE.Scotland	A
290.5	SB	[C] S.Bishop Lt	Pembroke	A,E,H,N,P
290.5	VI	Cabo Villano Lt	N.Spain	A,B,C,E,G*,H*,I*,J,K,M,N*,O*,P
290.5	VY	Visby	Sweden	I*
291.0	SM	Pt. St.Mathieu	France	I*
291.0	SN	Cabo San Sebastian	S.Spain	A*,B*
291.5	SU	[C] South Rock LV	Co.Down	A*,E,H,N
291.9	NA	Punta Lantailla	Canaries	A*
292.0	MH	Mahon, Minorca	Balearic Is	H*
292.0	SJ	[C] Souter Lt	Sunderland	E,H,N
293.0	CP	[D] St.Catherine's	Is of Wight	E,I*,K,M,N,P
293.0	SY	Svinoy Lt	Norway	H*,I*
293.5	BL	[D] Butt of Lewis	Is of Lewis	A*H
293.5	RD	Cabo Silleiro Lt	N.Spain	A*,I*
294.0	KU	Kullen High Lt	Sweden	A*,I*
294.0	PH	Cap d'Alprech	France	A,B,C,D,E,F*,G*,I*,K,L,M,N,O,P
294.6	ND	Cabo de la Nao	Spain	A*
295.0	SN	Sletnes Lt	Norway	A*,I*
295.5	CB	La Corbiere Lt	Jersey C.I.	A,B,C,F*,H,I*,K,N,O,P
295.5	CR	Cap Couronne	France	I*
295.5	JA	Jaroslawiec	Poland	A,C*,H*
295.5	RE	La Rochelle	France	A
296.0	GR	Goeree Lt	Holland	C,E,I*,M,N,O
296.0	KN	Skrova Lt	Norway	A*,H*
297.0	FG	Pt de Barfleur Lt	France	A*,I*,O
297.5	MA	Mantyluoto	Finland	A*
297.5	PS	Cabo Penas Lt	N.Spain	A,G*,H*,I*
298.0	GX	Ile de Groix	France	A*,G*,I*,O
298.0	TA	Cabo Gata	S.Spain	I*
298.5	RR	[C] Round Is Lt	Is Scilly	A,E,H,M,N,P
299.0	AD	Ameland Lt	Holland	A,I*
299.0	BN	Les Baleines	W.France	G*,I*
299.0	O	Tarifa	S.Spain	A*
299.5	NP	[D] Nash Pt Lt	S.Wales	A,H,I*,N,P
299.5	SK	Skomvaer Lt, Rost	Norway	H*
299.5	VR	Utvaer Lt	Norway	H,I*
300.0	CL	Cloch Pt Lt	W.Scotland	A*
300.0	MZ	[D] Mizen Head	Co.Cork	A,E,H,I*,N
300.0	TI	Cap d'Antifer Lt	N.France	D,I*
300.5	KS	M.Kanin	Artic Russ	A*
300.5	LA	Lista	Norway	A*,C,E,G*,H*,I*,L,M*,N*
301.0	CA	Pt de Creach	France	A,B,C,D,E,F*,G*,H,K,N,O,P
301.0	ER	Eierland Lt	Holland	A,I*
301.0	HA	Pt del Hank	Morocco	A*
301.5	DU	[C] Dungeness Lt	Kent	E,M,N,P
301.5	L	Torre de Hercules	N.Spain	A*,C,E,H*,I*
302.0	RB	Cherbourg Ft W Lt	France	A,B,C,D,E,F*,G*,H,I*,K,L,M,N,O*,P
303.0	D	Rota	SW.Spain	A*,C*,F*,H*,P*
303.0	FB	[O] Flamborough Hd	Yorkshire	A,E,H,I*,M,N,P
303.0	MY	Cabo Mayor(&304.5)	N.Spain	B,F*,G*,H,I*,L,O*,P*
303.0	YE	Ile d'Yeu Main Lt	W.France	I*
303.4	VC	Cape St.Vincent	Portugal	I*
303.5	BJ	Bjornsund Lt	Norway	A,E,G*,H,I*,M,N*,O*
303.5	FN	Feistein Lt	Norway	E,I*,N*
303.5	VL	Vlieland Lt	Holland	I*
304.0	BR	Cap Bear	France	A*
304.5	MY	Cabo Mayor	N.Spain	A,C,E,K,N*
304.5	PS	[D] Pt Lynas Lt	Anglesey	A,E,H,I*,M,N,P*
305.5	FP	[C] Fife Ness Lt	SE.Scotland	A,E,H,N
305.7	DA	Dalatangi Lt	Iceland	A*,H*
306.0	FN	[C] Walney Is Lt	Off Lancs	A,E,H,N
306.5	H	Hel Lt	Poland	A*
306.5	KL	Kolkasrags	Latvia	A*
306.5	UT	Utsira	Norway	A*,C,E,G*,H,I,M*,N*
307.0	GL	[C] Eagle Is Lt	Co.Mayo	A,E,H
307.0	LE	Leba Rear	Poland	A*
307.5	RS	Ristna	Estonia	A*,C*,E,H,N*,O*,P*
308.0	AK	Table D'Oukacha	Morocco	A*
308.0	PI	Cabo Espichel	Portugal	A*
308.0	RC	Cabo Roca	Portugal	A
308.0	RD	Roches Douvres Lt	France	A,I*
308.5	NZ	St Nazaire	France	A*,C,I*,M,N*
309.5	BA	Punta Estaca Bares	N.Spain	A*,B,C,E,F*,G*,H,I*,K,M*,N*,P*
309.5	MA	Marstein Lt	Norway	A*,H,I*
309.5	PB	[C] Portland Bill	Dorset	E,N,P
309.5	WE	Wangerooge Lt	N.Germany	C
310.0	ER	Pt de Ver Lt	N.France	A*,C,D,F*,I*,K,L,N,O,P
310.0	IP	Capo Sandalo Lt	Sardinia	I*
310.5	BO	Bokfjord Lt	Norway	I*
311.0	NF	[D] N.Foreland Lt	Kent	A*,I*,N,P
311.5	GD	[D] Girdle Ness Lt	NE.Scotland	A,E,H,N
311.5	LP	[D] Loop Hd Lt	Co.Clare	A,E,H
311.5	SB	[D] Sumburgh Hd Lt	Shetland Is	O
312.0	OE	Dostende	Belgium	A*,H,I*,J,O*
312.0	UH	Eckmuhl Lt	France	B
312.5	AK	Akmenrags	Latvia	A*
312.5	BK	Baltijsk	Russia	A*
312.5	BT	Mys Taran Lt	Russia	A*
312.5	CS	Calais Main Lt	France	A,C,D,F,I*,M,N,P
312.5	KA	Klaipeda Rear Lt	Lithuania	A*
312.5	LB	Liepaja	Latvia	A*
312.5	SR	Skardsfjara	Iceland	A*,H*
312.5	VS	Cabo Estay Lt	N.Spain	G*,H,I*
313.0	HA	Halten Lt	Norway	A*,H*,I*,N*
313.0	PA	Cabo de Palos Lt	S.Spain	A*,F*,I*,P*
313.0	TY	[D] Tory Is Lt	Co.Donegal	A,E,H,J
313.5	BR	Cap Bear Lt	S.France	I*
314.0	HK	Hekkingen Lt	Norway	I*
314.0	PO	Porquerolles	S.France	I*
314.0	VG	Ile Vierge Lt	France	A,B,C,D,E,F*,G*,H,I*,K,L,M,N,O,P
314.0	WU	Wustrow Lt	NE.Germany	A*
314.5	CM	[C] Cromer Lt	Norfolk	A*,E,G*,N
314.5	TL	Punta D.Penna	Italy	I*
315.5	ND	Nida	Lithuania	A*
316.0	IN	Ingolfshofdhi Lt	Iceland	A*,I*
337.0	MY	Myggenaes	Faeroe Is	A*,C*,H,I*,N*,P*
367.0	JV	Jakobshavn	Greenland	A*
372.0	OZN	Prins Chris's Sund	Greenland	A*,H*,I*,N*
381.0	AB	Akraberg	Faeroe Is	A*,C*,G*,H,I*,N*,O*,P*
404.0	NL	Nolso	Faeroe Is	A*,C*,G*,H,I*,N*,O*,P*
404.0	NS	Narssaq	Greenland	A*

DXers:-

(A)	Robert Connolly, Kilkeel.
(B)	Martin Goodey, St.Mary's, Isle of Scilly.
(C)	Brian Keyte, Gt.Bookham.
(D)	George Millmore, Wootton, IoW.
(E)	Albert Moore, Douglas, IoM.
(F)	Fred Pallant, Storrington.
(G)	Peter Pollard, Rugby.
(H)	Victor Robb, Belfast.
(I)	Peter Rycraft, Wickham Market.
(J)	Tom Smyth, Co.Fermanagh.
(K)	Andrew Tett, Hove.
(L)	Philip Townsend, E.London.
(M)	Eric Tubman, Whitstable.
(N)	Fred Wilmshurst, Northampton.
(O)	John Woodcock, Basingstoke.
(P)	Ross Workman, Shoreham-by-Sea.

Note:

Entries were compiled during January and/or February and/or March. Entries marked * were logged during darkness. All other entries were logged during daylight or at dawn/dusk.
Beacons marked [C] have now been (or soon will be) closed down.Beacons marked [O] now (or soon will) radiate DGPS data.

The sky waves from quite a few distant beacons reached the UK at night during January, February and March - see chart. Particularly favourable conditions for reception from the Mediterranean area were observed at night in early February by **Peter Rycraft** (Wickham Market). The beacons at Capo Sandalo Lt, Sardinia (IP) on **310.0kHz**; Capo Vaticano Lt, Italy (VN) **284.0kHz**; also Punta del Penna Lt, Italy (TL) **314.5** were rare catches for him. Several beacons along the Mediterranean coast were also logged at night by **Robert Connolly** (Kilkeel) - see chart. The most distant was Haifa Lt, Israel (HA) on **287.3**.

Sadly, most of the UK beacons have now been closed down but their absence has enabled some others to be received for the first time e.g. Les Baleines, France (BN) **299.0**, noted by **Peter Pollard** (Rugby); Lista, Norway (LA) **300.5**, noted by **Phil Townsend** (E.London); Wangerooge Lt, N.Germany (WE) **309.5**, noted by **Brian Keyte** (Gt.Bookham); Ijmuiden Lt, Holland (YM) **288.5**; Mahon, Minorca (MH) **292.0** & Rota, SW.Spain (D) **303.0**, noted by **Victor Robb** (Belfast). Since the closure of Pt.Lynas, **Albert Moore** (Douglas, IoM) has been able to receive the beacon at Cabo Mayor, Spain (MY) on **304.5** fairly well most days.

The remaining UK beacons are now radiating data for use with the 'Global Positioning System' (GPS) - see December '98 article. At each of these stations the known position of the site is compared with that indicated by GPS and the resulting 'differential' is then radiated as data on a specific frequency in the l.w. beacon band. At any location within range of the station, the differential-GPS data can be decoded with a differential beacon receiver and then applied directly to a GPS receiver via its input port. With relatively inexpensive equipment, the indicated position may then be in error by about 5m instead of the 100m (maximum) for uncorrected GPS.

In Dorking, **Walter Blanchard** has successfully decoded the data from fifteen DGPS stations. He used a CSI MBX-2 DGPS decoder plus external antenna and a Novatel 951R GPS receiver. His best DX so far is Reykjanes, Iceland, on **292.5**, so perhaps his achievements will lead to a new form of beacon DXing!

An up-dated 5th edition of Robert Connolly's popular guide to the LW Marine and Aero Radiobeacons has just been published, which includes a new section detailing the DGPS stations. For more information please send an s.a.e. to Robert via me initially.

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Info in Orbit

Fig. 1: *METEOSAT-7* 11 April 1201UTC Primary Data image showing cloud over region of Yugoslavia.

A significant computer upgrade has been due in my operations room (OK, a converted garage) for some time, so when I took delivery of a Pentium Pro 3 unit, I had some anticipation of making progress. In fact, I effectively became a beta tester for a certain well-known national computer supplier!

System crash after system crash continued to plague me for days, causing havoc with publication schedules, so I arranged collection and fixing of the unit. After three days wait, the supplier noticed the unit waiting for testing (!) and rang me to enquire. The computer was returned on Easter Saturday, and crashed after powering up. A few days later, I arranged for replacement.

Article deadlines prevented my thoroughly testing the new computer, so it is currently collecting METEOSAT WEFAX images, animating the weather over Yugoslavia, while simultaneously receiving polar satellite images via the sound card. New software is waiting tests, and I am currently writing features on the new Timestep Windows LC interface. Next month I'll feature notes on some new tracking and decoding software written by **David Taylor**.

Operational WXSATs

All of the operating polar WXSATs have provided regular images of the regions in Yugoslavia in late March, where NATO activity was partly dictated by cloud cover.

Following the frequency change for *METEOR 3-5* from 137.85 to 137.30MHz (that I logged on 11 March), *RESURS 1-4* and *METEOR 3-5* remained operational. Transmission frequencies and operations are notified in advance on the Internet by **Mike Kenny** of the Australian Bureau of Meteorology in Melbourne. If you have access to the Internet (and remember that such access is effectively now free in Britain), you can subscribe (free of charge) to the 'wxsat' mailing list. Visit my web page (see top of column) for links and details.

There was no indication in the early April notification that *METEOR 3-5* would stop transmitting, but I did not hear any passes on 9 April, and none on the days up to press deadline. For a couple of days, *RESURS 1-4* images experienced some line errors; I suspect that this problem may recur.

