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December 1999 £2.99



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REVIEWED

World Radio History

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SWM Author Info

To provide you with a ready reference here are the contact details of all our regular authors.

Airband

Godfrey Manning G4GLM, c/o The Godfrey Manning Aircraft Museum, 63 The Drive, Edgware, Middlesex HA8 8PS

All At Sea

John Hodgkinson, c/o SWM Editorial Offices. E-mail: aas@pwpublishing.ltd.uk

Amateur Bands

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

Attention 123!

Enigma, 17-21 Chapel Street, Bradford, West Yorkshire BD1 5DT.

Bandscan

Bandscan America

Gerry Dexter, c/o SWM Editorial Offices. E-mail: gdexter@pwpublishing.ltd.uk

Bandscan Australia

Greg Baker, PO Box 3307, Manuka, ACT2603, Australia. E-mail: greg.baker@pwpublishing.ltd.uk

Bandscan Europe

Peter Shore, c/o SWM Editorial Offices. E-mail: peter.shore@pwpublishing.ltd.uk

Decode

Mike Richards G4WNC, PO Box 1863, Ringwood, Hampshire BH24 3XD. E-mail: decode@pwpublishing.ltd.uk

DXTV

Keith Hamer and Garry Smith, 17 Collingham Gardens, Derby DE2 4FS

Info In Orbit

Lawrence Harris, 5 Burnham Park Road, Peverell, Plymouth, Devon PL3 5QB. E-mail: info.orbit@pwpublishing.ltd.uk

LM&S and Maritime Beacons

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

MilAir

Peter Bond G3WVW, c/o SWM Editorial Offices. E-mail: milair@pwpublishing.ltd.uk

Off The Record

Andy Corder, 28 Romney Avenue, Folkstone, Kent CT20 3DU. E-mail: offtherecord@pwpublishing.ltd.uk

Satellite TV News

Roger Bunney, 35 Drayling Mead, Fishlake, Romsey, Hampshire SO51 7RU.

Propagation

Jacques d'Aulgnon VE3VIA. E-mail: jacques@pwpublishing.ltd.uk

Scanning

Fans Rest, c/o SWM Editorial Offices. E-mail: scanning@pwpublishing.ltd.uk

ShackWare

Jerry Demings, 22 Downland Avenue, Southwick, West Sussex BN42 4RF. E-mail: shackware@pwpublishing.ltd.uk

SSB Utilities

Graham Taylor, 64 Attlee Road, Havell, Middlesex UB4 9JE. E-mail: ssa@pwpublishing.ltd.uk

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EDITOR:
Kevin Nice, G7TZC, BRS95787

NEWS AND PRODUCTION EDITOR:
Zoë Shortland

ART DIRECTOR:
Steve Hunt

ART EDITOR:
John Kitching

EDITORIAL ADDRESS:
Arrowsmith Court, Station Approach,
Broadstone,
Dorset BH18 8PW
Telephone: (01202) 659910
Facsimile: (01202) 659950

If you wish to send E-mail to anyone at SWM then our Internet domain name is:
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kevin@pwpublishing.ltd.uk

BOOKS, BACK ISSUES & SUBSCRIPTIONS (ALL ORDERS)
Michael Hurst:
(01202) 659930
(Out-of-hours service by answering machine)

ADVERTISEMENT DEPARTMENT
(Broadstone)
ADVERTISING SALES:
Chris Steadman MBIM

ADVERTISEMENT TYPESETTING & PRODUCTION:
Peter Eldrett
Telephone: (01202) 659920
Facsimile: (01202) 659950

ADVERTISEMENT MANAGER:
Roger Hall G4TNT
PD Box 948, London SW6 2DS
Telephone: 0171-731 6222
Facsimile: 0171-384 1031
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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 Hazalhurst 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.

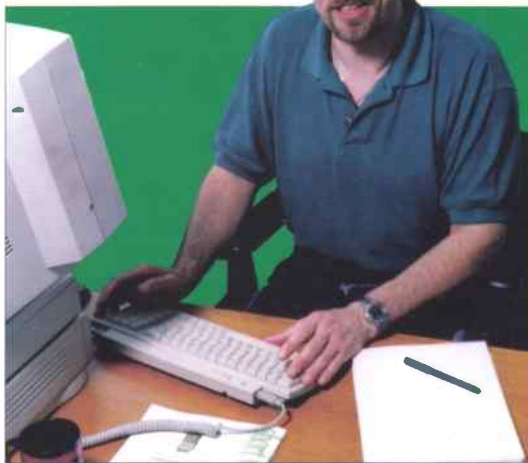
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Technical Help

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



Hello and welcome to the last issue of Volume 57, the last SWM to carry a 1999 date. The magazine has come a long way since its inception in 1937. I believe that now, just as at the beginning, that the material included in the leading listeners magazine, is current, relevant and as on topic as possible. We, on the Editorial Team, have a huge responsibility to ensure that this remains so. I am confident that as the focus and content of the hobby continues to change, so then will SWM reflect that change. So, into the next century we stride.

DDH47

From the latest and new topics back to an old but, in my opinion, not out-of-date mode, I recently received this news.

The German meteorological service plans to make a series of public broadcasts using Morse code mode A1A - involving on-off keying of the carrier - from its DDH47 transmitter at Pinneburg near Hamburg on 147.3kHz. This frequency is just below the first long wave broadcast channel of 153kHz.

These unusual transmissions will go out on the second Friday of each month for the next four months at 2230UTC using a nominal power of 15kW. You should therefore listen on the following Fridays: the 12 November, 10 December, 14 January and 11 February. You should hear c.w. messages in English and several other languages, mentioning the names of certain wireless pioneers. A special QSL card is available if you note the names in question, along with reception reports of the transmissions.

Send your reception reports to, **German Weather Service, Amateur Radio Group, Bernhard Nocht Strasse 76, Post Code D20359, Hamburg, Germany.**

SMS

Sticking with c.w., the other day I received quite a few SMS messages on my mobile 'phone. I've got the text message alert set to the ... —... (dididid dadah dididid) option. For those of you who don't speak Morse, that's SMS of course!

Well, all the frantic beeping brought PW Editor, Rob Mannion running, (well moving briskly), into my office enthusing about that fact that my 'phone could send Morse. A lengthy

discussion ensued about, amongst other things, how many people would actually realise that the alert was Morse. Well, sorry Rob, but I've got to come clean here, although he realised it was Morse he was hearing, Rob didn't

actually translate it on the first hearing. I guess this was due to the fact that he was in the office and not in the shack, pencil in hand.

Where's this leading you ask? Well, even though we are about to enter a new century and Morse is a very old means of communication, I personally believe that there is still ... (sorry but the time was 11 o'clock on the eleventh of November and I just was respecting the two minute silence)...a place for this mode. As I have mentioned within these very pages, a simple transmitter with no need for modulation is all that is required to convey complex messages. Much the same as I can utilise the 140 characters available with the text messaging on my 'phone to send vast amount of intelligible traffic, Morse too can achieve this by similar use of abbreviations such as the well known 'Q code' system for instance. It only takes a concerted trawl through the h.f. bands to realise that c.w. is far from being dead. It still has its place, it is clearly cost justified by its users just as is satellite delivery of moving digital images.

REA4

Still remaining on the c.w. theme, over the past two weeks I've watched an exciting piece of radio detective work unravel via the WUN and Spooks, Internet mailing lists. It all started with a peculiar sounding 'jammer' type of signal on 6.895MHz being noted, this aroused the interest of lots of monitors around the globe which resulted in debate as to who and what it was. Eventually, a c.w. station, callsign REA4, was noticed on frequency, sending number groups, on a regular schedule. Then more frequencies were discovered, traffic logged and posted to the list and analysis of the transmissions was possible. The theory is that it's a Russian station sending encrypted WX data. This seems plausible, but it's only a guess. It is just fascinating to watch and indeed partake of this kind of activity.

Would you believe there are ill informed people who think our hobby is "boring"?

Kevin Nice

73 de G7TZC

Dear Sir

After your request for eclipse reception reports in the September Editorial, I am enclosing the results of a competition we held. David Wright G4BKE of Broadstone was declared the winner. I was privileged (having booked the day off 12 months previous to the event!) to get some pretty spectacular results and see the eclipse out of the window at the same time. I would be very grateful if you could forward the entry forms to the RSGB when you have finished with them.

Could I please put in a plea for help from your readers. Has anybody out there picked up the English broadcasts from Radio Mongolia? I have tried in different conditions on the frequencies and times listed in *Passport To World Band Radio*, but have drawn a complete blank. I've not seen any reception reports in your magazine, but until subscribing a few months ago, I was only a 'frequent' reader.

Many thanks for an interesting magazine.

Rodney Wilde 2E1FGG
Portland

Rodney, thanks for the competition logs, they make interesting reading. I'm sure there will be lots of readers who will have heard Voice of Mongolia during the 1830-1900 slot.

Reports will be passed onto Rodney if anyone wants to share their logs. - Ed.

Dear Sir

I have been reading *Short Wave Magazine* for a number of years. Apart from *Practical Wireless*, they are the only means of keeping up-to-date with products and news for the radio amateur and listener.

I am very interested in data, mainly RTTY. My problem is that I am not on the Internet and I have a great difficulty of getting hold of software. I am a great fan of Mike Richards' Decode pages. Do you think it is possible that the address of the software companies be included in these pages?

Keep up the good work, *SWM* is about the best magazine around.

L.H. Landricombe G0KYE
Plymouth

*Unfortunately, these days, most shareware authors don't publish postal details. The main distribution mechanism for them is the Internet. We will, however, whenever possible, publish postal or telephone details. Thanks for your support, glad you enjoy *SWM* and *PW*. - Ed.*

Dear Sir

I have just read the article 'Radio - Technology Pull or Market Push?' with much interest, particularly as I am replacing my MVT-7100 scanner following its theft.

Having owned and operated several scanners over the last few years, including AOR, Realistic and Yupiteru, mainly for 'airband use', I suppose to some extent they are all 'horses for courses', much as any other product can be.

The PRO-60 was a good little scanner, with full v.h.f./u.h.f. airband, but sadly factory set step defaults which you couldn't alter. Also, it operated on 9V, not very car friendly!

The MVT-7100 doesn't include an AFC scan, which the earlier '7000 featured, and I find that if, for example, I am scanning a bank of channels, the '7100 will stop on a channel when only a carrier wave is present and this is quite irritating. Yes, I know you can 'skip' on the frequency scan, but if a channel comes up which you wish to listen to, you

have to delete the skip mode, because even with 'delay' set, the scanner will resume scanning - not very user friendly?

Having spoken to a number of suppliers for advice, I understand that none of the current scanners offer true AFC on a modulated, i.e. speech signal? Although on the AOR AR8000 you can set levels which may or may not work.

A colleague has an early AOR AR8200 which replaced his MVT-5000, on the face of it, quite an upgrade. However, he has complained of poor audio output and finds some control inputs too complicated.

I like the idea of linking a scanner to a computer to input frequency banks and amend settings, etc., and yet Yupiteru still have not introduced such a feature.

Having read the reviews of the '9000, I am tempted to consider buying it, but the AOR AR8000 does have a computer interface facility, although one supplier suggested that I should stick with the '7100, and a change to an '8000 would be 'going downhill'! (note: he did **not** try to sell me another scanner).

Perhaps *SWM* could help by running a 'Readers' Best' survey inviting comments on build quality, ease of use, reception quality, etc. and include any 'idiosyncracies'? In the meantime, I am left to consider spending money on a product which may or may not live up to expectations.

T.D. Evans
East Yorkshire

Horses for courses this one! I maintain that buying a radio is very much like buying a car. One that suits my requirements and desires perfectly may well not do anything right for you. If you try to incorporate all features that are available into one set then you end up with a mess that's difficult to use. I know it's not easy, but more than one radio is the best solution in my opinion. - Ed.

Dear Sir

I was looking for a dedicated short wave base receiver a few months ago and I read the article on the Icom R75 reviewed by John Wilson. I was so impressed with the review, I went to Lowe Electronics in Bristol, I explained to them that I live in a flat in Weston and I am unable to erect a suitable antenna, he said there was on the market a passive antenna called the Mini Random by RF Systems.

I purchased the R75, got it home, all I did with the antenna was put it over the curtain rail, switched on the set, and I could not believe the performance of it, it has amazed me ever since. I enjoy listening to Shanwick as I am an avid aviation enthusiast and the radio amateurs on 20m and other wave bands.

I was listening to W3NAN at Goddard Space Centre, following the space shuttle home back in June, it was so clear. I used to have an AOR AR3000A and a roof area back in my last house at Shrewsbury, but it was not as good as this radio.

I have recently purchased the d.s.b. module for it and it makes an enormous difference. It works so well and really does cut down background noise. I recommend this fantastic radio receiver to anyone who is looking for such a set and the RF Systems Mini Random antenna for anyone who cannot erect a suitable antenna, could you please pass this information to John Wilson who wrote the review.

I.P. MacLean
Weston-Super-Mare

Dear Sir

I am a 15 year old and have been scanning for about two years. I suppose I am pretty lucky to have a scanner, my uncle gave the scanner to me as he wasn't too interested and he wanted to concentrate about work matters.

I have a Realistic PRO-26 scanner and scan around 25-40MHz. I use a 10m telephone wire as an antenna, which sounds pretty stupid, but it certainly does the job of picking up the most weak signals.

What I would really like to know is what the transmissions are on 30MHz. I listen to these frequencies after school and regularly hear American stations. It sounds like Police and Ambulance services, but can I be sure that these are genuine and if so, how am I receiving them from such a distance?

I also find 10m very interesting to listen to and more repeaters seem to be switching on, so hopefully one day the band will be as popular as 20m.

P.S. Thanks for a brilliant magazine.

Richard Brown
Scotland

Richard, the transmissions you are hearing around 30MHz are undoubtedly from the US. They are likely to be p.m.r. users. Emergency services are one of the users of this segment. We are approaching the point in the '11 year' sun-spot cycle, which provides this kind of enhanced propagation. Today (11 November), I have had reports of 41MHz being particularly good. This is a good time to enjoy the 25-40MHz part of the spectrum. You will find there will be lots of QSOs, keep listening. - Ed.

Is there something you want to get off your chest? Do you have a problem fellow readers can solve? If so then drop a line to the Editor at QSL, Short Wave Magazine, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW.

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

TOP
QSL



An 800mm offset dish used with the new Active Feed.

WXSATs At Picketts Lock

Anyone interested in receiving live weather images from satellites will find the hobby well represented at the London Amateur Radio & Computer Show at the Lee Valley Leisure Centre in Enfield on 27/28th November 1999. Weather satellite manufacturers **Timestep** will be showing their latest products and the **Remote Imaging Group**, a forum for enthusiasts generally known just as 'RIG', will also be there to offer advice and guidance. UK Membership of RIG costs just £11 per year and includes an excellent and informative quarterly magazine.

Timestep will be selling their LC and "i" serial interfaces with the latest 32 bit software, as well as dedicated receivers, pre-amplifiers and antennas for both polar and geostationary satellites. Among

new products on show will be Timestep's revolutionary system 'Meteosat in a Briefcase'. This uses a small, flat antenna, just 229mm square (christened 'SHEP'!) and is ideal for people who, for whatever reason, are unable to accommodate the usual larger dish antenna. Meteosat sends images continuously (a new one every four minutes!), including relayed images from other similar satellites around the world.

There is further good news for enthusiasts previously put off receiving images from Meteosat by the cost of purchasing a separate receiver and expensive dish antenna. A new Downconverter and Active Feed which will work with an existing polar receiver and an 800 or 600mm offset dish (e.g. an old satellite TV dish) are now available through the Remote Imaging Group.

Designed by Timestep, this combination offers a lower cost option for people already receiving Polar satellite images (a

popular starting point for many) at just £99 for the Downconverter and £65 for the Active Feed.

Both Timestep and RIG look forward to seeing you if you're going along to the London Amateur Radio & Computer Show this year.

Bangor & DARS

Members of the **Bangor & District Amateur Radio Society** meet on the first Wednesday of every month in the Clandeboye Lodge Hotel, Bangor, at 2000. On Wednesday 1st December, a talk will be given by NIES entitled *Power to the People*. Visitors and new members are most welcome. The club Christmas dinner is to be held on Friday 10th December.

More information from **Mike G14XSF** on **028 42772383** or check out their website at: <http://welcome.to/bdars>

Going Loopy

Wellbrook Communications are pleased to announce the appointment of **The Shortwave Shop** as sole agent for their range of antenna products. Wellbrook have also added a new antenna to their range of broadband loops.

The new active loop, called the K9AY Directional Terminated Loop Antenna, has a frequency range from 60kHz to 2MHz and is designed for the l.w. and m.w. listener. The antenna used two loops to generate an electronically steerable null over 360° with up to 30dB front-to-back ratio. A unique system of Remote Controlled Variable Termination is provided to optimise the null depth.

Consisting of two assemblies: Loop Head Unit and a Control Unit, the antenna is simple to erect and use. The antenna also provides excellent omni-directional short wave reception similar to the T2FD. This new loop is probably one of the best l.w. and m.w. antennas currently available offering high sensitivity and very low noise.

The K9AY costs £125 plus £5 postage within the UK and Ireland. The full product range, including recent reviews, can be seen at the Wellbrook Web Site at www.wellbrook.uk.com

For further information, contact Wellbrook Communications at **Wellbrook House, Brookside Road, Bransgore, Christchurch BH23 8NA, Tel: (01425) 674174, E-mail: sales@wellbrook.uk.com**

Sold!

An incomplete ship-to-shore radio receiver, known as a 'multiple tuner' has been sold to a collector for £10,500 at The Canterbury Auction Galleries. Multiple tuning represented the latest technology when this equipment was built by The Marconi Wireless Telegraph Co. Ltd. in 1908 and the same type of equipment was subsequently installed in the *Titanic*.

The equipment on offer consisted of two boxes: tuner no: 26308 measuring 19in wide by 8in deep by 8in high and amplifier no: 60872 measuring 19in wide by 8in deep by 11in high. While the sides of the tuner were made of wood, the top and front were made of bakelite and, in addition, there were three brass cylinders, each 4in in diameter, on top.

The cylinders each carried a 2.5in diameter bakelite knob, which were labelled from left to right: 'aerial tuning condenser', 'intermediate tuning condenser' and 'detector tuning condenser'. There were also two dials on the front panel marked 'tuning switch wavelength' and 'aerial tuning inductance'. The other part, the amplifier, which is known as a 'maggie detector' looks like a long box with a glazed cover. It contains a clockwork winder mechanism with handle, which powers two bakelite surface-mounted crank wheels connected by a cord running between two vertical magnets.

The undistinguished-looking equipment was found in the garage during a house clearance on Rough Common, Canterbury, and was lotted up with a leather suitcase and an assortment of brass stair rods. Due to the Galleries' use of the Internet, however, it was picked up by several specialist collectors, including one in New York, who requested digital photographs.

Subsequently, the American collector withdrew and the underbidder gave up at £10,000 leaving a Sussex collector to make the winning bid of £10,500. Said the delighted vendor, who was selling up the family home, "The equipment was of no interest to my sister, who put it in the garage. It was my father who enjoyed fiddling with radios".



The 1908 ship-to-shore radio receiver sold at The Canterbury Auction Galleries.

Domestic Broadcasting Survey

The SWM Newsdesk has recently heard from Bent Nielsen, Treasurer of the Danish Short Wave Club International, who inform us that this year they did not print the usual Christmas List, but have issued an extended Tropical Bands Survey, now called the Domestic Broadcasting Survey, compiled by chairman Anker Petersen. The price for the publication is DKK 75, £8, \$12 DEM 20 or 14 IRCs.



The easiest way to pay is by cash in banknotes or by cheque. Orders should be sent to: **V/Bent Nielsen, Treasurer, Egekrogen 14, DK-3500 Vaerlose, Denmark**, E-mail: bentndx.elinh@post.tele.dk



EuroMix Gets Stronger

With the launch of EuroMix just weeks away, parent company World Radio Network has teamed up with Strong UK for a high profile competition. EuroMix will replace WRN 2 multilingual, bringing a fresh, exciting new sound to the pan European airways. It will carry programming from Europe's most respected public service broadcasters, bringing them a truly European perspective on current news and events. Broadcasters will cover a variety of European Union and Accession state languages.

To celebrate this launch, listeners to the new EuroMix, as well as the current WRN1 (English) and WRN3 (German), will have a chance to win the latest digital satellite receiver from Strong UK.

The SRT 4300 with common interface, supports all versions of conditional access modules, allowing access to 100s of digital radio and television channels all over the world, and to help keep track of the favourites, they have three separate menus each storing up to 100 presets. The machine also supports all types of downloading data facilities, from automatic to manual scanning as well as MSPC (multi channel per carrier) and SCPC (single channel per carrier) to ensure that analogue favourites can still be found after the transfer to the digital format.

EuroMix launches on December 1st and can be heard via Eutelsat DVB and the Internet at www.euromixonline.com

BDXC Christmas Bash!

The next regional get together of the **British DX Club** in this part of the world takes place on Wednesday 1st December. The now established and popular optional pre-meeting meal is, as usual, at the Beijing Chinese Restaurant, Portland Street, Manchester (on the edge of Chinatown, near Piccadilly Gardens) from 1800.

The DX meeting/Christmas 'do' will then be at the Lass O'Gowrie pub, Charles Street, off Oxford Road, behind BBC Manchester, from 2000. If you are turning up 'on spec' to either location, look out for copies of *Communication* (the monthly journal of the BDXC) and other DX items displayed at a table. Further information from **Chris Brand**, E-mail: chris@sutton-brand.freemove.co.uk or **Tom Read**, E-mail: tommyread@hotmail.com or telephone **(01625) 612916**.

New Appointment

Svetlana Electron Devices Inc. is proud to announce the appointment of UK company PM Components Ltd. as their full service, stocking distributor serving all of Europe. PM Components combines thermionic device experience and technology in a full range of services to many of the biggest names in the music business, both in guitar amplification and high-end audio.

From valve testing, grading and matching, to technical support and consulting, PM Components is a perfect complement to Svetlana's product line. Marshall Amplification uses PM Components exclusively to test and match valves for their original equipment as well as for the replacement market as Marshall's 'Gold Line' of Svetlana valves. The appointment of PM Components as Svetlana's European Distributor raises the standard of service and quality you can expect when buying Svetlana products.

For additional information and pricing, contact **PM Components Ltd. at Unit A, Jenkins Dale Industrial Estate, Chatham, Kent ME4 5RT**, Tel: **(01634) 848500**, FAX: **(01634) 848676**, E-mail: p.m.comp@lineone.net or check their web site at: www.pmcomponents.com

(L to R) Chris Breeching, Commercial Manager of PM Components, Mark Russell, Sales Manager at Svetlana, Charles Gray, Vice Chairman at Svetlana and Peter Watson, Chairman of PM Components.



Continued on page 10...

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.

November 27/28: The London Amateur Radio & Computer Show is to be held at the Lee Valley Leisure Centre, Picketts Lock Lane, Edmonton, London N9 0AS. The Lee Valley Leisure Centre has modern facilities, well illuminated halls, extensive free parking and easy access by roads.

December 4: The Rochdale & DARS are holding their traditional radio rally (yes, on Saturday!) at St Vincent de Paul Catholic Church Hall, Caldershaw Road, off the A680 Edenfield Road, approx two miles west of Rochdale. Follow the orange arrows from M62 J20. Doors open 1100 (1045 for disabled visitors). There will be refreshments and a rest area. **John G70AI**, evenings, on **(01706) 376204**.

December 8: West Kent Raynet will be holding their quarterly meeting at the Castle Room in the Angel Centre in Tonbridge. The meeting will start from 2000 and any Radio Amateurs who are interested in learning about West Kent Raynet and its activities will be welcome. Food will be available. Further details from **Colin GOUCH (QTNR)** on **(07930) 903664** or E-mail: colin@gouch.force9.co.uk

2000

January 23: The Lancastrian Rally will be taking place at Lancaster University. Routes from south - leave M6 off at J33, routes from north - leave M6 off at J34. Doors open at 1100, 1030 for disabled visitors. Entrance fee is £1.50. There will be a Bring & Buy, Morse tests on demand - two passport photos required. Licensed Café on site. For booking details contact **(01772) 621954**.

January 16: Oldham ARC will be holding their rally at the Queen Elizabeth Hall, Civic Centre, West Street, Oldham, Lancashire. Doors open 1100, 1030 for disabled visitors. Event features the usual traders and a Bring & Buy stall, Morse tests available on demand. Talk-in on S22 via GB40RC, commencing 0730. Refreshments and free parking will be available. Details: **(01706) 367454**, E-mail: m1cyl@netcomuk.co.uk

Send your news to Zoe Shortland at the Editorial Offices

Continued on page 11...

HAYDON COMMUNICATIONS



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NEXT DAY DELIVERY TO MOST AREAS, £10.00.

RECHARGEABLE ALKALINE CELLS

Starter kit includes charger & 4 x AA cells. **£13.99** + £2.50 P&P.
 Please note that only the special cells can be recharged with this charger.
 Extra cells available @ Rechargeable Alkaline. No memory effects. 1.5V cells. 3 x 4 x AA pack **£5.99** £1 P&P capacity of nicads.
 4 x AAA **£6.25** £1 P&P **NO QUIBBLE WARRANTY**

SCANMASTER SP-55
 Boost reception of your scanner with this pre-amp. 25-1500MHz, variable gain, band pass filters.
OUR BEST SELLER
SUPERB VALUE £59.95 P&P £3.50

POLICE STYLE HOLSTER "HHC-2"
 Matches all hand-helds can be worn on the belt or attached to the quick release body holster.
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 Deluxe over the ear earpiece.
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QS-300
 A fully adjustable desk top stand for use with all hand-helds. Fitted coaxial fly (FAI) with BNC & SO239 connectors.
 ONLY **£14.95** P&P £2

Q-TEK HF INDUCTIVE INTERFACE
 Allows the connection of any HF antenna to any scanner that has a BNC connector. Simply connect the long wire antenna to the push terminal on the top of the interface and attach to your scanner in place of your existing antenna.
 ONLY **£14.95** P&P £1

GARMIN PRODUCTS

GARMIN GPS-III PLUS
 Upgradable GPS system supplied with data lead and free on-board maps. Shows cities, airports and much, much more.

SALE PRICE **£329.95**
 Soft case for GPS-III Plus£20.00
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 Cigar power lead£20.00
 Active magmount antenna£39.95
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NEW GPS-12 NAVIGATOR
 (now with 24 hour battery life) 12 channel receiver. Includes: UTM, ordnance survey, waterproof to IPX-7 standard.

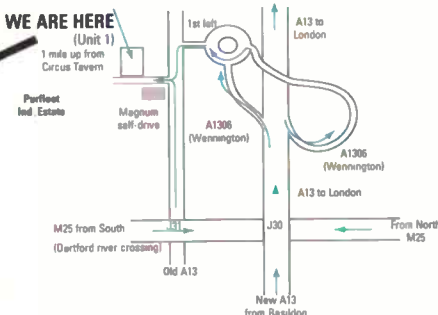
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 Communications receiver. As new. **£449.95**
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★ Up to 12 hours track time/70 hours stand by
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LIMITED STOCK.
 Once they've gone they've gone!

B.T. DIVERSE 2016
 ★ Up to 300m in range
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INTERFERENCE - STOP IT!

Rectangular snap-fixing ferrite cores suitable for :- Radio coax/TV/mains/telephone/PC & data cables.
 Plastic teeth prevent it from sliding on cable. Simply snap close onto cable and job is done! (Will fit large coax).
BULK PURCHASE hence 2 for £5
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Q-TEK "WSK-100"

Weather station picture & fax reception kit includes:
 a) A 2 element crossed dipole for receiving weather satellite pictures live from orbit
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ONLY £44.95
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Q-TEK LW-2

The ultimate in high quality long wire antenna kits. Complete ready to go wire antenna that should last forever - don't forget you get what you pay for! (0-30MHz) length - adjustable up to 150ft.
£39.95 P&P £5.
 (All parts - high quality and replaceable)

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 NO MAIL ORDER TO MIDLANDS BRANCH



Christmas sale now on!

Late night christmas shopping Thursday 9th, 16th &

23rd December. Open 8am - 8pm.



Q-TEK APOLLO 2000MkII
A brilliant new compact indoor antenna that covers 0-1650MHz and is just 20" tall (collapsed). Supplied with coax and BNC plug fitted.

ONLY **£49.95** P&P £5

Comments from John Griffiths

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

NEW Q-TEK D.C. 2000

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

OUR PRICE **£54.95** P&P £8.50

Comments from John Griffiths

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

Q-TEK INTRUDER
Superb quality wideband receiving antenna. Covers 100kHz-2GHz (all mode).

ONLY **£99.95** P&P £6.00

NISSEI HS-8000

Miniature wideband scanning antenna with magmount. RRP £24.99.

ONLY **£14.99** P&P £3.

AIR-44

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

£69.95 P&P £8.50

AIR-33 (As above) 1m long. Gain 3/6dB. **£44.95** P&P £5

DB-32

A miniature wideband antenna. Receives 30 - 1200MHz. BNC fitting only 1.5" long. It's superb (for its size).

RRP **£29.95** P & P £1.

TSA-6671 BNC magmount£22.95

REGULAR-GAINER RH-770

BNC 21cm flexible whip that is ideal as replacement

OUR PRICE **£14.95** P&P £1

SUPER-GAINER RH-9000

BNC 40cm flexible model for the ultimate in gain.

OUR PRICE **£19.95** P&P £1

Q-TEK HF-30

An amazing new design concept in compact HF antennas. Thanks to its six-stage multi-resonant coil system stacked vertically utilising a magnetic balun at the base you can obtain better results than ever experienced from a compact-vertical HF antenna. (SO-239 fitting:- 4' high - clamps to any mast up to 2" dia). 0-30MHz.

ONLY **£84.95** (DEL £10.00)

SUPERB HF SHORTWAVE ANTENNA

"Mario Gongolsky" - Freelance journalist for German magazines - brief comments after testing HF-30 . . . your HF-30 kept all the promises you have made.

Smooth reception on a suprisingly low noise level. The HF-30 supplied a very clear signal to the receiver. Continuous good performance throughout the whole frequency range.

NEW SP-1 SPYWIRE

Ideal for any receiver. Receives all short wave bands. All mode, no ATU required. Built in balun. SO239 connection.

£29.95 + £3 P&P



NEW Q-TEK BALUN

Short wave magnetic long wire adaptor for any short wave receiver. Simply screw onto receiver & connect the wire via supplied screw terminal. (It's brilliant!).

PL-259 ONLY **£22.95** P&P £1



Vectronics AT100

Active SW antenna Covers 0.3-30MHz with adjustable sensitivity. Simply connect to a receiver and away you go.

SUPERB VALUE **£69.95** P&P £4

(includes pre-selector)



GLOBAL AT-2000

Deluxe SW ATU 0-30MHz. SO239 fittings.

ONLY **£85.00** P&P £4

(Probably the best ATU around)

SANGEAN ANT-60

Portable SW reel antenna. Connects to a 3.5mm jack or clips onto your telescopic antenna. ~~£14.99~~

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COPPER ANTENNA WIRE (All 50mtr rolls)

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| Enamelled | £12.95 | P&P £5 |
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| Flexweave (PVC coated 20 mtrs) | £18.95 | P&P £5 |
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REACTION TUNE COMBOS

Mini Scout +

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Complete with lead ALL FOR

£519.00



Mini Scout + AR8000 (all leads/mods included).....£449.00

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Full Scout with reaction lead

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Scout MkII + AR8000 (lead modification included).....£599.00

LOW PRICED COUNTER HUNTER (10MHz-3GHz) includes nicads/ charger and antenna.

£59.95 + FREE CASE



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10MHz-1.4GHz frequency counter with bargraph and "reaction tune" caperbility (incl nicads and charger). With free case worth £14.99.

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| Techtoyz D.T.M.F. decoder | £89.95 |
| Optional antenna for micro counter | £8.99 |
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Data Interface for receiving CW/Baudot/ASCII/Amtor/ARQ/FEC/Sitor A/B/Navtex, Weather Fax, and Slowscan TV.

£39.95 P-P £2. Including:- interface and software connects to RS-232/3.5mm lead connects to receiver (no external power needed).

... continued from page 7

On Show

Haydon Communications would like to advise readers of three exciting new products which will be on show and for sale at the forthcoming Picketts Lock Show.

First up is the **Garmin GPSIII+** - this is Garmin's latest, newest addition to their range of global positioners and certainly is by far the most advanced in its range. With every facility you could possibly want, including loadable Mapsource CD-ROMs for enhanced detail along with PC download facility (PC lead supplied) and their famous

'Tracback' feature, which quickly navigates you home without the need for storing 'Waypoints', this must be a sure contender for that Christmas list - now on sale for only £329.

At the show, you can also snap up a pair of TA-200s for the reduced price of £150. The TA-200, from Motorola, is the very latest licence free walkie talkie (PMR-446), and although it is small in size, its performance isn't.

The **Q-TEK Triton** - this antenna outsold Haydon's expectations at Leicester this year, so they are taking twice as many to Pickett's Lock! The antenna covers 6, 2m and 70cm, with four elements and only a boom length of 1.13m and a longest element length of 2.96m - all for just £69.95 incl.

This year at Picketts Lock, for the first time ever, Haydon will be displaying their purpose made 'Display Unit' showing the entire range of Q-TEK products - so make sure you don't miss it!