For the first time in some months, I logged several transmissions from both *OKEAN-4* and *SICH-1* in March and (so far) in April. In each case, they were brief, usually lasting only a couple of minutes. Although NOAA a.p.t. transmissions have been nominal (same as usual), high resolution picture telemetry from *NOAA-15* has produced faults - see later.

Analysing The Sub-carriers

If you leave your WXSAT scanner (or any scanner that includes the 137MHz band) operating during the late evening, you should have heard *RESURS 1-4* switching on (137.85MHz) while still in darkness. The transmission contains essentially just the grey scale and bars, with a blank image content.

Nearer the end of these north-bound passes, the WXSAT is approaching the north pole, now in sunlight. The same night-time 'switch-on' happens to *METEOR 3-5* (when operating), but *RESURS 1-4* has come on much earlier (possibly under automatic timing) - while still in the night part of its orbit.

It is interesting to compare the signal content - as seen on an oscilloscope trace - of the NOAA and RESURS de-modulated signals. The program *wxsat* includes a 'test' facility that analyses the content of the nominally 2.4kHz sub-carrier. Most WXSATs modulate this sub-carrier such that minimal modulation represents bright features (for example, clouds) within the line data; maximum modulation represents dark features (seas).

For the electronics to be able to maintain lock on this sub-carrier, it should ideally not vanish to zero - that is, maximum modulation should never fall below about 5%. The image **Fig. 2** shows that the RESURS signal virtually disappears for the majority of the night-time scan line, and this feature can be heard, or seen, on a scanner when lock is lost during each line. To obtain a clear (if blank) picture, the 'mute' button can be set to hold the frequency in the un-squelched mode.

For comparison, **Fig. 3** shows the trace obtained during a typical day-time pass. Careful examination shows a short length of the trace where the modulation level reduces to almost zero (representing a dark portion of a picture line). The trace **Fig. 4** is from a *NOAA-14* afternoon pass containing a low modulation portion, but in this instance the level remains high enough to maintain signal lock.

In each of these

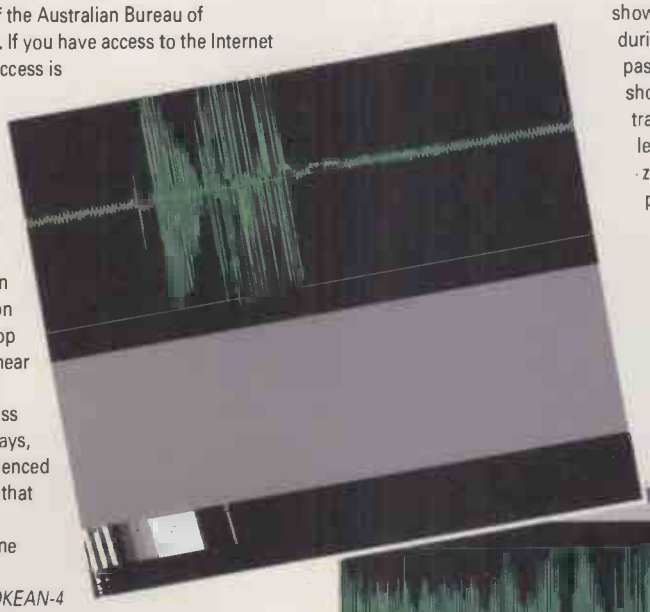


Fig. 2: *RESURS 1-4* oscilloscope trace for night-time pass.

Fig. 3: *RESURS 1-4* oscilloscope trace for day-time pass.

Fig. 4: *NOAA-14* oscilloscope trace for day-time pass.

figures, it is important to appreciate that one line of the oscilloscope trace represents just one line of the picture, and is a measure of the instantaneous signal amplitude - it is not a frequency spectrum.

NOAA-15 HRPT Problem

Users of h.r.p.t. data reported drop-outs in *NOAA-15*'s 1698.0MHz (S-band) in early April. NOAA (National Oceanographic and Atmospheric Administration) staff became aware of the problem, and **Wayne Winston**, a NOAA meteorologist, explained that this particular transmitter/antenna had not performed to specification since launch. The problem has worsened, apparently since the spring equinox.

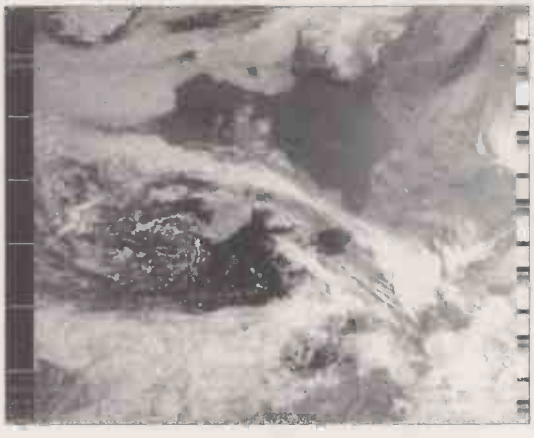


Fig. 5: *NOAA-15* morning pass catches the sun's reflection.

NOAA-15 carries an enhanced version of the Advanced Very High Resolution Radiometer (AVHRR) - the telescope that looks at the earth and analyses the radiation received, splitting it into various spectral channels. The new instrument (called AVHRR/3) has a sixth channel in the near-infra-red, at 1.6um (micrometers), referred to as channel 3A. Channel 3B corresponds to the previous channel 3 on the AVHRR/2 instrument.

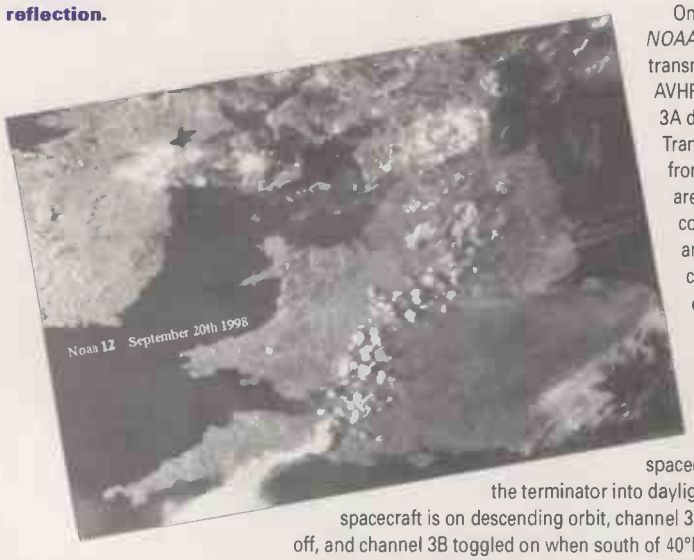


Fig. 6: *NOAA-12* h.r.p.t. image 20 September from Roger Ray.

On 9 March, *NOAA-15* began transmitting AVHRR channel 3A data. Transmissions from channel 3A are not continuous, but are shared with channel 3B data. Channel 3A is toggled on during daylight passes, as the spacecraft crosses the terminator into daylight. When the spacecraft is on descending orbit, channel 3A is toggled off, and channel 3B toggled on when south of 40°N. Automatic picture transmission (a.p.t.) users receive the AVHRR/3 channel 3A the same as channel 3B.

NOAA believes the problem may be related to channel 3A/3B switching on the AVHRR. It also seems more apparent on the morning descending (southbound) orbit. NOAA continues to investigate, and may temporarily stop 3A/3B switching as a test for several days. Ultimately, the h.r.p.t. transmission may have to be switched to another transmitter frequency.

Users of *NOAA-15* a.p.t. continue to receive superb images, particularly from the morning passes now in full illumination, spacecraft passes being an hour or two later than the early morning *NOAA-12* passes. On 2nd April, I received my first image of the season, which shows the sun's reflection off the Mediterranean Sea - see **Fig. 5**.

Roger Ray of Telford sent several images from his NOAA high resolution picture telemetry (h.r.p.t.) system, of which **Fig. 6** is from *NOAA-12*. I believe this is an evening pass, visible-light channel because the original image was fairly dark on the eastern side of Britain. I did a little image enhancement to improve its contrast for publication. The detail seen in this image really shows the meaning of 1km resolution. Individual clouds, complete with evening shadows, can be seen laid across part of the Welsh border. Most of eastern England is in late evening, with little solar illumination and therefore low contrast. I suspect that Roger has the same problem with his h.r.p.t. images as I have with PDUS - the quality is so good there is a great reluctance to delete them!

George Newport of Canterbury sent a collection of pictures including **Fig. 7**, a close-up of Iceland and of the eastern Mediterranean sea, as seen by *RESURS 1-4*. The Mediterranean islands are clearly seen, including detail on Cyprus.

Keith Artherton of Fakenham in Norfolk E-mailed an artificially coloured image of Iceland - see **Fig. 8** - seen cloud-free during the *NOAA-15* south bound morning pass on 31 March. Keith uses a Timestep receiver and quadrifilar antenna. Images are produced using the program *wxsat* on his computer.

METEOSAT Primary Data

Sooner or later, those monitoring METEOSAT WEFAX images may wish to consider the ultimate upgrade - a Primary Data system, so it seems helpful to provide a guide to the PDUS images transmitted by METEOSAT. During the next several columns, I plan to include examples of many (unencrypted) images.

In recent editions of this column I have described METEOSAT and the equipment essential to receive Primary Data transmissions. *METEOSAT-7* is Europe's geostationary WXSAT and transmits all image formats on 1691.0 and 1694.5MHz. For WEFAX reception, one can receive a good signal using a 1m dish or 45-element Yagi, together with a low-noise pre-amp.

For PDUS, a larger-than-normal dish is required; we must use a minimum of about 1.6m, though 1.8m is better. This is still below EUMETSAT's recommended minimum dish size for uninterrupted PDUS reception. The dish should be accurately aligned with *METEOSAT-7* (positioned at nominally zero longitude). One method of quickly doing this alignment is to use a WEFAX receiver first, and maximise the received signal by adjusting the direction of the dish.

After this is completed, the PDUS receiver can be connected and the process repeated to maximise the PD signal. All primary data is received on channel A2, interspersed with certain WEFAX formats. In addition, as discussed in previous editions, formats from other geostationary WXSATs are included; these should form a significant factor in any decision to move to PDUS.

Starting from around midnight, the first transmissions are two unencrypted METEOSAT images, BIW followed by AIW; the first contains infra-red and 'water-vapour' (technically - near-infra-red) formats of the European sector, covering the region seen in **Fig. 1**. Most METEOSAT home-grown images are actually two spectral images multiplexed (combined) in one transmission.

Software has therefore to re-build each image from this complex signal! After reception, your program should allow you to display either image from the original data. The second format (AIW) is a whole disc (indicated by the letter A), containing infra-red and water-vapour spectral images. As before, software allows you to look at each individually.

Reader Offer. Kepler Elements - WXSATs, *MIR* and Shuttle

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 print-out 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 print-outs to many people. To join the list please send a 'subscription' of £1 (secured, plus four self-addressed, stamped envelopes) for four editions. Transmission frequencies are given for the operating satellites. This data originates from NASA.

Please send your request to Lawrence Harris, at the address at the head of page 61.

Fig. 7: *RESURS 1-4* two images: Iceland and the Med from 4 March at 1254UTC from George Newport.

Fig. 8: *NOAA-15* Iceland image of 31 March from Keith Artherton.

Fig. 9: *GOES-East* Primary Data infra-red image from 13 April 0054UTC - obtained using Timestep's PDUS system.

The slot at 0014UTC contains a WEFAX whole-disc image of the earth in infra-red (DTOT), and is followed by the near-infra-red (ETOT) format. The ATEST format (numerically slot 1) is an unencrypted PDUS test format, and is a valuable one - an image of grey scales - allowing a qualitative assessment to be made of your whole system. I am pleased to say that the images on my PDUS system are noise-free.

The images transmitted at 0030 and 0034UTC are encrypted (BIW and AIW) formats. A second ATEST image is transmitted at 0046UTC, then, after a few minutes break, the first foreign format image - E_XI - is transmitted. This is a thermal infra-red image - see **Fig. 9** - originating from the *GOES-E* (currently *GOES-8*) WXSAT positioned over the east coast of America. The whole of North and South America is clearly seen from this superb vantage point. Severe weather systems are a regular feature of *GOES-E* images, and the format is transmitted every three hours. More on PDUS transmissions next month.

Shuttle Launches

Peter Wade of Sevenoaks spent a family holiday in Florida last autumn and took the opportunity to see a Shuttle launch and visit the Kennedy Space Centre. Peter sent me a large batch of photographs and brochures that I propose to include occasionally. **Figure 10** is another from this collection.

STS-96 - *Discovery* - 2nd U.S. International Space Station flight, Spacehab Double Module. Target KSC launch: 20 May at 1432 UTC. Orbital inclination 51.6°. ISS docking: 22 May at 0901UTC; *ISS* undocking: 28 May at 0307UTC.

STS-93 - *Columbia* - Payload Chandra X-ray Observatory (formerly AXAF). Target KSC launch: 9 July at 0619UTC. Orbital inclination 28.45°.

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

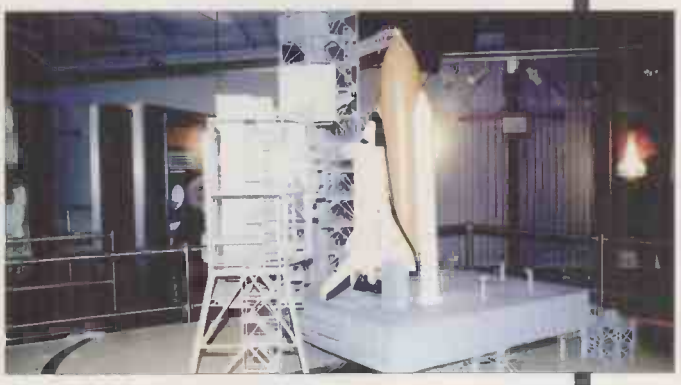


Fig. 10: Shuttle mock-up display at KSFC from Peter Wade.

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 (normally) transmits on 137.30MHz (see article).
OKEAN-4 and *SICH-1* use 137.40MHz.
RESURS 01#4 transmits a.p.t. on 137.85MHz.
METEOSAT-6 (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.

Bond's Budget Airband

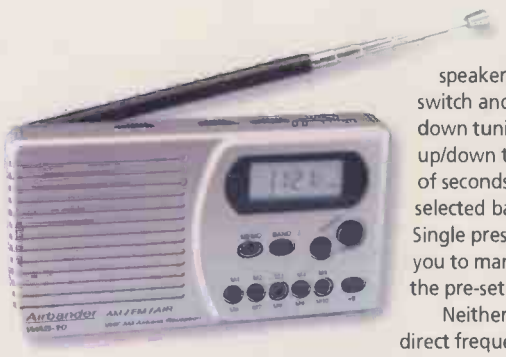
Peter Bond goes back to basics with two budget airband receivers.

I knew that April 15th was going to be an unusual day when I awoke to find snow and hailstones hammering from the skies. Whilst this may not have been a strange occurrence to those of you living in the northern parts of the UK, it certainly was for me. Where I live, near the south coast, that sort of weather is unusual in mid January, let alone mid April!

When the Editor rang me and asked if I could review not one, but two radios, I immediately visualised a comparison between the new £3000 wide band receivers, the Icom R11000 and the AOR AR12000, but my dreams were soon brought back to earth. The two radios in question were the very opposite end of the market and are the TrackAir FM/Airband PLL digital receiver and the WAB-10 Airbander digital auto tuning receiver. Both radios are aimed very much at the airband beginners market. (Please note: I have just invented the Icom and AOR radios mentioned above - so please don't ring or write in and ask about them!).

Similar Controls

Both radios are very easy to use and have similar controls, the following items are consequently common to both sets. The controls include a volume control, (no squelch), key lock, a speaker/phones switch, mono/stereo switch and plus and minus, up and down tuning buttons. Pressing these up/down tuning buttons for a couple of seconds starts a search in the selected band until a signal is found. Single presses of these buttons allows you to manually tune up and down by the pre-set increment.



Neither radio has numeric keys for direct frequency entry, and so selecting a new frequency can be a bit tedious as you have to search all the way through the band to reach it. Having said that, it would be unfair of me to expect such a facility from radios in this budget price range. Both radios also have a BAND button for selecting the differing a.m./f.m. bands plus five memory channel buttons. The digital read-out was clear and easily readable on both sets.

"I was disappointed, especially with the airband performance."

TrackAir

The TrackAir is a small black unit that is 115mm tall and fits neatly into the palm of the hand. It has four frequency bands which are as follows: (1) FM1 88.8-108.00MHz/50kHz steps, (2) FM2 108.00-140.00MHz/50kHz steps, (3) AM1 108.88-124.00MHz/12.5kHz steps, (4) AM2 124.00-140.00MHz/12.5kHz steps. There are five memory channels available on each band, giving a total of 20. Having the airband split into two sections was a bit of a pain to start with, but you soon get used to it.

WAB-10

The WAB-10 is a smart silver grey colour and is slightly larger than the TrackAir. It has three frequency bands as follows: (1) AM 522-1629kHz/9kHz steps, (2) AIR 108.88-140.00MHz/25kHz steps, (3) FM 87.3-108.1 MHz/50kHz steps. It has ten memories on each band, giving a total of 30 memories. Like the TrackAir, the memories are stored by pressing the MEMO button and then the desired memory channel, (M1-M5). The WAB-10 also has memories, six to ten are accessed by pressing the +5 key and then the M1-M5 keys which then become M6-M10.

On Air

The received audio on both radios on the broadcast bands was acceptable, if perhaps a bit tinny. On the airband, the local airfield and the airway almost directly overhead could be heard reasonably clearly, reception of anything further afield was almost impossible. Both of the sets suffered from a variety of background noise throughout the airband, both being affected by electrical appliances from within the house. The TrackAir was slightly the worse of the two, suffering annoying whistles on two local airband frequencies. With no squelch, that can be rather grating on the hearing.

Bottom Line

Whilst using the two radios for several days, I have kept foremost in my mind that they are budget receivers and not to expect too much - nevertheless - I was disappointed, especially with the airband performance. The prices are £39.95 for the WAB-10 and £49.95 for the TrackAir. It is my personal opinion that both are over priced and £29.95 would be a more reasonable figure.

If you want to buy a radio to listen to Radio 2 or Virgin Radio plus v.h.f. airband at local airfield, then either radio will suit you fine. If you wish to pursue airband listening more seriously, I would suggest that you save up the pennies and invest in one of the hand-held scanners which are now available for around £130.

However, If I had to choose between the two, it would be the WAB-10. I preferred the design and colour, it had the addition of the a.m. broadcast band, more memories, and slightly better audio with less annoying background noises.

My thanks to **Waters & Stanton PLC, Spa House, 22 Main Road, Hockley, Essex SS5 4QS** for the loan of the two radios.

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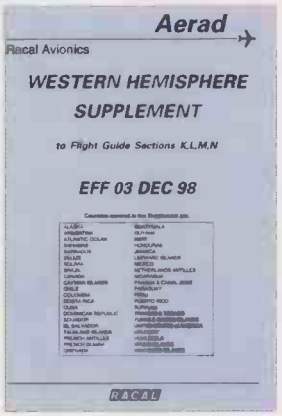
SSB Utilities



Aerad Books

At the London Amateur Radio Show in north London in March I met up with some contacts in the Air Training Corps (ATC), and was handed a pile of recent airline and Air Force frequency guides (thanks **Dave H!**).

One of the regular questions that I receive from readers and listeners is how they can obtain their own copies, so I thought that it would be worthwhile explaining their contents and why they are so useful. This will also serve a double purpose, as I spent some time at the show talking to somebody who was asking about the availability of these books, what they contained, and how it might be useful for short wave listeners.

The books are known as *Aerad Supplements*, and they are published by Aerad, now part of the Racal Avionics group of companies. The two books that I received cover Europe & Middle East and the Western Hemisphere.

Each book is generally broken-down into four sections, as follows: the **MET Section** covers all sorts of v.h.f. and h.f. meteorological information and ATIS broadcasts, and also precise details of how to decode the met messages. The h.f. VOLMET Broadcast pages cover each transmitting station, their operating schedule and coverage, and details of the kind of weather broadcast (e.g., TAF, METAR, SIGMET, etc.).

The **COM Section** is easily the biggest section of the book, and lists all the communications and navigation frequencies for every airfield covered by the book. Most of these are v.h.f. and u.h.f. frequencies, but there are a few h.f. frequencies hidden in there if you look hard enough. For many items, it also lists the exact latitude and longitude.

Following this are a few pages devoted to the h.f./RT Networks, once again showing their coverage and frequencies. Following this section are several pages which will be most useful for h.f. listeners - pages of frequencies and propagation predictions for Speedbird London, Berna Radio, Stockholm Radio and Portishead Radio.

The **AGA Section** lists all the runway information for all the airfields listed in the COM Section. The **GEN Section** contains all sorts of ad-hoc information which does not fit into the other sections. I can certainly recommend copies of these books, simply for the h.f. information in the first two sections of each book.

There is a page near the front of each book which gives details of how to get copies of these Aerad books. The general sales enquiries 'phone number is **0181-971 5522** - this is actually Aerad Customer Services, but they will be able to help you with ordering individual copies and price details.

Shanwick

A few months back I mentioned the web-page devoted to Santa Maria ATC in The Azores, and asked if anyone knew of a similar web-page for Shanwick Aeradio. I received several replies to this, and all indicating the very same page.

Mark Zee, in the Irish Republic, has a web-page devoted to Irish aviation, and includes several pages about Shanwick. The web-page address is: **http: www.iol.ie/~markzee/atlantic.htm** - don't forget the little squiggle (tilde) in the middle! Thanks to **Robbie Riddell**, **Michael Ellard** and **Martin Sutton** who kindly supplied this information.

Martin Sutton also took the opportunity to ask a question. He says that he is sad to hear about the loss of *High in the Sky*, but asks if the *Calling Shanwick* book covers military SELCALs. Well Martin, the answer to this question is a partial Yes and a large No. A quick random check of *Calling Shanwick* shows that it does **not** contain all the fleet of RAF C-130 Hercules transport aircraft, but it does contain most of the VC-10 transports and tankers and the BAe125 and BAe146 VIP transport aircraft.

One thing that it certainly does not contain is any SELCALs for German Army UH-1D Huey helicopters - I discovered four completely unknown SELCAL codes for these during March. To be fair though, they were not in *High in the Sky* either, nor in any other SELCAL directory, and I suspect that they have never been published before.

SCC

Back at the end of 1996 I was lucky enough to hear about the Sea Cadet Corps (SCC) plans to meet up with the Royal Navy Submarine just off the Isle of Man. When I discovered the name of the submarine, I was able to do some research, and found out that it was actually a nuclear-powered submarine - HMS *Vigilant*.

On the appointed day and time, the submarine and several SCC stations were heard communicating with each other, and their signals were heard all over Europe (since the event was report across the Internet). A few days later, I decided to send off a reception report to the SCC station in the Isle of Man, just to see if I would get any response. Much to my surprise, I received a QSL from TS Manxman a few weeks later.

However, much to my surprise, in recent weeks I have received another QSL card from them, this time with a picture of the submarine on the front. It also contains the crest of the submarine. The first QSL was from the Cadets, while the second one was from the Submarine, via the cadets.

Marine Channels

John Puckrin writes to say that he enjoys listening to the marine channels, and finds it quite profitable to listen to 2.182MHz from 0500 in the morning. He regularly hears signals from coastal stations in North America, such as St. Johns Coast Guard Radio in Canada. Well John, I don't know how you manage to get up so early, I sometimes have difficulty with 0800!

John says that for marine enthusiasts, a list of the channel designations used by the UK coastal stations (e.g. channel India) might be useful. I have featured a list of these in the past, and they are quite easy to find on the Internet. If you are anywhere near the coast, you can get this information from just about any harbour, marina, coastguard station or chandler (sailing supplies) shop. There is also a small pocket-book available from the *SWM* Book Store - the book that you need is *Ship to Shore Radio Frequencies* by Ken Davies. As I have provided this frequency listing before in this column, I want to avoid repeating it again - unless I get lots of letters asking for it, that is!

Kosovo

As I write these words in early April, the skies of Europe are full of military aircraft involved in Operation Allied Force. This is the result of the failed attempts to get a peace-deal between the Serbs and Kosovar Albanians.

There are many NATO aircraft flying from bases in Italy, and USAF B-52 and B-1 bombers are flying almost daily missions from the UK into the region. There are a lot of signals on h.f. (and much, much more on v.h.f./u.h.f. airband, but cannot be heard in the UK).

However, by the time that these pages appear in print in late May, there is a good chance that this conflict will be over. I have already received several E-mails and letters asking if I can put a list of active Kosovo frequencies in this column, but the time between an event happening, and you reading about it in these pages is just too much.

The issue of *SWM* which appeared on the shelf of your newsagent at the end of March (when the war started) was written by me during early February - a full six weeks before anything happened. However, those readers who are already on the Internet, and members of one or more of the radio monitoring groups, will have known about the active frequencies within hours of anything happening.

*Please see page 19 for our Kosovo Special - **Ed.***

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AOR AR5000+3	Ex-display unit	£1199
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ICOM ICR-10	Ex-display	£219
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WIN-108	Civil airband	£90
YAESU FRG-9600	+ HF converter	£229
YUPITERU MVT-7000	Boxed	£125
YUPITERU MVT-7200	As new	several from £219
YUPITERU MVT-9000K		several from £245

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TRIO SP-5DS	Speaker	£15
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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.