Radio & TVDX News

Bangladesh has welcomed its first commercial TV station with the opening, initially on a test basis, of 'Ekushey Television', which hit the air waves this Autumn prior to opening full time, hopefully early 2000. A new channel is now on-air in the Oslo region, Norway, aimed at the 25-45 age group. The channel, 'Metropol', is backed by both sporting, news and financial groups and if successful, will spread to other main population centres.

New African state TV networks are to launch in Botswana (BTV) and Tanzania (TVT), both hope to be on-air by the end of December '99. Meanwhile, Kenya has seen an expansion of commercial TV channels with Family TV, Nation TV and Citizen TV

hitting the airwaves.

Nation TV opens late '99, offering both local and international content taking CNN, Reuters and MTM, though programme budgets by TV terms are low. Citizen TV is now on air testing at v.h.f. across Nairobi taking satellite off-air

signals as fillers until programme plans are finalised. And still with analogue news, a TV network slowly establishing is the independent 'TV 'DANMARK' with aspirations of nationwide coverage, at this time Naestved ch.E23 @ 0.5kW hor and Odense ch.E49 horizontal @ 3kW e.r.p. are on air.

Both German broadcasters 'Vox' and 'RTL' have been promised digital access to several channels each when spectrum is available. Vox operating out of Cologne will receive two channels and RTL is hopeful of four channels. Each group must await the OK from each regional authority for access into the cable networks and air waves though RTL is hopeful of transmitting two of the channels by the start of 2000.

Meanwhile, the digital wheels turn, though slowly, in Spain. The first digital terrestrial TV (DTT) service started back on November 15th with 'Onda Digital' transmitting 14 Pay-TV channels and five audio channels and hopeful of a 70% population coverage by the end of December '99. Each channel will be encrypted, though must offer at least 32 hours per week FTA (free to air).

In total, 'Onda Digital' will have 3.5 multiplexes with four channels each and has existing digital satellite operators 'Canal Satellite' and 'Via Digital' as rivals. Further multiplexes will be operated by existing Spanish terrestrial broadcasters.

Current terrestrial FTA analogue TV broadcasters will be encouraged to go digital and the first FTA-DTT could be on-air by Spring 2000. At this point of the digital cycle, dual illumination should continue into the new century with an analogue switch-off 2012, or earlier, subject to technological advances.

Finland is also moving towards digital with the first licences already issued early September '99 and plans look to a 70% population coverage by the end of 2001 and total coverage by the end of 2006. Both national and regional broadcasters have received channel handouts within multiplexes and the present broadcasters will be expected to dual illuminate until 2006 - that is transmit in both analogue and digital for this period.

Meanwhile, here in the UK, the Media Secretary, Chris Smith, detailed plans for the new digital era in the UK at the September RTS Cambridge Convention. At least 95% of the population should have digital availability before a phased analogue switch-off, the receivers should be 'affordable' and all current FTA analogue services must be available on digital together with free Internet access. The earliest date for switching off analogue suggests 2006, with completion by 2010, but this date is variable and must relate to at least a 70% digital ownership before the actual closure date is announced.

Good news regarding potential r.f. interference with the Power Line Telecommunications plan being dropped, following representation from concerned bodies, including the RSGB. The intention was to use overhead power cables to carry widespread data communications based at h.f., interference could have been chronic for weak signal exponents.

Pat Hawker ('Technical Topics' in *RadCom*, RSGB) however writes that another localised telecoms system ADSL (Asymmetric Digital Subscriber Line) will utilise telephone lines running into buildings/homes for the transmission of data and already VDSL (Very High Speed Digital



Purbeck Club

The **Purbeck Amateur Radio Club** (callsign M0BLJ) meet on the third Thursday of the month at Harman's Cross Village Hall at 1900. Interests include Morse, h.f. WEFAX, SSTV, Packet, amateur bands and two members of the club are also members of RAYNET.

More information about this friendly club can be obtained from **Peter Wakefield**, Secretary/Treasurer, at **19 Osmay Road, Swanage BH19 2JQ, Tel: (01929) 424413** or E-mail Peter at **peter@byglades19.fr.eeserve.co.uk**



Subscriber Line) has been approved for European/USA use for 2-way communication up to 25Mbit/s and will be passed for UK operation within 12 months, bringing the potential of m.f.h.f. and possibly low v.h.f. into your sitting room! (for more information, read the October '99 RadCom).

RSL TV stations across the UK both currently on-air and those considering applying have heard from the ITC that their initial transmission period has been doubled, as from now, all RSL-TV licences will run for four and not two years, this to encourage the take-up of interested parties into local community TV.

Developments in office data systems have now enveloped the use of radio to connect several offices into a single network and avoiding the high costs of installation/leasing of ground wire/fibre cabling. Present cabling and modems were found to be unable to handle the much higher data transfer flow required.

Harlow District Council, after investigation into higher speed and more flexible communications, have now installed a wireless data system that connects 12 remote sites to the main council office centre in Harlow over a 10km² area and offering the potential of further nodes at minimal cost. High rise buildings at Willowfield, Stort and Terminus are used as the main relay stations for the 'BreezeCom' WLAN network providing 2-way data/traffic flow. The system will also support CCTV pictures which Harlow Council intends to exploit shortly. WLANs also allows for office expansion and building changes without the cost of cable resiting between offices.

Versatile Speaker

Ever wanted to really crank your hi-fi up so that you can hear it in the next room? You've always said that you would get around to wiring that other set of speakers to your hi-fi, but you've never quite got round to it. Well, now there is a simple solution with no wires whatsoever.

Headphone and speaker specialist **Ross** have come up with the simple solution, a wireless speaker that means you can play your favourite music on your hi-fi and take the speaker with you, wherever you want. Ross claim that this is the world's most versatile speaker and with good reason. You can connect the speaker to almost any audio source, hi-fi, TV, video game and computer and take the speaker to wherever you want.

Included in the pack is a small transmitter that connects to your hi-fi and rebroadcasts the signal from the speaker. Within the bookshelf-sized speaker, there is a receiving unit that then picks up the broadcast. That means that you can even take the speaker outside into the garden, garage or shed, and roaming around the house equipped with your favourite sounds couldn't be easier.

Inside the speaker is a lead acid battery that once fully charged will run for over 12 hours of continuous play. There is also a bass boost that gives you extra depth with the most soulful of music. A small switch on the back of the speaker allows you to add another speaker if required to create full stereo sound, however, when you are

moving around in your home or even outside, you very rarely get the benefit of the full stereo experience. The single speaker really does give you the answer to not having all of those wires running around your home.

The Ross wireless speaker is available from Comet, Tandy and leading electrical retailers, priced at £89.99 (recommended retail including VAT). Call Ross on **0161-702 5010** for further stockist details.

Javiation's JAV-232

The JAV-232 computer interface, from **Javiation**, continues to support an ever increasing number of scanners that are now available and offer 'Computer Control'. This includes: AOR AR8200, AOR AR8000, AOR AR2700, Alinco DJ-X10, Camnis HSC-150/HSC-190/HSC-200, Commtel COM600/COM610, Icom IC-R2/IC-R10 and other CI-V equipment, Optoelectronics Scout and Trident TR-2000/TR-2200/TR-4000/TRX-100XLT.

In addition, when used with the AR8000 and AR8200, the JAV-232 provides a squelch activated tape recorder circuit and constant audio. When used with the AR8200, the f.m. discriminator output is also available.

For use with the AR8000, AR2700 and some other units, a Sumitomo Flat Flexible Cable (FFC) is supplied and for use with other models a suitable cable is required. The JAV-232 is priced at £69.99 (for connection to some radios, an optional cable is required).

Additional details can be found at:

<http://www.javiation.co.uk/javint.html> - alternatively contact Javiation at **Carlton Works, Carlton Street, Bradford, W. Yorkshire BD7 1DA, Tel: (01274) 732146, FAX: (01274) 722627.**



Send your news to Zoe 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

February 6: The 15th South Essex Amateur Radio Society are holding their Radio & Computer Rally at the Paddocks, (situated at the end of the A130), Long Road, Canvey Island, Essex. Doors open from 1030 and features include Amateur Radio, Computer & Electronic components exhibitors, Bring & Buy, RSGB Morse testing on demand (two passport photos required). There will also be home-made refreshments, free car parking with space outside main doors for disabled visitors. Admission is just £1. More information from Brian **G7IIO** on **(01268) 756331** before 2100 please.

February 6: Harwell Amateur Radio Society will be holding a Radio & Computing Rally at the Harwell Science & Engineering Centre located just off the A34 between Oxford & Newbury. Doors open 1030-1530. Signposted from A34. Talk-in on 145.550MHz. Further details from Ann **G8NVI** on **(01235) 816379** or on <http://www.hamradio.harwell.com>

February 13: The Northern Cross Rally is to be held at Thornes Park Athletics Stadium, Wakefield, in one large hall, just out of town on the Horbury Road, easy access from M1 J39 & 40 - well signposted and with talk-in on 2m and 70cm. Doors open 1100 (1030 for disabled visitors and Bring & Buy). Details from Roy **G0TBY** on **(01924) 893321** (combined telephone and FAX number).

March 12: The Wythall Radio Club are holding their 15th Annual Radio & Computer Rally at Wythall Park, Silver Street, Wythall, near Birmingham. Doors open 1000 till 1600 and admission is only £1.50. Plenty of traders in three halls and a large marquee with bar and refreshment facilities on site plus a big Bring & Buy stand. Talk-in on S22. There will also be a unique free park and ride for easy and comfortable parking. Contact Chris **G0EYO** on **0121-246 7267** evenings, weekends for details, or FAX: **0121-246 7268** or E-mail chris@g0eyo.freeserve.co.uk



LM&S

As the 20th Century draws to a close, may I take this opportunity to thank the listeners who sent the details of their reception to me for inclusion in LM&S. They played a vital part in the preparation of the data and were much appreciated by me and no doubt the many readers who studied them.

With the approach of the 21st Century, I look forward to their continuing support and hope for a bumper crop of reports to mark the new Millennium! New contributors are always welcome. Wishing all readers and the contributors a Happy Christmas and good listening in the New Year.

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 September.

Whilst searching the band at 0120UTC on September 8, **Simon Hockenhuil** (E.Bristol) picked up a broadcast from Rikisutvarpid in Reykjavik via their 300kW outlet at Gufuskalar, W.Iceland on **189kHz**. He rated the transmission SINPO 24443.

The 'Multi Media Show', which is broadcast by R.Polonia (Polish R, Warsaw) in the short wave bands, has been attracting the attention of **Sheila Hughes** in Morden because there have been references to Polish Radio's new 1000kW l.w. transmitter, which is being constructed near Bydgoszcz and future plans for their reserve transmitter at Raszyn. At present, the intention is to frequency change the old Raszyn transmitter to **198kHz** when the new transmitter is brought into service on **225kHz**, but this proposal has met with objections from Scandinavian listeners because they enjoy listening to BBC R4.

Note: Some of the frequencies used by R.Polonia are detailed in the s.w. section herein.

Medium Wave Reports

There were no reports of m.w. broadcasts from stations in E.Canada and the USA reaching the UK at night during September. In contrast, the sky waves from quite a few of the m.w. stations in the Middle East, Africa, Europe and Scandinavia arrived here after dark - see chart.

Whilst visiting Scotland in mid-September, **Brian Keyte** (Gt.Bookham) searched the band during daylight for the ground waves from local radio stations. He found reception very good near Rhue by Ullapool, especially around breakfast time and in the early evening and logged some quite distant stations - see chart. He used the top strand of a barbed wire field fence as the main antenna for his AOR AR7030 receiver, but he also tried a loop which performed quite well. He noticed that the ILLR Yorkshire Dales Radio outlets on **936**

and **1413kHz** have basically the same programming and both now use the ident 'Fresh AM'.

Down in Dorset, **Bernard Curtis** (Stalbridge) has been picking up the ground waves from distant local radio stations during daylight with a rather novel home-made loop coupled to his Realistic DX400. He glued two Corn Flake packets together end on as a former for the main winding, which he wound around the outside edge. He then tuned it with a variable capacitor. A coupling winding was added to link the loop to his receiver. It has good directivity and performs well, as his entries in the chart show.

Early in October **Eddie Mc Keown** (Newry) spent a few days in Killarney, Co.Kerry. He took a portable receiver with him but reception proved to be rather disappointing. He says "Like Newry, it is in a valley but the hills are much bigger. Unfortunately my brief listening (approx 1730-1930UTC) had to be in the hotel and the concrete and steel were certainly not conducive to good reception. One surprise was my total inability to hear RTE R-2. Most of the high powers like Kvitsov or Marnach came through reasonably, while Spain was, of course, highly represented. France was extremely disappointing". Full details of his reception will be included in the m.w. chart next month.

Short Wave Reports

During September the **25MHz (11m)** band was used only by R.France International. Their daily transmission (500kW) on **25.820** (Fr 0900-1300) was beamed towards E/C Africa, but it could be received in some areas of the UK via back scatter and other modes. It was rated 33333 at 0935 in Stalbridge; 45333 at 1000 by **John Slater** in Scalloway, Shetland; 25343 at 1022 by **Fred Wilmshurst** in Northampton; 15432 at 1039 by **Fred Pallant** in Storrington; 25222 at 1137 in Newry; 15522 at 1210 in E.Bristol.

In contrast, the **21MHz (13m)** band was put to good use by many broadcasters. Noted before noon were the Voice of Russia **21.790** (Eng to Australia 0500-0900), rated 44434 at 0805 in Morden; R.Australia via Shepparton **21.725** (Eng to Pacific areas 0200-0900) 34443 at 0845 by **Tom Winzor** in Plymouth; Vatican R, Italy **21.850** (It, Fr, Eng to Asia? 1000-1029) 22222 at 1000 by **Thomas Williams** in Truro; R.Australia via Shepparton **21.820** (Eng to Asia 0900-1400) 35533 at 1010 by **David Edwardson** in Wallsend & 44333 at 1020 in Scalloway; Rai Rome **21.520** (It to Africa 0600-1300) 35444 at 1027 in Northampton; RFI via Issoudun **21.620** (Fr to E.Africa 0900-1200) 15532 at 1100 in E.Bristol; R.Sweden, Stockholm **21.810** (Eng to N.America 1130-1200) 33333 at 1150 by **Stan Evans** in Herstmonceux.

After mid-day, the BBC via Ascension Is **21.660** (Eng to Africa 1100-1700) was noted as SIO 444 at 1300 by **Tom Smyth** in Co.Fermanagh; UAER, Dubai **21.605** (Eng to Eur 1330-1350) 44333 at 1331 in Newry; Channel Africa via Meyerton, S.Africa **21.530** (Eng to Africa 1300-1455? Sat/Sun) 43334 at 1420 in Stalbridge; HCJB Quito, Ecuador **21.455** (Eng [u.s.b. + p.c.]) 32233 at 1502 by **Martin Venner** in St.Austell; Voz Christiana, Chile **21.500** (Sp to N.America 1100-2100?) 44444 at 1520 by **David Hall** in Morpeth; BBC via Ascension Is **21.490** (Eng to C.Africa 1500-1645) 34433 at 1522 by **Rhoderick Illman** in Oxted; VOA via Sri Lanka? **21.815** (Eng to Africa 1600?-1700?) 44434 at 1634 by **Vera Brindley** in Woodhall Spa; WYFR via Okeechobee, USA **21.525** (Eng, Ar, Port?, Fr to Eur, Africa 1600-2045) 22222 at 1910 by **Robert Beason** in Nottingham; R.Netherlands via Bonaire, Ned.Antilles **21.590** (Eng, Du to Africa 1830-2025) 32222 at 2040 by **Robert Hughes** in Liverpool.

Long Wave Chart

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

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

Listeners:-

- (A) Simon Hockenhuil, E.Bristol.
- (B) Sheila Hughes, Morden.
- (C) Brian Keyte, while at Rhue by Ullapool.
- (D) George Millmore, Wootton, IoW.
- (E) Fred Pallant, Storrington.
- (F) Tom Smyth, Co.Fermanagh.
- (G) Phil Townsend, E.London.
- (H) Fred Wilmshurst, Northampton.

Good reception was noted in the **18MHz (15m)** band from R.Sweden, Stockholm **18.960** (Eng to N.America 1123-1200), rated 55454 at 1142 in Newry; R.Denmark via R.Liberty **18.950** (Da to Africa 1930-1955) 45444 at 1945 in Scalloway; also Christian Science BC via WSHB Cypress Coast **18.910** (Fr, Eng to E/C.Africa 1600-?) 43333 at 2115 in Stalbridge.

Broadcasts from many areas reached the UK in the **17MHz (16m)** band. Before noon, R.Australia via Shepparton **17.750** (Eng to Asia 0000-0500, 0600-0800, 0630-1100) was 35433 at 0645 in Herstmonceux; R.Austria Int via Moosbrunn **17.870** (Eng to M.East 0730-?) was rated 44444 at 0731 by Francis Hearne in N.Bristol; Africa No.1, Gabon **17.630** (Fr to W.Africa 0700-1600) 24232 at 1047 in Storrington; R.Pakistan, Islamabad **17.835** (Eng to Eur 1100-1120) 45444 at 1103 by Tony Hall in Freshwater Bay, IoW; R.Bulgaria, Sofia **17.500** (Eng to Eur 1100-1200) 55544 at 1140 in Northampton.

After mid-day the Voice of Turkey, Ankara **17.830** (Eng to ? 1230-1325) was 54444 at 1325 in Plymouth; R.Romania Int **17.720** (Eng to Eur, N.America 1300-1356) 43343 at 1327 in St.Austell; AWR via Slovakia **17.525** (Eng to Asia 1430-1500) 44444 at 1440 in Newry; Israel R, Jerusalem **17.545** (Heb [Home Sce rly] to W.Eur, N.America) 54454 at 1805 in Liverpool; VOA via Morocco **17.895** (Eng to Africa 1600-1900) 35433 at 1840 in E.Bristol; R.New Zealand **17.675** (Eng to Pacific areas 1958-0458) 21122 at 2001 in Nottingham; HCJB Quito, Ecuador **17.660** (Eng to Eur 1900-2200) 34333 at 2053 in Woodhall Spa; BBC via Greenville, USA **17.715** (Eng to C.America 2115-2130) 34333 at 2123 in Oxted; WHRI via Maine, USA **17.650** (Eng to Eur, M.East, Africa 1600-2300?) 43333 at 2255 in Morden.

The propagation conditions in the **15MHz (19m)** band are often more reliable than in the higher frequencies, consequently many broadcasters take advantage of them. The occupants before noon include R.Kuwait **15.110** (Eng to SE.Asia 0500-0800), rated 33333 at 0605 in Herstmonceux; R.Slovakia Int **15.460** (Eng to Australia 0700-0730) 44444 at 0720 in Woodhall Spa; R.Australia via Shepparton **15.415** (Eng to Asia 0100-0400, 0600-0900) 22222 at 0820 in Truro; R.Australia via Shepparton **15.515** (Eng to SW/S.Pacific, N.America 0200-0900) 35543 at 0850 in Wallsend; China R.Int via ? **15.210** (Eng to Australia 0900-1000) 43333 at 0930 in Morden; BBC via Antigua **15.220** (Eng to C.America 1100-1400) 32223 at 1110 in Stalbridge; R.Bulgaria **15.700** (Eng to W.Eur 1100-1200) 44444 at 1146 in Newry.

During the afternoon R.Canada Int via Sines, Portugal **15.325** (Eng, Fr to Eur, M.East, Africa 1330-1500) was rated 44444 at 1330 by Clare Pinder in Appleby; VOA via ? **15.255** (Eng to Eur, N.Africa 1400-1800?) 54444 at 1416 in Freshwater Bay; VOA via Woofferton, UK **15.205** (Eng to Eur, N.Africa, M.East 1500-1700) 24433 at 1518 in E.Bristol; China R.Int via ? **15.300** (Eng to Eur? 1700-1800) 54444 at 1730 in Plymouth; VOA via Botswana? **15.445** (Eng to Africa 1600-1800, 1900-2200) 44444 at 1747 in St.Austell.

Later, R.Philipinas, Tinang **15.190** (Pil to Asia 1730-1930) was 21122 at 1845 in Nottingham; RCI via Sackville **15.325** (Fr, Eng to Eur, Africa 1900-2200) 44333 at 1917 in Oxted; WWCR Nashville, USA **15.685** (Eng to N.America, Eur 1100-2200?) 34333 at 1935 in Morpeth; V of Indonesia, Jakarta **15.150** (Eng to Eur, Africa 2000-2100) 54454 at 2010 in Liverpool; LJB, Libya **15.415** (Ar [Home Svce relay]) 45454 at 2015 in Storrington; R.Romania Int **15.180** (Eng to N.America 2100-?) SIO 555 at 2100 in Co.Fermanagh; BBC via Ascension Is **15.400** (Eng to Africa 0800-1130, 1500-2300) 45544 at 2140 in Northampton; R.Taipei Int via WYFR **15.600** (Eng to Eur 2200-2300) 44333 at 2200 by Clare Pinder while in Glasgow.

In the **13MHz (22m)** band R.Austria Int via Moosbrunn **13.730** (Eng to Eur 0730-0800) was 55555 at 0747 in Plymouth; Swiss R.Int via Sottens **13.685** (Eng, It, Ger, Fr to Australasia 0830-1030) 33333 at 0830 in Truro; R.Australia via Shepparton **13.605** (Eng to Pacific 0800-1200) 25543 at

1059 in Wallsend; R.Prague, Czech Rep. **13.580** (Eng to Eur, Asia 1300-1330) 54444 at 1300 in Morden; R.Marti via ? **13.820** (Sp to Cuba) 34222 at 1440 in Scalloway; R.Kuwait via Kabd **13.620** (Ar to Eur, N.America 0930-1605) 44444 at 1520 in Stalbridge; R.Austria Int via Moosbrunn **13.730** (Eng to Eur, Africa, Asia 1630-1700) 44444 at 1647 in Woodhall Spa.

Later, AIR via Bangalore **13.780** (Eng to NW.Africa 1745-1945) was 42333 at 1825 in Liverpool; V of Turkey, Ankara **13.695** (Eng to Eur 1830-1918) 53333 at 1830 in Appleby; Croatian R, Zargreb **13.830** (Cr, Eng to N.America 1230-2100) 44444 at 1945 in Oxted; Swiss R.Int via Fr.Guiana? **13.770** (It, Ar, Eng, Ger, Fr to S.Africa 2000-2130) 33333 at 2017 in Nottingham; WWCR Nashville, USA **13.845** (Eng to Africa 1400-0100) 35333 at 2020 in Northampton; V of Vietnam, Hanoi **13.740** (Eng to Eur 2030-2100) SIO 333 at 2030 in Co.Fermanagh; R.Damascus, Syria **13.610** (Eng to Eur 2005-2105) 34443 at 2044 in Newry; RCI via Sackville, Canada **13.670** (Eng, Fr to Eur, Africa 1900-2200) 35322 at 2055 in E.Bristol; RCI via Sackville, Canada **13.650** (Fr, Eng to Eur, Africa 1900-2200) 54434 at 2122 in Freshwater Bay; RCI via Sackville, Canada **13.670** (Eng to USA, Mexico, Caribbean 2230-0000) 44444 at 2348 in St.Austell.

Good reception over long distances has been noted in the **11MHz (25m)** band. During the morning the BBC via

Continued on page 15.



Local Radio Chart

| Freq (kHz) | Station | ILR BBC | e.m.r.p (kW) | Listener | Freq (kHz) | Station | ILR BBC | e.m.r.p (kW) | Listener |
|------------|-----------------------|---------|--------------|---------------|------------|----------------------|---------|--------------|-----------------|
| 558 | Spectrum, London | I | 0.80 | G,J | 1170 | 1170AM, High Wycombe | I | 0.25 | D,I,J |
| 585 | R.Solway | B | 2.00 | A,E,F | 1242 | Capital G, Maidstone | I | 0.32 | E,G,I |
| 603 | Capital G, Litt'brne | I | 0.10 | A,D,E,G,I,J | 1251 | C.G Amber, Bury StEd | I | 0.76 | A,F,I |
| 630 | R.Bedfordshire(3CR) | B | 0.20 | B,D,E,G,I,J | 1260 | Marcher G, Wrexham | I | 0.64 | F |
| 630 | R.Cornwall | B | 2.00 | A,B,G | 1260 | SabrasSnd, Leicester | I | 0.29 | F,J |
| 657 | R.Clywd | B | 2.00 | A,B,F,G,H,I | 1278 | Cl.Gold 1278 W.York | I | 0.43 | A |
| 657 | R.Cornwall | B | 0.50 | A,G,K | 1296 | Radio XL, Birmingham | I | 5.00 | A,F,G,J |
| 666 | Cl.Gold 666, Exeter | I | 0.34 | A,B,G,J | 1305 | Magic AM, Bamsley | I | 0.15 | A,F |
| 666 | R.York | B | 0.80 | A,D,F,I | 1305 | Premier via ? | I | 0.50 | E,F,G,J |
| 729 | BBC Essex | B | 0.20 | E,G,J | 1323 | Capital G, Southwick | I | 0.50 | D,E,F,G,I,* |
| 738 | Hereford/Worcester | B | 0.037 | A,D,I,J | 1323 | SomersetSnd, Bristol | B | 0.63 | A,F |
| 756 | R.Cumbria | B | 1.00 | A,F | 1332 | Premier, Battersea | I | 1.00 | E,F,G |
| 756 | The Magic 756, Powys | I | 0.63 | A,B,D,F,G,J | 1332 | Cl.Gold 1332, Pr'bo | I | 0.60 | A,F,J |
| 765 | BBC Essex | B | 0.50 | E,F,G | 1359 | Breeze, Chelmsford | I | 0.28 | F |
| 774 | R.Kent | B | 0.70 | E,G,I,J | 1359 | Cl.Gold 1359, C'try | I | 0.27 | F |
| 774 | Cl.Gold 774, Glos | I | 0.14 | G | 1359 | R.Solent | B | 0.85 | F,G |
| 792 | Cl.Gold 792, Bedford | I | 0.27 | E,G,I,J | 1359 | Touch AM, Cardiff | I | 0.20 | F |
| 792 | R.Foyle | B | 1.00 | A,F | 1368 | R.Lincolnshire | B | 2.00 | F,G,I |
| 801 | R.Devon & Dorset | B | 2.00 | A,C,F,G | 1368 | Southern Counties R | B | 0.50 | E,F,J |
| 828 | Cl.Gold 828, Luton | I | 0.20 | E,I,J | 1368 | Wiltshire Sound | B | 0.10 | G |
| 828 | Magic 828, Leeds | I | 0.12 | A | 1377 | Asian Sd, Rochdale | I | 0.10 | A,* |
| 828 | 2CR CG, Bournemouth | I | 0.27 | C,E,G | 1413 | R.Gloucester via ? | B | ? | B,F,J |
| 837 | R.Cumbria/Furness | B | 1.50 | A,F | 1413 | Premier via ? | I | 0.50 | E,F |
| 837 | Asian Netwk Leics | B | 0.45 | D,E,F,G,I,J | 1413 | Fresh AM, Skipton | I | 0.10 | A,F |
| 855 | R.Devon & Dorset | B | 1.00 | B,G,K | 1431 | Breeze, Southend | I | 0.35 | E,F,I |
| 855 | R.Lancashire | B | 1.50 | A,F | 1431 | Cl.Gold, Reading | I | 0.14 | A,F,G,J |
| 855 | R.Norfolk, Postwick | B | 1.50 | E,I | 1449 | R.Peterboro/Cambs | B | 0.15 | A,F,G,J |
| 855 | Sunshine 855, Ludlow | I | 0.15 | B,C,F,J | 1458 | R.Cumbria | B | 0.50 | A,F |
| 873 | R.Norfolk, W.Lynn | B | 0.30 | E,G,I,J | 1458 | R.Devon & Dorset | B | 2.00 | A,F,G |
| 936 | Brunel CG, W/Wilts | I | 0.18 | G | 1458 | 1458 Lite AM Manch' | I | 5.00 | FH* |
| 936 | Fresh AM, Hawes | I | 1.00 | A,F | 1458 | R.Newcastle | B | 2.00 | F |
| 945 | Cl.Gold GEM, Derby | I | 1.20 | A,F | 1458 | Sunrise, London | I | 50.00 | E,F,G,J |
| 945 | Capital G, Bexhill | I | 0.75 | E,F,G,I | 1458 | Asian Netwk Langley | B | 5.00 | J |
| 954 | Cl.Gold 954, Torquay | I | 0.32 | B,G,F | 1476 | CountySnd, Guildford | I | 0.50 | C*,D,E,F,G,I,J |
| 954 | Cl.Gold 954, H'ford | I | 0.16 | B,J | 1485 | Cl.Gold, Newbury | I | 1.00 | C,F |
| 963 | Asian Sd, E.Lancs | I | 0.80 | A,F | 1485 | R.Humberside (Hull) | B | 1.00 | F |
| 963 | Liberty R, Hackney | I | 1.00 | D,E,F,G,J | 1485 | R.Merseyside | B | 1.20 | A,F,H* |
| 972 | Liberty R, Southall | I | 1.00 | B,C,D,E,F,G,J | 1485 | Southern Counties R | B | 1.00 | E,G,I |
| 990 | R.Aberdeen | B | 1.00 | F | 1503 | R.Stoke-on-Trent | B | 1.00 | A,C*,D*,F,G,I,* |
| 990 | R.Devon, E.Devon | B | 1.00 | A,G | 1521 | Breeze, Reigate | I | 0.64 | E,F,G,I |
| 990 | Cl.G, Wolverhampton | I | 0.09 | F,J | 1530 | R.Essex, Southend | B | 0.15 | G,I |
| 999 | C.Gold GEM Nott'ham | I | 0.25 | F,J | 1530 | Cl.Gold W.Yorks | I | 0.74 | A,F,H* |
| 999 | Magic 9-99 Pstn | I | 0.80 | A,F | 1530 | Cl.Gold Worcester | I | 0.52 | B,F,G,J |
| 1017 | Cl.G, Shrewsbury | I | 0.70 | A,F | 1548 | Capital G, London | I | 97.50 | A,E,F,G |
| 1026 | R.Cambridgeshire | B | 0.50 | F,I,J | 1548 | Magic1548, Liverpool | I | 4.40 | F |
| 1026 | Downtown R, Belfast | I | 1.70 | A,F,H | 1548 | Forth AM, Edinburgh | I | 2.20 | F |
| 1026 | R.Jersey | B | 1.00 | A,G | 1557 | R.Lancashire | B | 0.25 | A,F |
| 1035 | RTL Country 1035 | I | 1.00 | B,E,F,G*,J | 1557 | Cl.Gold 1557, N.hant | I | 0.76 | F,I,J |
| 1035 | N.Sound 2, Aberdeen | I | 0.78 | A,F | 1557 | Capital G, S'o'ton | I | 0.50 | F,G |
| 1035 | West Sound AM, Ayr | I | 0.32 | F | 1584 | London Turkish R | I | 0.20 | F,G |
| 1107 | Moray Fth, Inverness | I | 1.50 | F | 1584 | R.Nottingham | B | 1.00 | D*,F |
| 1116 | R.Derby | B | 1.20 | A,F,I,J | 1584 | R.Shropshire | B | 0.50 | A,F |
| 1116 | R.Guernsey | B | 0.50 | G | 1584 | Tay, Perth | I | 0.21 | F |
| 1116 | Valley R, Ebbw Vale | I | 0.50 | F | 1602 | R.Kent | B | 0.25 | E,F,G,I |
| 1152 | Cl.G Amber, Norwich | I | 0.83 | F | | | | | |
| 1152 | Clyde 2, Glasgow | I | 3.06 | F | | | | | |
| 1152 | LBC 1152 AM | I | 23.50 | E,G | | | | | |
| 1152 | Pic'ly 1152, Manch'r | I | 1.50 | A | | | | | |
| 1152 | Cl.G, Birmingham | I | 3.00 | J | | | | | |
| 1161 | R.Bedfordshire(3CR) | B | 0.10 | I,J | | | | | |
| 1161 | Magic AM, Humberside | I | 0.35 | A,F | | | | | |
| 1161 | Southern Counties R | B | 1.00 | E,G | | | | | |
| 1161 | Tay AM, Dundee | I | 1.40 | F | | | | | |
| 1170 | Magic 1170, Stockton | I | 0.32 | A,F | | | | | |
| 1170 | Capital G, Portsmouth | I | 0.50 | D,E,G | | | | | |
| 1170 | Signal 2, Stoke-on-T | I | 0.20 | A,F | | | | | |
| 1170 | Swansea Snd, Swansea | I | 0.58 | F | | | | | |

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

Listeners:-

- (A) Robert Connolly, Kilkeel.
- (B) Bernard Curtis, Stalbridge.
- (C) Simon Hockenbuhl, E.Bristol.
- (D) Sheila Hughes, Morden.
- (E) Rhoderick Illman, Dxted.
- (F) Brian Keyte, while at Rhue by Ullapool.
- (G) George Millmore, Wootton, IoW.
- (H) Tom Smyth, Co.Fermanagh.
- (I) Phil Townsend, E.London.
- (J) Fred Wilmsurst, Northampton.
- (K) Tom Winzor, Plymouth.

£89.95

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.)