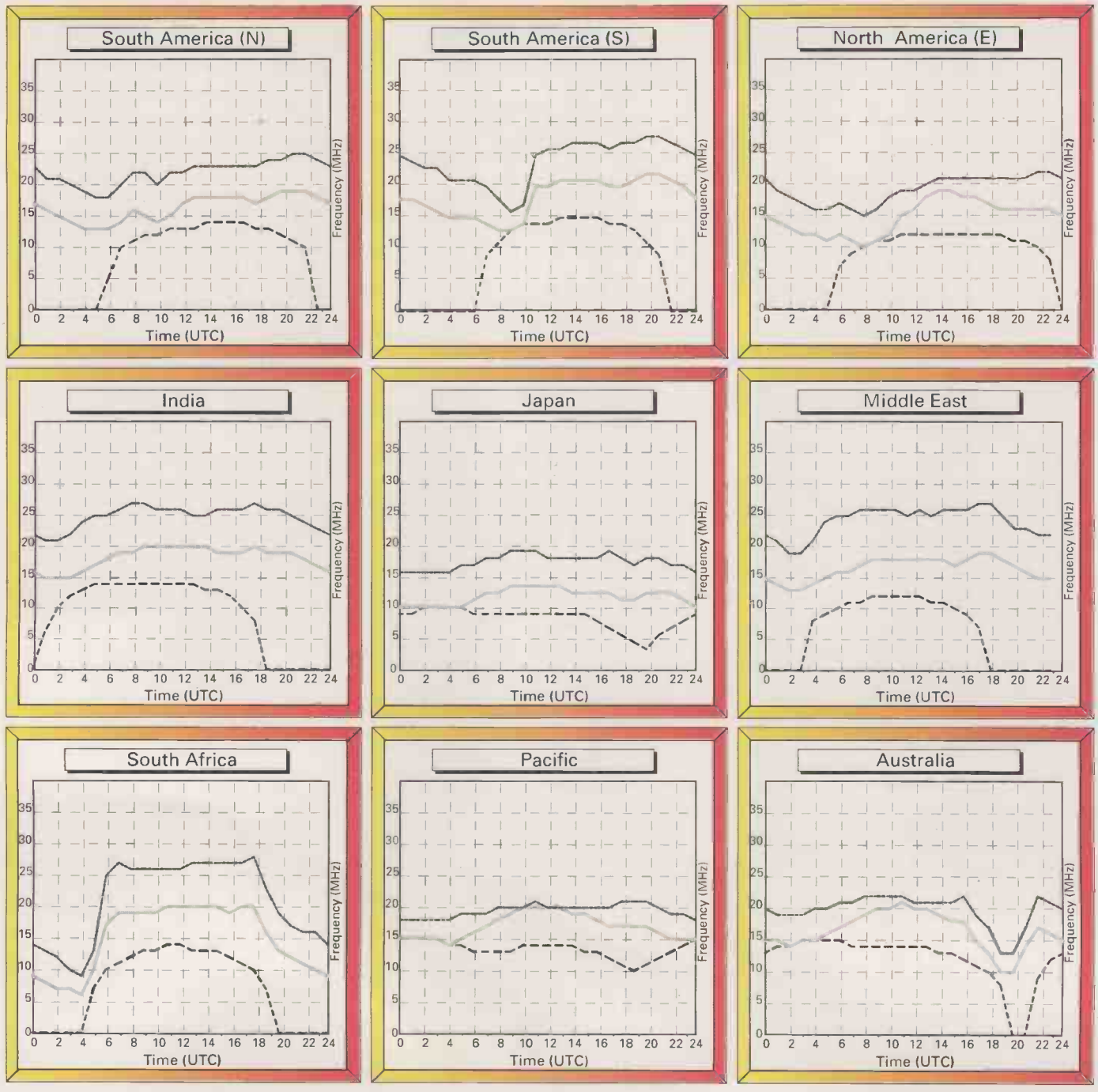
The middle line indicates the optimum working frequency (OWF) with a 90% probability of success for the particular path and time.

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.

June 1999
Circuits to London

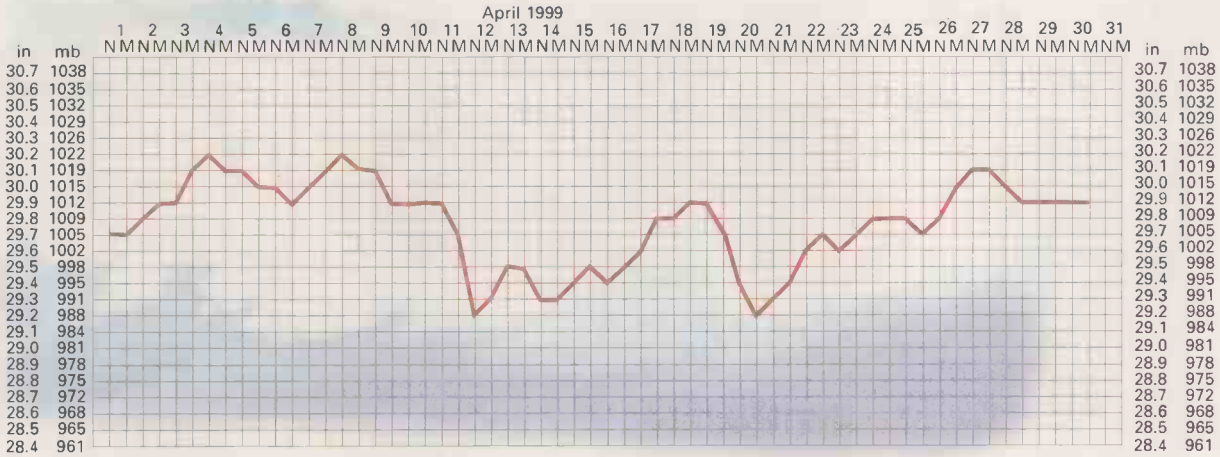


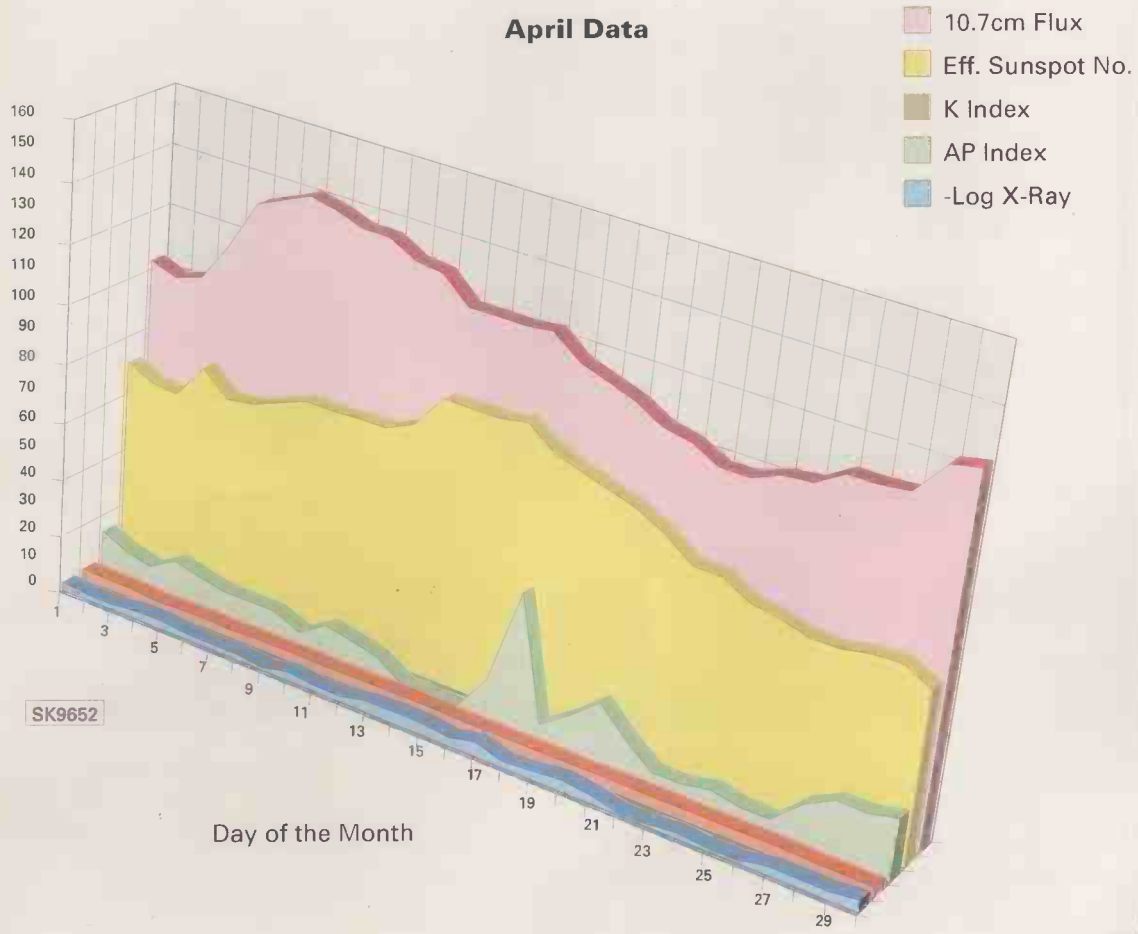
SK9651

■ 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, April 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

At the time of writing (early April) our media are still dominated by the military action in Kosovo. This is modern warfare; a bomber leaves Fairford, hits the target and returns a few hours later. Compared to a ground battle, losses are much reduced and the politicians are pleased that they have been seen to act.

Questions are also raised. A ground campaign would be more costly in loss of life (and taxpayers' funds), but has the advantage that control of the country is established and the refugee problem can be better controlled. Nightly air strikes mean no back-up control of the territory by day. Personally, I understand the arguments for and against unsupported air strikes and remain open-minded. By the time this is printed, perhaps the success of this strategy will be known?

I also keep in mind the fact that our own airspace might be visited by unwelcome aggressors whose objective would be to bomb Fairford. So far there seems little prospect of this, fortunately. I am not aware of any CAA warnings to civil aviation in the UK that hostile aircraft might be encountered, but the idea does make me pause for thought.

Follow-Ups & Foul-Ups

Although the May 'Airband' said that the database from **Len Woolley** (Bude) came on 3in discs, I am sure you all correctly understood that these are in fact 3.5in PC discs and not the old 3in Amstrad PCW variety. Also in May (Follow-Ups section), the marine liaison frequency 132.65MHz, callsign Coastguard, is corroborated by **Ian Mackay** and **Mark Thundercliffe** (Swanmore).

Why is 122.95MHz used by air ambulance helicopters? In the April 'Scanning' on page 78, Faris Raouf mentioned these in answer to **Paul Wade** (Essex). The simple answer is that there's nowhere else. In fact, the frequency is known as DEPCOM and has been reserved to allow co-ordination between helicopters operating from uncontrolled sites.

Unlike fixed-wing operations, a helicopter can alight on any small open patch of ground. The intention is to transmit blind when the machine lifts off again. Other arriving helicopters should listen out on DEPCOM when approaching the same uncontrolled landing spot. This will resolve the problem of two pilots having the same idea and meeting unexpectedly in the middle!

At various times (for example, in the March 'Airband') I see that I've incorrectly abbreviated LARS. As you see this time, this is a Radar Service. The facility is capable of providing an information OR advisory service according to circumstances and hence the word 'Advisory' is not part of the abbreviation. It may be subtle, but pilots get confused about radar services, so apologies if my misprint caused any misunderstanding.

These radar services are available outside of controlled airspace. Pilots see and avoid each other but the extra help from radar 'eyes' is always welcome. Under a Radar Information Service, the pilot receives information as to where conflicting traffic appears. Upgrading to a Radar Advisory Service means that the pilot is also told how to steer to avoid confliction. Although not legally bound to accept the advice, pilots must make it clear when not taking the avoiding action that has been recommended.

Do not confuse Lower Airspace Radar Service with Flight Information Service. This latter is not equipped with radar and can only inform pilots of the approximate whereabouts of other flights that have also decided to participate on the frequency. This works fine in good weather, of course.

More abbreviation trouble in April, they went missing altogether from my feature article 'In the Cockpit' and so I have combined them with this month's table.

In March, **Les Griffiths** (Sheffield) noticed aircraft on UB4 and Len Woolley reminds us that LATCC work this sector on 131.05MHz. I'm not sure that Len's 135.575MHz will help at Les' location, as my *Aerad* supplement only shows this frequency covering UR4 from Isle of Man to Pole Hill, too far to the west. I suggest 121.325, 126.775, 128.125, 133.525 or 136.275MHz.

In The Cockpit

I hope that **Peter Wade** (Sevenoaks) enjoyed my feature in April with the above title. Peter wants more details on certain airborne radio aids. Starting with radio altimeters (April, page 25, **Fig. 3** item 14) these operate in the band 420-460MHz. You won't be illuminated by their signal unless the aircraft is directly overhead. Most function only below 5000ft height and I'm not sure how much signal (if any) will be received if the aircraft flies overhead higher than this. Remember too that pulse transmissions sound strange on a scanner - or might not be resolved at all.

Cloud/collision (airborne weather) radar conventionally operates either around 4GHz (ideal for detecting rain) or in the 5.2-10.9GHz range. Not much of the signal illuminates the ground if the aircraft passes at high altitude, unless the specific mapping mode is selected. See April, page 24, **Fig. 2** item 11.

Secondary surveillance radar heads interrogate at 1030MHz with little signal available at ground level. Aircraft replies on 1090MHz (same figure, item 12) might be heard as brief pulses on a scanner. Airport ground movement radar is usually on 10.3GHz and this can interfere with anything, even producing regularly-repeating pips on a car radio!

On The Ground

Ian McDowell (Peterborough) would like to see a review of the Racal airband antennas. Well, if you think that they cost at least £300, Ian, then I certainly couldn't afford to review one and I don't think there would be much demand from readers of *SWM*! Could you give me the issue and page number where you first saw these mentioned, Ian?

My advice to readers is that you don't need military-specification or airworthy equipment. Sensible amateur techniques are acceptable and, with care, durable. In fact,

Abbreviations

AIP	*Aeronautical Information Publication*
CAA	Civil Aviation Authority
d.m.e.	distance measuring equipment
ft	feet
GHz	gigahertz
h.f.	high frequency
Hz	hertz
I.l.s.	instrument landing system
kHz	kilohertz
LARS	Lower Airspace Radar Service
LATCC	London Area & Terminal Control Centre
MHz	megahertz
PC	Personal Computer
SID	Standard Instrument Departure
s.s.b.	single sideband
STAR	Standard Terminal Arrival Route
u.h.f.	ultra high frequency
UTC	Universal Time Co-ordinated
v.h.f.	very high frequency

Maule 180 Sky Rocket.
Christine Mlynek.

Pietenpol Air Camper.
Christine Mlynek.

Airband

Continued from page 71.

airborne antennas might perform poorly on the ground unless provided with a ground plane to make up for the missing metal fuselage. For general v.h.f. and u.h.f. work, why not try a discone? It's vertically-polarised, omni-directional and broad-band.

Retired pilot **Leslie Greville-Smith G4SUJ** (South Staffordshire) introduced me to The International Association of Airline Hams. If you want to know what they talk about, listen on Sundays and Wednesdays 14.28 or Thursdays 21.38MHz (or nearby if interference is on frequency). The hours (UTC) are 1500-1800 or, during American daylight saving time, 1400-1700.