LOG PERIODIC MLP62

Freq. Range Receive 7 transmit
 50-1300MHz Length 2085mm
 Wide Band 16 Element directional beam which gives a maximum of 12-14Db Gain Forward and 17Db Gain Front to Back Ratio. Complete with mounting hardware.

£169.95

£49.95



ROTATOR AR-300XL

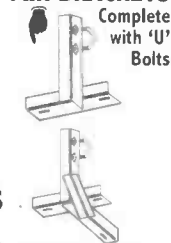
- * Rotation Torque-222Kg
 - * Vertical Load-45Kg
 - * Mast Size - 28-44mm
 - * Control Box-230v AC
 - * Cable-3 core
 - * Direct Compass Bearings
- (Ideal for Light to Medium Beams, i.e. LOG PERIODIC above.)*

6" STAND OFF BRACKET
 Complete with 'U' Bolts



£6.00

T&K BRACKETS
 Complete with 'U' Bolts



5' SWAGED POLES

- Heavy Duty Ali (1.2mm wall)
- SINGLE 1 1/4" £6.00
- SET OF FOUR 1 1/4" £19.95
- SINGLE 1 1/2" £9.00
- SET OF FOUR 1 1/2" £29.95

12" - £10.95
 18" - £14.95
 24" - £16.95

CONNECTORS

- PL259/9..... 0.75 each
- PL259/6..... 0.75 each
- PL259/7 for mini 8 1.00 each
- BNC (Screw Type) 8 1.00 each
- BNC (Solder Type) 8 1.00 each
- N TYPE for NS82.50 each
- N TYPE for RF213 ..2.50 each
- SO239 to BNC1.50 each
- PL259 to BNC2.00 each
- N TYPE to SO239 ..3.00 each

CABLE

- RG213 MILITARY 0.85 per mtr.
- MINI RF8 0.85 per mtr.
- RG58 STANDARD 0.35 per mtr.
- RG58 MILITARY 0.60 per mtr.

MICRO MAG MTS42

Freq. Range
 25-2.1 GHZ
 Length
 225 mm

WEATHER SATELLITE ANTENNA

TURNSTILE 137

Freq. 137.5 MHz
 Length 1000mm

This Antenna is designed for external use to receive weather satellite signals.

Complete with mounting hardware.

£39.95

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

£29.95

SUPER SCANAIR BASE (Airband)

(Stainless Steel)
 Freq. Range
 Receive 117-140MHz
 Transmit 117-140MHz
 Length 825mm
 Connector-N TYPE

This is a transmitting & receiving antenna designed for the aircraft frequency range.
(For the control tower & aircraft listener.)

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.)*

£49.95

SUPER SCAN STICK II

Freq. Range 0-2000 MHz.

Length 1500mm. 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)*

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)*

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.)*

£89.95

IVX 2000

Freq. Range Receive - 0-2000 MHz.

Transmit 50 - 52 MHz gain 2.00Dbd
 144 - 146 MHz gain 4.00 DbH
 430 - 440 MHz gain 6.00 Dbd
 Length 2.5 m.

For external use, but at a pinch can be used in the loft. It has been finely tuned to make this Antenna the best there is. It has stainless steel radials and hardware. *(THE BEST)*

MWA-H.F. WIRE ANTENNA

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

£29.95

SWP 2000 FREQ. 25 - 2000 MHz. Length 515mm.

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

£29.95

SWP HF30

Freq. Range 0.05-30MHz Length 770mm

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

£39.95

TRI SCAN III

Freq. Range 25-2000MHz
 Length 720mm

Desk Top Antenna for indoor use with triple vertical loaded coils. The tripod legs are helically wound so as to give it its own unique ground plane. Complete with 5mts of low loss coax and BNC plug. *(Ideal for Desk Top Use.)*

ROYAL DISCONE 2000

(Stainless Steel)
 Freq. Range Receive 25-2000MHz
 Transmit 50-52MHz

144-146MHz
 430-440MHz
 900-986MHz
 1240-1325MHz
 Length 1540mm
 Connector-N TYPE

The Ultimate Discone Design. 4.5DB GAIN OVER STANDARD DISCONE!

Highly sensitive, with an amazing range of transmitting frequencies, comes complete with mounting hardware & brackets *(The Best There is.)*

G. SCAN II

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

£19.95

HF DISCONE

Freq. Range 0.05-2000MHz
 Length 1840mm

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

£49.95

£39.95

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.)*

DISCONE

Freq. Range 70-700MHz
 Length 920mm

Internal or External use. (Classic Antenna Design). Comes complete with mounting hardware and brackets. *(Ideal for the Beginner.)*

£29.95

ADD £6 P&P PER ORDER

Ascension Is 11.765 (Eng to Africa 0300-0700) was SIO 222 at 0400 in Co.Fermanagh; KWHR World Harvest R via Hawaii **11.565** (Eng to ? 0700-1600) 34333 at 0727 in Woodhall Spa & **33323** at 0850 in Stalbridge; HCJB Quito, Ecuador **11.730** (Eng to Eur 0700-0900) 45554 at 0742 in Wallsend & 44444 at 0825 in Truro; R.Australia via Shepparton **11.880** (Eng to Indonesia 0900-1100) 23352 at 0900 by **Conway Longworth-Dames** in Brixham; FEBC via KFBS Marpi, N.Mariana Is **11.650** (Russ to Russia 0900-1100?) 44444 at 1005 in Scalloway; BBC via Skelton & Woofferton, UK **12.095** (Eng to Eur, N/W.Africa 0600-2000) 34233 at 1015 in Newry; R.Korea via Sackville, Canada **11.715** (Eng to E.USA 1030-1100) 44444 at 1030 in Appleby.

After mid-day R.Australia via Shepparton **11.660** (Various to Asia 1430-1700) was 25433 at 1430 in E.Bristol; R.Nederlands via Tashkent **12.075** (Eng to S.Asia 1430-1625) 43343 at 1625 in Liverpool; R.Nederlands via Flevo **11.655** (Eng to Africa 1730-2025) 43233 at 1825 in St.Austell; WWCR Nashville, USA **12.160** (Eng to N.America, Eur 1400?-2200) 33333 at 1936 in Morpeth; R.Kuwait via Kabd **11.990** (Ar 1615-1800, Eng 1800-2100 to

Eur, N.America) 43344 at 1800 by **Gerald Guest** in Dudley; V of Mediterranean, Malta via Russia **12.060** (Eng to Eur 1900-2000) 44444 at 1920 in Plymouth; R.Damascus, Syria **12.085** (Ger, Fr, Eng to Eur 1805-2105) 44444 at 2030 in Morden; BBC via Skelton, UK **11.835** (Eng to W.Africa 1900-2300) 21122 at 2031 in Nottingham; Egyptian R, Abis **12.050** (Ar [Home Svce relay] to Eur, N.America 0200-0000) 55544 at 2050 in Northampton; R.Bulgaria, Sofia **11.720** (Eng to Eur 2100-2200) 53443 at 2115 in Herstmonceux; AIR via Bangalore **11.620** (Eng, Hin to Eur 1745-2230) 34433 at 2116 in Oxted; R.Australia via Shepparton 11.880 (Eng to Pacific areas, N.America 1700-2200) 34333 at 2134 in Freshwater Bay; R.Bulgaria, Sofia **11.700** (Eng to N.America? 2300?-0000) SIO 444 at 2332 in N.Bristol.

Noted in the **9MHz (31m)** band before noon were Deutsche Welle via Kigali, Rwanda **9.565** (Eng to Africa 0400-0450) SIO 222 at 0400 in Co.Fermanagh; HCJB Quito, Ecuador **9.745** (Eng to W.America 0500-0700) 33333 at 0625 in Morpeth; R.New Zealand via Rangitaki, N.Island **9.700** (Eng to Pacific areas 0706-1015) 35333 at 0807 in Northampton; TWR Monte Carlo, Monaco **9.870** (Eng to Eur 0700?-0850?)



Medium Wave Chart

| Freq (kHz) | Station | Country | Power (kW) | Listener | Freq (kHz) | Station | Country | Power (kW) | Listener |
|------------|------------------------|--------------|------------|-------------------|------------|-------------------|--------------|------------|---------------------|
| 531 | Torshavn | Faeroe Is. | 100 | F | 1224 | Lelystad | Holland | 50 | G* |
| 531 | Berg | Germany | 20 | G* | 1233 | RFE via ? | Czech Rep. | ? | G*,K* |
| 531 | RNE5 via ? | Spain | ? | G*,H | 1233 | Virgin via ? | UK | ? | E,L |
| 531 | Beromunster | Switzerland | 500 | H,K*,L | 1242 | Marseille | France | 150 | C* |
| 540 | Ware | Belgium | 150/50 | E,G*,H,K,L | 1242 | Virgin via ? | UK | ? | G* |
| 540 | Sidi Bennour | Morocco | 600 | G*,H* | 1251 | Marcali | Hungary | 500 | G* |
| 549 | Les Trembles | Algeria | 600 | G*,H* | 1251 | Huisberg | Netherlands | 10 | G*,H* |
| 549 | Thurau (DLF) | Germany | 200 | G*,H,K,L | 1260 | SER via ? | Spain | ? | G*,H* |
| 558 | Espoo | Finland | 50 | G* | 1260 | Guildford (V) | UK | 0.5 | E |
| 558 | RNE5 via ? | Spain | ? | G*,H | 1269 | Neumunster(DLF) | Germany | 600 | G*,H*,K*,L* |
| 567 | Tullamore(RTE1) | Eire | 500 | E,F,H,J,K,L,M* | 1278 | Dublin/Cork(DLF) | Ireland | 10 | F,G*,H*,J,K*,L* |
| 567 | RNE5 via ? | Spain | ? | H* | 1287 | RFE via ? | Czech Rep. | 400 | G*,H*,K |
| 576 | Muhlacker(SDR) | Germany | 500 | G*,H | 1287 | Lerida(SER) | Spain | 10 | C*,G* |
| 576 | Riga | Latvia | 500 | H* | 1296 | Valencia(COPE) | Spain | 10 | H* |
| 576 | Barcelona(RNE5) | Spain | 50 | G*,H*,K* | 1296 | Orfordness(BBC) | UK | 500 | G*,K* |
| 585 | Paris(FIP) | France | 8 | E,H,K | 1305 | RNE5 via ? | Spain | ? | G* |
| 585 | Madrid(RNE1) | Spain | 200 | C*,G*,H*,K*,L* | 1314 | Kvitsoy | Norway | 1200 | G*,H*,K*,L |
| 585 | Dumfriess(BBCScot) | UK | 2 | F,G* | 1323 | Wbrunn (V.Russia) | Germany | 1000/150G* | K,L* |
| 594 | Frankfurt(HR) | Germany | 1000/400G* | H*,K*,L* | 1332 | Rome | Italy | 300 | G*,H*,L* |
| 594 | Oujda-1 | Morocco | 100 | H* | 1341 | Tarrasa(SER) | N.Ireland | 100 | C*,F,H*,J,K*,L* |
| 594 | Muge | Portugal | 100 | H* | 1341 | Lisnagarvey(BBC) | Spain | 2 | L* |
| 603 | Lyon | France | 300 | H | 1350 | Cesvaine/Kuldiga | Latvia | 50 | H* |
| 603 | Bucharest | Romania | 50 | H* | 1359 | Madrid(RNE-FS) | Spain | 600 | G*,H*,L* |
| 603 | Sevilla(RNE5) | Spain | 50 | H* | 1368 | Foxdale(Manx R) | I.O.M. | 20 | C*,F,G*,H*,J |
| 603 | Newcastle(BBC) | UK | 2 | F,G* | 1377 | Lille | France | 300 | E,G*,H,K,L |
| 612 | Athlone(RTE2) | Eire | 100 | F,H,J,K,L | 1386 | Bolshakovo | Russia | 2500 | C*,D*,E*,F,H*,K*,L* |
| 612 | Wavre | Belgium | 80 | E,G*,H,K,L | 1395 | TWR via Filake | Albania | 500 | C*,G* |
| 621 | Barcelona(OCR) | Spain | 50 | G*,H* | 1395 | Lopic | Netherlands | 120/40 | H,K,L* |
| 630 | Vigra | Norway | 100 | G*,H* | 1395 | RNE5 via ? | Spain | 2 | G* |
| 630 | Tunis-Djedeida | Tunisia | 600 | G*,H* | 1404 | Brest | France | 20 | G*,H*,K*,L* |
| 639 | Praha(Libice) | Czech | 1500 | G*,H*,K* | 1422 | Heusweiler(DLF) | Germany | 1200/600G* | H*,K*,L* |
| 639 | RNE1 via ? | Spain | ? | G*,H* | 1440 | Mamach(RTL) | Luxembourg | 1200 | D*,H*,J*,K*,L* |
| 648 | Drfordness(BBC) | UK | 500 | E,F,G*,H,K,L | 1440 | Damman | Saudi Arabia | 1600 | C* |
| 657 | Napoli | Italy | 120 | K* | 1449 | Squinzano (RAI) | Italy | 50 | H* |
| 657 | Madrid(RNE5) | Spain | 20 | G*,H*,L* | 1449 | Redmoss(BBC) | UK | 2 | F,H* |
| 657 | Wrexham(BBCWales) | UK | 2 | F,J,L | 1467 | Monte Carlo(TWR) | Monaco | 1000/400D* | H*,K*,L* |
| 666 | Messkirch(Rohrdt(SWF)) | Germany | 150 | G* | 1485 | SER via ? | Spain | ? | L* |
| 666 | Sitkunai(R.Vinius) | Lithuania | 500 | G* | 1485 | Carlisle(BBC) | UK | 1 | F |
| 666 | Lisboa | Portugal | 135 | H* | 1494 | Clermont-Ferrand | France | 20 | C*,E* |
| 675 | Lopic(R10 Gold) | Holland | 120 | O,E,G*,H,J,K,L | 1494 | St.Petersburg | Russia | 1200 | C*,O*,H*,K* |
| 684 | Sevilla(RNE1) | Spain | 500 | C*,G*,H*,K*,L* | 1503 | RNE5 via ? | Spain | ? | O* |
| 693 | Droitwich(BBC) | UK | 150 | H*,L | 1512 | Volveterm | Belgium | 300 | A,E*,H,K,L* |
| 702 | Hensburg(NOR) | Germany | 5 | G*,H* | 1521 | Kosice(Citazica) | Slovakia | 600 | H*,K* |
| 702 | TWR via Monte Carlo | Monaco | 300 | H* | 1521 | R.Mannes(SER) | Spain | 2 | H* |
| 702 | Sabaa-Ajou | Morocco | 140 | G* | 1530 | Vatican R | Italy | 150/450 | C*,D*,E*,F,H*,K*,L* |
| 711 | Remes 1 | France | 300 | E,G*,H,K,L | 1539 | Mainflinger(ERF) | Germany | 350/700 | C*,E*,H*,K*,L* |
| 711 | Laayoune | Morocco | 600 | H* | 1557 | Nice | France | 300 | E* |
| 720 | Lisnagarvey(BBC4) | N.Ireland | 10 | F,H* | 1575 | Genova | Italy | 50 | H*,L* |
| 720 | Norte | Portugal | 100 | G* | 1575 | SER via ? | Spain | 5 | E* |
| 720 | Lots Rd_Ldn(BBC4) | UK | 0.5 | H,L | 1584 | SER via ? | Spain | 2 | O*,H*,L* |
| 729 | Cork(RTE1) | Eire | 10 | F,H*,J | 1593 | Holzkirchen(VQA) | Germany | 150 | C*,H*,K*,L* |
| 729 | RNE1 via ? | Spain | ? | G*,H*,L* | 1602 | SER via ? | Spain | ? | H* |
| 738 | Paris | France | 4 | D,H | 1602 | Vitoria(EI) | Spain | 10 | H*,K*,L* |
| 747 | Barcelona(RNE1) | Spain | 500 | G*,H*,K* | 1611 | Vatican R | Italy | 15 | F*,K* |
| 747 | Flevo(Hilv2) | Holland | 400 | E,G*,H,K,L* | | | | | |
| 756 | Braunschweig(DLF) | Germany | 800/200 | G*,H*,K* | | | | | |
| 756 | Bilbao(EI) | Spain | 5 | G*,K* | | | | | |
| 756 | Redruth(BBC) | UK | 2 | B,H | | | | | |
| 765 | Sottens | Switzerland | 500 | C,G*,H* | | | | | |
| 774 | Enniskillen(BBC) | N.Ireland | 1 | F,G*,J | | | | | |
| 774 | RNE1 via ? | Spain | ? | G*,H*,L* | | | | | |
| 783 | Lepzig(MDR) | Germany | 100 | G*,H*,K* | | | | | |
| 783 | Miramar(R.Porto) | Portugal | 100 | H* | | | | | |
| 783 | Dammam | Saudi Arabia | 100 | H* | | | | | |
| 792 | Limoges | France | 300 | C*,G* | | | | | |
| 792 | Linger(NDR) | Germany | 5 | H* | | | | | |
| 792 | Sevilla(SER) | Spain | 20 | H*,K* | | | | | |
| 792 | Londonderry(BBC) | UK | 1 | J | | | | | |
| 801 | Munchen-Ismaning | Germany | 300 | G*,K | | | | | |
| 801 | RNE1 via ? | Spain | ? | G*,H* | | | | | |
| 810 | Madrid(SER) | Spain | 20 | H* | | | | | |
| 810 | Westergien(BBCScot) | UK | 100 | F,H*,J,L* | | | | | |
| 819 | Batra | Egypt | 450 | H* | | | | | |
| 819 | Toulouse | France | 50 | G* | | | | | |
| 819 | S Sebastian(EI) | Spain | 5 | G*,H*,K* | | | | | |
| 828 | Rotterdam | Holland | 828 | G*,K | 1224 | Lelystad | Holland | 50 | G* |
| 837 | Nancy | France | 200 | G*,J* | 1233 | RFE via ? | Czech Rep. | ? | G*,K* |
| 837 | COPE via ? | Spain | ? | G*,H* | 1233 | Virgin via ? | UK | ? | E,L |
| 846 | Rome | Italy | 1200 | C*,E*,G*,H*,K* | 1242 | Marseille | France | 150 | C* |
| 855 | Berlin | Germany | 100 | G* | 1242 | Virgin via ? | UK | ? | G* |
| 855 | RNE1 via ? | Spain | ? | G*,H*,L* | 1251 | Marcali | Hungary | 500 | G* |
| 864 | Santah | Egypt | 500 | G*,H* | 1251 | Huisberg | Netherlands | 10 | G*,H* |
| 864 | Paris | France | 300 | C,E,H,K,L | 1260 | SER via ? | Spain | ? | G*,H* |
| 864 | St.Petersburg(TWR) | Russia | ? | G* | 1260 | Guildford (V) | UK | 0.5 | E |
| 873 | Frankfurt(AFN) | Germany | 150 | C,G*,H*,K* | 1269 | Neumunster(DLF) | Germany | 600 | G*,H*,K*,L* |
| 873 | Zaragoza(SER) | Spain | 20 | G*,H* | 1278 | Dublin/Cork(DLF) | Ireland | 10 | F,G*,H*,J,K*,L* |
| 873 | Enniskillen(R.UJ) | UK | 1 | F,G*,J | 1287 | RFE via ? | Czech Rep. | 400 | G*,H*,K |
| 882 | COPE via ? | Spain | ? | G* | 1287 | Lerida(SER) | Spain | 10 | C*,G* |
| 882 | Washford(BBCWales) | UK | 100 | O*,E,F,G*,H,J,K,L | 1296 | Valencia(COPE) | Spain | 10 | H* |
| 891 | Algiers | Algeria | 600/300 | G*,H*,J* | 1296 | Orfordness(BBC) | UK | 500 | G*,K* |
| 900 | Milan | Italy | 600 | C*,E*,G*,H*,K* | 1305 | RNE5 via ? | Spain | ? | G* |
| 900 | COPE via ? | Spain | ? | G* | 1314 | Kvitsoy | Norway | 1200 | G*,H*,K*,L |
| 909 | Lisnagarvey(BBC5) | N.Ireland | 10 | J | 1323 | Wbrunn (V.Russia) | Germany | 1000/150G* | K,L* |
| 909 | B'mans Pk(BBC5) | UK | 140 | H,L | 1332 | Rome | Italy | 300 | G*,H*,L* |
| 918 | Domzale | Slovenia | 600/100 | C,G*,H*,K* | 1341 | Tarrasa(SER) | N.Ireland | 100 | C*,F,H*,J,K*,L* |
| 918 | Madrid(R.Int) | Spain | 20 | G*,H* | 1341 | Lisnagarvey(BBC) | Spain | 2 | L* |
| 927 | Wolvertem | Belgium | 300 | E,G*,H,K,L | 1350 | Cesvaine/Kuldiga | Latvia | 50 | H* |
| 936 | Bremen | Germany | 100 | G*,H* | 1359 | Madrid(RNE-FS) | Spain | 600 | G*,H*,L* |
| 936 | Venezia | Italy | 20 | H* | 1368 | Foxdale(Manx R) | I.O.M. | 20 | C*,F,G*,H*,J |
| 945 | Toulouse | France | 300 | C | 1377 | Lille | France | 300 | E,G*,H,K,L |
| 954 | Bmo (CRo2) | Czech Rep. | 200 | G*,H* | 1386 | Bolshakovo | Russia | 2500 | C*,D*,E*,F,H*,K*,L* |
| 954 | Madrid(CI) | Spain | 20 | G*,H* | 1395 | TWR via Filake | Albania | 500 | C*,G* |
| 963 | Sofia | Bulgaria | 150 | H* | 1395 | Lopic | Netherlands | 120/40 | H,K,L* |
| 963 | Pori | Finland | 600 | G*,H*,L* | 1395 | RNE5 via ? | Spain | 2 | G* |
| 963 | Tir Chonail | Eire | 10 | F | 1404 | Brest | France | 20 | G*,H*,K*,L* |
| 972 | Hamburg(NDR) | Germany | 300 | G*,H*,L* | 1422 | Heusweiler(DLF) | Germany | 1200/600G* | H*,K*,L* |
| 972 | RNE1 via ? | Spain | ? | G* | 1440 | Mamach(RTL) | Luxembourg | 1200 | D*,H*,J*,K*,L* |
| 981 | Alger | Algeria | 600/300 | G*,H*,K*,L* | 1440 | Damman | Saudi Arabia | 1600 | C* |
| 990 | Berlin | Germany | 300 | G*,H*,K | 1449 | Squinzano (RAI) | Italy | 50 | H* |
| 990 | R.Bilbao(SER) | Spain | 10 | G*,H* | 1449 | Redmoss(BBC) | UK | 2 | F,H* |
| 990 | R.Bilbao(SER) | UK | 1 | G*,J* | 1467 | Monte Carlo(TWR) | Monaco | 1000/400D* | H*,K*,L* |
| 990 | Tywyn(BBC) | UK | 1 | F | 1485 | SER via ? | Spain | ? | L* |
| 999 | Schwern (RIAS) | Germany | 20 | G* | 1485 | Carlisle(BBC) | UK | 1 | F |
| 999 | Madrid(COPE) | Spain | 50 | G*,K*,L* | 1494 | Clermont-Ferrand | France | 20 | C*,E* |
| 1008 | Madrid(Hilv-5) | Holland | 400 | E,G*,H,K,L* | 1494 | St.Petersburg | Russia | 1200 | C*,O*,H*,K* |
| 1017 | Rheinsender(SWF) | Germany | 600 | G*,H*,K | 1503 | RNE5 via ? | Spain | ? | O* |
| 1017 | RNE5 via ? | Spain | ? | H* | 1512 | Volveterm | Belgium | 300 | A,E*,H,K,L* |
| 1026 | Graz-Dobl | Austria | 100 | G* | 1521 | Kosice(Citazica) | Slovakia | 600 | H*,K* |
| 1026 | SER via ? | Spain | ? | H* | 1521 | R.Mannes(SER) | Spain | 2 | H* |
| 1035 | Lisbon(Prog3) | Portugal | 120 | G* | 1530 | Vatican R | Italy | 150/450 | C*,D*,E*,F,H*,K*,L* |
| 1044 | Dresden(MDR) | Germany | 20 | G*,H* | 1539 | Mainflinger(ERF) | Germany | 350/700 | C*,E*,H*,K*,L* |
| 1044 | Sebba-Ajou | Morocco | 300 | H* | 1557 | Nice | France | 300 | E* |
| 1044 | SER via ? | Spain | ? | G* | 1575 | Genova | Italy | 50 | H*,L* |
| 1053 | Talk R.UK via ? | UK | ? | E,H,J,L | 1575 | SER via ? | Spain | 5 | E* |
| 1062 | Kalundborg | Denmark | 250 | G*,H*,L* | 1584 | SER via ? | Spain | 2 | O*,H*,L* |
| 1062 | R.Uno via ? | Italy | ? | G*,H* | 1593 | Holzkirchen(VQA) | Germany | 150 | C*,H*,K*,L* |
| 1071 | Bilbao(EI) | Spain | 5 | H*,K,L* | 1602 | SER via ? | Spain | ? | H* |
| 1071 | Talk Radio UK via ? | UK | ? | E,H,J,L | 1602 | Vitoria(EI) | Spain | 10 | H*,K*,L* |
| 1080 | SER via ? | Spain | ? | G*,H* | 1611 | Vatican R | Italy | 15 | F*,K* |
| 1089 | Talk Radio UK via ? | UK | ? | E,H,J,L | | | | | |
| 1098 | Nitra(Jarok) | Slovakia | 1500 | C*,G*,H*,K,L | | | | | |
| 1107 | AFN via ? | Germany | 10 | C*,G* | | | | | |
| 1107 | Talk R.UK via ? | UK | ? | E,G*,H,J,L | | | | | |
| 1116 | Bari | Italy | 150 | K | | | | | |
| 1125 | La Louviere | Belgium | 20 | G*,H*,L* | | | | | |
| 1125 | Deanovec | Croatia | 100 | K | | | | | |
| 1125 | RNE5 via ? | Spain | | | | | | | |

Tropical Bands Chart

| Freq (MHz) | Station | Country | UTC | DXer |
|------------|-----------------------|---------------|------|-------------|
| 4.885 | KBC East Sca Nairobi | Kenya | 1918 | G,H,J |
| 4.890 | RFI Paris | via Gabon | 0405 | D,J |
| 4.900 | SLBC Colombo | Sri Lanka | 0005 | B |
| 4.915 | R.Anhanguera | Brazil | 0142 | B,C |
| 4.915 | GBC-1, Accra | Ghana | 2016 | B,G,H,J,N |
| 4.920 | R.Quito, Quito | Ecuador | 0325 | C |
| 4.930 | R.Internacional | Honduras | 0410 | D |
| 4.935 | KBC Gen Sca Nairobi | Kenya | 1918 | H |
| 4.950 | R.Nacional, Mulvenos | Angola | 2030 | D |
| 4.950 | AIR Srinagar | India | 0120 | B |
| 4.950 | VDA via Sao Tome | Sao Tome | 2018 | H,J,J,M,N |
| 4.955 | R.Nac. de Colombia | Colombia | 0425 | B,J |
| 4.960 | VDA via Sao Tome | Sao Tome | 0430 | J,M |
| 4.965 | R.Alvorada | Brazil | 0010 | B |
| 4.965 | Christian Voice | Zambia | 1831 | H,J |
| 4.975 | R.Uganda, Kampala | Uganda | 1832 | A,D,G,H,J,N |
| 4.980 | PBS Xinjiang, Urumqi | China | 0015 | B |
| 4.980 | Ecos del Torbes | Venezuela | 0102 | A,B,C,N |
| 5.005 | R.Nacional, Bata | Eq.Guinea | 1833 | H,J |
| 5.009 | R.TV Malagasy | Madagascar | 1655 | J |
| 5.010 | AIR Thiru'puram | India | 0110 | B |
| 5.020 | La V du Sahel, Niamey | Niger | 1940 | H,J,N |
| 5.025 | R.Rebelde, Habana | Cuba | 0412 | B,D |
| 5.025 | R.Uganda, Kampala | Uganda | 1834 | H,J |
| 5.035 | R.Aparecida | Brazil | 2259 | N |
| 5.035 | R.Bangui | C.Africa | 1810 | J |
| 5.047 | R.Togo, Lome | Togo | 1834 | F,G,H,J,N |
| 5.050 | R.Tanzania | Tanzania | 1840 | H,J |
| 5.055 | RFD Cayenne(Matoury) | French Guiana | 0432 | B,J |
| 5.060 | PBS Xinjiang, Urumqi | China | 0015 | B |
| 5.075 | Caracol Bogota | Colombia | 0120 | B,D,F |
| 5.100 | R.Liberia, Totota | Liberia | 2150 | J,N |

| | |
|---------|---------------------------------|
| DXers:- | |
| (A) | Robert Beason, Nottingham. |
| (B) | Robert Connolly, Killeel. |
| (C) | David Edwardson, Wallsend. |
| (D) | David Hall, Morpeth. |
| (E) | Simon Hockenfull, E.Bristol. |
| (F) | Sheila Hughes, Morden. |
| (G) | Rhoderick Illman, Dxted. |
| (H) | Fred Pallant, Storrington. |
| (I) | Clare Pinder, while in Appleby. |
| (J) | John Slater, Scalloway. |
| (K) | Tom Smyth, Co.Fermanagh. |
| (L) | Phil Townsend, E.London. |
| (M) | Martin Venner, St.Austell. |
| (N) | Fred Wilmshurst, Northampton. |

44444 at 0815 in St.Austell; KNLS Alaska **9.615** (Eng to F.East (0800-0900) 44333 at 0840 in Scalloway; Christian Science BC via WSHB Cypress Creek, USA **9.860** (? , Eng to Eur? 0800-1000) 44444 at 09?? in Truro; R.Vilnius, Lithuania **9.710** (Eng to Eur 0930-1000) 54444 at 0935 in Freshwater Bay; R.Nederlands via Wertachtal **9.860** (Eng to Eur 1030-1225) 55444 at 1150 in E.Bristol.

After mid-day, Polish R, Warsaw **9.525** (Eng to Eur 1200-1300) was 34343 at 1208 in Newry; R.Australia via Shepparton **9.500** (Eng to Asia 1430-2130) 43433 at 1644 in Woodhall Spa & 44444 at 2000 in Dudley; Africa No.1, Gabon **9.580** (Fr to C.Africa 0500-2200) 22342 at 1650 in Storrington; R.Vlaanderen Int, Belgium **9.925** (Eng to Eur, M.East 1730-1800) 54444 at 1752 in Plymouth; V of Russia **9.480** (Eng to Eur 1800-2000?) 44444 at 1800 in Morden; VOIRI Tehran, Iran **9.022** (Ger, Fr, Eng to Eur 1730-2030) 32233 at 1952 in Nottingham; BBC via Kranji, Singapore **9.740** (Eng to Oceania 1800-2200) 42232 at 2010 in Liverpool; R.Nederlands via Flevo **9.895** (Eng to Africa 1830-2025) SIO 444 at 2019 in N.Bristol; REE via Noblejas **9.595** (Eng to Eur? 2000-2100 Mon-Fri, 2100-2200 Sat/Sun) 44444 at 2100 in Appleby; VOA via Morocco? **9.760** (Eng to Eur, M.East, N.Africa 1700-2200?) 32432 at 2100 in Oxted; China R.Int via ? **9.535** (Eng to Eur 2000-2200) 54544 at 2110 in Herstmonceux; R.Cairo, Egypt **9.990** (Eng to Eur 2115-2245) 54445 at 2150 in Stalbridge; R.Nac del Paraguay **9.735** (Sp [Football] 0800-0400) 35453 at 0149 in Wallsend.

The **7MHz (41m)** band is used by some broadcasters to reach listeners in Europe. Those noted came from WYFR via Okeechobee, USA **7.355** (Eng 0600-0800, also to Africa), rated 54444 at 0629 in Plymouth; R.Japan via Woofferton, UK **7.230** (Jap, Eng 0500-0700) 55544 at 0640 in Herstmonceux; R.Denmark via R.Norway **7.180** (Da 0630-0700) 42333 at 0630 in Stalbridge; AWR via Forli? **7.230** (Eng 0930-1000 Sun) 44434 at 0948 in Freshwater Bay; Polish R, Warsaw **7.285** (Eng 1700-1800) 43333 at 1730 in Morden; R.Budapest, Hungary **7.170** (Eng 1900-1930) 44444 at 1920 in St.Austell; RCI via Skelton, UK **7.235** (Fr, Eng 1900-2200) 43444 at 1924 in Oxted; R.Yugoslavia **7.230** (Eng

1900-1930) 43443 at 1925 in Scalloway; R.Minsk, Belarus **7.210** (Russ) 53433 at 1931 in N.Bristol; R.Thailand, Udon Thani **7.195** (Eng 1900-2000) 32222 at 1935 in Truro; Vatican R, Italy **7.250** (Fr, Eng 1930-2010) 33333 at 2002 in Nottingham; R.Norway Int **7.485** (Norw 2000-2030) 55555 at 2018 in Northampton; V of Turkey **7.190** (Eng 2200-2245?) 43443 at 2200 in Newry; AIR via Bangalore **7.410** (Hi, Eng 1745-2230) SIO 333 at 2209 in N.Bristol.

Whilst beaming to other areas the V of Russia **7.180** (Eng to Americas) was SIO 322 at 0300 in Co.Fermanagh; WJCR Upton, USA **7.490** (Eng to E.USA 24hrs) was 33333 at 0555 in Morpeth.

Some of the many broadcasts to Europe in the **6MHz (49m)** band were noted in the reports: R.Nederlands via Julich **6.045** (Eng 1030-1225) rated 55544 at 1110 in Herstmonceux; R.Vlaanderen Int, Brussels **5.985** (Du, Eng 1100-1156) 35233 at 1130 in Newry; DW via Julich? **6.140** (Eng Service) 44444 at 0920 in Truro & 43344 at 1600 in Dudley; R.Vlaanderen Int, Brussels **5.910** (Eng 1730-1756) 55555 at 1730 in Glasgow; R.Yugoslavia, Belgrade **6.100** (Eng 1830-1900) 44333 at 1850 in Scalloway; Vatican R, Italy **5.880** (Various [Eng 1950-2010]) 44444 at 1856 in Oxted; R.Sweden via Horby **6.065** (Eng 1930-2000) 54444 at 1932 in Plymouth; RAI Rome **5.970** (Eng 1935-1955) 44444 at 1935 in E.Bristol; R.Polonia [Polish R], Warsaw **6.095** (Eng 1930-2025) 32222 at 1956 in Nottingham; China R.Int via Russia? **6.950** (Ger, Eng 1900-2157) 55544 at 2018 in Northampton; RCI via Rampisham, UK **5.995** (Fr, Eng 1900-2100) 55555 at 2048 in St.Austell; R.Yugoslavia, Belgrade **6.185** (Eng 2100-2125) 43333 at 2100 in Morden; R.Budapest, Hungary **6.025** (Eng 2100-2130) 33333 at 2101 in Woodhall Spa; RAI Rome **6.010** (Various to N.America?) SIO 333 at 2304 in N.Bristol.

Also noted were R.Taipei Int via WYFR **5.950** (Eng, Chin to N.America 0200-0600), rated SIO 433 at 0330 in Co.Fermanagh; WEWN Birmingham, USA **5.825** (Eng to N.America 2200-0900?) 55555 at 0445 in Morpeth; BBC via Delano, USA **6.175** (Eng to N/C.America 0500-0800) 32223 at 0815 in Stalbridge.



Greg Baker, PO BOX 3307, MANUKA, ACT 2603, AUSTRALIA

E-MAIL: greg@pcug.org.au

Bandscan Australia

This time I have news of moves to re-open the Cox Peninsula facilities of Radio Australia and more on digital radio and television and on talkback radio. I also have a few Internet radio sites and some reception reports.

Radio Australia

In light of the East Timor crisis there have been renewed calls for the Cox Peninsula facilities of Radio Australia (RA) to be re-activated. Readers will recall that budgetary cuts forced on the Australian Broadcasting Corporation (ABC) by the incoming Liberal National Party coalition government meant that Cox Peninsula was closed in 1997. This left Shepparton in central Victoria and Townsville in northern Queensland as the only RA transmission sites. As a by-product of this closure, transmissions were curtailed and transmissions to the western end of the Indonesian archipelago were made virtually impossible.

Despite the difficulty of broadcasting to ex-patriate Australians in East Timor and to Australian members of the post-election peace keeping force, the government has been unsympathetic to this proposal saying that the ABC would need to find the money itself to re-open Cox Peninsula facilities. The government of the Northern Territory has even offered to provide some assistance to a re-opened Cox Peninsula site, but the federal government appears to be simultaneously attempting to sell or lease the site.

Meanwhile, the RA has been trying to get a signal into East Timor and has at times cancelled other programming to free up frequencies and transmitter time for what it sees as a more pressing need. In addition, it has leased offshore transmission facilities in Taiwan and Singapore for up to six hours a day to extend RA's transmissions into Indonesia.

For the Australian troops, it has begun a one-hour per day special program of news, interviews, music and messages from families and friends. Called *Touch of Home*, frequencies are 9.500 and 11.660MHz at 0930, Timor local time. Also reported here is a United Nations request to re-open the Cox facilities for Radio UNAMET to broadcast UN messages and information into East Timor.

Radio Australia says that the Cox Peninsula site would take several weeks to re-activate because of the need for spare parts and servicing. Meanwhile, the Australian Communications Authority (ACA) has ordered Radio Australia to move from one of the frequencies it is using for East Timor broadcasts because it interferes with police broadcasts in northern and central Queensland.



HDTV

A small war has broken out between media interests over the introduction of digital television. In the one corner are most of the existing free to air television broadcasters who want the spectrum set aside for digital television to be used by high definition television. Of course, this uses more bandwidth than standard definition television and does not allow a great range of simultaneous datacasting.

In the other corner are those players keen to get some of the possible future datacasting action. Existing networks only want to see text-based services in available spectrum while the new players want to use the available spectrum to broadcast several standard definition channels plus video based datacasting. Shortly the government must decide which way they are going to go on this issue and hence which technologies will be introduced.

In the meantime, the competing interests are lobbying heavily in the corridors of Parliament House in Canberra. I will report next time about where the pendulum has landed.

It is also reported that state governments across Australia are keen to have some of the digital television spectrum action

to bring state government services to the community 24 hours a day. And in the wings, those who believe television's future is via the Internet bide their time.

Reception Reports

I have a few more reception reports this time. **Martyn Gardiner** from Portsmouth still finds time in a busy life to listen to Radio Australia. RA still sounds good on 9.500MHz in the evening at around 2100UTC, even on Martyn's portable radio with a 600mm telescopic antenna. The situation in East Timor seems to have dominated the news on RA in this period.

Kjell-Ingvar Karlsson from Upplands-Vsby in Sweden has been getting good RA reception too using a Lowe HF-150/PR-150/AP-150 combination with a 12m longwire and an MLB. He says that he listens from 0800-0900UTC on 15.415, 15.515 and 17.750MHz. He reports 17.750MHz with SIO 355 and 15.415MHz even earlier at 0620UTC at SIO 344-355.

QSL Radio Australia

I have had a query about QSLing Radio Australia. The address to send reception reports is **Radio Australia, GPO Box 428G, Melbourne 3001, Australia**. Don't forget to include the frequency, your location, the date, time, details of the program you heard sufficient to confirm that you really were listening to it and details of the signal strength and interference.

Talkback Radio

The talkback radio story reported last time is still with us. At writing, one of the enquiries I referred to last time was about to get under way. That enquiry by the Australian Broadcasting Authority (ABA) is reported to involve thirteen companies and organisations which had contracts with the main talkback radio host under investigation.

Also reported here is that a top executive from the Australian Bankers Association - the main organisation accused in the scandal - stood to gain \$A120,000 (£48,000) in the deal, apparently designed to give favourable on-air commentary. In addition, legal advice is that members of the public may make submissions and appear before the enquiry.

An ABC radio announcer who trains private company staff in media skills has been advised on avoiding conflicts of interest in on air interviews. Despite all the furore, Sydney a.m. radio station 2UE - the main station involved - has returned to the top of the radio ratings table after a slump as the initial news broke. And in Melbourne, a.m. talkback radio station 3AW is claiming that its audience share of 17.5% is one of the highest in the world.

Digital Radio

Some influential commentators here are saying that digital radio is dead even before it becomes a reality and the on-line services will overtake digital radio as the Internet, mobile 'phones, computers, televisions and car receivers converge. They say that the bandwidth problem is on the way to being solved and that wireless Internet access via hand-held terminals is not more than twelve months away.

Internet Radio

As if to prove the point, new Internet radio stations have begun to appear here. The latest is Radio Groove operating under the DigitalOne brand. It is at <http://www.radiogroove.com.au/> This station is planned to be the first of a number from this company targeting niche audiences.

Other on-line radio stations are being operated by Austereo at <http://ozchannel.com.au/> and Sydney radio station 2GB at <http://2gb.com/3.01/main.html> Spike Networks and Clear Communications are reputed to have started similar ventures but my web searches have yet to yield the URLs.

BROADCAST

Other News

The Government expects the stolen mobile 'phone black market to die out with the introduction of a lost and stolen mobile 'phone database. The database has been developed with the cooperation of the myriad of telephone companies that seem to have sprung up in the new privatised deregulated telecommunications environment. Mobile 'phone theft is reported to have cost Australia up to \$A100 million (£40 million). Pay television is now installed in one million Australian households and has captured 7.3% of all viewing.

And Finally

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

Web Watch

Find Radio Groove at <http://www.radiogroove.com.au/> Other on-line radio stations are being operated by Austereo at <http://ozchannel.com.au/> and Sydney radio station 2GB at <http://2gb.com/3.01/main.html>

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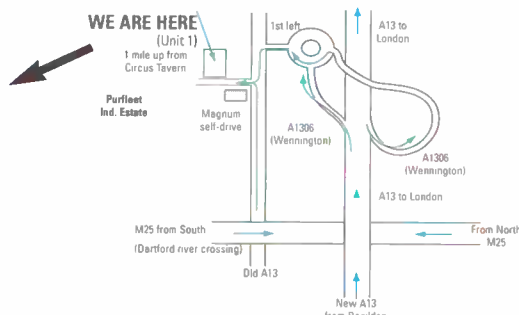
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Old Lessons, often repeated for the beginner

John Wilson is back this month with an extended review of AOR's new add-on Spectrum Display – the SDU5500.

It's been said many times that having a radio receiver is like having a window on the world, but it's also true that this is a very narrow window because you only want to listen to one signal at a time and a great deal of effort has gone into making your receiver capable of listening to that single signal and cutting out all others. It's rather like sitting on top of a high hill on a sunny day and looking at the distant horizon. What a wide and wonderful view.

Now put your head inside a cardboard box with a narrow vertical slit cut into the front face and scan the horizon again; this is exactly what your receiver selectivity does for you. It allows you to concentrate your gaze on a single tree on the horizon, but you have no idea what is all around.

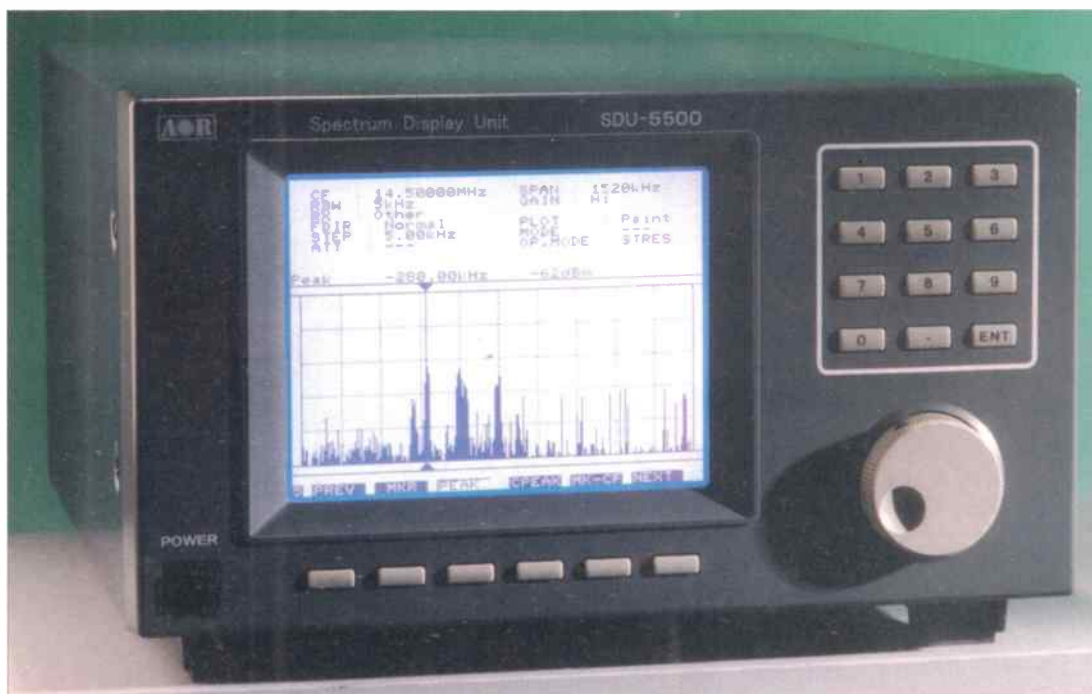
If the cardboard box is an analogy for your receiver, then the corresponding analogy for your uninterrupted view of the entire horizon is a spectrum analyser, and by spending large amounts of money, let's say anything from £10,000 to £80,000, you could get yourself an analyser which would provide a perfect view of the entire radio spectrum from almost d.c. to tens of GigaHertz. Fortunately, there is a simpler and cheaper alternative to contacting the sales force of Hewlett Packard or Rohde & Schwarz, because if you already own a wide range receiver such as those considered in this article, you have the spectrum analyser front-end in

your possession. Let's take a quick look at the general idea of spectrum analysis before we launch into the product detail.

A spectrum analyser is an instrument based on a wide range receiver in which the frequency to which it is tuned can be swept across the entire receiver range - rather like having an electronic tuning knob. So far, the spectrum analyser is just a receiver. However, the analyser presents the frequency display not as numbers but as the 'X' or horizontal axis on a display screen, whilst the signal strength at any frequency is not shown on an 'S' meter but as a deflection of the base line in the 'Y' or vertical direction. The spectrum analyser therefore draws a two dimensional graph showing frequency increasing from left to right (the horizon), with signals displayed as increasing height 'pips' (the trees on the horizon) from base line to top screen. (Does an Arabic analyser draw frequency from right to left?). The display device itself has traditionally (and rather obviously) been a c.r.t., but recent advances in l.c.d. technology have resulted in these being used as flat screen displays. The limiting factor in the choice of display has been the resolution capability of the device used, hence the dominance of the c.r.t.

What's It All Mean?

Now for a few of the terms and abbreviations commonly encountered when reading about or using spectrum analysers - and all this will become relevant when we get to the real purpose of this article/review. Centre frequency (CF) is the frequency represented by the centre of the display screen. Span (SP) is the frequency range covered by the entire X axis from left to right. If for example you had a centre frequency of 100MHz and a span of 20MHz, the analyser screen would represent the range from 90 to 110MHz, or if the span were increased to 50MHz, the range would be from 75 to 125MHz. This assumes that the frequency display is linear, but some advanced analysers will have facilities for displaying



A Broad View of AOR's SDU5500

frequency using a linear or logarithmic scale. In a way, Span describes the limits of your viewing horizon, whilst Centre Frequency is what you see when you look straight ahead.

Resolution bandwidth (RBW) is the equivalent of the bandwidth selection on a normal receiver, and represents the final window in the spectrum analyser receiver section. Selection of the resolution bandwidth is often a trade-off between the smallest signal you want to see and the speed at which the analyser sweeps across the tuning range. With wide RBW, sweep speed can be high, which is useful for covering a wide span, but for detailed signal analysis a narrower RBW has to be used which requires a slower sweep speed, and usually a narrower span. It's rather like using a zoom lens on a camera where in order to see the detail you have to narrow the field of view.

Some professional spectrum analysers actually use the term 'Zoom' to describe the function of reducing the frequency span and increasing the detail observed in a smaller RBW.

Now it's helpful to know at what frequency a signal of interest has appeared, and although the display screen is normally provided with a series of lines forming a graticule, usually ten divisions across the screen, the better analysers also provide a marker (MK or MKR) which is a bright line or cursor which can be moved along the frequency display by a rotary knob or cursor keys with a tracking frequency readout which tells you the frequency to which the marker is tuned. The marker also normally provides a reading of the amplitude of any signal selected. It's a facility which is almost like having a second receiver that you can tune across the entire displayed spectrum, and in the really clever analysers, the marker facilities are extended so that you can tell the analyser to re-set the display centre frequency to coincide with the marker frequency. The AOR SDU5500, which is the eventual subject of this review, has a clever extension to this which I will describe later.

The 'Y' display of signal amplitude is normally calibrated in dB, either referenced to the top or bottom of the screen, but in better instruments the amplitude measurements are accurate enough to be calibrated in absolute units such as dB referenced to one microvolt, or more practically in dBm which is referenced to one milliwatt. Note however that when converting dBm to voltage, this measurement has to be made in a specified impedance, which in r.f. engineering is usually 50Ω, but in classic telecommunications engineering is 600Ω.

Limited Bandwidth?

So what has this all got to do with the enthusiastic listener who may not have tens of thousands to spend on a spectrum analyser? Well, remember that the front-end of a spectrum analyser is a wide band receiver, so if you already have such a receiver, there are ways of adding spectrum analysis facilities by extracting a band

of signals not at r.f. but at the i.f. stage of the receiver, where they have already been converted to a fixed range such as 9 or 10.7MHz or whatever. There are, of course, some drawbacks to this approach particularly when considering spectrum analysis on an h.f. receiver, because the available scan width (span) available at the first i.f. is limited by the bandwidth of the receiver front-end tuned circuits. Most h.f. receivers have some front-end selectivity which may limit the span of the analyser to 1 or 2MHz, so analysis can only be carried out over a span less than this. However, when looking at a broadcast band or amateur band you only need to look at about 100kHz each side of the centre frequency to see what's going on around you so the limitation need not be as inhibiting as first thought would suggest. The first 'spectrum analysers' to be used in this way (circa 1940) were usually known as 'Panoramic Adapters' or 'Panadapters', and operated at the then common i.f. of 455kHz. It is truly amazing that these early units managed to achieve a sweep span of around 200kHz, and their amplitude readout was neither very wide nor accurate, but they were a revelation for the age in which they were introduced. Even as recently as the 1980s, manufacturers such as Trio-Kenwood produced panoramic adapters (which they re-christened 'Spectrum scopes') such as the SM-220 for the TS-820 transceiver series, and the SM-230 for the TS-830. These operated at a higher i.f. of 8.83MHz but, still couldn't produce much better span than the early panadapters because of the selective front-end of the matching receivers.

Different Story

When you come to wide range v.h.f. and u.h.f. receivers it's a different story, and spectrum display add-ons become a much more useful operating tool. This is simply because these receivers have much wider front-end selectivity than their h.f. cousins, and an i.f. output is usually provided which has sufficient bandwidth for driving an external TV decoder; for example in the case of the Icom IC-R8500 or AOR AR5000. Usable spectrum spans available at these i.f. outputs can be as wide as 10MHz which means that if you had a suitable spectrum analyser add-on connected you could continuously monitor spectrum activity up to 5MHz each side of the frequency to which the receiver is tuned, and get an instant indication of any signal which popped up, even though your receiver was still listening to a single different frequency. Enter AOR, the techno demons of hobby radio:-

AOR had already taken a first stab at spectrum displays with their SDU5000, but the new SDU5500 is quite a bit more versatile, and when used in conjunction with their own AR5000, turns a good wide band receiver into a really interesting listening tool. I was privileged to have the SDU5500 and the AR5000 on my bench together, and to add to the experience was also asked to check out the SDU5500 with the Icom R8500 as well. No-one in his right mind would turn down the opportunity to drive both a McLaren and a

"The new SDU5500 is quite a bit more versatile, and when used in conjunction with AOR's own AR5000, turns a good wide band receiver into a really interesting listening tool."

**Continued
on page 24...**



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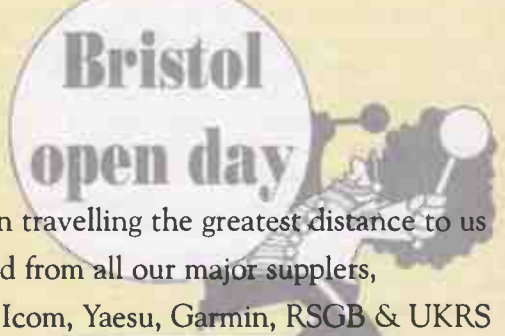
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Icom PCR100 & PCR1000
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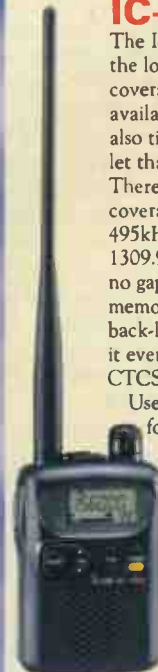


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A Broad View of AOR's SDU5500

...continued
from page 21

Ferrari in the same session, would they?

The SDU5500 is housed in a professional looking metal case finished in dark grey and measuring 225 x 124 x 240mm, with the front panel dominated by the display screen which is a high resolution liquid crystal display (l.c.d.) measuring just under 125mm square. Underneath the screen is a row of five rectangular 'soft' keys, the 'soft' referring to the fact that they have different functions according to what is displayed on the screen, rather than the feel of them when touched. Alongside the screen is a ten key pad used for entry of numerical values, such as span, centre frequency, etc., whilst underneath the keypad is a rotary spin wheel control used for multiple functions, but in normal use, is probably best used for control of the marker cursor on the display screen.

Power requirement is 12V d.c. at about 1A and the unit under test was supplied with an AOR mains power supply. Power connection is on the rear panel as are two 9-pin D-type connectors; one for connection to a companion receiver and the other for connection to a suitable RS-232 port on a computer. Finally, on the rear panel, is a BNC socket for the i.f. connection from the receiver in use. All very simple don't you think? Let's switch it on first of all without connecting to a receiver, and discover that despite its compact size, the SDU5500 is a complex device. The screen lights up with a white display on a blue background, with the trace running along the bottom of the screen, whilst the top third of the display is taken up with a comprehensive listing of all the functions in use at the time. With so many facilities being offered, control of the SDU5500 is provided by

seven menus, each of which designates the 'soft' keys below the main display. The menus are arranged in logical order and it takes no time at all to get used to flipping between them because each key is always clearly designated. When you get to know the menu layout, you can select the menu you want by simply pressing the appropriate number on the numeric keypad, and I found this much quicker than stepping through them in sequence using the 'PREV' and 'NEXT' keys.

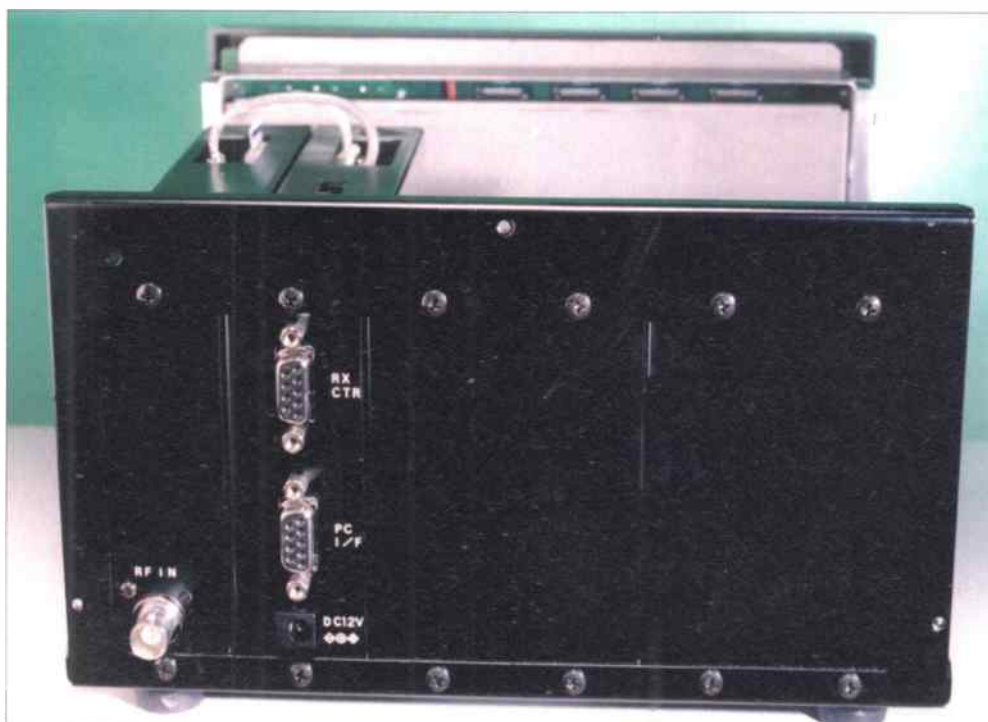
The SDU5500 defaults to a centre frequency of 10.7MHz to match the AOR (and Icom) receivers such as the AR5000 and the IC-R8500, and a resolution bandwidth of 30kHz, although a narrower 5kHz RBW is selectable. The span at switch on is whatever was last used before switch off, and this seems to be retained even when the power lead is disconnected. Maximum available span is 10MHz, that is 5MHz each side of centre frequency, and any span can be selected in 1kHz steps using menu 4 when in spectrum analyser mode. The first menu allows selection of any companion receiver, with AR5000, AR3000A, IC-R7100, IC-R8500, IC-R9000 and 'other', meaning any receiver not covered in the list. It would seem that AOR and Icom have very close agreement on remote control facilities in their respective receivers, and I will immediately say how very nice the combination of SDU5500 and IC-R8500 proved to be (at least to me). The IC-R8500 operates directly via its RS-232 socket, but the R-9000 and R-7100 require use of the Icom CT-17 interface adapter in this application. The joy of using one of the receivers listed is that there is two-way communication between the display and the receiver, and this extends control facilities considerably to the benefit of the user. Also from the first menu you can set the screen contrast,

change the background and choose whether you want a single line display or a 'paint' display which fills in the space underneath the graph to give a much more readable impression of occupied bandwidth of each received signal.

The second menu starts to allow you to control the companion receiver, including selection of tuning step, attenuator settings and receiver mode. Note though that these facilities are only available in the receivers in the 'companion' listing.

The third menu covers selection of the basic operating function of the SDU5500 from 'spectrum analyser', 'step resolution' and 'channel scope' modes. In 'SPECT' or spectrum analyser mode, the SDU5500 sweeps continuously over the displayed range, whereas in 'STRES' or step resolution mode, you can tell the unit to scan only

Not much
around the back.





in frequency steps appropriate to the frequency range being monitored, for example in 25kHz steps across the v.h.f. marine band. In this mode, the SDU5500 automatically calculates the correct frequency span.

Menu 4 gets you into frequency setting facilities in which you can key in a centre frequency for the spectrum analyser and the companion receiver will go to that frequency and place it at the centre of the display. So, for example, you could key in 125MHz and immediately see what is happening in the airband from 120 to 130MHz. The next menu puts you in control of the screen marker, and using the rotary knob on the SDU5500 lets you tune the marker cursor across the displayed spectrum, simultaneously displaying both marker frequency and signal amplitude. If a strong signal pops up, you can tune the marker to it, measure its frequency and strength and then use the next facility (MK-CF) to retune the receiver to the marker, place the new frequency at centre display and let you listen to it. Further marker facilities include forcing the marker to go to the highest peak on a scan and an intriguing extra facility enables the marker to freely hop about automatically locking on to the highest signal displayed and measuring its frequency and amplitude. Truly an 'intelligent' marker system.

Menu 6 controls the way in which the display trace is drawn and includes the most useful 'MAX' function in which the display holds the maximum signal recorded at any frequency. This allows you to leave the SDU5500 scanning the spectrum around the centre frequency whilst you go off and make a coffee. When you return you will find a display containing all the signals which have popped up during the time the receiver has been running. You can then use the marker facility to check these individually and tell the receiver to tune to each frequency in turn to find out what they were. For airband enthusiasts this is a particularly useful feature to

have. Finally, **Menu 7** offers quick methods of moving the centre frequency by predetermined steps up or down, and can be useful in stepping through a communications band in steps equal to the prevailing channel increments.

Of necessity, this can only be a brief overview of the main facilities offered in the SDU5500; the operating manual consists of over 40 pages of densely packed text which reveal that AOR, as usual, seem to have thought of everything. However, it also has to be said that I find the AOR manuals rather like pumpernickel bread; dense textured, full of good things, but taking some chewing through and occasionally indigestible.

Acid Test

How did it work as a complete station? I started, naturally enough, with AOR's own AR5000. Connection was so simple; a labelled RS-232 cable was provided which connected the rear of the SDU5500 to the rear of the AR5000, as did a coaxial lead also provided and labelled to carry the 10.7MHz i.f. signal. Switching on the SDU5500 and selecting "AR5000" from the "RX" menu put the display unit in control and disabled every control on the AR5000 panel except for the volume, squelch, and the main tuning knob and sub tuning knob. Mode, frequency, step size and so on were now all driven from the menus on the spectrum display unit. I had loads of fun keying in frequencies using the display unit key pad and taking a quick look around, for example at TV signals. I now know why no-one in Devon can receive Channel 5, because the SDU5500 told me that the received signal is at least 20dB down on all the other TV channels. I live in a location where C-130 Hercules aircraft fly in line-astern formations of three along a valley which puts them below the level of my house, and by using the SDU in 10MHz slices across the u.h.f. airband I was at last able to find their operating frequency and listen to what they had to say as they trundled along at zero

**The review
'hall of fame'.**

A Broad View of AOR's SDU5500



"At the end of a very extended session with the SDU5500 and the three receiver/transceiver units I was fortunate to have with it, I was quite overwhelmed with what I had experienced."

feet. I also listened to the marine v.h.f. band which is usually very quiet here even though I am close to the North Devon coast, and using the 'MAX' facility I did find the active frequencies in use after letting the display update over an hour or two. Most impressive and very useful.

I noticed when in the frequency range around 150MHz that when I had the AR5000 on maximum gain I could see and hear a raspy background noise, and this turned out to be emanating from the SDU5500 screen. It was my own fault for not using an outside antenna during these trials, and the indoor whip about two metres from the receiver was perfectly capable of picking up the self generated noise - so beware. Switching to an outdoor antenna removed the problem for me. The other thing I noticed was that if I used maximum gain on the AR5000, the receiver was, if anything, too sensitive. Going down by 10dB (controlled by the SDU-5500) made the display calibration correct (in dBm) and the background noise went down accordingly. This is how I would recommend using the AR5000 at frequencies below 500MHz.

Icom's Turn

Turning now to the IC-R8500 I found that AOR had provided another pair of leads properly labelled to fit between the receiver and spectrum display, and once again it was just a matter of connecting up and switching on. Unlike the AR5000, the R8500 retains control of its own front panel even when under SDU-5000 control, and this at first seemed rather more flexible in use. However, since it was possible to accidentally knock the buttons on the receiver and get into a state of confusion where the SDU didn't tell the same story as the receiver front panel, I changed my mind and understood why AOR had locked out the panel on the AR5000. On the odd occasion when the R8500 ceased to talk to the SDU, it was easy to restore control by just switching off the display and then switching it back on again, whereupon the display took over control.

Operation with the R8500 was just as easy as that with the AR5000, and it's a tribute to the manufacturers that they seem to have achieved such harmony. No doubt as other receivers hit the market, they may well incorporate the necessary i.f. outputs to allow them to be used with analysers such as the SDU5500. If they don't, it will be an opportunity lost, since the display unit really does add a lot to the usefulness and sheer enjoyment of using the receiver. Now what if the receiver in question has an i.f. other than 10.7MHz? AOR have provided the "OTHER" receiver in the set-up list, and with this you can set the SDU5500 centre frequency to, say, 8.83MHz to suit Kenwood equipment. This leads me to the thank you I owe to Kenwood UK for letting me have their demonstrator TS-870 transceiver so that I could

see how the SDU5500 performed as a close-in 'Panadaptor'.

No Control

In the 'other' receiver mode, you do not have control from the SDU5500 to the receiver or transceiver; the SDU simply acting as a close in spectrum analyser, but the results are impressive and better, dare I say it, than the earlier Kenwood monitors such as the SM-230, because the resolution of the SDU5500 is so much improved, and the level calibration is very accurate. In fact, with the TS-870 there is close agreement between the actual signal level at the antenna connector and the reading on the screen of the SDU5500. All you have to remember is that this calibration is in dBm rather than microvolts, but most operators these days are fairly comfortable with that.

In use, I found that using the SDU5500 and TS-870 in the middle of a busy amateur band gave me a constant check on activity, albeit in a span limited by the 8.83MHz bandwidth of the TS-870 to about 500kHz around centre frequency, but there is no doubt that the display would be a real help to keen contest operators, and the white on blue screen is easy to read in a hurry.

At the end of a very extended session with the SDU5500 and the three receiver/transceiver units I was fortunate to have with it, I was quite overwhelmed with what I had experienced, and I just knew that I would have difficulty in putting my impressions down in a form which a reader could understand. Looking back at my comment about the AOR handbook being difficult to digest, I realise that this article may be just as difficult to read if you don't have an SDU-5500 in front of you. Let me try and summarise by saying that the facilities offered by the SDU5500 when used in conjunction with any of the 'companion' receivers are quite exceptional. If you already own an AR5000, AR3000A, Icom R7100, R8500 or R9000 you should think very seriously about adding the SDU5500 to your station, because it really will extend your listening capabilities. If you are a keen amateur radio operator, and the SDU5500 will accept the i.f. of your receiver, again you would derive real benefit in using it as a panadaptor. If you are in semi-professional monitoring, you just have to have this magic box.

Further Extension

AOR always surprise me by pushing along at the front-end of development, and their skills are there for all to see - literally in the case of the SDU5500. And they haven't finished yet, because it is possible to control the SDU5500 via an RS-232 port from a PC, thus extending the facilities even further. All in all, I have had great pleasure in using the SDU5500 and I'm reluctant to part with it, particularly because I was also given use of an AR5000, IC-R8500 and TS-870 at the same time. My thanks go to AOR UK, Trio-Kenwood UK and Icom UK for being so generous, and if I were you I would ask AOR for full details of the SDU5500 before Christmas, so that you can get your requests in to Santa Claus in time.

Happy (visual) listening

SWM

Progression In The Clarke Belt

Roger Bunney updates last year's 'Satellite TV Special' with more tips and hints.