I don't know how often aeronautical mobile (/AM) amateurs call in to this net, if you hear one then let me know about it! The CAA won't allow the amateur licensing authority to permit /AM operation with a British callsign but there was a one-off special event some years ago under military auspices, operating from a Canberra aircraft.

Frequency & Operational News

Summarising *AIP* amendments from **Martin Sutton** (CAA) who, I am pleased to report, enjoyed April's 'Airband Special' edition.

Aerodromes: Beccles re-appears as a licensed aerodrome once more. Edinburgh runways are renumbered due to the relentless shifting of magnetic north, so 13/31 becomes 12/30 and 07/25 becomes 06/24. Woodford wants to claim its share of the limelight and henceforth insists on being addressed as Manchester/Woodford. I went there to a display once; one of the items made a navigational error and overflew the real Manchester! Let's hope this name change doesn't cause more such confusion. If Ian McDowell correctly forecasts the re-opening of RAF Wyton for training (Tucanos, etc.) then 134.05MHz might be re-activated.

Beacons: At Cambridge, it's all change with d.m.e. The old one, CAB, is replaced by I CMG (reply 1011MHz) in association with the new i.l.s. also I CMG on runway 23 (localiser 111.3, glidepath 332.3MHz).

Procedures: Luton Compton 2C SID is amended as 3C; LOREL 3E STAR is now 4E. Stansted has new ABBOT STARs 1A, 1D and 1E.

Reporting Points: Just north of Manston, Kent, was the REPLO reporting point; now it's called KOPUL. You'll find it on (U)G39, M604 and (U)Y4. New points appear to be ABBOT, ADNAM, CASEY and KEMPY, all associated with Stansted instrument procedures; TOAKS likewise for Luton where, also, BOYSI is withdrawn. Sorry I've no more detailed information on those at the moment.

Reader Offer

If you want the up-to-date procedures (SIDs and STARs) for your local aerodrome, you can't do better in my opinion than to buy a complete set of let-down plates from *Aerad*. I choose these as being presented in a clear format and readily available by mail order to the public. When ordering, ask also for a free copy of their *Legend Booklet*.

How do you know where to purchase this and other useful (even official) information? The answer is on my *Airband Factsheet* and that is available from the Broadstone Editorial Offices (**not** from me, I don't have a photocopier!) Just send a self-addressed pre-paid envelope to hold two A4 sheets, or check out **www.pwpub.demon.co.uk** for an on-line version.

As a bonus I include a chart of supersonic routes that I don't think you can obtain anywhere else in such a comprehensive form. This might interest **Steven Harper** (la belle France Sud) who asked about Concorde in Graham Tanner's 'SSB Utilities' April page 71. Just because an aircraft is supersonic doesn't mean that special frequencies are required, Steven. Concorde works Shanwick and Gander just as any transatlantic flight would between 45° and about 61° north (depending on exact location).

All letters and information received up to April 7 have been included. The next three deadlines (for topical information) are June 7, July 5 and August 2. Replies always appear in this column and it is regretted that **no** direct correspondence is possible.

DX Television

March was relatively rewarding for Band I reception. As daffodils popped up out of the soil, the sound of rotating antennas could be heard furtively scanning the Spring horizon in search of Sporadic-E activity. And, sure enough, a small but welcoming opening from Spain occurred on the 8th with others to follow. The Winter gloom had vanished!

Reception Reports

Peter Barber (Coventry) reports Sporadic-E signals on Channel E2 from Spain on the 8th, between 1024 and 1031UTC. He saw what could have been a *Crime Watch*-type programme. On the 11th, cartoons, a female announcer and news items were observed from Sweden, also on Channel E2. Signals materialised at 1021 and a 'UR' logo was present in the top-right corner of the picture. At 1037, Channel E3 became active with skating and langlauf (cross-country skiing), before fading completely at 1050. On the 18th, a lunch-time opening to Spain on Channel E3 produced pictures of Jacques Santos, the ex-chief EU Commissioner, giving an interview.

Stephen Michie (Bristol) has been busy capturing Meteor-Shower reception. Test cards from Denmark and Sweden have been identified on E3, but other snatches of programmes have been too short in duration to identify.

While checking for signs of F2 activity, **Simon Hockenhull** (Bristol) heard Russian or Ukrainian signals between 34 and 37MHz. This was between 1200 and 1430UTC on March 7th. Incidentally, the data transmissions, discovered by Peter Barber (which we mentioned last month) have stabilised at 48.275MHz. These are now present all day long.

Tropospheric reception was virtually nil, apart from a slight improvement in signal-strength from Belmont and Caldbeck on the 17th. This was noted by **Peter Barclay** in Sunderland.

March Reception Log

Reception reports for this month's log have been supplied by Peter Barber (Coventry) and Stephen Michie (Bristol). All times are in UTC.

Day	Log
1	Unidentified Meteor-Shower picture on Channel E3 at 2246.
2	Denmark (DR-TV) E3 with the PM5534 test card at 0952 via Meteor-Shower.
4	Prolonged Meteor-Shower signal at 0915 on E4.
7	Netherlands (Ned. 1) E4 with weak signals at 0952; Italy (RAI UNO) IA with very weak signals between 1010 and 1011 MS/Sp.E).
8	Sweden (SVT-I) E3 with the PM5534 test card via Meteor-Shower at 0735; Spain (TVE-1) Channel E2 via Sporadic-E between 1024 and 1031.
10	Unidentified '1' caption on E3 at 0717 via Meteor-Shower.
11	Sweden (SVT-1) E2 between 1021 and 1033; Sweden E3 between 1037 and 1050; subtitled programme on E4 via Meteor-Shower at 1515.
13	Subtitled programme on E4 via Meteor-Shower at 1002.
17	Programme via Meteor-Shower on E3 at 2235.
18	Spain E3 between 1225 and 1246 via Sporadic-E.
20	Meteor-Shower picture on E3 at 0856.

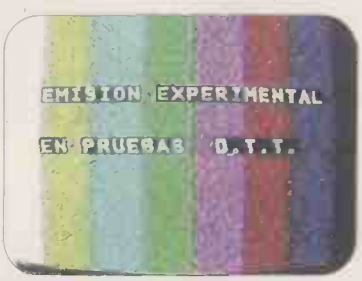


Fig. 1: The D.T.T. colour-bar pattern radiated on the Costa del Sol in Spain.

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

Fig. 2: The Syrian clock caption with a large version of the much smaller L-shape on-screen identification with the word 'Syria' in English and Arabic. This logo normally appears superimposed in the lower left-hand corner of the picture.

DXTV Antennas

Peter Barber (Coventry) can recommend the Band III antenna design by **Brian Williams** (April *SWM*). Having built it he comments on its good front-to-back ratio and a well-defined forward lobe, which is not too narrow but just right for DXing. This now replaces his quad loop beam.

The column has inspired **David Hamilton** (Cumnock, Ayrshire) to take up TV DXing. David has acquired an NEC receiver, from the Netherlands, which covers v.h.f. and u.h.f. TV frequencies. David has always been interested in radio and constructs all his own antennas. For Band I monitoring he is using a full-wave loop covering 40 to 90MHz, horizontally-mounted at 16m above the ground. The side rejection is very good. A 75Ω downlead is used without amplification, as David is a firm believer in using an efficient antenna. This is wise thinking as it also removes the possibility of cross-modulation and other undesirable effects generated by all those nasty bugging devices (e.g. baby alarms) and other unwelcome itinerants lurking within Band I.

French SECAM Portable TV

Nick Brown (Rugby) informs us that the small-screen multi-standard Goodmans TV (model CS520) we mentioned in an earlier column, is similar to the one bearing the 'Roadstar' badge, except that it is much cheaper. Comet are still selling the Goodmans receiver for £139.95, so rush out and get one before other DXers snap them up! Equipped with French System L, it is a 'must' for any DXer living in the south-east. At least in that area the u.h.f. band should be void of digital interference for the next few months!

George Garden (Edinburgh) has added a Sony 50mm l.c.d. colour receiver (Model FDL-E22U) to his DXing equipment. It appears to be very sensitive and economical on batteries, but its main drawback seems to be its search tuning, fixed contrast and colour levels. However, check that it covers v.h.f. frequencies before you buy.

Calling All Rowridge Viewers

Has anyone noticed a slightly degraded picture quality on BBC-1 over the past few months, particularly during local news opt-outs? We understand that there were adjacent channel interference problems at the Rowridge transmitter after the installation of digital equipment, towards the end of last year, but this has now been corrected. Please scrutinise your picture and let us know if the quality matches the other channels.

Mystery Disappearance

Andy Ridgway G4VRA (East Sussex) is using a Grundig multi-system receiver fed from a Band I and Band III Yagi and a 15-element wideband u.h.f. antenna. Signals from the Netherlands (Goes), Belgium (Egem) and France (Boulogne) are normally available 'on tap', but since the Autumn, the French signals on L34 and L37 have almost disappeared. Tf-1 on Channel L29 is still present, but with some degradation. One possibility is digital interference from the Crystal Palace MUXs on Channels 29 and 44, but Channel 37 is a mystery. Unless, of course, the increase in the e.r.p. of Channel 5 from Croydon is affecting it. Can anyone explain this phenomenon, as **John G7VGA**, living a short distance away in St. Leonards, is still receiving the Boulogne signals?

Fig. 3: The latest identification logo introduced last February by RTL-2.

New Cordless Telephone Frequencies

The new cordless telephone allocations have now been widely publicised, thus clearing up Brian Williams's recent mystery conversations heard between 31 and 39MHz.

Both **Godfrey Manning G4GLM** (*SWM* 'Airband' column) and **Graham Geoffrey Dobbs G4LAY** (Market Rasen) have sent in information about the new frequencies. On page 32, under the heading 'Transmission Frequencies', the *Freestyle 320 Handbook* quotes "As the use of cordless telephones becomes more widespread, users may experience a reduction in the quality of service obtained from this apparatus". The choice of frequencies is rather strange. All we have to do now is sit back and wait for complaints of interference affecting TV receiver i.f.s to flood in!

Fig. 4: This month's excursion down 'Memory Lane'; the ATV logo from London used in the Fifties and Sixties.

Digital TV Trials

On the Costa del Sol in Spain, a colour-bar test pattern was being radiated 24 hours a day on Channel E32 during March. They carried an inscription 'Emision Experimenta En Pruebas D.T.T.', but why an analogue test pattern was being radiated is something of a mystery!

On the other side of the globe, Channel 7 in Melbourne have recently conducted digital test transmissions using Band III Channel 6 (174-181MHz) with 15W. These took place at 0900 on 10th February 1999, and public notices asked for reports of interference.

Of particular interest is the choice of Band III rather than u.h.f., the latter being favoured in Europe for transmissions. Using a lower transmission frequency, adjacent channel interference (ACI) is easier to notch out because filters are easier to produce with sharper cut-off characteristics than those intended for u.h.f. This means less undue attenuation of the wanted analogue signal.

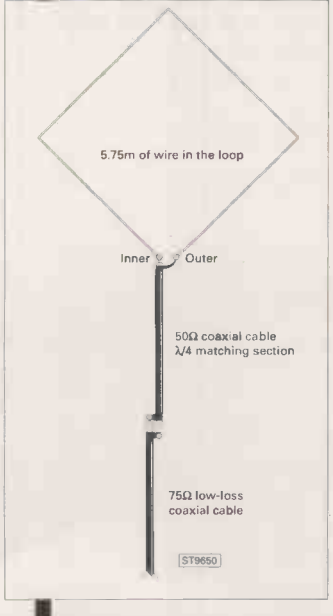


Fig. 5: David Hamilton's wire loop antenna for Band 1 DXing (40-90MHz).

Keep On Writing!

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

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

Decode

Software Help

I received a few queries from readers which merit an answer through the column, as I'm sure many of you will have, or are currently struggling with these problems. To start with, let's look at the problem with old *Hamcomm* or *JVFAX* interfaces appearing not to work with more modern software, such as *RadioRaft*. I received a recent query from **Tom Sorbie** on this one.

Tom has been using *Hamcomm* successfully for some time but has just upgraded his PC and added *RadioRaft* to his range of software. Although *Hamcomm* continues to work, *RadioRaft* refuses. There are a number of things that can cause this. A clue may lie in the fact that Tom has been using an old PC and may have been using an old version of *Hamcomm*. The *Hamcomm* and *JVFAX* comparator interfaces use an integrated circuit to amplify and voltage limit the audio signal from your receiver. In order to do this, the integrated circuit requires some electrical power. One of the neat parts of the interface design is that it actually takes its power from the serial port, so saving the inconvenience of having to run a separate power supply with the inevitable trailing leads.

To extract the power from an ordinary computer serial port, the software has to perform a minor trick by forcing one of the serial port wires to sit with a positive voltage, whilst another wire is forced negative. It's not that difficult to do, but it is an easy way of providing a low current power source to an external device. The problem with a system such as this is that there has to be some form of agreement between different software suppliers if the same interface is to be used with different programs.

Unfortunately, in the early days of software based decoders such as this, there wasn't this co-ordination and, for a time some, different standards existed. The two most common options used the same two serial ports connections for the power, but used the opposite polarity!

So, if you are using an early version of *Hamcomm/JVFAX* successfully, you may find that your interface won't work with the more up-to-date version of the program. If you have a home-built or easily modified interface and you know what you're doing, you can reverse the connections yourself. However, a safer option would be to get one of the modern interfaces, such as those supplied by Pervisell. Not only will the connections be right, but the integrated circuit used in the interface has been updated to optimise performance. A second possibility for *RadioRaft* failing to operate could be incorrect settings of the *RadioRaft* interface settings. I know that some users get confused between the various options that are available. In order to set these up, you do need some basic information about your PC set-up.