The December 1998 issue of *Short Wave Magazine* featured the first 'Satellite Special', which actually produced letters from readers, so at least we know that out there in reader-land someone is absorbing these lines of wisdom!

The December '98 special issue of *SWM* should be read in conjunction with the '99 special as material contained previously, for instance 'How Do You Start?', 'Satellite DXing - The Digital Way' won't be included this time around.

Progress

Played out on the satellite TV screens over the past 12 months has been a war, hurricanes, ships in trouble, executions, shootouts, residential flats explosions, the untimely death of King Hussein of Jordan and shortly after the King of Morocco, plus countless sporting events, plane crashes and an eclipse. All of these, and a hundred other events, have been viewed on relatively simple and inexpensive equipment in my back garden.

The top of my Ku-band dish is just visible over the top of a standard B&Q panel fence, which should suggest to anyone considering setting up a satellite viewing system that you certainly do not



Autumn Equinox approaches, so the Ku-band LNB assembly shadow minimises and heads for dish centre, look out for cooking your LNB! Note the cheap LNB weather cover made from a domestic polythene container. The cover length is minimised by using a 90° 'F' connector at the LNB output socket allowing the cable feeder to exit vertically downwards.

require a Goonhilly acreage and dish - and if you arrange your dish discretely on a ground stand framework, held down with sandbags, bricks and heavy weights (such as your wallet) - planning

permission isn't necessary, since the dish is not fixed on a permanent foundation.

Analogue To Digital

What has become obvious over the last 12 months is

that there has been a steady progression by satellite news linkers into digital from traditional analogue. Take for example the Kosovo conflict that climaxed into air attacks around March 24th. I first monitored footage of Serbian bombing via the 27.5°W Intelsat ex the 'Intrak-Hol/BT' SNG truck for the German ZDF network @ 11.480GHz-H, Symbol Rate (SR) 6116; Forward Error Correction (FEC) 3/4.

The footage was **digital** and with little exception, **all** news feeds coming out of the Balkans conflict were in **digital**. Regular readers of the satellite column are increasingly noting receptions, typically 12.567-H, SR 5678; FEC 3/4 (digital), rather than 12.567-H PAL, audio 6.60/7.20MHz (analogue).

Like it or not, the way forward with our satellite observations is digital. Fortunately, many broadcasters still operate partially or wholly in analogue, the BBC for example operate most of their SNG fleet digital, though both Northern Ireland and Scotland still use analogue and regularly appear on *Telecom 2c* @ 3°E.

Though I have always favoured the outside broadcast/news satellite links, hundreds of broadcasters are active in digital and many enthusiasts are entertained by scanning across the satellites for unusual broadcasts. With *Arabsat 3A* orbital at 26°E, most of the Middle East TV channels are represented at high levels into the UK and viewable on a 900mm dish. If you want to watch TV from the Yemen, the Sudan, Jordan or Kuwait it's easily accessed with just a small dish system.



The C-band LNB shadow at the Equinoxes approaches the centre of the dish. Note the protective LNB cover.



SITN is a New York TV facility company that provides satellite circuits and programme feeds. MCR = Master Control and IFB = Interrupted Foldback (a reverse but keyed programme circuit).

Continued on page 30...

SDU5500 - SPECT



AOR receivers and major items are capable of full computer control

Setting new standards, SDU5500 Spectrum Display Unit

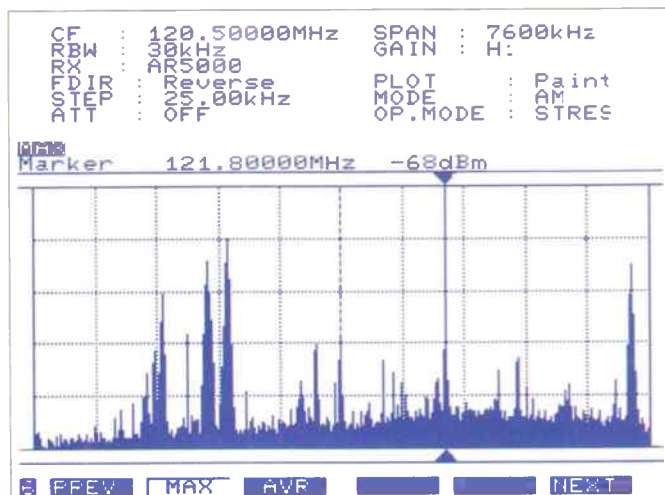
The SDU5500 is an 'all new' Spectrum Display Unit and a worthy successor to the SDU5000 (which offered practical and cost effective monitoring). Coupled to the AR5000 receiver, it provides a spectrum display of 10 MHz bandwidth anywhere between 10 kHz and 2600 MHz.

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.



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

| Receiver | |
|----------|----------|
| AR5000 | IC-R8500 |
| AR3000A | IC-R9000 |
| IC-R7100 | Other |



The SDU5500 supports a number of AOR and ICOM receivers, see above. In addition, the SDU5500 may be used with other receivers which offer a 10.7 MHz I.F. output with suitably wide bandwidth, please refer to the colour leaflet for details. Various enhancements have been implemented over the earlier SDU to provide even greater functionality and professionalism. **Free internet download software** for the PC Windows operating system is available from our UK web site <<http://www.aoruk.com/itm5500.htm>> **£869**

Commercial and government organisations are selecting the AR5000 and SDU5500 every month. The combination is so successful that in many cases it is being singled out for implementation or consideration as their 'standard kit'!



AR5000

True base receivers are few and far between, some have simply evolved from the hand held equivalents with little tangible improvement in performance or facilities over their smaller counterparts - *the AR5000 is not like this!*

High performance, top quality build and true wide coverage all mode receive. The "+3" version offers even more with synchronous AM, AFC and Noise Blanker. Popular with government agencies throughout the world. **£1445**

AR5000c

When making critical measurements, the frequency coherence is very important whether a single or multiple unit is employed. This involves the use of a single reference for all oscillators employed throughout the receiver. The AR5000C now provides this commercially required capability. The "C" version may be provided to order in either the standard AR5000 format or with two of the +3 additions of AFC and NB. If you are a commercial operator with this application in mind, please request the separate specification leaflet for the AR5000C. **£1825**

AR5000+3 - Sync AM, AFC, NB

The "+3" version offers even more with synchronous AM (upper side band, lower side band and double side band with excellent lock range), AFC (Automatic Frequency Control for accurately tracking moving transmissions or unusual band plans) and Noise Blanker. **£1699**

Passport to World Band Radio'99.

"Front-end selectivity, image rejection, IF rejection, weak-signal sensitivity, AGC threshold and frequency stability all superior".

"Unlike virtually every other receiver we have tested over the past 21 years, the frequency readout is unfailingly accurate to the nearest Hertz. This should make the AR5000+3 of exceptional interest to broadcast engineers".

World Radio TV Handbook'99.

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

AR5000+3

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

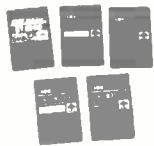
RUM DISPLAY UNIT*

control, many have software available as a free internet download



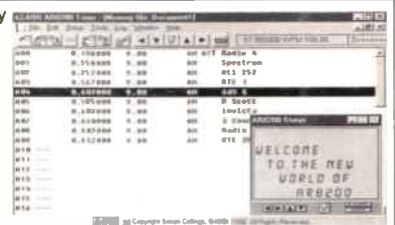
The **AR8200** has been the first hand portable wide band all mode production unit to arrive on the market place with the new airband channel step of 8.33kHz correctly implemented. Add to this memory bank re-sizing, extensive step adjust capabilities to trace unusual band plans, an editable (via PC) meaningful auto mode bandplan, **free internet download** PC Windows software, optional SLOT CARDS and you have just the tip of the iceberg. The facilities offered by the AR8200 are stunning... take the 'step-adjust' feature for example. If you have a frequency of say 151.010MHz and wish to step in 15kHz increments, most receivers would simply assume 151.000 MHz then step 151.015, 151.030 etc. However, the AR8200 may be programmed to step in the desired manner of 151.010, 151.025, 151.040, 151.055MHz etc. Other real life examples would be the 27.60125MHz CB frequency incremented in 10 kHz steps, no problem... also the 900MHz band which implements 25 kHz steps but a 12.5kHz offset. Add to this the foresight of 8.33kHz airband steps and you have a very flexible unit!

AR8200 £399



Shown here with optional slot cards

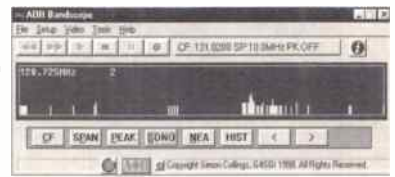
Full computer control is provided by the AR8200 receiver (via the optional CC8200 interface or equivalent), *not just clone of data*. You can set frequencies, edit memory channels, add text comments, customise search banks, edit the auto-bandplan data etc etc. The '**8200 toolkit**' software is available as a **free download from the AOR web site** and is provided with the optional CC8200 computer control interface.



When comparing the AR8200 with other models ask the following important questions:

- ✓ Is **FULL computer control** available and can you set frequencies from the PC?
- ✓ Is 'official' **software** provided by the manufacturer as a **free download** from the internet?
- ✓ Are **NiCad rechargeable batteries** and charger provided and can you charge them inside the radio?
- ✓ Can the radio be connected to an **external 12V** supply (such as the car cigar lighter socket) using the standard supplied lead?
- ✓ Are both search AND **SCAN speeds** fast?
- ✓ Has it correct implementation of programmable scan delay from when the squelch closes?
- ✓ Does it have EEPROM memory storage with alpha text comments and memory bank re-sizing?
- ✓ Does the receiver support the new **8.33kHz airband steps** (correctly implemented)?
- ✓ Are optional **slot cards** available to further enhance capabilities, can it '**reaction tune**' with the Opto Scout?

AR8200: The answer to all the above is YES



AR7030 short wave receiver



As reported earlier this year, the latest production run of the AR7030 has been completed and is shipping. The AR7030 has retained the same design but has 'evolved' in certain areas. The latest production features **alternative click encoders** which provide a smoother and more consistent quality feel and a **new-style liquid crystal display** with higher contrast and a wider viewing angle.

Now in its 4th year of production, the AR7030 has established itself as the popular performance trendsetting short wave receiver representing the new 'benchmark' in excellence. There have been many new entries by competitors since the launch of the AR7030, some feature DSP but none can match the **sheer performance excellence** of the AR7030. Don't take our word for it, have a look at the many technical reviews and compare the technical results... go on, compare it to others! 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.

AR7030 £799 AR7030 PLUS £949

NEW INTERNET ADDRESSES

The AOR UK internet web and e-mail address have recently been changed. The web has been transferred to a new high bandwidth 60MB site with new content added. The e-mail address has also been brought in line with our corporate partners. Please amend your address books and bookmarks:

**e-mail: info@aoruk.com
web: www.aoruk.com**



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ARD2 portable ACARS & NAVTEX decoder & display unit, can be operated from internal batteries or external d.c. supply. An RS-232 port expands capabilities, **free supporting software** from the AOR internet web site. **£349.**



The **AR3000A** is evolution at its very best. Wide band all mode receiver, 100kHz to 2036MHz high performance, RS-232 port as standard. Respected best seller with over 70,000 sold world-wide. The PLUS version has enhanced facilities. **£799 (£899 PLUS version).**

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SATELLITE TV SPECIAL SATELLITE TV SPECIAL SAT

...continued
from page 27

The mass of Arabsat programming - the exception being the subscription Orbit Channel package - is Free-to-Air (FTA) and a basic digital FTA receiver is sufficient for these and many other broadcasts across the sky. There's even a Thai TV service available on Eutelsat's *Hot Bird* 13°E slot!



A digital news feed via SISLink, English Channel collision. BBC reporter preparing for an evening news transmission, note the service idents that the RSD receiver can display, '64' is the memory channel, SNG vehicle ident has not been included, MPEG encoder therefore provides a default 'Auto 9MHz' ident., (36°E, 11.580GHz-H, SR 5632; FEC 3/4).

satellite dishes for direct foreign programme pick-up.

Information Sourcing



Sirius @ 5°E provides a rather blank Snell and Wilcox digital test card with local receiver ident. 12.133GHz-V, SR 27500; FEC 3/4.

Programming in both analogue and digital, listing is very important for up-to-date information. Where can I find this information? Well, for general satellite orbital listings in printed magazine form, the German *Tele Satellite International* is bi-monthly and contains full global information, so if you live on the Isle of Wight or the Isle of Tonga, get this magazine. The Internet also offers many sources of free information, check out ads in the UK published monthly *What Satellite TV* or dial up <http://www.TELE-satellite.com> for general information.

Due to the mass of satellites now orbital, *Tele-Satellite* have now divided the sky into segments, which can be accessed for occupant data. A generalised global review is found on

<http://www.SatcoDX.com> which provides TV and radio info downlinking.

SatcoDX segmental divisions are as follows - 1) 0° - 18.9°; 2) 19° - 40.9°; 3) 41° - 99.9°; 4) 100° - 145.9°; 5) 146° - 199.9°; 6) 200° - 250.9°; 7) 251° - 275.9°; 8) 276° - 314.9° and 9) 315° - 359.9°. These slots run from Greenwich 0°E around the World and eventually arrives

back at Greenwich from the West. So, 359.9°E (of Greenwich) is the same as 0.1°W (of Greenwich). Thus *NSS-K* (previously *Intelsat K*) at 21.5°W shows also as 338.5°E. To access satellite information in the above segments, you merely tap in (for segment 1)

<http://www.SatcoDX1.com> and <http://www.SatcoDX7.com> (for segment 7) and

hopefully all you need to know in daily updated information will arrive on your PC.

SatcoDX also produce a CD-ROM with a mass of global satellite data, downlink footprints, transmission parameters, encryption, both analogue and digital. A single 'currently updated' CD-ROM costs US\$29.50 + US\$2.50 P&P from **SatcoDX, PO Box 445, HU-1395, Budapest, Hungary**. For more information ring (from UK) +44-1334620611, E-mail order@SatcoDX.com or check out the net at <http://www.spectronet.net/satcodx/order/> - a bi-monthly CD-ROM subscription for one year costs US\$150 with no charges.

Most of the major space groups have their own web sites - try the Hughes Space and Communications site at www.hughespace.com, the NASA site at <http://www.nasa.gov> or during a space mission there's <http://spaceflight.nasa.gov> for the latest news.

A Year In Digital

Often the query arrives 'how do you start in digital?' or 'how do you find the signals, there's nothing there?'. I personally didn't go down the usual route of a Nokia 9200 and its infamous 'red menus', but waited until the 2nd generation receivers appeared on the market when hopefully operation would be much simpler.

Late Summer 1998 I bought a UK manufactured (RSD Communications Ltd.) ODM-300 digital receiver and entered the world of digits, of software upgrades and symbol rates. I first tried reading the NTL publication *MPEG - Digital Television For All* - Swift Television Publications - (01793) 750620 - to gain an insight into digital TV, but gave up at 'Discrete Cosine Transformation' and 'Quantised Coefficients', finding it best to skim through the basics leaving the heavy stuff!

The box with the digital receiver inside was much more exciting. The low profile slim black anonymous



The EBU Moscow colour bars via 36°E digital.

box was easily wired into circuit. Though the ODM300 offers polarity switching, LNB voltage supply/switching via the coaxial feeder to the LNB, my own system uses an external p.s.u./polarity arrangement (there are five other receivers feeding from the Ku LNB/i.f. input via an eight output Global DA) and a d.c. block was inserted into the digital receiver's 'F' socket signal input.

The one main setting was the LNB oscillator, mine @ 10GHz being an older dual band LNB - in

Continued on page 34...

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- GPS 12XL Europe Hand-held portable system includes: Europe City Point Database, 12 parallel channel receiver, built-in antenna, carrying case & lanyard. **£165.00**
- GPS 12CX Same as GPS12XL with colour screen **£210.95**
- GPS II Plus Europe Hand-held portable system includes: Europe City Point Database, 12 parallel channel receiver, portable antenna, velcro & lanyard. **£165.00**
- GPS 48 Europe Hand-held portable system includes: Europe Marine Database, 12 parallel channel receiver, a built-in point database including major cities, buoys and lights, portable antenna, carrying case & lanyard. **£180.00**
- GPS 3 Hand-held mapping portable system includes: 12 parallel channel receiver, a built-in international basemap including major cities, roads, lakes and rivers, portable antenna, velcro mount & lanyard. **£250.00**

Frequency Guides and Books

- UK Scanning Directory 6th edition **£18.00**
- Scanners 4 **£14.95**
- UHF/VHF Frequency Guide **£12.95**
- Passport to World Band Radio 1999 **£19.99**
- World Radio TV Hand Book 1999 **£19.99**
- Global Radio Guide **£3.95**
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- PC cable **£26.00**
- PC cable with cigar lighter adaptor for GPS 2/3/48/12XL **£30.00**
- PC cable with cigar lighter adaptor for GPS 12 **£30.00**
- PC software & cable kit **£69.95**
- Car cigar lighter adaptor for GPS 2/3/48 **£19.95**
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- AR5000 +3 As above but with noise blanker, syncr AM & AFC £1749.00 **£1375.00**
- AR3000 all mode base rcvr 100kHz-2056MHz no gaps RS232 port fitted £799.00 **£615.00**
- AR3000 plus As above but with narrow AM & SAT filter, tape relay SDU ready £899.00 **£670.00**
- AR8000 Still the best h/h rcvr available. All mode 500kHz-1900MHz £349.00 **£260.00**
- SA7000 Ultra wide passive ant 30kHz-2600MHz £136.00 **£115.00**
- SA08000 Link between AR8000 & Opto Scout. No mod req **£24.95**
- CU8232 Computer control/clone interface for AR8000 **£79.95**
- PC Manager PC based DOS management software for AR8000 **£49.00**
- PC Manager WIN As above Windows based for AR2700 & AR8000 **£49.00**
- Opto Scout Freq counter 400 mem 10MHz-2GHz £399.95 **£319.95**
- AR8000 + Scout Package AR8000 + Scout + SAC8000 £775.00 **£615.00**
- SDU5000 £799.95 ASK price **£559.95**

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ICOM

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- ICPCR-1000** **£PHONE**
- IC-R8500** pro base rcvr £1695.00 **£1450.00**
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AR3000A



PCR1000



PCR100

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| AR3000A | Unique all mode extremely wide band base-mobile receiver 100kHz - 2036mhz with no gaps. RS232 port fitted. | £595.00 |
| AR3000A + (plus) | Customised AR3000A with switchable narrow SM & SAT filters, Tape relay, SDU ready and discriminator output. | £679.00 |
| AR8200 | New advanced wide band all mode hand-held receiver with enhanced microprocessor facilities, slot card options available, multi-function display. | £359.00 |
| AR8000 | The New Concept. Wide band all mode hand-held receiver with many microprocessor facilities, dot matrix display and computer compatibility. | £263.12 |
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| IC-R75E | Excellent all round for the professional listener 0-60MHz. High Stability receiver circuit 100 DB Dynamic range. Twin bandpass Tuning. Optional digital processor. Best selling receiver | £629.00 |
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SATELLITE TV SPECIAL SATELLITE TV SPECIAL SATELLITE TV

...continued
from page 30



A religious occasion is upcoming on NSS-K digital, preceded with a test card and basic transmission detail - for the USA - on Telstar-4 C-band @ 89°W.

fact, the Chaparral LNB must be at least six to seven years old now, which indicates it is possible to utilise elderly gear at times. Switch on and set up the TV receiver to match the u.h.f. output of the ODM300's modulator (or feed in at SCART). The receiver offers a screen welcome and then off you go tuning via menu screens.

Get Real

Initially, I wanted to experience real digital and **John Locker** talked me in via landline on a

21.5°W signal Reuters feed - at least having entered the various options John said 'There, tell me what you've got' and I said 'Nothing'. Initially I found the whole process frustrating, time consuming and I and suspected a receiver or LNB instability fault.

Eventually of course I was rewarded a couple of nights later with my first news bureau test pattern ex Washington. A perfect image, no noise, but as soon as the dish was moved off the satellite, the

picture just cut out, no noise or sparklies, it was either excellent or nothing.

Over a few days I spent time on 21.5°W and several signals were received and went (automatically) into memory. Then I tracked the dish to the Eutelsat 13°E Hot Spot and locked up several digital programmes. It wasn't easy initially, but practice makes for speed. I had to press three IR

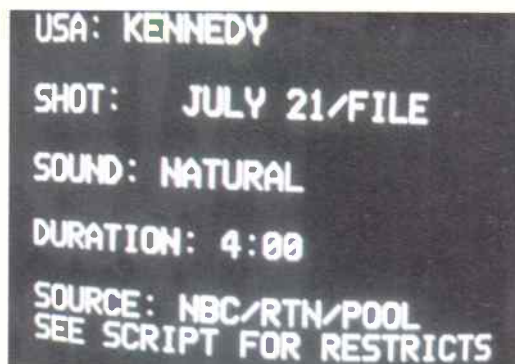
remote buttons to arrive at a 3rd menu which contained tabulated slots for parameter inputting, all I did was to insert 'auto' on FEC and Symbol Rate and then enter the frequency.

Push a 'search' button enters the receiver into a signal strength level/search TV screen display, if you're lucky, then the bar suddenly goes green and shoots up to a high level. If it's an analogue signal then it still shoots up, but in red. The digital signal hopefully will encourage the receiver to caption, for example 'found 2 new video channels, 6 new radio channels' type of announcement and enter them into memory for you to review later.

I would stress that the ODM-300 will search and auto lock up on symbol rate, FEC and PIDS (Packet <or programme> identification) if you enter auto for these parameters, though I ignore PIDS. Once you enter the 'frequency' and 'search', the receiver starts checking across that frequency and then extends its search either side by several MHz.

Seeking Unknown Digital Signals

Tuning the satellite bands for known signal sources provided by magazine/Internet listings offers many hours of absorbing interest, though if suddenly you hear - or see - a news flash that there has been an air-strike into Kosovo. How do you find the 'wild feeds' downlinking into



John Kennedy died in a plane crash July 17th and his body was recovered July 21st. A major international news story.

Europe with breaking live news?

The Balkans conflict had a long build up and several UK based SNG trucks had already moved into the area ready. The easiest satellite to access that has minimal broadcast activity and cheap to lease is *Eutelsat II F3 @ 36°E* in Ku-band. Another bird that has historically carried live feeds from the Middle East region has been 16°E - it's pretty busy in Ku, but the Telecom band part is clear.

Those are the first places to check out activity. Unfortunately, the traditional *Eutelsat W3, 7°E* EBU news carrier generally operates in MPEG-4:2:2 - impossible to lock on our domestic MPEG-2 receiver. The Eutelsat 10°E slot could be another possible, but the 36°E is the one I'd bet on - and it was.

The Turkish earthquake, however, provided considerable SNG output on its own *Turksat 1C @ 42°E* amongst the mainline Turkish broadcasters on this craft, but output was also monitored on 36°, 28.5°, 16°, 10° and 7°E. Often, second hop output intended for North America can be monitored on my favourite 21.5°W bird.

Though France will use her own Telecom satellites, Spanish SNG operators may ignore their own national satellite 30°W 'Hispasat' and instead use *PAS-3R* capacity at 43°W, Telecoms' at 5°W or 3°E. The UK doesn't have its own satellite(s) and so broadcaster/SNG links may well be found on Intelsat, NSS, PanAmSat, Eutelsat, the BBC's favourite is Telecom 3°E. Experience - as with terrestrial TVDXing - will generally tell you where to look.

Where To Look

Knowing 'where to look' is only half the problem, 'where to tune' is the other half of the question - there's no Internet listing for a wild feed out of Glasgow airport when the Cessna crashed killing eight passengers on September 3rd.

The answer is simply use an analogue receiver for finding digital signals. It is essential that the chosen receiver tunes in a scan mode, this will stop on a signal that it finds.

I have a couple of Manhattan bottom range LT-6300 Plus MkII, they're simple, basic and cheap. I merely put one down to the lower end of Ku-band, enter in 'scan' and then 'up' and off it chases. When it hits a signal, it should stop on that frequency, though sometimes it skips by a kHz or two.

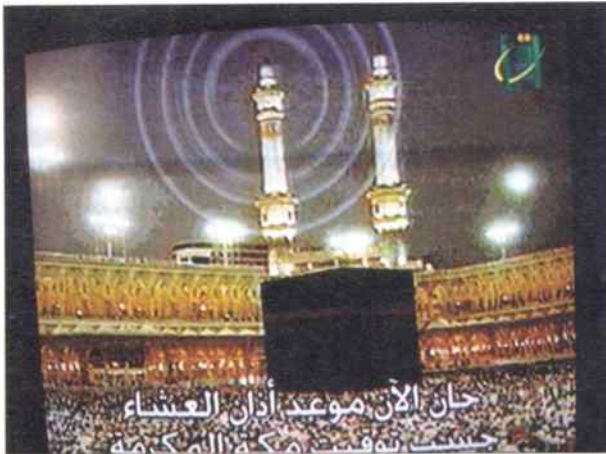
On a TV screen all you will see from the digital



Kukes, Kosovo, BBC reporter awaits for the cue to present his news report. A digital feed.



News report live from the streets of Pristina for Associated Press TV News.



Mecca, the holy month of Ramadan, in Mecca, is featured on most Arabic TV services.

signal is perhaps a darkening slightly in brightness, but the picture information is just noise. Now enter that frequency into the digital receiver, merely leave FEC and SR in 'auto' and then 'search'. This can be frustrating, as the receiver seems to take ages. I've adopted the habit of leaving FEC at 3/4 and just SR as 'auto' to speed things up.

Suddenly - if you're lucky - the signal scale jumps up and there is 'FEC LOCK' and 'QPSK LOCK'. Then on the screen is the caption 'found 1 new video channel' which has at once entered itself into memory. It's then an escape out of the menu back to the memories and to examine the signal find, there will be a service ident like 'SISLINK UKI-456' or perhaps 'CNN-MILANO I-456'. Unfortunately, I seem to be more unlucky and more cases than not I have to scan up on the analogue until it stops again.

That's how I search out the one-off wild news or outside broadcast (OB) programme circuits. But never forget analogue, since broadcasters are still using this technology, satellite capacity is plentiful and cheap. Working SNG units are unlikely to re-equip just to use the new methods if existing equipment is relatively new. We look forward to hearing from other signal searchers and the methods that they employ to discover digital signals.

Problems On Your Dish

The tracking dish is the most important component in the satellite receiving chain! Despite the amount you spend on a satellite receiver, unless the signal incoming from space is optimised at the head-end losses may well occur, degrading system performance, noise and lower signal levels result. Here's a few ideas for checking out.

Twice a year at the Equinoxes, the sun tracks behind the Clarke Belt where all our geostationary satellites are parked in their 'stationary' orbital slot. To check that your LNB assembly is correctly on-axis to the focal point on a sunny day in early April or early October, point your prime focus dish due South and check that the LNB assembly shadow is central on the dish surface - this ensures that the LNB, feed, etc. is aligned on axis with the focal point.

The next check whilst minimising your shadowing across the dish face is to reach across and hold your hand in front of the LNB feed tube. It should be very hot at the centre as the solar energy is reflected to the focal point at the mouth of the feed.

If you have confirmed that there is heat at the focal point, you must be aware that the focused heat is capable of conducting itself into the LNB assembly and there is every chance that terminal damage will result. During the Equinoxes therefore - which only last for a few days - ensure that the dish isn't left pointing at higher elevations, lest the heat will barbecue your LNB and polariser.

The LNB itself is a highly sensitive, microwave converter, exposed as it is on your dish to snow, rain, wind and the sun. I have found it sensible to shroud the LNB assembly with a polythene tube.

A bonus is that the white polythene cylinder will reflect sunlight and minimise

temperature rise in the LNB itself. Increasing temperature increases noise. Remember the early days of helium immersed microwave amplifiers, the colder the better. Incidentally, for those active with C-band (4GHz), the much larger LNB/feed system can easily be shrouded by using square two litre polythene bottles. Cut off the pouring end and the remaining square piece fits - with a little tailoring - over the head electronics. Cheap but effective!

When fitting your low loss CT100, CT125 satellite feeder, ensure that you apply just a touch of silicone grease to the thread of the LNB 'F' socket and then a minimal hint to the inner conductor on the 'F' connector to prevent oxidation and signal loss. The tightened F connector should then be carefully taped over with self amalgamating tape to provide 100% weather protection - even if it is within the polythene container.

All cables should be brought out without sharp bends, plastic ties should retain but **not** distort the cable in anyway. Similarly, if the feeder cable is tacked to a wall, do **not** distort the cable shape. If there is any physical variation in cable measurements, then signal loss will instantly result, the impedance will change, standing waves and sadness will result.

Do **not** make joins in the feeder cable and remember that voltage is sent to the LNB via the coaxial cable itself. A tracking dish means that cables will hang from the dish rim to a fixed point nearby, so ensure that there is sufficient slack for dish rotation and you are advised to tape the coaxial cable to the polariser cable for additional mechanical support.

I usually hang the cables in a large loop underneath to a 'chain' made from strong plastic ties which are tied to the back of the dish support post allowing the cable to be supported, but able to slide through the lowest plastic tie loop, the run of coaxial loops to the first fixed point on a wall, post, etc. to run indoors.



Islamic discussion is featured heavily in Arabic broadcasts. Dubai is seen within the Arabsat digital bouquet on 13°E with excellent reception on dishes down to 900mm.



King Hussan II of Morocco died July 25th, 1999.

Passport to World Band Radio

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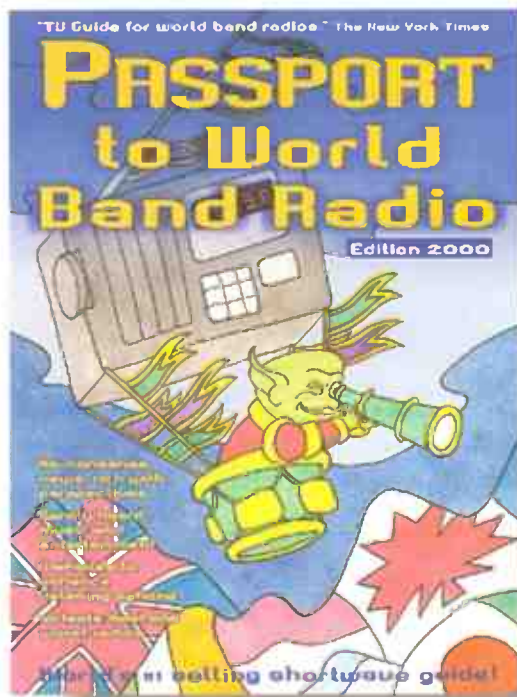
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Solar Outage

No Cause For Outrage!

If you were watching satellite TV on October 10th this year, depending on which satellite you were watching, at some time during your viewing, your picture may have disappeared into the noise for a couple of minutes. Was it that pesky pigeon preening itself on the the dish arm, blocking the signal to the LNB, was it a freak snow storm, or worse, had the dish worked loose? Anyway, how do I know that this happened? Well, in fact, it not only happened on the 10th, but around the same time for the next five or six days. Coincidence, no. Solar Outage, yes!

Digital Age

We are living in the digital age of satellite TV where things rarely go wrong. Satellite operators can't afford downtime, because time is money, and the discerning viewer expects perfection, and normally, he gets it, but there are occasions when even the biggest of players in the field cannot stop the elements from having their say.

For those five or six days, twice a year, satellite uplink stations hold their breath, and wait for the worst to happen. They know it will happen, but what they don't know, and can't calculate, is just how bad the effects of Solar Outage will be, because they are taking on the Sun, and there can only be one winner!

So what is 'Sun' or 'Solar' Outage? And how will it affect you, the viewer? By now, as a regular reader of *Short Wave Magazine*, you will have realised that those mystical TV signals that fall onto your dish with the power of a gentle snowflake, have travelled at least 35200km from the Satellite to your front room...some going! Along the way, they face all kinds of hurdles, but none so great as the radiation from the Sun.

Normally this isn't an issue, but in early March and October, the signals face a 'Battle Royal' as the Sun aligns itself behind the Clarke Belt, and slowly but surely tracks behind each satellite in turn blanketing the output from the transponders in solar radiation. The result is an increase in 'noise' at the dish, and a loss of picture on your TV.

Thankfully this event only lasts two to three minutes. Simple mathematics tells us that the sun tracks the arc at a rate of four minutes per degree, so, assuming your dish is aligned correctly, the noisy picture soon clears and those annoying sparklies melt away. But I wonder how many people reach for the 'phone when their favourite channel breaks up!

For fixed dish viewers of Astra, this can only happen once each day, correct? Well in fact no, because its a little more confusing than that. It is true that analogue viewers will lose their signal around mid morning, but for Astra's digital viewers watching from the 28.5° slot, the blackout will hit about 40 minutes earlier.

To confuse issues even more, if you happen to be watching CNN on either Astra analogue or digital later in the afternoon, you could be in for a bonus

ball. Until last year, The Cable News Network was fed into Europe from 27°W, C-band.

Now however, the main programming comes in by a C-band digital feed from *Intelsat 803*, at 21°W. As a result, as the sun moves around behind 21°W, putting that satellite into outage, your pictures from CNN, on Astra analogue or digital, could well start to warm up.

Ready Steady Cook!