The most important is to know which serial port you are using. Once you know this, you should start *RadioRaft* and go to the Settings menu which can be found at the right-hand end of the top menu bar. In this menu you need to select 'AF Interface' - make sure you don't select Modem as this is only for use with a special modem, not the simple comparator interface that most people use. On this same menu you should go to the Port option and make sure the appropriate serial port is highlighted. Following these suggestions should get you on the air. If not, drop me an E-mail and I'll see if I can come up with any other bright ideas!

Another query this month comes from a reader who's attempting to use *JVFAX* and a standard comparator interface to resolve satellite pictures on 137MHz. I'm afraid this can't be done, but I will explain why. All the FAX signals on the h.f. bands use Frequency Shift Keying of one type or another. This means that the picture information is sent by varying the frequency of the transmitted signal. In a typical system, the signal will vary by 800Hz depending on whether a black or white part of the FAX image is being sent. The comparator interface processes the resultant audio signal from the receiver by amplifying it to a fixed level. This is done to strip out any variations in the level of the signal, so that the decoder stands a better chance of dealing with the frequency variations of the signal.

It's this process of stripping out the level variations that makes this type of decoder unsuitable for v.h.f. satellite pictures. Why? Because v.h.f. satellite images are sent using (a.m.) amplitude modulation, i.e. the picture information is sent by varying the volume of the transmitted signal. It is this amplitude modulation that the 'comparator interface has been designed to remove, hence no picture!

New *RadioRaft*

Yes, it's here at last. Francois Guillet has been beavering away for the last year perfecting this latest offering and he's kindly sent me a copy hot off the press for review. The new release is version 3.0 and includes a host of new features along with some improved detection algorithms. I don't have space for a full review this time, so I'll just briefly run through the good news. If you want to get yourself a demo copy or the full version you can do so via his UK agents, Pervisell Ltd., using their web site at **http://www.pervisell.com** or Tel: **(01494) 443033**. The latest version is very well worth the wait and offers some excellent improvements. There are six additional receive modes to increase the program's versatility and these are available for automatic detection, as with previous versions. Francois has also completed some significant work to improve the decoding quality. This has been achieved by changing the way in which f.s.k. signals are handled along with improved tolerance to propagation effects. There are also changes to the automatic scanning to improve its reliability. Finally, there is a new shift meter system for monitoring transmissions. All in all a pretty tasty upgrade!

Using The *SWM* CD

For 'Decode' readers, one of the useful features of the CD supplied with the April issue was the inclusion of 61 audio tracks with samples of a wide range of data signals.

Now, these are always a really useful source of reference, so I thought you might appreciate a few tips on how to get the best from the tracks. The most obvious use of the tracks is to help train your ear so that you can quickly recognise data modes without having to fiddle with your decoder. The value of this ear training mustn't be underrated as the ear-brain combination is just about the quickest signal identifier I know of! By using an experienced ear, you can save hours of listening time by making sure you go straight to the type of signal you want, instead of trying to resolve the unresolvable.

***JVFAX* Resolution of Track 28 from the *SWM* cover CD.**

Another use is to help newer users learn how to use their decoders to receive some of the more advanced modes. Whilst the reception of basic RTTY, FAX and SITOR is relatively straightforward, the other, more obscure, systems can take some getting used to. These samples really come into their own because you already know the type of signal you're dealing with, so you can pre-set the decoder to see what it does when it encounters one of these modes.

***JVFAX* Resolution of Track 29 from the *SWM* cover CD.**

Not only do you know the mode, but in most of the examples the speed is quoted along with information on whether or not there is any traffic present. Although this is a great way to learn, there are a few problems that you need to be aware of. The first is the length of the samples. With some of them, the amount of usable signal is a little too short to allow for fully automatic decoding, though you should be able to capture the signal if you pre-set your decoder.

To give you a better idea of what to expect, I tried decoding the samples myself using a fairly typical set-up. This comprised a 486 PC running the latest *RadioRaft* (v3.0) with a basic Pervisell

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decoder and playing the audio tracks of the CD through a Sony Walkman CD player. The following tracks were automatically detected and resolved: 1, 3, 4, 6, 9, 10, 13, 15, 20, 21, 22, 23, 32, 38, 39, 41, 42, 45, 53, 54, 55 and 57. With some of the signals that contain idles followed by traffic you may find that the decoder won't latch-on until the traffic starts.

Although I've shown 21-23 as received okay *RadioRaft* shows the signal as SPREAD 51 not AUTOSPEC. However, these are similar and use the same Bauer code, so the traffic as printed fine. Much the same applies to track 51 that was decoded as CIS11 rather than TORG10. The following tracks could not be resolved because the mode is not available in *RadioRaft*. 16, 17, 18, 19, 24, 25, 26, 27, 33, 34, 35, 36, 37, 43, 44, 47, 48, 49, 50, 51, 52, 56, 58, 59, 60 and 61. The following tracks couldn't be resolved for the reasons shown: Track 8 - SITOR ARQ - this track is a mix of ARQ and Morse code, but the length of the ARQ section was too short for *RadioRaft* to synchronise. Track 40 - ITA2 - This is a hand typed amateur QSO and it's just too slow for the decoder to auto detect. However, if you pre-set 45 baud RTTY you should find that the text comes through readable. To take a look at the FAX pictures I used the same set-up but with *JVFAX7.1* to resolve the pictures. The difficulty with resolving the FAX images is that they are all just part images, so there's only a small part of the signal available. I've shown examples of the output in the column. By the way, you can't use a standard comparator interface to resolve tracks 30 and 31 because they use a.m. not f.m. See my help section for more details on this.

RadioRaft Frequency List

For those of you that may be tempted to try *RadioRaft* with the more complex modes here is a specially filtered version of Day Watson's Complex Frequency List.

Frequency	Mode	Time	Station
1.9487	ARQ/E3//192/E/400	1005	FF PARIS
2.1770	DSC//100/E/170	1915	DSC CALL CHANNEL
2.1875	DSC//100/E/170	2005	GMDSS ALERT CHANNEL
2.1895	DSC//100/E/170	1930	DSC SHIP-SHORE CALL CHAN
3.1665	ARQ/E//85.7/I/170	0550	UNID
3.2000	ARQ/E//96/I/85	2300	UNID
3.3012	ARQ/E//46.2/E/170	2039	UNID
3.8327	ARQ/342//200/E/400	2244	FF PARIS [RFFP]
3.8992	ARQ/342//200/E/400	2207	FF PARIS
4.0121	ARQ/E3//48/E/400	1959	ANTANANARIVO AIR (5ST)?
4.0242	ARQ/E//72/E/400	1830	UNID
4.2075	DSC//100/E/170	0001	GMDSS ALERT CHANNEL
4.9707	ARQ/E//48/E/150	1400	UNID
4.9707	ARQ/E//48//E/150	1400	UNID
5.0717	ARQ/E3//192/E/400	2228	UNID FF?
5.2215	ARQ/342//96/I/400	2227	COTONOU AIR (TYE)
5.2840	ARQ/E//85.7/I/170	1408	UNID
5.3010	ARQ/E//192/E/400	1458	UNID
5.4260	ARQ/E//72/E/400	2248	UNID
5.4300	ARQ/E//192/E/400	2121	FF BASTIA [RFFHCB] ?
5.7325	ARQ/E//72/E/430	0012	UNID
5.8120	FEC/A//144/I/400	0928	UNID.
5.8120	FEC/A//144/I/400	0702	YUGOSLAV EMB? ?LOC
5.9110	ARQ/E//72/E/400	1554	UNID
6.3120	DSC//100/E/170	2325	GMOSS ALERT CHANNEL
6.8070	ARQ/POL//100/-/250	1427	POLISH EMB BELGRADE
6.8200	FEC/ROU//164.R/R/400	1811	MFA BUCHAREST [V5G]
6.8340	ARQ/E//184.6/I/400	1924	FF NAQOURA [RFFXL]
6.8367	ARQ/E3//200/E/400	2015	FF NDJAMENA [RFTPA]
6.8390	ARQ/E//72/E/400	0922	UNID
6.8820	ARQ/POL//100/-/250	1813	POLISH EMB BUCHAREST
6.9587	ARQ/E3//200/E/400	2254	FF UNID
6.9638	ARQ/E//192/I/200	2024	FF KOUROU [RFLIGA]
6.9840	ARQ/POL//100/-/250	1511	POLISH EMB MOSCOW
7.4567	ARQ/E3//192/E/100	2245	FF DAKAR [RFTJ]
7.4840	ARQ/POL//100/-/250	1538	MFA WARSAW (SNN299)
7.4840	ARQ/POL//100/E/250	1611	POLISH EMB BUCHAREST?
7.5240	ARQ/342//96/E/400	2323	CONTONOU AIR (TYE)
7.5240	ARQ/342//96/E/400	2244	COTONOU AIR (TYE)
7.5857	ARQ/E3//192/E/400	1935	FF UNID
7.5860	ARQ/E//96/E/400	1758	FF DZAOUDZI?
7.6067	ARQ/E3//192/E/400	1028	FF PARIS?
7.6140	ARQ/E//192/E/170	2210	FF MARSEILLE [RFFH] ?
7.6225	ARQ/E//72/E/400	0953	FF UNID
7.6427	ARQ/342//200/E/400	2030	FF PARIS [RFFVA]
7.7160	ARQ/E//192/E/170	1855	UNID
7.8200	FEC/ROU//218.3/R/400	1818	UNID
7.8222	ARQ/E3//200/E/400	1933	FF PARIS [RFFA]
7.8315	ARQ/E3//48/I/400	2228	ANTANANARIVO AIR (5ST)
7.8417	ARQ/E//96/E/400	2305	FF BANGUI [RFFXI]
7.8967	ARQ/E3//96/E/400	1000	FF FT DE FRANCE [RFLI]
7.9460	ARQ/E//96/E/400	1957	FF LE PORT [RFVI]
8.0150	ARQ/E//184.6/E/345	2005	FF PARIS [RFFX]?
8.0280	FEC/ROU//164.5/R/400	1110	MFA BUCHAREST [V5G]
8.0502	ARQ/342//200/E/400	2245	FF DJIBOUTI [RFQP]
8.1082	ARQ/342//200/E/400	2220	FF DJIBOUTI [RFQP]
8.1479	ARQ/POL//100/E/170	1245	MFA WARSAW (SNN299)
8.1480	ARQ/POL//100/E/250	0952	MFA WARSAW (SNN299)
8.4145	DSC//100/E/170	2235	GMDSS ALERT CHANNEL
9.0767	ARQ/E3//192/E/400	1921	FF PARIS (RFFA)?
9.1080	ARQ/POL//100/I/250	1407	POLISH EMB THE HAGUE
9.1267	ARQ/E3//192/E/400	2139	FF LIBREVILLE [RFTJD]
9.1267	ARQ/E3//192/E/400	2310	BREVILLE [RFTJD]?
9.1980	ARQ/POL//100/E/250	0958	POLISH EMB BRUSSELS
9.2340	ARQ/POL//100/I/250	1556	POLISH EMB TEHRAN
9.3800	FEC/A/192/E/400	0930	MFA PARIS [RFGW]
9.3930	FEC/A/VFT	1107	UNID
9.3837	ARQ/E3//100/E/400	2125	FF PARIS [RFFA]
10.0487	ARQ/E3//192/E/400	1511	FF PARIS [RFFA]?
10.1777	ARQ/E3//192/E/400	0612	FF PARIS
10.2540	ARQ/E//184.8/E/400	1624	FF VERSAILLES [RFFXCCS]
10.2813	ARQ/E3//192/I/400	0629	FF CAYENNE (RFLIG)
10.3140	ARQ/POL//100/I/250	0800	MFA WARSAW (SNN299)
10.3640	ARQ/E//48/I/850	1956	FF LIBREVILLE [RFTJD]?
10.3937	ARQ/E3//200/E/400	2318	FF PARIS?
10.4930	FEC/ROU//164.5/R/400	1115	MFA BUCHAREST [V5G]
10.4937	ARQ/E3//48/E/400	1655	FF PORT BOUET [RFTJF]
10.5217	ARQ/E3//192/E/400	0702	FF FT DE FRANCE [RFLI]
10.6260	ARQ/E//184.6/I/400	1541	FF NAQOURA [RFFXL]?
10.7983	ARQ/E3//192/I/400	2328	FF FT DE FRANCE [RFLI]
10.8020	FEC/A//144/I/400	0840	MFA BELGRADE [DFZG]
10.8220	FEC/A//144/I/400	0645	MFA BELGRADE [DFZG]
10.8692	ARQ/E3//100/E/400	0001	FF LE PORT [RFVI]
10.8737	ARQ/E3//100/E/400	1939	FF LE PORT [RFVI]
10.9120	ARQ/POL//100/E/250	0702	POLISH EMB CAIRO
10.9177	ARQ/E3//48/E/400	2147	FF DAKAR [RFTJ]
10.9551	ARQ/E3//48/E/850	1735	FF PORT BOUET [RFTJF]?
10.9622	ARQ/342//200/E/400	1950	FF SARAJEVO [RFFVAY]
11.0469	ARQ/SWE//100/I/400	1104	MFA STOCKHOLM (SAM)
11.0520	ARQ/POL//100/I/250	1037	POLISH EMB BERN
11.0581	FEC/A//192/E/850	1518	UNID
11.0590	FEC/A//192/I/400	1625	FRENCH EMB BELGRADE [G8T]
11.0725	FEC/A//192/E/400	0858	MFA PARIS [RFGW]
11.0850	FEC/A//192/E/400	0753	MFA PARIS [RFGW]
11.1735	FEC/A//192/E/400	0837	MFA PARIS [RFGW]
11.4167	ARQ/342//200/E/400	1608	FF UNID
11.4167	ARQ/342//200/E/400	0556	FF SARAJEVO [RFFVAY]
11.4710	ARQ/POL//100/E/250	1025	MFA WARSAW (SNN299)
11.4830	FEC/A//192/E/400	1410	MFA PARIS [RFGW]
12.0902	ARQ/E3//192/E/400	1457	FF DAKAR [RFTJ]
12.1902	ARQ/E3//100/E/400	1625	FF LE PORT [RFVI]
12.2282	ARQ/E3//200/E/400	0726	FF UNID?
12.5770	DSC//100/E/170	0901	GMDSS ALERT CHANNEL
13.4442	ARQ/E3//100/E/400	1655	FF DJIBOUTI [RFQP]
13.4460	ARQ/POL//100/E/250	1110	POLISH EMB? LOC
13.4670	ARQ/POL//100/-/250	1000	MFA WARSAW (SNN299)
13.5437	ARQ/E3//193/E/400	0750	FF LIBREVILLE [RFTJD]
13.5500	FEC/ROU//164.5/R/400	0813	MFA BUCHAREST [V5G]?
13.5515	FEC/A//192/E/400	1450	MFA PARIS [RFGW]
13.5725	ARQ/E//184.6/E/400	1543	FF PARIS [RFFX]
13.5937	ARQ/E3//192/E/170	0834	FF PARIS?
13.8467	ARQ/E3//100/E/400	1722	FF LE PORT [RFVI]
13.8520	ARQ/POL//100/E/250	1114	POLISH EMB MADRID
13.9530	FEC/A//192/E/400	0847	MFA PARIS [P6Z]
13.9777	ARQ/E3//200/E/400	0435	FF PARIS?
13.9867	ARQ/E3//192/E/400	1725	FF PARIS [RFFA]?
14.4817	ARQ/E3//48/E/400	1457	FF DAKAR [RFTJ]
14.4860	FEC/A//192/E/400	1319	MFA PARIS [RFGW]
14.5530	FEC/A//192/I/850	1325	FRENCH EMB MOSCOW [U3H]
14.5580	FEC/A//192/E/850	1426	FRENCH EMB NOUAKCHOTT [Z4D]
14.5750	FEC/A//192/E/400	1356	MFA PARIS [RFGW]
14.5856	ARQ/E3//200/E/400	0540	FF NDJAMENA [RFTPA]
14.5857	ARQ/E3//200/E/400	1650	FF NDJAMENA (RFTPC)
14.6267	ARQ/E3//192/E/400	1124	FF FT DE FRANCE [RFLI]
14.6267	ARQ/E3//192/E/400	1938	FF FT DE FRANCE [RFLI]
14.6333	ARQ/E3//192/I/400	0736	FF FT DE FRANCE [RFLI]
14.6390	ARQ/POL//100/-/250	0943	POLISH EMB BAGHDAD
14.6760	FEC/ROU//164.5/R/400	0905	MFA BUCHAREST [V5G]
14.6810	FEC/ROU//164.5/R/400	1120	MFA BUCHAREST [V5G]
14.6844	FEC/ROU//164.5/R/400	1632	MFA BUCHAREST [V5G]
14.7183	ARQ/E3//100/E/400	0840	FF NOUMEA [RFHI]
14.7317	ARQ/E3//192/E/400	1550	FF LE PORT [RFVI]
14.8017	ARQ/E3//100/E/400	1550	FF LE PORT (RFVI)
14.8940	ARQ/POL//100/E/250	1123	POLISH EMB ANKARA
14.9267	ARQ/E3//192/E/400	1224	FF DAKAR [RFTJ]
14.9597	ARQ/E3//192/E/400	0948	FF DAKAR [RFTJ]
14.9704	ARQ/SWE//100/I/400	1353	SWEDISH EMB? LOC
14.9750	FEC/A//192/E/400	0937	MFA PARIS [RFGW]
15.7170	FEC/A//144/E/850	1048	MFA ANKARA (TAD)
15.8217	ARQ/SWE//100/I/400	1155	MFA STOCKHOLM (SAM)
15.8331	FEC/ROU//164.5/R/400	1550	MFA BUCHAREST?
15.8617	ARQ/E//96/E/170	0922	FF PARIS [RFFX]
15.8627	ARQ/E//96/E/400	1458	FF PARIS [RFFX]?
15.8730	FEC/A//192/E/400	0941	MFA PARIS [RFGW]
15.8980	FEC/A//192/E/400	0615	MFA PARIS [RFGW]
15.9617	ARQ/E3//192/E/400	0953	FF FT DE FRANCE [RFLI]
16.0208	ARQ/E3//192/E/400	0805	FF UNID
16.0777	ARQ/E3//192/E/170	1128	FF PARIS [RFFA]
16.0877	ARQ/E3//100/E/170	1352	FF LE PORT [RFVI]
16.1069	ARQ/SWE//100/I/400	0958	MFA STOCKHOLM (SAM)
16.1252	ARQ/342//200/E/170	1327	FF DJIBOUTI [RFQP]
16.1652	ARQ/342//200/E/400	1110	FF PARIS
16.1677	ARQ/E3//200/E/400	1125	FF PARIS
16.1932	ARQ/342//200/E/400	0850	FF DJIBOUTI [RFQP]
16.2040	FEC/A//144/E/850	1314	MFA ANKARA (TAD)?
16.2170	ARQ/E//96/E/850	0657	ROME [WJI]
16.2277	ARQ/E//96/E/400	1335	FF BANGUI [RFFXI]
16.2450	FEC/A//192/E/400	1403	FRENCH EMB ADDIS ABABA [D7A]
16.2600	FEC/A//192/E/400	0647	MFA PARIS [RFGW]
16.2617	ARQ/E3//192/E/380	1729	FF LIBREVILEE [RFTJD]
16.2630	FEC/A//192/E/400	1116	FRENCH EMB TRIPOLI [T6S]
16.2802	ARQ/342//200/E/400	0842	FF PARIS
16.3102	ARQ/E3//200/E/400	1518	FF PARIS
16.3170	ARQ/POL//100/-/250	0856	POLISH EMB KINSHASA
16.3220	ARQ/POL//100/E/250	0913	POLISH EMB BAGHDAD
16.3320	FEC/ROU//164.5/R/400	1044	MFA BUCHAREST [V5G]
16.3420	FEC/ROU//164.5/R/400	1045	MFA BUCHAREST [V5G]
16.3518	ARQ/E3//192/E/170	0938	FF UNID
16.4281	ARQ/POL//100/E/250	1138	POLISH EMB NAIROBI
17.4227	ARQ/E//200/E/400	1304	FF DHAHRAN [RFFVAE]
17.4288	ARQ/SWE//100/I/400	1402	MFA STOCKHOLM (SAM)
17.5494	ARQ/E3//192/E/400	1724	FF DAKAR [RFTJ]
17.5509	ARQ/E3//192/E/400	0828	FF DAKAR [RFTJ]
17.5524	ARQ/E3//192/E/400	1630	FF DAKAR [RFTJ]
18.0427	ARQ/E3//192/E/400	1530	FF LIBREVILLE [RFTJD] ?
18.0640	ARQ/POL//100/E/250	1150	MFA WARSAW (SNN299)
18.1874	ARQ/SWE//100/I/400	0931	MFA STOCKHOLM (SAM)
18.2140	ARQ/E//184.7/E/400	1643	FF UNID
18.3085	FEC/A//192/E/400	1147	MFA PARIS [RFGW]
18.3207	ARQ/E3//192/E/400	1453	FF DAKAR [RFTJ]
18.3802	ARQ/E3//100/E/400	1700	FF PARIS
18.5037	ARQ/E3//192/E/400	1400	FF PARIS?
18.5520	FEC/ROU//164.5/R/400	1126	MFA BUCHAREST [V5G]
18.6557	ARQ/E3//200/E/400	1130	UNID FF?
18.6557	ARQ/E3//200/E/400	1448	FF DHAHRAN [RFFVAE]
18.7251	ARQ/POL//100/E/300	1148	POLISH EMB ? LOC
18.7600	FEC/A//192/E/400	1534	MFA PARIS [RFGW]
18.7620	FEC/ROU//164.5/R/400	1048	MFA BUCHAREST [V5G]
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19.0467	ARQ/E3//192/E/400	0953	FF PARIS
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19.1017	ARQ/E3//192/E/400	1511	FF FT DE FRANCE [RFLI]
19.1311	ARQ/E3//192/E/400	1545	FF UNID
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19.2047	ARQ/E3//100/E/400	0910	FF UNID
19.2047	ARQ/E3//100/E/400	0925	FF FT DE FRANCE [RFLI] ?
19.2167	ARQ/E3//96/E/400	1958	FF FT DE FRANCE [RFLI]
19.2167	ARQ/E3//96/I/400	1435	F FT DE FRANCE [RFLI]
19.2252	ARQ/E3//200/E/400	1627	FF UNID
19.3566	FEC/A//96/E/660	1253	MFA LAGOS
19.3570	FEC/A//96/E/750	0725	NIGERIAN EMB STOCKHOLM
19.5302	ARQ/E3//96/I/400	1035	DTRE KERGUELEN (FJY2)
19.8530	FEC/ROU//164.5/R/440	1051	MFA BUCHAREST [V5G]
20.1797	ARQ/E//100/E/400	0852	FF PARIS
20.5565	FEC/A//192/E/400	1542	MFA PARIS [RFGW]
20.6337	ARQ/E//100/E/400	1500	FF LE PORT [RFVI]
20.7167	ARQ/E3//192/E/400	1510	FF PARIS
20.7979	ARQ/POL//100/E/200	1603	POLISH EMB? LOC
20.8133	ARQ/E3//96/I/400	0931	FF UNID
20.8133	ARQ/E3//96/I/400	1030	UNID
20.9598	ARQ/SWE//100/I/400	1016	MFA STOCKHOLM (SAM)
24.3670	FEC/A//192//E/400	1100	MFA PARIS [RFGW]

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

Satellite TV News

European hostilities, March 1999 - a preamble... March 24th, 1999 and a new European war breaks out across the Balkan states, the Bosnian Serbs that have been rattling the sabre against the Kosovo Albanians refused to climb down on the ongoing aggression and, after warnings, the NATO forces commenced air strikes, gradually intensifying the frequency, target variation and distances into Serbia until Belgrade, the capital city, had been repeatedly hit.

Military targets were the main thrust extending into the supporting infrastructure, e.g. bridges, oil refineries and administrative buildings. Unlike the Iraqi war when several journalists with their attendant satellite uplink equipment (plus video editing gear, etc.) remained in Baghdad relaying pictures of the destruction, the Serbs, by the second day of war, had rounded up most of the 'western' journalists and evicted them out of Serbia. As a consequence, most of the uplinkers were set up in border towns of the adjacent of Macedonia, Montenegro, Albania, plus a few on Italian air bases.

The other main and fundamental difference with this particular war, compared with recent battle theatres, was that virtually **all** uplinking has used digital technology, exploiting the benefits of lower transmit powers and physically smaller equipment.

For those satellite enthusiasts that have taken what is a big financial step and bought into digital satellite equipment, they have reaped the harvest of news feeds out of the Balkans; for those still with analogue only systems, then they have been reliant on the Serbian TV main channel transmitted over *Eutelsat II F2* @ 10°E and news programmes aired over traditional downlink channels. White House statements back-hauled to Europe on New Skies/*Intelsat K* 21.5°W have been mainly digital over the established BT Washington/Reuters circuits, though analogue one-way and two-way reports have been seen, usually the reporter in front of the White house, and one enthusiast reported analogue press meetings on *Intelsat 801* @ 31.5°W.

Dramatic and exciting as this viewing may seem, we must not forget that for those involved in the Balkans, it is a human tragedy of mega proportions, of refugees, ethnic cleansing and of death, a sad digital re-run of an earlier dictatorship.

The news flash advised NATO air strikes were in progress late at night on the 24th,and the UK TV networks and CNN carried live pictures of bomb explosions. An initial check over *Eutelsat W2* 16°E Telecom band revealed little activity - the uplinkers were all found on the newly placed *Eutelsat II F3* now at 36°E. My first late evening digital sighting was from SISLink's UKI 145 (11.676GHz-H SR 5632; FEC 3/4).

Meanwhile, other readers had been very active and over the next few days details started to arrive with a mass of subtle frequencies and uplink sites. Uplinks had been sited at Italian air bases of Aviano and Gioia Del Colle, from these sites were offered shots of aircraft roaring into the skies and on-ground interviews and reports.

By the 2nd/3rd days of hostilities, Balkan based uplink sites had been established in Montenegro, Albania (Kukesi), Skopje and Macedonia - several at border villages too small to register on average maps. The numerous broadcast reporters sharing uplink time and using leased/hired gear caused a little uncertainty as to who was working with what, it being common for, say, a BBC reporter to give report 1) to BBC World 2) to BBC 24 Hours and 3) sound only to BBC World Service. Newsforce, a pioneer in digital satellite linking and SISLink, both had several flyaway packages around the Balkan states representing news groups such as ITN, BBC, CNN and APTV.

Readers will have seen news footage on the UK networks showing the refugee columns and for much of the time from the 26th the received satellite reports tended to concentrate on the plight of the unfortunate Kosovan-Albanians escaping the tyrannical Serbs. Readers **Jim Scofield** (Lake, IW using a Nokia 9600) and **Hugh Cocks** (Algarve, using a Nokia 9200) supplemented my own sightings and produced a listing (as logged) of active frequencies via 36°E.