For owners of motorised systems, it can be fun to try to track the outage through the day - sometimes its more fun than the programmes you can't watch! Try using the information I have provided. If I have done my mathematics right, the sun will track the arc according to the timetable during 2000.

If you are reading this from sunnier dimes, and own a nice polished dish, **don't try this at home!** The concave face of your antenna turns into a solar oven, and it has been known for the reflected sun rays to focus on the cap of an unsuspecting LNB, melting the plastic and damaging the feed probe.

For the rest of us, provided we practice 'safe sats' we can track away. An excellent way to make sure your equipment is correctly aligned. It's a comforting sight when at the allotted time a spot of light appears on the LNB cap for a few seconds. Try it for yourself, but please, if looking at the cap of your LNB means hanging by one hand from guttering 10m up, whilst holding a mirror in the other hand...well, don't say I didn't warn you.

The next outage period will run from 26th February - 4th March 2000.

Sun Outage Prediction Timetable For February 26th 2000.

| Satellite | Position | Outage Time (UTC) |
|---------------|----------|-------------------|
| Kopernicus | 28°E | 1007 |
| Astra Cluster | 19°E | 1045 |
| Eutelsat | 13°E | 1114 |
| Intelsat | 1°W | 1216 |
| Intelsat | 21°W | 1341 |



Missed October's Solar Outage? Don't worry, there are more on the way. Here John Locker explains just what happens when the sun starts to cook the TV sats, and how to catch the next dish warming party.

As the sun tracks the Clarke Belt through the day, each satellite is bathed in solar radiation.

SATELLITE TV SPECIAL SATELLITE TV SPECIAL SAT

Natural Phenomenon

Twice a year, in the spring and autumn, a natural phenomenon, known as sun transit, or sun outage, occurs. All geostationary spacecraft lie in the equatorial plane. The sun also passes through this plane twice a year, during spring and autumn. At these times, the sun appears directly behind the spacecraft from the perspective of a satellite antenna on the ground. The sun generates wideband radio frequency noise with a signal strength many times the desired signal from the spacecraft, and overcomes the satellite's signal during these periods.

Fortunately, the period generally lasts only a few minutes each day, and only occurs over a three to five day period. Exact forecasts for these peak periods are difficult to make, due to the many variables involved at each downlink site.

Solar Outage Risk 2000 - Produced using Satmaster Pro.

IMPORTANT: All calculations in Local Time.

Add local daylight saving as appropriate.

| | |
|----------------------|---------------------------------|
| Site Name: | Birmingham |
| Site Latitude: | 52.50°N |
| Site Longitude: | 1.92°W |
| Satellite Name: | Astra Group |
| Satellite Longitude: | 19.20°E |
| Year Of Interest: | 2000 |
| World Time Zone: | 0 (hours relative to Greenwich) |
| Antenna Diameter: | 1m |
| Operation Frequency: | 11.5GHz |
| Antenna Beamwidth: | Standard |

Early Season Group

| Date | Begin | Peak | End | Depth | Closest ° |
|-------------|-------|------|------|--------|-----------|
| February 26 | 1045 | 1048 | 1051 | Low | 1.38 |
| February 27 | 1043 | 1048 | 1052 | Medium | 1.01 |
| February 28 | 1042 | 1048 | 1053 | High | 0.63 |
| February 29 | 1041 | 1048 | 1053 | High | 0.26 |
| March 1 | 1041 | 1047 | 1053 | High | 0.13 |
| March 2 | 1041 | 1047 | 1053 | High | 0.51 |
| March 3 | 1042 | 1047 | 1052 | Medium | 0.89 |
| March 4 | 1043 | 1047 | 1050 | Low | 1.27 |

Late Season Group

| Date | Begin | Peak | End | Depth | Closest ° |
|------------|-------|------|------|--------|-----------|
| October 8 | 1020 | 1023 | 1026 | Low | 1.42 |
| October 9 | 1017 | 1022 | 1027 | Low | 1.04 |
| October 10 | 1016 | 1022 | 1027 | High | 0.67 |
| October 11 | 1015 | 1022 | 1028 | High | 0.29 |
| October 12 | 1015 | 1021 | 1027 | High | 0.10 |
| October 13 | 1015 | 1021 | 1027 | High | 0.46 |
| October 14 | 1016 | 1021 | 1026 | Medium | 0.83 |
| October 15 | 1016 | 1021 | 1025 | Low | 1.20 |
| October 16 | 1019 | 1021 | 1022 | Low | 1.57 |

| | |
|----------------------|---------------------------------|
| Satellite Name: | Astra 2A |
| Satellite Longitude: | 28.50°E |
| Year Of Interest: | 2000 |
| World Time Zone: | 0 (hours relative to Greenwich) |
| Antenna Diameter: | 1m |
| Operation Frequency: | 11.5GHz |
| Antenna Beamwidth: | Standard |

Early Season Group

| Date | Begin | Peak | End | Depth | Closest ° |
|-------------|-------|------|------|--------|-----------|
| February 26 | 1005 | 1008 | 1011 | Low | 1.40 |
| February 27 | 1003 | 1008 | 1013 | Low | 1.03 |
| February 28 | 1002 | 1008 | 1013 | High | 0.65 |
| February 29 | 1001 | 1007 | 1014 | High | 0.28 |
| March 1 | 1001 | 1007 | 1014 | High | 0.11 |
| March 2 | 1001 | 1007 | 1013 | High | 0.49 |
| March 3 | 1001 | 1007 | 1012 | Medium | 0.87 |
| March 4 | 1003 | 1007 | 1011 | Low | 1.25 |
| March 5 | 1006 | 1006 | 1006 | Low | 1.64 |

Late Season Group

| Date | Begin | Peak | End | Depth | Closest ° |
|------------|-------|------|------|--------|-----------|
| October 8 | 0939 | 0942 | 0945 | Low | 1.42 |
| October 9 | 0937 | 0942 | 0947 | Low | 1.05 |
| October 10 | 0936 | 0942 | 0947 | High | 0.67 |
| October 11 | 0935 | 0941 | 0948 | High | 0.29 |
| October 12 | 0935 | 0941 | 0948 | High | 0.09 |
| October 13 | 0935 | 0941 | 0947 | High | 0.46 |
| October 14 | 0935 | 0941 | 0946 | Medium | 0.83 |
| October 15 | 0936 | 0940 | 0945 | Low | 1.20 |
| October 16 | 0938 | 0940 | 0942 | Low | 1.56 |

| | |
|----------------------|---------------------------------|
| Satellite Name: | Intelsat/Thor |
| Satellite Longitude: | 0.80°W |
| Year Of Interest: | 2000 |
| World Time Zone: | 0 (hours relative to Greenwich) |
| Antenna Diameter: | 1m |
| Operation Frequency: | 11.5GHz |
| Antenna Beamwidth: | Standard |

Early Season Group

| Date | Begin | Peak | End | Depth | Closest ° |
|-------------|-------|------|------|--------|-----------|
| February 26 | 1212 | 1216 | 1219 | Low | 1.31 |
| February 27 | 1210 | 1215 | 1221 | Medium | 0.93 |
| February 28 | 1209 | 1215 | 1221 | High | 0.56 |
| February 29 | 1209 | 1215 | 1221 | High | 0.19 |
| March 1 | 1209 | 1215 | 1221 | High | 0.20 |
| March 2 | 1209 | 1215 | 1221 | High | 0.58 |
| March 3 | 1209 | 1214 | 1220 | Medium | 0.97 |
| March 4 | 1211 | 1214 | 1218 | Low | 1.35 |

Late Season Group

| Date | Begin | Peak | End | Depth | Closest ° |
|------------|-------|------|------|--------|-----------|
| October 8 | 1147 | 1150 | 1153 | Low | 1.45 |
| October 9 | 1145 | 1150 | 1155 | Low | 1.07 |
| October 10 | 1144 | 1149 | 1155 | High | 0.70 |
| October 11 | 1143 | 1149 | 1155 | High | 0.32 |
| October 12 | 1143 | 1149 | 1155 | High | 0.08 |
| October 13 | 1143 | 1149 | 1155 | High | 0.43 |
| October 14 | 1143 | 1148 | 1154 | Medium | 0.80 |
| October 15 | 1144 | 1148 | 1153 | Low | 1.17 |
| October 16 | 1146 | 1148 | 1150 | Low | 1.54 |

| | |
|----------------------|---------------------------------|
| Satellite Name: | Intelsat 803 |
| Satellite Longitude: | 21.40°W |
| Year Of Interest: | 2000 |
| World Time Zone: | 0 (hours relative to Greenwich) |
| Antenna Diameter: | 1m |
| Operation Frequency: | 11.5GHz |
| Antenna Beamwidth: | Standard |

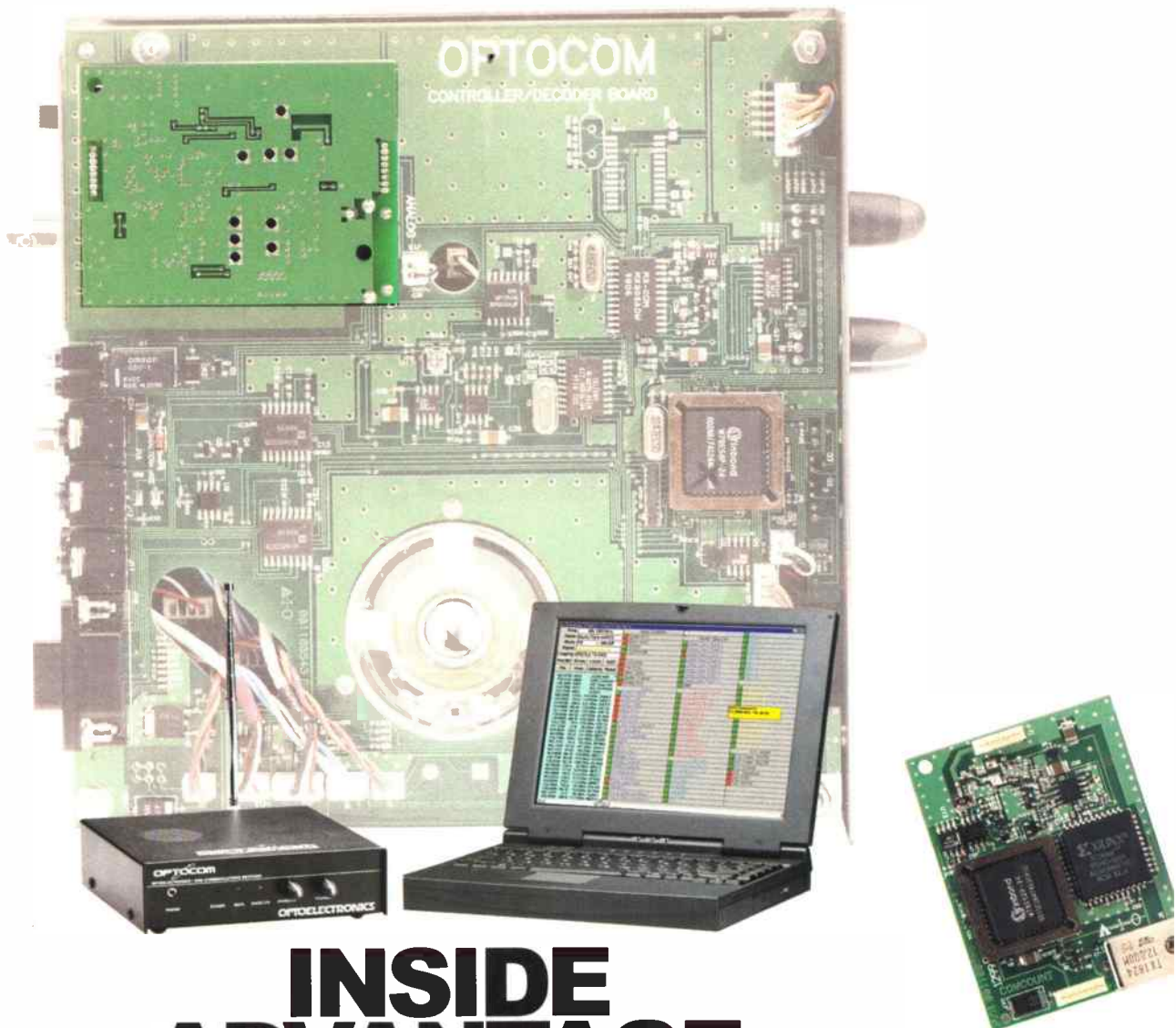
Early Season Group

| Date | Begin | Peak | End | Depth | Closest ° |
|-------------|-------|------|------|--------|-----------|
| February 26 | 1343 | 1346 | 1350 | Low | 1.33 |
| February 27 | 1341 | 1346 | 1351 | Medium | 0.95 |
| February 28 | 1340 | 1346 | 1352 | High | 0.58 |
| February 29 | 1340 | 1346 | 1352 | High | 0.21 |
| March 1 | 1339 | 1346 | 1352 | High | 0.18 |
| March 2 | 1340 | 1346 | 1352 | High | 0.56 |
| March 3 | 1340 | 1345 | 1350 | Medium | 0.94 |
| March 4 | 1341 | 1345 | 1349 | Low | 1.33 |

Late Season Group

| Date | Begin | Peak | End | Depth | Closest ° |
|------------|-------|------|------|--------|-----------|
| October 8 | 1318 | 1321 | 1324 | Low | 1.38 |
| October 9 | 1316 | 1321 | 1326 | Medium | 1.00 |
| October 10 | 1314 | 1320 | 1326 | High | 0.63 |
| October 11 | 1314 | 1320 | 1326 | High | 0.25 |
| October 12 | 1313 | 1320 | 1326 | High | 0.13 |
| October 13 | 1314 | 1320 | 1326 | High | 0.50 |
| October 14 | 1314 | 1319 | 1325 | Medium | 0.87 |
| October 15 | 1315 | 1319 | 1323 | Low | 1.24 |
| October 16 | 1318 | 1319 | 1320 | Low | 1.60 |

My thanks to Derek Stephenson, creator of *Satmaster Pro*, for confirming my outage predictions. Download a free limited demo of his software (Version 5.6a) from <http://www.arrowe.co.uk/>



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Satellite TV News

As I have commented before in these pages, bad news - be it floods, earthquakes, crashes or war - brings out the sat zappers, since satellite news activity is always much higher at such tragic times. Unfortunately, the past few weeks has seen plenty enough of these events!

Monday September 13th witnessed a tremendous bomb explosion in Moscow, reducing a residential block of flats to rubble and with the resultant high loss of life. The 36°E *Eutelsat II F3* satellite fired up via the normal BBC leased digital frequency - 11.600GHz-H (SR 5632; FEC 3/4) from early morning through to late evening, feeding out numerous news packages and reports for both the BBC and other news groups, including Reuters Moscow Bureau.

Raw footage was sent out direct with harrowing shots of the dead being recovered, the dust grimed and weary rescue workers toiled in the heaps of rubble clawing with their bare hands searching - mostly in vain - for survivors. At times, when Mockba reports and/or footage wasn't being sent West, the Moscow switching centre often substituted the Mockba Channel 1 programme.

At 1700UTC there appeared the Moscow 2100 news bulletin which featured largely with the bomb explosions (the latest had been the largest of a series), but at one point included a 2-way live report from a distant Russian studio, the remote studio picture carried hum bars suggesting a poorly regulated mains supply at that distant news studio!

Within two days, a disaster was narrowly averted when a UK 'Britannia Airlines' aircraft failed to make a correct landing in Northern Spain (15th September) and skidded off the runway, coming to rest in nearby fields. The aircraft simply fell apart in sections as it absorbed the shock which saved all the passengers lives.

NSS-K, the 'New Skies Satellite NV' bird @ 21.5°W carried early morning footage of the passengers night rescue and shipment into hospitals, which in turn were used over the European news services that day. Sky News were still using the pictures some 17 hours later. The news film was preceded with the 'TV3 - TV DE CATALUNYA' PM5534 test card, this a rare analogue news feed @ 11.497GHz-H.

That same day, the 15th, another drama was unfolding across the Atlantic with Hurricane *Floyd* moving across following devastation in the Bahamas to threaten the Eastern Seaboard of the USA. Pictures of the winds, bending palm trees and roaring waves were carried on the digital Reuters lease at 11.566GHz-H (SR 5632; FEC 3/4), origination from 'Reuters Havana'.

The 0630UTC footage was preceded with late night live New York coverage of the UN proceedings discussing the developing situation in East Timor. More Hurricane *Floyd* was seen the next day on the Globecast North Atlantic circuit, 11.590GHz-V. SR 20145; FEC 3/4, checking PIDS at A-1120; V-1160.

All was not doom and destruction as the lovely Carol Vorderman appeared on the *NSS-K* 'UKI-149-GMTV' analogue downlink -11.529GHz-H (audio 6.60MHz) discussing mathematics education developments in a classroom environment on the 15th at 0700UTC. Interesting that 10 days later David Plunket was also featured on the same GMTV downlink being interviewed about classroom truancy.

But it was October 5th that the fragility of innocent life was brought home to us all when two trains crashed just outside Paddington station, an express inbound to the city impacted with an outbound local stopping train at a combined impact of an estimated 192kmh⁻¹. Damage was absolute and at once engulfed with explosion and fire from the winter thinned diesel, many therein trapped were incinerated. A week later the wreckage and ash was still being sifted to establish the true casualty figure - if it will ever be known.

In the following days, argument over signalling, light visibility and the 'price of life' versus warning system

installation costs were played out in the press and television. SNG trucks were rapidly on the crash scene that tragic day feeding out their pictures of smoke, destruction and the people disaster to the ever news-hungry world.

The UK networks were obviously receiving live coverage, but interest was world-wide and *Eutelsat II F3*, 36°E, was truly active with digital feeds outbound. 'NBC PADDINGTON' was carried via the SISLINK UKI-125 truck using 3.58MHz NTSC (11.064GHz-H; SR 5632; FEC 3/4) with live reports being transmitted into the New York programme centre.

'ITN LINKS RAIL DISASTER, SIS-35 UKI-495 ITN' also carried live reports into the UK network, though I noticed a couple of SISLINK feeds, but encrypted. One signal that refused to picture lock was at 11.177GHz-H with SR 6111; FEC 3/4 - just a blank screen. Coverage thinned out over the following days, other satellites were obviously in use, though I hadn't the time to locate them. A depressingly active day.

Better Days

There were better days to report. October 10th and the South African Motor Cycle Grand Prix from the Welkom circuit near Johannesburg, the whole day's racing carried in its entirety via *Eutelsat II F4* @ 10°E and in real analogue! The 11.078GHz-H sports outside broadcast featured all the day's races, prepared graphics and 'Replays of lost material SAGRP' as one colour bar test pattern stated.

As we approached the traditional UK Sunday lunchtime, the picture went into noise for several minutes and I wondered perhaps heavy rain was imminent, and then realisation - 'the Equinoxes' - checking outside confirmed the sun's shadow reproduced the LNB axis dish dead centre, this a solar outage. The day's racing concluded after 1430 and there appeared colour bars and 'Centro de Control TV Madrid'. It seemed that European distribution was via the Madrid uplink to the 10°E bird, a secondary hop to the primary South Africa-Europe circuit, which was most likely in C-Band.

The 'Dorna Satellite Transmission' group arranged for the primary uplink out of Welkom circuit. Meanwhile, next door on W3 @ 7°E, Spanish horse jumping trials were also being featured as a live OB at 11.175GHz-H analogue with audio at 6.60MHz FX plus commentary, 7.20MHz FX only.

Readers' Reports

Dean Rogers is our sports spotting expert, London based, on an upper floor with only a small balcony, he's able to swing an 800mm dish to collect the sports action. September 19th and the Globecast digital package on *NSS-K*, 21.5°W is very busy early evening UK time. Channel 1 is carrying the 1999 United States Tennis Association Cup tournament for ESPN; channel 2 has golf and on channel 3 yet another golfing tournament, this the 1999 PGA Tour - BC Open from the En-joie Club, Endicote, NY State, this too for ESPN.

Cricket was still about, at least on the 17th, with real analogue action via *Telecom 2C* @ 3°E, various sporty type programme links and related news, at 1800 UK on 12.603GHz-V, audio 6.60/7.20MHz. This the BBC OB unit in Scotland, later seen on the 20th with a Celtic football club interview (in the street outside!) - 'BBC-UKI-234' once more using the 12.603GHz downlink.

Rarely do I mention signals on Astra 19.2°E, but just a comment that for space rocket anoraks, live launches are often relayed via the Bayerische Fernsehen transponder 11.141GHz-H in their *Space Night* programme after midnight UK time. The launches by Arianespace ex Kourou are always carried as was their V121 event with the successful lofting of the *Telstar 7* satellite night of September 25th, they also trailed that the *Orion II* launch would also be transmitted on October 18th.

A note from **Roy Carman** (Dorking) that Jordan TV disappeared late September from the 11.940GHz-V analogue transponder on *Arabsat 3A* @ 26°E. It's now re-appeared (at the time of writing) on 11.859GHz-V. Also on *Arabsat-3A* have a look on 11.859GHz-V in clear PAL for

The army and firemen claw at rubble trying to locate victims, so often too late.



A Telecom 2C @ 3°E analogue test card, no other video was seen and the test card just cut off!



The Reuters Moscow bureau with VTR countdown clock prior to a news package ex bomb explosions, October 13th, via Eutelsat II F3 @ 36°E, digital 11.600GHz-H.



An exhausted rescue worker at the Moscow flats bombing early morning.



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'Kuwait Space Channel', which has been testing in recent times.

Evening national TV news over the Moscow-UK circuit with the Moscow reader and a remote studio connection (can anyone translate the captions?), 13/9/99.

After the mega Turkish earthquake, minor shocks have seemingly occurred around the world. September 21st and 11 F4 @ 10°E relayed news pictures from Taiwan showing devastation after a major quake in Taipai, the main city. Buildings tipping sideways and live footage showing rescue attempts in the darkness, European time around 1630.

More pictures were seen the following day using the same analogue frequency - 11.164GHz-H. Roy often watches the domestic satellite links carried on Kopernikus DFS-2 @ 28.5°E late afternoon as several analogue circuits are usually 'up' for the German teatime regional news magazine programs. NDR for example regularly use 11.596GHz-V for their local picture feeds, 11.526GHz-H and 11.550GHz-V are other common frequencies for other broadcasters.

New Broadcasters

There's a couple of new Balkans broadcasters' on the air - Kosovo Radio and Television - and Roy noted their output daily 1800-2000UTC - check out W2 @ 16°E, 11.497GHz-analogue. This is an EBU supported activity intended to resurrect both radio and TV broadcasting in that region after the conflict earlier in the year. Next door in the Hot Bird slot @ 13°E more Balkans radiation, but digital with the Croatian HRT National service at 12.520GHz-H using a common SR 27500; FEC 3/4 - you'll need a Viaccess equipped digital receiver though.

Now Established

And finally, BDXC member Tim McClellan living on Christchurch Bay says that the French International TV Service 'TV5' is now established on Telecom 2B @ 5°W, check on 12.648GHz-V in real analogue PAL and in the clear, this slot previously used by TMC, Monte Carlo. The 24 hour TV5 service is a compilation of French speaking offerings from Canada, Belgium and of course the main French channels.

Tim utilises the French programming on 5°W for language tuition as a distance learning aid.

Receiver Comments

From time to time the request arrives seeking recommendations for a suitable receiver for satellite reception and DXing. I'm not employed in 'the trade' and therefore am unable to provide advice other than relating my own experiences and those noted in readers' letters.

My present digital receiver is an RSD ODM-300 FTA, which provides an auto search/lockup function with just an input frequency given. Once the technique of digital satellite TV hunting was mastered, I was reasonably satisfied with the results - being that the receiver is fairly inexpensive.

I would, however, urge caution in the purchase of two receivers. The Praxis Digimaster series such as 9600/9800/AD, if advertised from a UK source. Praxis is a Middle Eastern company that imported this range from Korea for use within the Middle East only. The receiver is a reboxed version of an Echostar design. Praxis in turn exported them into Europe achieving good reviews in the technical press, but Echostar discovered the company had breached their agreement by trading outside of the Middle East. Supplies were cut-off ex Korea and it now appears that service back-up/upgrades may not be easily forthcoming. A pity, since the r.f. performance was excellent.

I would also be cautious of the latest Nokia 9800 digital receiver - at least if you intend to use it other than for Astra/Eutelsat reception of broadcast programmes. The 9800 will not automatically find channels with unknown SR/FEC



An Italian medical test transmission featuring a cataract operation on the eye, the thin probe breaks up the cataract and the thick tube 'hoovers' up the debris, via 'Video Cataract '99' on Eutelsat II F4 @ 10°E analogue, 11.077GHz-H.

and apparently is unwilling to display news feeds, even when they have been found.

Another reader found difficulty in downloading broadcast signals and the service advice backup at Nokia was less than helpful, blaming the reader's LNB - which worked OK on his other receivers! Earlier Nokias, such as the 9600, were good, especially in the red menu search mode. Readers comments on their experiences with digital satellite receivers would be helpful and will be included in this column to guide others with equipment purchase.

Orbital News

Still more expansion is planned by Eutelsat in their 13°E slot with their recent contract for the construction/launch of Hot Bird 6 which should be ready for slotting Autumn 2001. Alcatel Space will construct the new craft which will use both Ku (total 28) and Ka (total four) band transponders, offering up to 18 digital carriers per transponder and in conjunction with seven Skyplex units. These will allow small ground based users, e.g. corporate/consumer groups to uplink digital signals for widespread distribution via the downlink signal into dedicated DVB-MPEG receiver systems. There will be four transponders on the Ka craft loading offering fully interactive communications + Skyplex availability working down to 600mm dishes.

More commercial plans have been announced for the Kopernikus, DFS-2 slot at 28.5°E with a new satellite - the Eutelsat W-1R - to be launched end 2000 offering 24 Ku-band transponders. The new bird will utilise the following segments: 11.20-11.40; 11.40-11.70 and 12.50-12.75GHz, similar to those used by the currently active Kopernikus-2.

Eutelsat plan to expand TV and multi-media operations from this relatively quiet slot, remembering that Astra 2A is active at 28.20°E - peace reigns between the two operators after an agreement to co-exist with careful frequency downlinking planning. And in a press release of mid October, Eutelst claim that some 81 million homes now have access to the Hot Bird 13°E slot either by DTH or secondary access via cable, some 24 million of these are DTH satellite.

There are now some 420 digital (+100 of these are FTA), 30 analogue TV channels and 250 radio channels available from their 13°E slot.

Another 'Hot Bird' just in the early stages of commercial fruition is that of the INSAT-2E bird, operational from 83°E. An Indian group 'Videsh Sanchar Nigam Ltd.' is organising a general shift of all TV services currently downlinking into India from several orbital slots onto the single Insat-2E and vastly simplifying dish installation at lower costs for Indian viewers. This move has the general support of the government since it achieves an exclusive Indian 'Hot bird' which can be easily regulated against outside media predators, e.g. AsiaSat, Star TV, etc. whilst encouraging viewers to opt into non-tracking dishes. Already two channels have moved onto the 83°E slot.

New Skies Satellite NV (Amsterdam) have ordered a new bird for the 21.5°W slot, this the NSS-7 will be constructed by Lockheed Martin and will provide both C (4GHz) and Ku (11GHz) band capacity over the North Atlantic circuit and launches late summer 2001. NSS-7 will provide the full comms package of TV, radio, data, Internet and telephony and cover Europe, the Americas, Africa and parts of the Middle East. The present incumbent NSS-803 (formally Intelsat 803) will be moved into the Pacific Ocean service. An earlier ordered Intelsat craft - K-TV - is in the final stages of testing and will launch mid 2000 for operation across Asia.

Football anoraks will be pleased to learn that the Spanish 'Via Digital' TV platform have taken on board the 24 hour 'Futbol Total' channel which will include 'footie' offerings from around Europe including the UK, Portugal, Germany, France and Belgium. Finally, an odd development is the French 1st division 'Olympique Lyonnais' football club who have opened their own channel 'OLTV' though only a few matches will be carried as most live transmission rights are owned by Canal Plus and TPS.



Test card prior to a news package via NSS-K digital @ 21.5°W detailing Hurricane Floyd movement and damage, 16/9/99.



This caption preceded a football news item of an 'Antenna 3' feed from Greece into Madrid, NSS-K, analogue @ 11.530GHz-H, 14/9/99.



Awaiting a live news report into ITN from the Paddington train crash that same night, note the satellite news truck with dish in the background via Eutelsat II F3 @ 36°E digital (5/10/99).



The South African Motor Cycle Grand Prix carried all events on the 10th October, European distribution ex Madrid via 10°E analogue.

SPECIAL SATELLITE TV SPECIAL SATELLITE TV SPECIAL SAT

Monitoring Space Missions

John Locker reveals the secrets of the Russian Space Agency's tracking and communications satellites and catches the action in orbit, live.



The last press conference with the MIR crew before departure. NASA TV. (courtesy NASA).



Mission control as seen on Russian TV. (courtesy NASA).



MIR was dogged by many mishaps, including the onboard fire. (courtesy NASA).

High above the Earth resides a memorial to the exploits of manned space flight. Over one hundred and twenty tons of what is now no more than scrap metal. Inside the complex, condensation glistens on the surface of the control consoles in the cold darkness, lit only by the occasional shaft of sunlight, picking its way through the tiny portholes. The thin damp atmosphere inside the spacecraft, the last testimony to the final gasps of breath of the three crew members, who crawled reluctantly into the escape capsule, as they bade farewell to what had been their home for the best part of a year.

No, not part of the screenplay for an episode of *Red Dwarf*, but the reality facing the crew of Russia's ailing spacestation *MIR*. At the end of August 1999, the hatch closed for what will probably be the last time on the orbiting vessel *Peace*.

Two weeks later, the Russian Space Agency declared that they had powered down the onboard computers, and *MIR* was put into free drift. As this article goes to press, unless a benefactor is miraculously found, *MIR* will be on the way to a fiery end some time in the Spring of 2000 over the Pacific Ocean, bringing to a close nearly fourteen years of amateur communications from space.

Whilst we are all familiar with the amateur radio 'Mirex' exercises operated in the 2m band, and more recently on 70cms, few may be aware that the crew also operated a video link with their operations centre, via a geostationary tracking and data relay satellite, positioned at 16.5°W.

The Luch slot in the Clarke Belt was dedicated to space communications by Russia in a similar way that the USA uses the mid Atlantic TDRS satellite to communicate with the Space Shuttle. However, whilst TDRSS activity was well publicised, Russia's

video links were known initially to only a few.

Trail Of Discovery

My own interest in satellite TV technology had originally been driven by the prospect of receiving live TV from NASA (more of that later), so the idea of 'catching' feeds from *MIR*, in addition to radio downlinks, set me on a trail of discovery.

The satellite in use in the early nineties was *Cosmos 2054* at the 'Luch 1' position of 16.5°W. Part of the Soviet satellite tracking network designated 'SDRN' (Satellite Data Relay Network). Transmissions were carried at around 10.830GHz, down in the basement of the Ku-band frequency range. That was a bit of a problem for most satellite 'DXers' (my LNB was officially rated to no lower than 10.950GHz). The bird was also inclined.

After a search through mountains of NORAD data, I found a string of numbers relating to *Cosmos* (Keplerian elements) which indeed confirmed that it had a nasty wobble, above and below the equatorial plane, by about 2° each day. Then the final

straw - not only was I outside the signal footprint - but the output from the craft was very low, about 40dBW, spot beamed on Moscow.

Position Monitored

For months I monitored the position whenever I could. By feeding the Kepler elements into a PC tracking programme, I could predict when the satellite would be 'passing through' the equator. I could just lock onto a data stream from *Cosmos* at about 11.3MHz, but no pictures were to be found lower down the band.

There were so many factors to take into account. Inclination, time (no good looking when the crew would be asleep!), position of *MIR* (the window to the satellite opens as *MIR* crosses the South American coast, tracking north east towards Europe), plus the fact that there was no regular pattern to their transmissions, they could go days, or even weeks, without using video through *Cosmos*. It seemed an impossible task.

Early one September morning in 1994 I was preparing for work, and for some reason, decided to check the 16.5°W slot. Swinging the dish back east from *Intelsat K* at 21° I noticed the slightest trace of carrier.

Full threshold was applied on my Echostar receiver, the dish position tweaked for maximum signal, and there it was, fighting through the noise. I could just make out an image of a suit clad figure, and what appeared to be a solar panel behind him. Surely not! This was some kind of EVA, but I wasn't aware that a *MIR* spacewalk was planned.

Checking the computer, *MIR* was speeding north east across the Atlantic - towards Europe, and *Cosmos 2054* was just off the equatorial plane, heading slowly back into inclination and away from the 'sight' of my dish. For about ten minutes I watched as the cosmonaut floated in and out of view, then gradually faded into the background noise.

The next few days were spent desperately trying to confirm that an EVA had taken place. I had no access to the Internet at that time, so enquiries were made by amateur packet radio. Eventually, back came a reply from a Hungarian monitor who confirmed that he had heard EVA ops on the v.h.f. radio downlink (143.625MHz) at the same time that I had received pictures. This was the proof I needed.

A few days later, I managed to get hold of a copy of the *MirNews* circular, left, it confirmed that an EVA had taken place.

Extract from *MirNews* for Sept 1994 giving details EVAs.

MirNews .229 - 13 September 1994

2 Spacewalks (EVAs):

On 9.9.94 Malenchenko and Musabayev worked in open space for the first time. The duration of the EVA was more than 4 hours (a reliable source even spoke about 5 hrs 2 mins).