I'll include the flagged idents where known...albeit by the time this is read the situation may have changed completely: 11.080GHz - SIS/ITN 9MHz; 11.055, 11.058GHz Newsforce - UKI 143 (Mentenegro); 11.064GHz Newsforce CNN; 11.684GHz - 9MHz,PAL,2,audio (BBC Kukeis); 11.600GHz RTV MOSCOW 4 (BBC feeds); 11.580GHz SISLINK 29 UKI 418 (Gioia Del Colle); 11.062GHz P11062H 01 (CNN likely Montenegro); 11.678GHz 157P11678 HOI (or) APTN SKOPJE; 11.173GHz Belgacom; 11.047GHz LOCKED ON COMMS (Aviano Air Base). Others were noted on 11.047, 11.072, 11.088GHz and **all** used SR 5632; FEC 3/4 and were **all** horizontally polarised.

An interesting variation was at 11.096GHz with SISLINK/ITN LYONLINK - this is (as captioned on screen) an ITN Core Coverage feed, restricted to ITN subscribers and featured various news items plus main ITN news broadcasts including rehearsals, seemingly for their 'subscribers' to record off-air and also for feeding the Euronews centre in Lyons, which ITN now own. Many of these carriers were on test throughout the day, the BBC Kukesi often with a locked-off shot showing the general scene of refugees arriving. At times, an outgoing feed would be encrypted either to avoid broadcasters pirating material or to prevent the Serbs viewing pre-edited material.

The Serbian TV output on 10°E (RTS-SAT) at 11.596GHz-H in analogue proved 'interesting' once Belgrade had been bombed, which brought out live camera coverage onto the streets and the population across Serbia then saw actuality pictures of NATO bombing. RTS-SAT during the air campaign had shown propaganda montage of the armed forces, their air force commanding the 'skies', their navy ruling the waves and the army with tanks, and other armoured vehicles battling (though obviously training film) to cheer up the local population.

Damage footage concentrated on houses and other domestic damage, though the ethnic cleansing operation across Kosovo - the cause of present hostilities - seemed to be completely avoided! Although this war differs considerably from the Iraqi conflict in the methods of satellite coverage, I think it true to state that digital SNG came of age and matured in March 1999.

As Serbia rumbles on, the World elsewhere continues ever onwards and in satellite terms, so still does analogue. In amongst the digital coverage of the Balkans on 36°E, I came across the BBC's Scottish analogue SNG truck up in Aberdeen on March 30th. On this day, Alexander Ferguson, manager of the local football team, was given the freedom of the city, this included speeches at the civic hall and a busabout round the town, carried via UKI-234 from 1800 hours onwards with parts live into the 1830 evening magazine programme - 11.010GHz-H audio at 6.60MHz.

Remember Herbalife ? This is the American food supplement and dietary group that extensively markets its products through area and local sales folk. The 1999 promotion is now winding up and *Eutelsat II F2* @ 10°E carried a live analogue corporate under the 'Herbalife Kick-off April '99' banner, evening of April 7th. The true international operation of HBN - Herbalife Network - was evident from the long listing of venues and dates for national sales presentations both around Europe and the States, this leading up to the 'Expo '99 for HBN.

The presentations are intended for close circuit viewing at selected meetings around the various countries, rather than domestic viewing. For a time in '97/'98, HBN offerings were encrypted and in digital. Tech notes - 11.161GHz-H @ 1800UTC clear PAL audio at 6.40MHz though dubbed/voice-overs in other languages were carried on other audio subcarriers.

The Kurdish problem in Northern Iraq continues and MED-TV that carried extensive propaganda favouring the Kurds was taken off-air by the ITV for violation of acceptable programme content. I came across a 'Kurdish TV test transmission' on *Eutelsat W2* - 16°E on March 20th at 1900 (11.163GHz-H clear PAL analogue).

Kurdish TV news seen via *Eutelsat W2* @ 16°E - analogue.

***Eutelsat* 36°E war news feed from an Italian airfield involved with the Serbian bombing - digital.**

This a general view from the locked off camera at Kukesi, a border town in Albania. Refugees arrive in this square and wait for transport to take them away, coaches are seen arriving RH. The sheeting lying on the ground extreme left was made into a makeshift shelter - it was raining. The ident is my receiver sourced showing memory 149 with uplinker service ident - this disappears after a few seconds. Starbird is a London based facility offering SNG (satellite news gathering) servicing. Via 36°E digital.

The Associated Press TV News circuit from Skopje, Macedonia, via 36° - digital.

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Programme content was heavily military, Kurds waving AK47s and driving along dusty roads waving at other similarly equipped folk. The picture quality was dreadful, resembling a smudgy VHS recording (which it probably was!). The programming has been seen on subsequent evenings presuming that they are now offering a daily service between 1800-1955. At closedown, up comes colour bars plus ident 'BOS-SAR-3', which is for the Bosnian/Hercegovine TV programme at 2000.

Backtracking to *Eutelsat* 36°E, check out the early mornings for the 'Big Breakfast' outside broadcast inserts which are live analogue feeds into the Channel 4 service from about 0745 onwards - often via the UKI-133 SNG truck (it's often seen in the back of shot!) using 11.674GHz-H. Tuning up a little on the same bird, **Roy Carman** (Surrey) noted an indifferent live OB insert for the 'KIDS ITV' Sunday morning programme, March 28th, from the car park of Northampton's Tesco.

Colour bars identing as 'CITV N'Hampton' ceased transmission around 1030ish. Leaving the receiver running, up popped 'SIS-18 UKI-145' at 1110 hours on the same frequency (11.636GHz-H analogue) which was yet another live programme offering for a Sunday programme 'It's your Shout' and this live from Winson Green prison.

A query from another reader - he's found on *Hot Bird* 13°E digital a couple of transmissions which he couldn't id, nor can I, having tuned to the frequency and found the signals flagged up, locked but a blank raster - both appear on 12.536GHz-H and run SR 27500; FEC 3/4. One flags as 'Skygate 2' and the other as 'VLD TDMA' - answers on a postcard please.

March 28 and Roy Carman monitoring *Eutelsat II F2*, 10°E at 11.141GHz-H and a live news transmission from the mouth of the Mont Blanc road tunnel, where a few days earlier a lorry fire entrapped and killed nearly 40 travellers. And a few MHz down the band at 10.985GHz the same time and the Italian coastguard being interviewed over their watchkeeping duties within the Adriatic Sea area lest events with Albania, Kosovo - or indeed the Russian Navy *en route* from the Black Sea fleet - become threatening.

A few days earlier Roy watched an afternoon insert carried on *Telecom 2c* @ 3°E - 12.690GHz-V analogue NTSC March 18th, this was a video for CBS showing a man carrying a leather case (of clock mending tools) through the streets of Paris, then he is standing by an antique clock, the leather case is opened, he donns kid gloves and proceeds to mend and to rewind the clock enabling it to start up again. This was a gentle, quiet and enjoyable experience comments Roy, similar in fact to another sighting on March 23rd when on *Intelsat 705* (18°W, 11.138GHz-V) there was a live concert feed from the centre of Venice.

The outdoor concert had a massive audience who were entertained by 'an ageing Italian icon' as evening approached, a peaceful beautiful scene. Ironic when a few hundred miles away NATO planes were preparing for another night's onslaught into Serbia. For many years the 18°W slot was well favoured by Italian OB operators, but in recent times, such feeds also appear on the French Telecom birds and *Eutelsat* 10°E.

For sports fans, it's worth checking out *Intelsat 801* @ 31.5° since several readers have commented that this bird is often used with both digital and analogue transmissions for ITV and Sky Sports football feeds, usually in the clear. March 17 had no less than five live football Champions League feeds for both ITV and ITV-2 during the evening for their mid-week match programmes.

Despite *Eutelsat II F4* @ 7°E going fully digital, MPEG 4:2:2 for all EBU news and sports contribution/distribution feeds, the occasional analogue signal appears often using the old SIS (sound in syncs) transmissions, i.e. no audio is heard, though the picture shakes with the (unheard) accompanying sound as the audio is digitised within the picture syncs. Incidentally, MPEG 4:2:2 cannot be resolved with the current DVB MPEG-2 domestic receivers.

News Within Orbit

The French are launching a 'youth channel' called TF-2 aiming at the 15-35 audience level, competing with the M6 channel, which should start Spring 2000. The German Kirch group have bought out the Premiere digital group and will combine with the DF-1 package, being relaunched Autumn '99 with many new channels covering music, sports and themed offerings.

The German channel PRO-7 intends opening a 24-hour TV news channel across Bavaria, though available on both cable and satellite. Called N24, it comes on-air January 2000 and concentrates on business and economic affairs. Canal Plus France are also intending opening a rolling news service late '99 to rival the national channel's TF-1 news service.

Another new channel on-air is the Spanish football 'REAL TV MADRID' carried on the Canal Satellite Digital package on-air 12 hours a day. And in Tokyo plans are advanced for 'The History Channel' opening across Japan late in '99.

Poland has a new channel 'E!Poland' within the @ Entertainment platform, it's produced by Wizja TV from the old TVS studio at Maidstone. Already nearly 900000 viewers have signed up and E!Entertainment plan to open further channels for Rumania and Russia late '99 or in 2000. And in the home patch, MTV Europe reckons on opening three new 24-hour channels soon, these will be VH1 Classics, MTV Base and MTV Extra which will air via *Astra* 28.2°E digital.

After BTI bought out the Dutch SNG operator Intrax, NTL have done a similar deal with the Swedish Teracom AB group, making for one of the largest satellite linking operations in Europe. They now total 20 OB/SNG trucks for coverage of sports and breaking news. There's an ATV station output available on *Eutelsat W2* @ 16°E running *MPEG-2* @ 12.701GHz-H, SR 3012; FEC 5/6, look out for P16ALK, a good time to check would be the weekends, if anyone sees his pictures, let us know.

More activity from the 12.5°W orbit now with Eutelsat slotting their old *I F5* and *TV-SAT2* birds there and reacting their 'Atlantic Gate' providing immediate and cost effective digital/data and TV communications into North America. They've tied up with an American comms operator with their States-wide fibre optic network able to provide an Internet Skyway for European/North American data transfer. Now on test, the full service opens May 1st.

The French TPS digital package has confirmed carriage of the terrestrial national channels TF1, France 2, France 3 and M6 in 2000, and possibly several years further, this in preference to carriage on the commercial Canal Plus channel digital group.

The Iridium LEO project, that of a Low Earth Orbiting international cellular communications network using satellites, went into operation November '98, but has only signed up around 3000 subscribers by the end of '98 instead of the hoped for 200000. Iridium reckon that 12 satellites have proved faulty, using up their eight spares, though Motorola (who provide the technical operation) are reluctant to comment on the orbital status of individual birds. The claimed success for calls achieved is 94% and paging calls were averaging one lost in 1500 calls.

Problems on the *PAS-8* satellite that is orbital at 166°E with hoped for signal levels across the Pacific basin being well out of specification. A rumoured story suggests (in *SatFACTS*, March '99) that during the prelaunch checks in Russia, a faulty Ku-band module was found and this was replaced by Loral. In the refitting, two antenna feeders were reversed in error. Expected East bound signals went to the West and for West bound so they were directed to the East. Well, that's the story.

And finally, April 12 is the scheduled date for the flight of Eutelsat's *W3* satellite out of Cape Canaveral, Florida, and will replace the existing *II F4* @ 7°E. Once in safe orbit, the new craft will provide a mix of telecomms, broadcast TV and consumer digital traffic, this apart from their 7° traditional customer - the European Broadcasting Union - with their pan-Europe uni, multi lateral feeds and news exchanges for the broadcast markets.

Interesting to note that there's a take up from corporate users such as VW, General Motors for their business communications together with several news agencies including Reuters - this promises to be an interesting satellite to monitor!

A reporter about to present a news item into SVT, Stockholm, seconds later shots rang out behind him, he reacted, but wasn't able to locate the source - digital.

A news pool feed ex San Salvador via New Skies/*Intelsat K* @ 21.5°W - analogue.

The setting sun over a Maharishi Open University transmission on 36°E - digital.

Dramatic ident via *Telecom 2c*, 3°E - analogue.

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Timestep ProSat for *Windows 95/98*, as new, LC interface software cables, manual, £75 plus P&P. Yaesu FRG-7000, good old set in working order, £60, buyer to collect. Tel: Castleford (01977) 555642, evenings please.

Trio R-2000 with v.h.f. converter, v.g.c., £220. Sony PRO-80, 150kHz - 223MHz, 40 memories, case, boxed, v.g.c., £125. ERA Microreader, £80. Martin on (01689) 870475, or 0181-325 3992.

Yaesu FRG-100 complete with p.s.u. and f.m. board, £300. R88 in working order, good door stop, £50 o.n.o. MFJ-1020B active antenna, £40. Martin Coulson, Newmarket. Tel: (01638) 720662, after 1800.

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Yaesu FT-757GX transceiver, FP757HD, power supply, FC757AT auto tune antenna unit, all very good condition, manuals, boxes, mic, cables, £600. Tom, Liverpool. Tel: 0151-427 1949, 1800 - 2100.

Wanted

Eddystone 830/7 communications receiver, in good condition. Bert, Leicester. Tel: 0116-289 6391.

Eddystone EC10 Mark II range switch wafers and any other spares. J. Pusey, 29 Arthur Moody Drive, Carisbrooke, IoW. Tel: (01983) 521103, evenings.

Heathkit Mohigan, any information on improvements/modifications. I believe *Practical Wireless* had some articles; any material most welcome, I have the handbook. Postal/photocopy refunds, no problem. Mike Evans, 120 Loughton Way, Buckhurst Hill, Essex IG9 6AR. E-mail: **bbms4ozone@compuserve.com** Tel: 0181-505 6303.

Meccano Radio Crystal set model RS1 or RS2, and any red green Meccano sets up to number 10, so I can make one, or any spare parts, please! Peter, Surrey. Tel: (01372) 454381, or (0374) 128170 anytime.

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