During the pass in orbit 48915, 1200-1207 UTC, so within our VHF range, they reported the closure of the hatch at 1202 UTC.

On 13.09.1994 they worked in open space for the 2nd time.

The EVA lasted 6 hours and 1 minute between 0631 UTC (opening of the hatch) and 1232 UTC (closure of the hatch). The cosmonauts did a lot of minor repairs, replacements of bolts, screws, etc. of platforms and equipment on the outer surface of the complex.

They also spoke about an old antenna. Activities of this kind must be done now and then, but have been often neglected during EVAs due to more important matters.

Regular Event

After that, monitoring *Cosmos 2054* became a regular event. I say regular, pictures were observed every few weeks or so, but were always very, very weak and as time went by, the inclination of the satellite increased, making it more difficult to locate.

By Autumn 1997, *Cosmos* had



which is used to fire their small hydrazine burners. These burners can give up to 3km s^{-1} thrust, in short bursts.

Contrary to popular belief, satellites do not stand still in the Clarke Belt. They are affected by the gravitational influences of the Sun, Moon and larger planets. As a result, their positions have to be constantly corrected. This is achieved using Hydrazine rockets and onboard fuel is usually sufficient to carry out these adjustments for about ten to twelve years. Remember, solar panels provide energy to power the receiver/transmitters (transponders) and electrical circuits, not movement.

Imaginary Cube

Each satellite has its own 'box' in the belt, an imaginary cube, just over 100km each side. Failure to stay within this slot, would result in drifting, loss of signal and an almighty, and costly, pile up of space debris!

So, as the fuel runs low, a decision must be made by the operators - keep the satellite on position to the bitter end - or fire up the boosters to blast it into a figure of eight pattern above, and below the Equator, this controlled oscillation giving the gift of longevity. Inclination gradually increasing at a rate of about 1° every year.

Bearing in mind the figure of eight orbit takes place over a 23 hour period, it follows that only twice in 24 hours will the bird actually be where it should be, and that's when you see it! This explains why a constant signal will fade in and out each day.

Having determined what's going on, the next stage is to decide when the satellite will be 'visible'. Doing this will save a lot of time, searching for something that just isn't in range, and give you a better chance of seeing some of those interesting feeds.

Need Help

This is where we need the help of NORAD, the North American Aerospace Defence Command establishment, buried deep below Cheyenne Mountain, Colorado, USA. It is they who track every object in space for military purposes.

Thousands of tracks are plotted each week, including the 'Geosats', and these co-ordinates are published daily on the Internet. Its a simple matter to download the data into a home PC and feed the information into a basic satellite tracking programme.

Under normal circumstances, tracking a geo-stationary satellite is like watching paint dry, but this isn't the case with inclined birds. The programme predicts the wobble and so indicates the optimum viewing time as the craft crosses the equator twice every 24 hours.

Inclination can be defined as the value in degrees a satellite will vary its position by, above and below the equator each orbit. A typical 'Geosat' orbit is just less than 24 hours. Some of the older satellites will have inclinations of up to 4° ...that's terminal!

At this point, they become unusable, and are released from their mortal coil to drift off to the great satellite graveyard. Even that final burst of activity is controlled, otherwise they would speed off on a collision course along the arc.

Ideally, the inclination of a satellite should be as near to zero as possible, but nothing in this world is perfect. An inclination of up to 0.100° is barely noticeable in most circumstances, however, beyond that, things start to become a bit of a problem.

Full Details

For more information on how to receive digital satellite TV relays, contact me via E-mail at: satcom@cybase.co.uk NASA TV is available via the Internet in Real Player format. Point your browser to <http://www.broadcom.com/events/nasa/nasatv.ram>

become almost unusable, power was failing, output greatly reduced. It was a bad year for *MIR*, first the fire, then the collision and computer failures on a regular basis. It didn't look good. Interest in activity up there was at its peak in the UK as British born crewman Mike Foale played out the greatest adventure of his life.

Just before Mike hitched a ride home on STS 86, Russia manoeuvred a new bird into the 16°W position and Cosmos was put out to graze in the satellite graveyard.

The new craft *Altair 2*, NORAD catalogue number 23426, turned out to be only slightly inclined, and tightly spot beamed on the Russian receiving station, however, signals into the UK did increase a little in strength. It was Mike Foale who first appeared on my screen from the new bird, making what was to be his last transmission before returning to Earth.

Transmissions from *Altair 2* gradually became few and far between, and in the Autumn of 1998, it became clear that the satellite was unusable. The Russian Space Agency abandoned it, and it was allowed to drift off position.

This marked the end of an era for *MIR*, and as it turned out, the beginning of the end!

What Of The Future?

There are rumours that the Russian Space Agency is proposing to put a new satellite at 16.5°W to facilitate communications to and from the International Space Station. Subject of course, to funding. This may take place as early as mid 2000. Meanwhile, dedicated space enthusiasts will hopefully continue to have access to re-feeds of NASA TV via the European news agency circuits.

NASA TV

For many years now NASA TV has been transmitting continuously, covering all of the major space events. It's not been an easy task keeping the station alive, and NTV is very often on the agenda when NASA's budgetary matters are discussed.

For Americans, the programming is free to air, and the signal is transmitted into Continental USA (CONUS) via Spacenet 2, one of the many communications satellites serving the continent. A number of US cable companies also carry NASA TV as part of their package.

Until 1994 when the station used a satellite just visible from Europe, it was just possible to monitor the signal from the west coast of the UK, provided you had a rather large receiving dish. Now, alas, direct reception is impossible.

However, major events are still covered by the main European TV companies, and to accommodate this, relays are provided via Atlantic TV communications satellites, which are visible to enthusiasts with more modest TV equipment. All Shuttle missions are covered on an ad hoc basis, with live images of launch, mission objectives and landing.

Over the years, I have collected hundreds of hours of raw NASA material, captured via satellite relays displaying spectacular imagery of man's efforts in space, from space walks (EVAs) to the release of spacecraft and dockings with the *MIR* Spacestation.

Indeed, it is ironic that the very reason NASA made such leaps in the early years of space exploration was as a direct result of Soviet advances in the science during the Cold War period. This has now come a full circle, with astronauts and cosmonauts joining together in space to celebrate their accomplishments. For the time being, NASA TV is safe from budgetary cutbacks, and long may it be so.

With the building of the International Space Station (ISS) and interplanetary missions, the next five years is going to be one of the most active periods of Space history, and I for one would like to continue to occupy my front row seat, thanks to the efforts of all at NASA TV.

Inclination

As we know, TV satellites are geostationary, holding their position in Cosmic equilibrium, 35,200km above the equator - the Clarke Belt. They are launched with a limited amount of fuel on board,



NASA TV carried live pictures of the last crew (flight 27) departing *MIR*.
(courtesy NASA).



***MIR* in orbit.**
(courtesy NASA).



Flight 27 prepares to leave *MIR* for the last time.
NASA TV.
(courtesy NASA).

The Joint Maritime Course

Surprised at the lack of SWM coverage, Keith Elgin GI7SOB set about putting things straight. Here is Keith's explanation of the well known (to some) JMC exercises.

A Sea King delivers stores to HMS Illustrious.
(courtesy HMNB Clyde).

As a long time reader of SWM I was surprised to see little coverage of the Joint Maritime Course (JMC) within the pages of this magazine. When this exercise is running, radio activity can be found across the h.f./v.h.f./u.h.f. spectrum and monitors anywhere in the UK should be able to pick up some relevant traffic, especially on h.f. From a v.h.f./u.h.f. perspective however, an ideal location would be the west coast of Scotland or the north coast of Northern Ireland. To try and explain in a single article the numerous radio circuits in operation during a JMC is simply not feasible, so what follows is a brief account of some of the activity taking place during these periods. First, though, an explanation is probably in order for those who may be unfamiliar with this particular military exercise.

An Explanation

The JMC is a UK national course conducted over a two-week period three times each year. Taking place over and around Scotland, it consists of air, maritime and land components operating on the surface, subsurface and in the air. The aim of the course is to train units in a multi-threat maritime environment with the emphasis on war-fighting principles and procedures, the principal aim being to train the RN and RAF to a standard ready to join the UK JRRF (Joint Rapid Reaction Force).

NATO and Allied navies and air forces are also invited to take part, each unit having the opportunity to practice all aspects of maritime warfare. These include air/surface attack and defence exercises, electronic warfare, mine-hunting, fast patrol boat attacks and submarine operations.

The first week of the course is the 'work-up phase' and the second week sees the ships and aircraft crews on round-the-clock alert during the intensive combat exercises. The RN and RAF elements come under the command of Flag Officer Sea Training (FOST) and Air



HNLMS Van Speijk sails from HMNB Clyde to join the Task Force. (courtesy HMNB Clyde).

Officer Commanding (AOC) 11/18 Group respectively.

Co-ordination is by the Joint Maritime Operational Training Staff (JMOTS) based at Northwood, where they are co-located with Commander-In-Chief Fleet and HQ 11/18 Group. JMOTS controls events very closely and during the exercise periods operates from the Maritime Operations Centre at HM Naval Base Clyde, Faslane, Scotland.

Check The 'Net

If you have access to the Internet, one of the easiest ways to find out when a JMC is due to take place is on the RAF's web-site. Looking in the Deployments and Exercise section at <http://www.raf.mod.uk/news/deplex.html> provides details relating to current operational deployments along with forthcoming exercises. The National Air Traffic Services (NATS) web-site at <http://www.ais.org.uk> is another excellent source.

A number of weeks prior to the start of a major exercise a *Supplement* to the UK AIP (Aeronautical Information Publication) is made available for download. The Supplement is obtainable as an Adobe Acrobat file and there's even a link provided to download the Acrobat Reader if you don't have it installed on your computer. The *Supplement* provides details of when and where Target Towing, High Seas Firing/Gunnery, Air-to-Air refuelling and Intense Low-Level Activity is scheduled to take place.

Also included is a map of the overall exercise area showing the various sub divisions. Each of these sub divisions is allocated a letter of the alphabet and knowing the approximate location is useful to the monitor as they are quite often mentioned on many of the h.f. voice circuits in use.

When an exercise is actually in progress, it's also worth returning to the NATS web-site as it is possible to view/download the daily NOTAMS (Notice to Airmen) which also includes updated or new information relevant to the exercise. For those capable of decoding NAVTEX (Navigational Text) messages, 'Portpatrick Radio' relays a navigational warning just prior to and for the duration of the course. The NAVTEX broadcasts can be found on 518kHz SITOP-B 100Baud at 0220, 0620, 1020, 1420, 1820 and 2220UTC.

JMC993

The final JMC for this year, JMC993, actually encompassed two other annual exercises, 'Northern Light' and 'Green Wader', and took place on 13-25 September 1999. The exercise was under the command of Allied Commander-in-Chief Eastern



Atlantic Area (CINCEASTLANT) in conjunction with Commandant la Zone Maritime Atlantique, (CECLANT) commanding the French Atlantic Forces.

Involved were 11 nations, which were Belgium, Canada, Denmark, France, Germany, Netherlands, Norway, Portugal, Spain, United Kingdom and the United States. The exercise area extended from the northwest of Scotland to the north of the Bay of Biscay and Brittany.

Amongst the forces taking part were two of NATO's four multi-national Immediate Reaction Forces, namely the Standing Naval Force Atlantic (STANAVFORLANT) and the Mine Countermeasures Force North-western Europe (MCMFORNORTH). This was also the first time that the Force Navale Franco Allemande (French-German Naval Force, FNFA) had participated in a major NATO exercise and that French and German troops had been integrated within the UK/NL Amphibious Task Force.

JAAWSC

One of the busiest h.f. circuits is known as JAAWSC (Joint Anti-Air Warfare Shore Co-ordination), often

misreported as Jorsk, which is how it sounds as a spoken word over-the-air. Listening to a JAAWSC net it is possible to hear the Control and Reporting Centres (CRC) passing details relating to various radar tracks being monitored. This verbal reporting is known as Crosstel.

Airmove arrivals and departures, the passing of frequency designators for other circuits in use and status codes relating to the Link-14 data system, codename 'Beaver', are also heard here. Prior to JMC993, finding the JAAWSC frequency was very easy. Following transmission of the regional pressure settings forecast at H+00 (on the hour) or the airfield availability and minimum weather conditions at H+30 on the STCICS (Strike Command Integrated Communications System) h.f. network, callsign 'Architect', three of the h.f. channel designators currently in operation were announced.

Here is an example:- "Additional information two repeat two PO-UA-MC". The first digit relates to the main radar station co-ordinating the exercise, in this case CRC Buchan. Next we have the JAAWSC, Charlie Squared (C²) and Chick Co-ordination designators. The actual frequencies in this case were 6.715 (PO), 4.724 (UA) and 5.270MHz (MC). Very little traffic is ever logged on the C² these days and as for Chick Co-ordination being conducted on h.f., don't hold your breath!

During *Northern Light 99* no mention was made of the h.f. designators, so it was back to hunting the bands for relevant traffic. Thankfully, as with exercises in the past, frequencies rarely changed once good communications were established and during the two-week period the JAAWSC net could be found on either **4.706** or **6.715MHz**. This net was active from approximately 0600 until 1545 daily.

One other slight change this time was RAF Buchan and RAF Neatishead assumed composite callsigns. Buchan became 'Nechan' (Neatishead Buchan) and Neatishead, which should have been 'Buehead' (Buchan Neatishead), was monitored spelling the callsign as 'Butthead'!

Verbal Discussion

Although the JAAWSC generates the most voice traffic, there is another circuit monitors will undoubtedly come across. This is known as Link Co-ordination (LC) and is used for the verbal discussion of the Link-11 data circuit. Link-11, codename 'Alligator', allows for the exchange of air, surface, and subsurface radar tracks along with EW data and limited operational data between Command and Control (C²) units.

The operating procedures for Link-11 are discussed over-the-air using a system similar to the Q-Code. These three letter codes, known as X-Codes, provide a valuable insight to

the workings of this system. During the first week, many of the h.f. frequencies found active contain LC traffic.

The following week, when the intensive combat phase is in progress, these same frequencies will also be carrying ASUW (Anti Surface Warfare) or ASW (Anti Submarine Warfare) traffic. During *Northern Light 99* the following h.f. frequencies were logged with LC/ASUW traffic - **2.0785, 4.033, 4.048, 4.149, 4.724, 4.779, 4.8785, 4.880, 5.0915, 5.910, 7.8605** and **7.8615MHz**.

Maritime Patrol

RAF Kinloss in Scotland, home to the Nimrod MR2 fleet, hosts the Maritime Patrol (MARPAT) element of the course. As well as the local based Nimrods, up to 10 maritime aircraft from a number of countries forward deploy to Kinloss for the two week period.

Regular visitors are Atlantics from France, Germany and Italy, Auroras from Canada and P-3s from the USA. Also taking part are P-3 Orions from Valkenburg Naval Air Station in the Netherlands, although these aircraft usually fly directly from their home base for each mission.

Each day, two MPA (Maritime Patrol Aircraft) are tasked with providing SURPIC information. SURPIC, an abbreviation for Surface Picture, is a very important role carried out by the MPA. Building a picture of the fleet from a central vessel, the HVU (Highest Value Unit, usually an oiler or aircraft carrier), the positions of all other vessels are then measured relative to this point.

The SURPIC messages are broadcast at 30-minute intervals, but when the need arises, this can be reduced to as little as five



A busy HMNB Clyde Quayside as the Fleet readies for departure.
(courtesy HMNB Clyde).



HMS Illustrious in the Clyde Estuary.
(courtesy HMNB Clyde).

minutes. The broadcasting of the SURPIC is done on h.f., v.h.f. and u.h.f. and for the past few years 6.724MHz, 122.650 and 290.200MHz have been used. MPA tasked to provide the SURPIC use 'Mission ####' callsigns where the first pair of digits are the date and the second pair are the sortie number.

As there are only two SURPIC flights each day, one in the morning and one in the afternoon, these are allocated 00 and 50. Therefore, the second flight on the 15th would have been 'Mission 1550'.

The Safety Factor

Safety is of course the most important factor. With so many aircraft in transit to and from their operational areas, a number

Continued on page 48...

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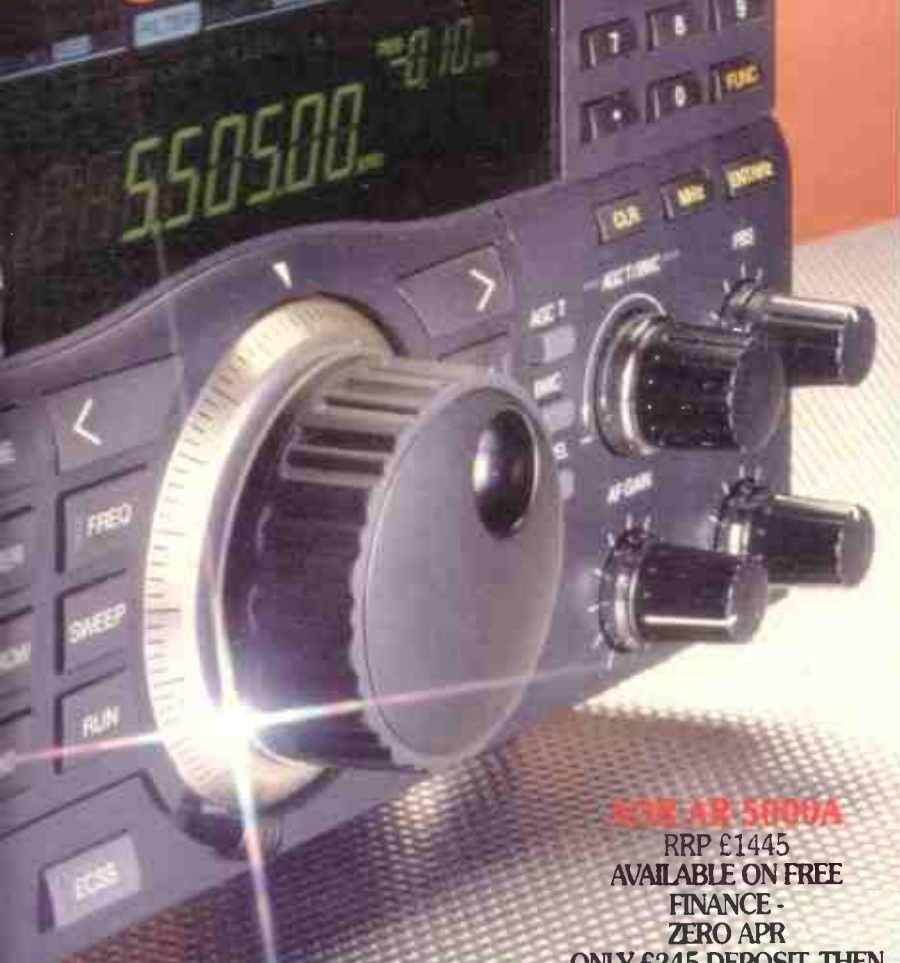
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Mast diameter +45dBm IP 3rd order

Dimensions (10MHz /12V)

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(230V mains adaptor for 12V DC is supplied with the antenna)

ARA40 TEL 30-50mm can be fitted

ARA40 115cm total length with glassfibre whip. Antenna tube 40mm x 140mm

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Technical performance

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Output impedance 2.3dB less gain

Connector to Rx 50.75 ohm coaxial

Gain PL type delivered as standard. Other standards can be fitted upon request

Intercept Point 10dB + /-0.2dBs

DC power supply +50dBm IP 3rd order

(10MHz /12V)

ARA60 11.5-13 volt DC at 80mA typ.

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Output impedance 50-75 ohms coaxial

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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

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(courtesy HMNB Clyde).

of agencies help to ensure this is achieved.

As the main exercise area falls within the Scottish FIR, the Scottish Air Traffic Control Centre (ScATCC), operating from Atlantic House, Prestwick, near Ayr in Scotland is responsible for Air Traffic Control. All of the frequencies allocated to 'Scottish Mil' are in use at some point during the two-week period, but particular attention should be paid to the Initial Contact Frequencies (ICF).

Aircraft north of 58°N call up on 231.625MHz and south of 58°N on 249.475MHz. On v.h.f., the ICF is 134.300MHz and this frequency covers all of the Scottish sector.

During the JMC, RAF Buchan or Neatishead also handle some of the ATC responsibilities. This job is undertaken by the Maritime Marshaller (MM) and is conducted on TAD 035 240.300MHz. On the outbound leg, the MM controls the aircraft until they reach their hand-over gate, then switching to their next controlling agency, either Fleet control or an orbiting E-3 AWACS (Airborne Warning and Control System).

Returning aircraft can sometimes recover directly to base under radar control of the MM, others necessitate a handoff back to 'Scottish Mil'. Aircraft operating in the Fighter Areas Of Responsibilities (FAOR) have ship-borne air traffic or fighter controllers providing air safe co-ordination. These controllers not only handle friendly aircraft, but also provide Procedural or Flight Information Services to OPFOR (Opposition Force) aircraft attacking the Fleet.

A Nimrod Maritime Patrol Aircraft makes a low level pass for visual identification.

(courtesy RAF Kinloss).



Operating under the callsign 'Eagle Safety', two jam-free u.h.f. circuits, 'Eagle 1' 356.400 and 'Eagle 2' 371.000MHz, are utilised for this purpose. Rarely heard these days is 'Falcon Safety', the callsign associated with non-radar qualified helicopter controllers or non-radar equipped ships. The MPA not only have air safe co-ordination from the Fleet, but also a v.h.f. and u.h.f. circuit for deconfliction between themselves.

130.100MHz, often referred to as 'SOF Victor' (Safety of Flight), and 373.700MHz 'MPA Common' are the frequencies to monitor. As well as air safety messages, occasionally sitreps (situation reports) are passed here when communications cannot be established on the pre-briefed tactical nets.

Ship-To-Air

Although many of the u.h.f. frequencies used are for ship-to-ship communications and therefore out of range for most monitors, a number of ship-to-air frequencies are also used. These are likely to be heard when ships work with E-3 AWACS of which there is at least one on station each day.

The UK has twelve designated areas for the E-3 to orbit in, starting with UK-01, located off the western coast of Lands End, to UK-12 north of the Orkney Islands. During a JMC, UK-07, 09 and 11 are used quite often, 07 and 09 providing monitors in the northern half of the UK with excellent reception.

As well as the RAF E-3s from RAF Waddington, NATO E-3s based at Geilenkirchen, Germany, and the French E-3s based at Avord, France, are also frequent participants. The E-3s operate under a number of callsigns, depending on the agency they are working with. Talking to ATC, flight deck communications from RAF E-3s use 'Nato 30-47', NATO E-3s use 'Nato 01-29' and the French use 'French Air Force 90##'.

The RAF mission crew in the back end use 'Magic ##' with the numeric 50 higher than the front end callsign. The NATO E-3s use the same system, but with a 60 split between the front and back, 'Nato 18' is the exception, as the back end is 'Magic 58'. The French mission crew simply use the callsign 'Cyrano'.

Working with naval forces, one of the primary circuits is known as the AW (Air Warfare) net. Both h.f. and u.h.f. are used, although u.h.f. is preferred. Callsigns are single or two characters spoken phonetically. The callsign 'Alpha-Whiskey' is usually held by the PWO (Principal Warfare Officer) as he is in charge of the Task Force Air Warfare Net.

The E-3s tend to be allocated callsigns from the end of the alphabet, 'Yankee' or 'Zulu' being especially common. There may of course be an AEW (Airborne Early Warning) Sea King also in the air; the AEW Sea Kings often precede their allocated letter with 'Anyface' to avoid any confusion.

Different Designators

Many different types of designators are heard during the JMC. Tie-ups for the actual frequencies in some cases are only valid for the current exercise, others remain in use for much longer periods. One such list, which changes each exercise, is known as 'Kilo Juliet'. Reading postings to related newsgroups and mailing lists on the Internet you will find numerous requests for these.

The KJ series covers both h.f. and u.h.f. with no logic to their order; even if you confirmed that KJ 21 was 379.000MHz, KJ 22 could still be anywhere in the h.f./u.h.f. band. Tactical Air Directive (TAD) is another designator commonly heard. These are used on a daily basis throughout the year and tend not to change that often.

None of the airband frequency guides listed in the SWM Book Store identify the TAD designators with the relevant frequency, but finding them should not be a problem with the storage capacity and speed of modern scanners.

SWM

Uniden Bearcat BC245XLT 'Trunktracker II' Review

For several years Motorola trunked systems have been on the air in the UK. These systems consist of a data channel and up to 27 voice channels. Users are divided into talkgroups and the voice channels are shared between talkgroups. When a member of one talkgroup wants to speak, the system assigns a voice channel and the channel change is signalled to all members of that talkgroup by the data channel. These systems are difficult to follow with a conventional scanner because the voice channel is usually changed at the end of each over and multiple talkgroups are generally using the system simultaneously. Single disjointed sentences from several talkgroups appear on each voice channel frequency in a random fashion.

Enter The Trunktracker

In 1997, Uniden Bearcat released the 235XLT 'Trunktracker' hand-held trunk tracking scanner in the USA. This could follow Motorola trunked systems, but only systems using 800MHz frequencies. Unfortunately two systems in the UK use 400MHz and the other uses v.h.f. Computer programs, like 'Trunker', were also released, but these needed one or two scanners linked to a computer and hand-held UK trunk tracking remained impossible.

In July 1999, the BC245XLT 'Trunk tracker II' was released in the USA and this represents a major improvement. The good news is that with this radio you can now trunk track Motorola systems using v.h.f., 400, 500, 800 and 900MHz frequencies and can therefore track the UK 400MHz systems (but unfortunately **not** the v.h.f. system due to the implemented channel step sizes). The bad news was that there were no initial plans to market this in the UK. Therefore, a little travelling was needed.

First Catch Your Scanner

Luckily, I had a business trip arranged to Ohio in the US. A quick detour to the local scanning store with \$230 bought a new '245XLT with \$25 extra for a spare battery pack. Back in my hotel room in Dayton, I opened the box which yielded a sleek black scanner measuring some 155 x 60 x 40mm and weighing approximately 370g (including battery). The top panel, from left to right, has a BNC connector, earphone connector and rotary squelch control and volume control. The earphone connector is well constructed since it feeds both

ears using mono and stereo earphones without needing to use an adapter. The squelch control is unusual since turning it anticlockwise raises the squelch threshold. The volume control also turns the scanner on and off. An earpiece and a 160mm 'rubber duck' helical antenna are supplied.



Scanning By Remote Control

The right side of the scanner has a rubber flap, behind which is a data connector. A supplied data cable locks into this connector and the other end can be connected to a 9-pin serial port for computer control but no software is included. Programs have been released that allow complete computer control of the scanner and can upload and download frequency and talkgroup information into the memories, but they are beyond the scope of this review. A function called 'SmartScanner' also exists to connect the scanner directly to a modem and download local frequencies from Uniden Bearcat, but this only works for US frequencies and it wasn't operational in early July.

We Have The Power...But At 110V

The power adapter that comes with the scanner is US standard 110V and produces 12V which connects to a plug on the left side of the scanner. This powers the scanner and charges the battery pack. The battery pack is proprietary and consists of four AA cells sealed together on a non-standard plug, which plugs into a connector in the battery bay at the back of the scanner, at the bottom. A charged battery pack takes 14-16 hours to charge and powers the scanner for approximately seven hours. For use in the UK, you would need to cannibalise the power adapter lead to connect to a 12V power supply (Care with the polarity) although power adapters supplied with several UK-supplied scanners of other makes are of the right voltage and have a connector that fits. It would have been far better for the scanner to use standard AA cells. A belt clip is also provided.

Conventional Scanning

The liquid crystal display is numeric with a row of 20 bank/activity indicators along the top and status indicators for most functions. The selectable autolight function is a good idea and turns the display light on for five seconds when traffic is received. However, it doesn't work quite as planned

Colin Goy, desperate to sample the BC245XLT American-style hand-held trunk tracker went to the US to get his hands on one. Now it's available here in the UK too.

Continued on page 52...

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...continued
from page 49

"It does
have its
imperfections
but other
scanner
manufacturers
should sit up
and take
notice of
trunked
system
scanning
before
Trunktracker III
arrives."

because if the traffic goes away and returns, the light still turns off five seconds after the initial activation. Also, if traffic returns within two seconds of the light going off, it doesn't come back on at all until there is a longer than two second pause.

The front panel has a conventional appearance with rubber keys. These have a positive feel and are arranged logically but have a beep that cannot be disabled. The beep volume depends on the main volume control. Most functions can be accessed with a single key press or two second key hold and any second function of a key is only activated with the scanner in the appropriate mode. The overall effect is clear and straightforward with no requirement for a 'shift' or '2nd function' key. However, there is no lack of features to control. There are 300 frequency memories, arranged as ten banks of thirty, and these hold frequency only since this sets the mode and step sizes automatically. The mode and step size cannot be set manually, which is disappointing. Frequency coverage, automatic mode and step sizes are shown in **Table 1**.

Memory scanning is very fast, measured around 70 channels/second using random frequencies. A full range of scanning control functions is available. Individual banks can be toggled in and out of the scan pattern. Individual memories can be locked out of scan and a single memory in each bank can be set as a priority channel, checked every two seconds.

Searching was less impressive, with no ability to search directly from a memorised frequency and priority does not function whilst searching. Two frequency limits have to be entered for it to search between. Directly entering a frequency to listen to was not possible since it has to be entered into a memory and there was, surprisingly, no dedicated monitor memory for this purpose. Search speed is fast at around 75-85 channels/second and Turboscan is available for bands with 5kHz channel steps giving a measured speed of around 235 channels/second. Up to fifty frequencies can be locked out from search and there is an attenuator which can be set globally on or off for search and scan. A data skip function operates on f.m. to allow search to continue automatically after the scanner stops on pager channels and this worked well on the local pagers but less well on intermodulation which had to be locked out. A two second delay is selectable for each frequency memory and for search.

The scanner's American origins show through with pre-programmed US frequencies for police, fire, railroad, aircraft, marine and weather can be scanned at a press of the SVC button (Service Scan). Unfortunately, only the airband and some of the



marine frequencies have UK applications and the remainder cannot be changed.

Trunk Tracking - Intelligence Led Scanning

The BC245XLT can trunk track Motorola type I, II and hybrid systems and Ericsson EDACS systems, but there are presently no known EDACS systems in the UK. To trunk track properly on Motorola 400MHz systems, which are all type II, the '245XLT needs two crucial pieces of information:

1. A complete list of frequencies used by the system. Any missing frequencies will cause gaps in trunk tracking. If there is only one system in a band, this information can be easy to search out using the conventional features above. However, some systems have backup data channels (up to three) which can stay silent for long periods of time and multiple systems can be operating in one band which can be confusing to untangle. Trunking computer programs and the Internet can be very useful in providing this information and I obtained information for the US Air

Force Base in Dayton (which uses a 400MHz trunked Motorola system) to make the best of my brief visit.

2. Frequencies called BASE and OFFSET used by the specific trunked system. The operating guide is generally good, apart from a few misprints, but it has no explanation of these important numbers which is a serious omission for those interested in Motorola 400MHz tracking. In simple terms, BASE and OFFSET differ for each trunked system and tell the scanner where to look for voice channels. BASE is the frequency of decimal channel number 380 (17C in hexadecimal) in MHz and OFFSET is the increment between channels in kHz and the channels are numbered sequentially upwards. BASE and OFFSET can be calculated by formula given frequency and channel number data collected by a trunk tracking computer program like 'Trunker' (as featured in the 'Scanning' column in July's *SWM*). See http://home.att.net/~wwhitby/tt_ids.htm for the formula. Alternatively, calculated BASE and OFFSET values can be found on the Internet for some systems. In desperation, trial and error can be used, bearing in mind that OFFSET can be 12.5, 25 or 50 (examine the spacing of the system frequencies) and BASE is generally close to the lowest frequency used by the system but it can be a very frustrating way of getting started.

The WebPage

<http://www.bearcat1.com/fleetgb.htm> has especially useful information on BASE, OFFSET and system frequencies.

Trunk Tracking - A New (But Familiar) World

In trunk tracking, once the BASE, OFFSET and system frequencies are stored, they become

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almost irrelevant. Talkgroup IDs become analogous to conventional scanning frequencies. This analogy is followed closely in the design of the BC245XLT which allows almost all conventional scanning features to have their equivalent in the trunk tracking domain and their method of operation during trunk tracking is also similar to allow ease of use.

One bank of frequency memories can store only one active trunked system. The trunked frequencies have to be stored when the scanner is in trunking mode and this allows you to enter the BASE and OFFSET and set the type of trunked system. The scanner creates an ID scan list for each trunked bank, which can store up to 100 talkgroup IDs as ten lists of ten IDs. Once the scanner is trunk tracking, search starts the scanner looking for IDs on the data channel and it listens to the first talkgroup that becomes active. That ID can be stored in an ID list or it can be locked out if it is of no interest. Alternatively, the scanner can just continue searching on. Up to 200 IDs can be locked out per bank and this locks out that ID in search and scan. A two second delay can be set for ID searching and individual IDs in lists. Individual IDs can be held to allow all traffic on one talkgroup to be followed. One ID in each list of ten can be set as a priority ID during ID scan and the ten ID lists can be toggled in and out of the scan just like the conventional frequency banks during conventional scanning.

Additional features possible during trunking mode include three different display modes toggled between by the DATA key. One of these allows you to see which voice channels are active at any one time on the system by using the ten bank ID list indicators plus ten additional indicators in the top of the display which is initially fascinating to watch. Frequency Find displays the current frequency the traffic is on and allows the frequency changes involved in a conversation on the system to be revealed. ID monitor displays the currently active IDs continually but doesn't listen to the traffic. This allows a list of active talkgroups to be rapidly compiled.

I was soon trunk tracking the Wright-Patterson Air Force Base system in Dayton without difficulty. This includes the USAF Museum, and most aspects of airbase operations have specific talkgroups allocated. Details of the system are summarised in **Table 2**.

Most type II systems can have up to 4096 talkgroups. The only thing the BC245XLT cannot track on a trunked system are private or interconnect calls made between individual users, but there are reported to be few of these on most systems.

All At The Same Time?

The scanner can scan any combination of trunked and conventional banks. Conventional frequencies can also be stored in trunked banks. However, this feature is not well implemented. What generally happens is that the scanner scans the conventional bank(s) once in a fraction of a second and then pauses on the first trunked bank. It holds on each trunked bank for a minimum of five seconds and then moves on to the next, only if no unlocked active IDs are found. However, there is usually trunked traffic which stops the scan until there has

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been none for five seconds and this causes the trunked banks to stall the scan pattern and effectively ignore the conventional banks. A shorter delay time would have been better for the pause. This can be corrected whilst under computer control.

Performance

No quantitative measurements could be performed but the BC245XLT was compared side-by-side with a Yupiteru MVT-7100 on an identical antenna. Sensitivity was slightly less for the '245XLT on all bands tested but there was little difference. The nearby pager transmitter around 138MHz did cause slight breakthrough, but certainly no more than the '7100. The speaker audio tone had less bass depth on the Bearcat but was acceptable. The scan/search speeds on the '245 were extremely fast (as above), the Yupiteru managing only 32, 5kHz channels/second in search and 18 channels/second in scan (identical frequencies).

What I Think

The BC245XLT has a good solid feel to it. It has shortcomings in conventional scanning in terms of frequency range, modes and steps, especially compared to multiband scanners marketed in the UK. However, it is designed primarily for use in the USA and the features are optimised for that environment, especially Service Scan. The high search and scan rates are impressive. The cost, though, is only around the equivalent of £145, although duty and shipping would push this up to around £215, if obtained by mail order. What distinguishes the BC245XLT is the unique hand-held trunk tracking capability it provides, which is easy to use and works well. Some knowledge of the trunked system is required to set the scanner up and this requires some minor detective work to collect, although the Internet has made this task much easier. It has a significant technological advantage compared to other scanners on sale currently if there are Motorola systems in the vicinity. The potential for computer control is a bonus. It does have its imperfections but other scanner manufacturers should sit up and take notice of trunked system scanning before Trunktracker III arrives.

Unfortunately, at the time of writing, it is currently only available in person or by mail order from the USA, but buying by credit card from a reputable dealer is straightforward and some credit cards provide insurance on items paid for using their card. I think I'll have to try and see the USAF museum in Dayton properly at another time but the BC245XLT will definitely be going too. In the meantime, I'll have to make do with

<http://www.wpafb.af.mil/museum/> **SWM**

Table 1: Frequency coverage vs mode and step size.

| Frequency Range (MHz) | Mode | Channel Step (kHz) |
|-----------------------|------|--------------------|
| 29-54 | f.m. | 5 |
| 108-137 | a.m. | 12.5 |
| 137-174 | f.m. | 5 |
| 406-512 | f.m. | 12.5 |
| 806-956* | f.m. | 12.5 |

*less 824-849MHz and 869-894MHz US cellular phone frequencies)

Table 2: Example System Details.

Wright-Patterson AFB.
 BASE 406.35MHz, OFFSET 50kHz.
 System Frequencies: - 406.35, 406.55, 407.15, 407.35, 407.95, 408.75, 408.95, 409.55, 409.75, 409.95.
 Some Decimal Talkgroups Found: -16-Patterson Ground, 496-Base Operations, 528-Air Force Museum, 1008-88th ABW Flight Line, 10672-445th AW, 11248-445th AW, 14544-445th AW.

Since this review was written, **Martin Lynch & Sons** have begun stocking the BC245XLT, with a UK mains version of the p.s.u.
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www.mlands.co.uk

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£78

Carriage £5.50

£149

Just the thing for short range communications at home, work or leisure. Ideal for cycling, fishing, air shows, boating, antenna erection, and many other pursuits.

ICOM IC-R75 Receiver

30kHz - 60MHz



NEW

£629

FREE AC PSU & DSP Unit

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

AOR-5000 Receiver

10kHz - 2.6GHz



£1299

Covering an extremely wide frequency range and offering USB, LSB, CW, AM, FM. It features 1,000 Alphanumeric Memories * 45 Channels per sec Scan Speed

* 2,100 programmable Pass Frequencies * DTMF Decoder * RS-232 Port * 1Hz tuning steps * 6 switchable bandwidths * Pre-amplifier * Duplex monitoring *

ICOM ICR-8500 Receiver

100kHz - 1.99GHz



£1395

Icom's wide range receiver has all the performance and engineering qualities you expect from this company. Features include USB, LSB, CW, AM, FM, WFM * Wide dynamic range * RS-232C interface * 1000 alphanumeric memory channels * Comprehensive scanning * Sleep function and Timer * IF Shift control * 3 Antenna connectors * Voice synthesizer option * Keypad frequency entry * Analogue S-meter * Large LCD readout etc. Send for brochure.

AOR-3000A Receiver

100kHz - 2036MHz



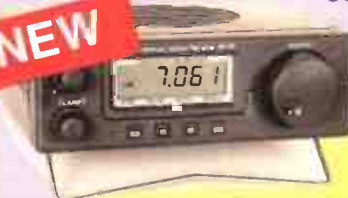
£699

The AOR-3000A goes on and on. It offers a wide frequency range at a very competitive price. Features include USB, LSB, CW, AM, FM * Fast 50 channels per sec search, *

GaAsFET RF amplifier * Wide range of tuning steps from 50kHz * RS-232 port * 400 memory channels * Built-in clock * Channel pass feature * Back illumination * Rear whip antenna etc. Ask for leaflet.

NASA HF-4E Receiver

30kHz - 30MHz



£199

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FREE Software Disk

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

YAESU FRG-100 Receiver

50kHz - 30MHz



£389

The FRG-100 has stood the test of time. It offers full coverage of the short wave bands plus long wave and medium wave. It features, * USB, LSB, AM, CW,

* 50 memories * 2 stage attenuator * Noise Blanker * Band Scanning * Memory Scanning * Dual Speed AGC * High and low impedance antenna inputs * Programmable steps from 10Hz - 1kHz * Optional Narrow Filters, PSU and FM board * BFO reverse for CW * Twin Clocks. Ask for leaflet.

Fairhaven RD-500VX

20kHz - 1.75GHz



Phone

This very wide range receiver offers a complete listener station in one package. Features

include USB, LSB, CW, AM, FM, Video out * 5Hz step accuracy * Over 13,000 memories with 20 Alphanumeric Characters * Noise Blanker * Text Search * Pass Band Tuning * Stereo CW Reception * Notch & Peak Filter etc.

AOR-7030 Receiver

0kHz - 32MHz



Phone

Needing little introduction, this receiver has become a classic of design. Features

USB, LSB, CW, AM, FM, * 100 Memories * Dual VFOs * Resolution to 10Hz * Clock and Timer * Variable Bandwidth * Wide Dynamic Range * Seamless Tuning using Single Loop DDS * Clear LCD Readout * Infrared Remote Controller * AC Power Supply. Send for leaflet.

NRD-545 DSP Receiver

100kHz - 30MHz



Phone

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



Phone

Yupiteru MVT-7100EU 100kHz - 1.65GHz

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



Phone

Yupiteru MVT-7000EX 100kHz - 1.3GHz

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



£179

AOR-8200 500kHz - 2040MHz

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



Phone

ICOM IC-R10E 500kHz - 1300MHz

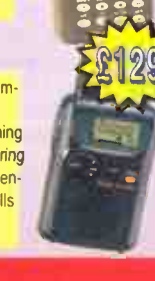
USB, LSB, CW, AM, FM, WFM * 1,000 Memories * Bandscope * Noise Blanker * Wide range of tuning steps * alphanumeric Display * Real Time Band Scope * Voice scan feature * Data output port * Programmable scanning * Ni-cad pack, AC charger and helical antenna.



£249

ICOM IC-R2 500kHz - 1309MHz

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



£129

UK Radio Communications Equipment Guide 2000

NEW

Just published, this A4 book gives detailed information on over 2000 ham radio and listener items. And at a price cheaper than a magazine! £2.95 + £1.25 postage



Yupiteru VT-225 108MHz - 391MHz

The VT-225 is a dedicated AM Civil and Military airband scanner. It offers the ultimate in sensitivity. Features AM, FM * 100 Memories * Programmable Steps * Priority Channel * Pass Function * High Sensitivity * Signal strength meter * Ni-cads, Antenna and AC charger.



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Super Searcher Auto Tunes Your Receiver

This frequency counter covers 10Hz - 3GHz and has the added ability to auto tune receivers with data ports. It will work with AOR 8200 and IC-R10 models. As soon as it finds a signal it tunes the receiver in a flash. Can also be used as a stand-alone unit. Supplied with ni-cads, charger and antenna.



£99.95

Hunter Frequency Counter 10MHz - 3GHz Super Value

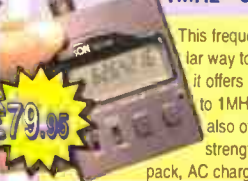
This is one of our most popular counters - and rightly so at the price! Supplied with rechargeable battery pack, AC charger and telescopic antenna. It has a range of several hundred feet (for handhelds) and sniffs out any local transmission, displaying the exact frequency. You then simply key that frequency into your scanner.



£59.95

FC-130 Frequency Counter 1MHz - 3GHz

This frequency counter functions in a similar way to the "Hunter" above. However, it offers a wider frequency range down to 1MHz and has a 10 digit display. It also offers a 16 digit bargraph field strength meter. Supplied with ni-cad pack, AC charger and antenna



£79.95

WAB-10 Airband Receiver

This receiver is ideal for the air band enthusiast. It offers proper AM reception of the complete VHF airband and has 10 memory channels. The digital display offers exact, rock-steady tuning. Needs AA cells. Includes VHF FM stereo (using headphones)



£39.95

Double Your Life!! NiMH Cells

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



- 4 x AA cells £9.95
- 4 x AAA cells £9.95
- Charger for above £9.95
- Carriage £2 maximum. Quantity discounts - phone

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

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



£279.95

Improve Reception Watson Scanning Antennas

These antennas will dramatically improve your reception. They replace the factory supplied models and have BNC fittings.

- W-801 Regular Gainer Rubber Duck 21cms long £12.95
- W-901 VHF / UHF Airband Rubber Duck £19.95
- W881 Super Gainer Rubber Duck 40cms long £19.95
- W-889 Telegainer Telescopic scanner whip £14.95

Global AT-2000 Rx ATU Short Wave ATU with Q-switch



Covers the complete short wave spectrum. It matches your antenna to your receiver, thus ensuring maximum signal strength. The 3-stage Q-switch provides improved front-end selectivity that will dramatically improve reception on crowded bands, reducing noise and making signals clearer.

£89.95

Hoka Decoding Software



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

W-MM1 Data Decoder Scanner Short Wave Matcher



This decoder is connected between PC serial socket and receiver audio socket. It is self powered. Supplied with software, it will decode data signals on your PC including Packet, AMTOR, SSTV, Fax, RTTY, CW, NAV-TEX, SYNOP. Now you can read those strange noises!

£69.95



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

Airband

In October's 'Airband' I expressed my concerns about privatisation of the air traffic control system. Last week, only four days after the tragic Paddington train crash, a remarkable story was carried in the national press. It appears the Government is reconsidering its decision.

I'll tell you what that suggests to me and you can decide if you can follow my argument or if you disagree with my opinion. The decision was made as a rapid response to public dismay at the poor safety record of the privatised railways. If this is the result of selling off one transport system, then perhaps the same effect could apply to another (air traffic for example). In other words, there is no logical reason for privatisation. After years of debate, the decision could be reversed in just days when the true consequences become apparent! I await the final definite outcome with interest.

Another profit-motivated short-lived wonder could be power line transmission of data and in September I explained how this proposal would interfere with essential communications (including h.f. air traffic control). I'm pleased to see that one electricity provider has decided against installing this data-carrying system. The message is starting to get through! (*Sadly, only due to poor profit opportunities and not due to r.f.i. considerations! - Ed.*)

Events

Get your New Millennium diaries out and note the following dates (provisional, please confirm nearer the time). May 20 and 21: Air-Britain Fly-In at Coventry and June 23, 24 & 25: PFA Rally at Cranfield (note, earlier in the year than usual). Chris and I hope to be at both events if anyone wants to meet up.

Help!

Nick Read G7DND - contact him direct please on (01372) 459710 - is desperately seeking BAC One-Eleven parts for a genuine and historically-important restoration project. Please, if anyone has the slightest idea where to start looking, contact him. He'd be most grateful.

Probably beyond help (according to reports in the press) is the fine collection of aircraft owned by Peter Vallance. As I've said in this column previously, Gatwick is an unsuitable place to keep aircraft. I don't agree, nor does the local authority on which the airport lies. But, just to one corner of the airport site lies Peter's collection. Sit on the right of the cabin and, on take-off from 26L, you'll see the aircraft.

Unfortunately, there's an anomaly. Despite being in line with North Terminal, Peter's property lies within an enclave of Mole Valley District Council's area. This authority does not cover Gatwick and have been trying to get Peter's aircraft scrapped for years. As there are no near neighbours (apart from the airport) I can't understand why. Among others, two Shackletons will be lost if the collection really has to go.

Receiver Hardware

What antenna can improve reception on a v.h.f./u.h.f. scanner? Readers

such as **David McCurry** (Co. Londonderry) often ask. The requirement is that it is omnidirectional (receives just as well

no matter from which direction the signal comes), vertically-polarised and covers the (often broad) bands in question. My personal favourite that fits the bill is the discone. For narrower frequency coverage, a vertical dipole is also good and simple. It's also less visually obtrusive. The best place for the antenna is outdoors and as high up as circumstances allow.

The disadvantage is that scanners overload easily on strong signals. No harm is done, but you can't hear what you were hoping for! Filtering and/or attenuation all reduce this problem. Some other antennas were mentioned on page 74 of the September issue.

Another suggestion is from **Bob Palmer G20519** (Kempston). He suggests the bow-tie vertical antenna. This is in fact a wide dipole where each half is tapered, narrowing to where the feeder cable joins at the centre. The entire dipole is in effect driven (Bob refers to the lower half as a reflector) as I don't think the lower half functions as a ground-plane. Only a minor technical difference, though.

By using wide elements, bandwidth can be increased. Each half of the dipole (quarter-wave element) should be about 621mm long at 115MHz, 305mm at 244MHz and 190mm at 400MHz. Rather than a direct connection, I recommend a 1:1 balun between coaxial cable and a dipole so as to ensure an omnidirectional reception pattern and reduce interference coming down the braid of the feeder. I'm sorry, Bob, I can't recall this design appearing in 'Airband' before - do you know in which issue you saw it?

Another simple antenna is the Maxview, a dipole intended for the v.h.f. broadcast band and available from Index shops (catalogue number 550-047). **Andrew Green** (Barnsley) fitted better-quality coaxial cable to his. I can't see a balun in the catalogue picture, is there one, Andrew?

It's absolutely correct of Andrew to point out that modulation mode is not dependent on antenna. The v.h.f. broadcast band (Band II, 88-108MHz) is adjacent to the airband and, carrying frequency modulated signals, has become erroneously known as the f.m. band. A so-called f.m. antenna will cover this band, but be quite happy with a.m. signals as found in the airband.

Folded dipoles don't out-perform simple ones or we'd all be using them, Andrew! The fold is a trick to increase the impedance to about 300Ω thus matching suitable ribbon feeder. If used as the driven element of a Yagi array, the impedance falls again and 50Ω feeder (usually coaxial cable, balun recommended) can be matched.

Information Sources

David McCurry would also like a good book to learn more. There are plenty on offer from our own *SWM* Book Store (see page 85 in this issue) but these publications aren't always crystal-clear for beginners. I tried to help explain some of the jargon used by pilots in my article 'Flying: What do the Numbers Mean?' in *SWM* March 1994 page 30 (backnumbers available from the Book Store).

Last month, I mentioned that a trial CD-ROM of the *AIP* is now on sale. Send a cheque or postal order for £5, payable to National Air Traffic Services Ltd., to **AIS Publications (CD-ROM), Room 160, Control Tower Building, London Heathrow Airport, Hounslow, Middlesex TW6 1JJ.**

After a wait of a couple of weeks my copy arrived as a CD-ROM and 3.5in floppy. A commercially-available virus checker declared both to be clean. I need to mention some proprietary computer jargon to explain the next bit so skip to the next sub-heading if this doesn't apply to you. Inserting the CD-ROM (under Windows® 95) automatically brought up the opening menu.

Run the configuration check. If any of the test screens don't display properly, the missing tools to correct the

Abbreviations

| | |
|--------|--------------------------------------|
| AIP | Aeronautical Information Publication |
| a.m. | amplitude modulation |
| BAC | British Aircraft Corporation |
| CAA | Civil Aviation Authority |
| CD-ROM | Compact Disc - Read Only Memory |
| e.m.c. | electro-magnetic compatibility |
| FIR | Flight Information Region |
| f.m. | frequency modulation |
| h.f. | high frequency |
| Mb | megabytes |
| MHz | megahertz |
| mm | millimetres |
| PFA | Popular Flying Association |
| u.h.f. | ultra high frequency |
| UIR | Upper Information Region |
| v.h.f. | very high frequency |
| WGS | World Geodetic System |



Swissair MD-11 at Zürich.
Christine Mlynek.



problem are on the disc itself. These include two web browsers (they read the CD-ROM just as easily as they access the Internet) and Shockwave software to enhance the display.

The other useful item is Adobe Acrobat Reader version 4. Many documents (ending .PDF) are supplied in the form that this software reads, so it's worth having. I even put an icon on my opening Windows screen to access this package directly. If you already have an earlier version, you must delete it first, though.

The floppy contains WGS84 co-ordinates for aerodromes, etc. My version was incorrect and I was then sent the latest which had a single file wgs84fix.exe of 1.095Mb created September 29. Find this with the My Computer facility and click on its icon to run. You will also need to create an icon on your opening screen to access the database. Don't forget that the password is PASSWORD (in upper case)!

Was it worth it? Andrew Green asks about a list of frequencies and next month I'll show how I identified them using this software.

Frequency & Operational News

All A/P amendments from **Martin Sutton** (CAA). Airway changes. (U)A47 now both stop at Seaford beacon (on the south-east coast) and their southward continuations are now (U)M605.

East of the Thames Estuary next. Where (U)B29 cross the U/FIR boundary, the reporting point is now called XAMAL. The old (U)R126 are now (U)L608 and, where they cross the boundary, the point is now called XAMIK. Also, (U)G39 now become (U)L610. Likewise (U)R12 are now (U)L620. Where (U)Y76 cross the boundary the point is now XAMOX. Hint: point names beginning with X (for Xeno?) are often on the U/FIR boundaries, may appear in flight plans, but might not always be mentioned by pilots over the radio.

Off Land's End UR72 is redesignated UP620. Between the Trent beacon and WELIN, A20 becomes T420. On the Aberdeen to Dublin route, (U)B2 become (U)P600.

Changed points on instrument procedures. Just north-east of Benson is new point RODNI which serves London City, Luton and Northolt. At Birmingham and Coventry, BIRCH is replaced by nearby GROVE. Edinburgh Tweed STAR 1D is replaced by 1E.

A little local knowledge comes from **Tom Evans** (Hull). The Hull Royal Infirmary helicopter landing site can't take Sea Kings! Instead, emergency flights now land at the Cricket Circle, Anlaby Road. My maps show the hospital close to Lansdowne Street, but the sports ground is in the angle between Walton Street and the Anlaby Road flyover. The helipad is in the south-east corner of the ground, close to the railway line and flyover. I hope there isn't a match on at the time.

Next month I'll identify reporting points for **Pete Jarmolinski** (Doncaster) and there'll be more e.m.c. news from **Martin** (Clapham). All other letters received up to October 14 have been answered. The next three deadlines (for topical information) are December 6, January 10 and February 7.

Replies always appear in this column and it is regretted that no direct correspondence is possible.

Miles Magister.
Christine Mynne.

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Attention-123!

What Next? - The Millennium

We are now just a matter of weeks away from the new millennium, so what does the future hold for 'Number Stations'? Many felt that most stations would close with the ending of the Cold War, but to quote a well known saying, "the news of my death has been greatly exaggerated". Rather than look at specific stations, we will try to examine the overall scene and see what the future holds.

If we begin at the end of the Cold War, several stations did close, most notably those from the former East Germany, however, there was no dramatic fall off in traffic from other operators. In the last decade, there has been a move away from voice traffic (although there is still plenty about), towards Morse. Rather than closing down, other stations re-configured, and with the sweeping political changes in Eastern Europe and the C.I.S., others simply found new masters.

The major players, those with world-wide interests, continue to spy. Russia, USA, Britain and France remain very active on h.f. The French DGSE, which avoids voice like the plague, has the most impenetrable system, as to be expected from the world's oldest intelligence service. The British mainly operates just two voice stations, but these send 'blanket' transmissions, much being dummy traffic. (MI6's and SAS's Morse transmissions are far more interesting). The USA, although it has a world-wide network of transmitters, operates a very basic h.f. agent-running system (voice only) compared to the other three, but especially to the Russians which use a fiendishly complex, flexible and much more active system, using sites in C.I.S., Cuba and Vietnam.

Yet eclipsing all these in sheer number of voice transmissions is the tiny Israeli Mossad organisation, whose traffic almost certainly serves more than this single agency. Israel and the Palestinian territories of the West Bank & Gaza Strip together make up an area little bigger than Wales, and have a population of 4.6 million (compared to Egypt's 52 million!).

In this region, the other main operators (Turkey, Algeria, Egypt and ex-Soviet Caucasus states) combined are far more modest in their traffic output. No other country is quite so aggressive in its greed for hijacking frequencies, regardless of ITU allocation, as Israel, which holds onto them as if they are their own exclusive territory!

Many Changes

In Europe, there have been many changes. The biggest decline in recent years has been that of the unified Germany, which now sends virtually no voice traffic. Further East, Hungary, Romania, Bulgaria and former Yugoslavia all still have operations, but none are typical Number Stations, except possibly Bulgaria, which may operate one of the major families (XV). Poland not only runs its own large (but peculiar) network (III), but plays host to a former Western family (XI), which moved there a few years ago.

However, the Czech republic (and Slovakia) in the heart of Europe, are far more active than all these other East European countries combined. Like the Russians, the Czechs favour complexity almost for the sake of it, and untangling their numerous different formats is difficult, but challenging.

There have been three major losses, which unlike that of DDR, took place in more recent years: Family IV (Austria?), the 23 hour per day Czech OLX network (Family IXb) and the much smaller M27/S8 network (Family VIII) of, most likely, Yugoslavia.

Outside Europe, Taiwan, China (in progress of establishing a relay in Cuba), North & South Korea can also be heard. North Korea has a very large Morse network (M40, formerly M53), which seems to have relays nearer to Europe - these are the two schedules 747 and 515, the only two which use i.c.w. (rather than m.c.w. uses by all the rest frequently reported from Siberia and Japan, which have yet to be reported in Europe). The Cuban DGI also runs a large network beaming to the Americas and Europe - it seems to still have a relay in Russia.

In addition to all the above, there is a vast array of other stations still sending 'Numbers' in Morse over h.f. We can only guess at their purpose: some may be military, some act as status indicators only, some are related to special operations, coming and going without rhyme or reason.

Despite the many forms of modern communications from E-mail and the Internet to letters, telex, telephone, etc., nothing is more secure than one way h.f. radio transmissions which can be heard over thousands of miles, yet are untraceable to the recipients. This method

of agent running will continue to operate in the years ahead, as its simple, robust nature has yet to be improved upon. The encryption systems used may seem inefficient and archaic to some - but they are easy to use and, unless compromised by 're-cycling' or defectors, are impossible, even for the most powerful computers to decrypt - and always will be.

Cherry Ripe

E3A is climbing higher. A new schedule has recently been introduced by MI6's Far East station transmitting from US facilities on Guam. An easy Far Eastern station for those new to the subject - which is the only reason we include it here.

The changing of schedules, according to various rules, is so common amongst many stations that it's taken for granted, and publishing details would take up many pages. But at least E3A is likely to stick to the following for some time:

Mondays to Fridays only. At present (October):-

| Time (UTC) | Frequency (MHz) |
|-------------------|-----------------|
| 1000 | 20.474/23.461 |
| 1100 & 1200 | 17.499/23.461 |
| 1300, 2300 & 0000 | 17.499/22.108 |
| 2200 | 17.499/24.644 |
| 0100 | 19.884/21.866 |

La Femme Francaise

A new station (ENIGMA designation V23) appeared from nowhere twice daily at 0900 and 1900 for seven days in August, using four frequencies alternatively. As the format is identical to Family Ia, we assumed it to be Russian, however, its scheduling is not at all typical Ia style, but follows E17z's habits, so at the Ukraine was its other possible origin. All messages were different (around 90 groups with no nulls or repeats) and the ID for both schedules was the same throughout: 362.

| Day | Date | Frequency (MHz) 0900 Slot | Decode Key/ Group Count | Frequency (MHz) 1900 Slot | Decode Key/ Group Count |
|-----|------|------------------------------|--------------------------------|------------------------------|----------------------------|
| Fri | 13.8 | 15.840 | ? | 11.060 | 490/7 |
| Sat | 14.8 | 10.635 | 499/91 | 8.124 | 508/82 |
| Sun | 15.8 | No tr. | (yet DKs account for this day) | | |
| Mon | 16.8 | 15.840 | 525/90 | 11.060 | 544/95 |
| Tue | 17.8 | 10.635 | 552/81 | 8.124 | 559/96 |
| Wed | 18.8 | 15.840 | 571/93 | 11.060 | 590/87 |
| Thu | 19.8 | 10.635 | 590/80 | 8.140 | 559/96 |
| Fri | 20.8 | 15.840 | 607/90 | 11.060 | 616/91 |

If you study the Decode Keys you will see a pattern, (559 could be a monitoring error). The 8.140 frequency was chosen to avoid a transmission already using 8.124MHz - a typical Family Ia habit.

On the Monday at 0700 on 16.342 an unpredicted V6A appeared with DK/GCs of 553/85 and 534/84. On the Thursday at 1100 on 10.630 an unpredicted E6C appeared using the same 362 appointment code and DK/GCs of 591/93 and 592/98. Both DKs and GCs follow the V23 pattern and 10.630MHz is only 5kHz off 10.635 - quite usual with Family Ia.

Two message variants of V6 and E6 have never been noted before, unlike S6E and M14E (very common). This confirms V23 to be a member of Family Ia, but reserved for special operations.

Whatever operation this was, it involved French, Spanish and English speaking agents. The only other French language station reported over the last 15 years was V12. (The 362 ID has also been used by a M14A schedule for well over a year, and still appears at 1900 every Wednesday, always with two messages totalling around 140 groups, but is probably unconnected).

This is one of many examples of how ENIGMA is able to identify the family origins of new transmissions.

Another Newcomer

Another newcomer is a West European located Morse station (M80) which unusually sends four figure message groups and ends in AR AR.

Reader's Question

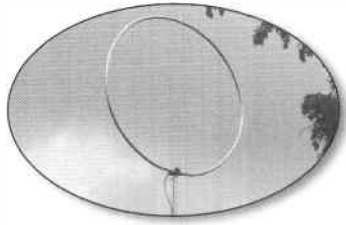
Martin (Bedford) asks an interesting question - do any Numbers transmissions originate from the British Isles? They certainly do! In the past, 'Lincolnshire Poacher' (E3) transmissions have been heard coming from Gawcott and possibly also Creslow (both in Bucks.). Both stations are now closed (Creslow very recently, after the entire replacement of buildings and antennas and nearly 200 masts at vast expense).

The M16 station at the former HMGCC Poundon - which, amongst other duties, received messages from agents - has now moved. Other h.f. sites (in Scotland and Herefordshire, etc.) have for many years been dedicated to the support of covert operations - mainly in Europe. Anyone wanting further details should write to us.

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DX Television

Although Sporadic-E was on the decline during September, there were still a few glorious openings. Tropospheric reception produced an impressive variety of Scandinavian and German stations, not only in the north-east, but also in the Bristol area.

Reception Reports

Sporadic-E activity occurred on the 2nd between 1600 and 1930 with a substantial opening into south-east Europe and Spain. Italian signals were identified by **Peter Barber** (Coventry) from RAIUNO and also the two private stations TVA on Channel 1A and VIDEO just below Channel E2.

Spain was established by 1730 on E2 and E3 with bullfighting followed by the Telediario news programme. At 1805, **Simon Hockenhuil** (Bristol) noticed a Ford Focus car commercial from the Slovenian Kum transmitter on E3. By 1815, Hungary (RTL KLUB) R2 was present with Croatian commercials on E4. At 1820, a programme about war was identified as the Swiss TSR French-language network from the La Dôle E4 transmitter operating in the Lake Geneva area.

Another intense opening commenced around 1700 on the 7th with a children's cartoon on E3. This was subsequently identified as Slovenia by Simon Hockenhuil and was followed at 1718 with country scenes and commercials from the German Channel E3 transmitter at Kreuzburg.

At 1725, **Peter Barclay** (Sunderland) noticed Swiss commercials on E3, going onto programmes before the signal disappeared at 1733. By 1730, Italian signals were evident on 1A and 1B with Spanish signals emerging around 2114. **Tom Crane** (Hawkwell) logged the Ukraine second-network YT-2 on Channel R2 at 0900 on the 22nd.

Tropospheric Reception

Excellent lift conditions were experienced in many areas between September 3rd and the 11th. On the 10th, the highlight for **Stephen Michie** (Bristol) was the sight of the Swedish SVT-1 PM5534 test card on Channels E11 and E43.

Other signals included Denmark E7 and the German ZDF network on E30. In the north-east, Peter Barclay encountered dozens of German, Dutch and Scandinavian channels. The 11th was highly active with the following German channels being logged:-

| | |
|-----------|--|
| ARD: | Channels E29, E51 and E53 |
| ZDF: | Channels E24, E30, E31, E34 and E39 |
| N3: | Channels E28, E43, E44, E48, E57 and E60 |
| SAT-1: | Channels E49 and E56 |
| RTL PLUS: | Channels E25 and E59 |



Fig. 1: The Swedish PM5534 electronic test card from the control centre in Stockholm.



Fig. 2: The Philips PM5537 colour block-board test pattern from Eesti TV in Estonia which includes the identification 'Tallinn'.



Fig. 3: A typical colour-bar test pattern used by TVE in Spain.



Fig. 4: The PM5534 test card radiated by TV-2 in Denmark.

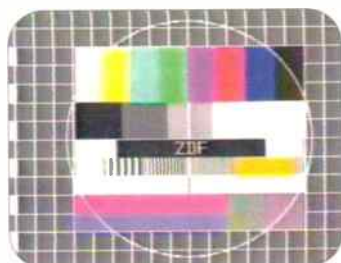


Fig. 5: The ZDF FuBK test card from Germany. This is rarely shown nowadays due to wall-to-wall programming!



Fig. 6: This month's saunter 'Down Memory Lane'. The Granada logo used during the early Seventies with the introduction of colour on ITV.

Scandinavian Schedules

Summer saw the usual reduction in programme output in several countries, but this year they seemed to be more severe. According to observations made by Peter Barclay, Denmark TV-2 appeared to axe their early morning TV in favour of the test card! The start time of the afternoon programmes had also been moved to a later time, namely 1530 local time (Mondays to Fridays). By September, longer programme hours had resumed.

During one opening, SVT-2 was good enough to enable the format of their trade test transmissions to be monitored. A classical music compilation of six tracks accompanied the PM5534 test card with a 90-second period of tone radiated every two tracks beginning with a high frequency and then lowering down the scale. The whole sequence of the tone and the same six tracks was repeated over and over all day. TV technicians in Sweden must have found this remarkably tedious to listen to!

Sweden also appeared on September 10th. SVT-2 were showing the PM5534 test card when the channel was first received around mid-morning. The signal had disappeared by midday, but re-appeared around 1500UTC with a news programme displaying an 'SVT-24' logo in the top-right of the picture. This suggests that 'SVT-24' might be a new digital channel similar to the BBC's 'News 24' and is being radiated over the 1st and 2nd networks to fill in some of the daytime closedown period.

FM Reception

The tropospheric lift between 1st and 11th produced mainly UK stations. However, on the 1st and 11th, Stephen Michie heard two unidentified French stations on 105.2 and 107.5MHz.

The intense Sporadic-E opening on the 2nd affected the f.m. band. Shortly after 1915UTC, Simon Hockenhuil noticed that the f.m. band had become alive with Italian stations between 87.8 and 92.0MHz.

Service Information

Estonia: Stephen Michie advises that the station opening sequence features a windmill-type scene changing to the identification 'EESTI TV'. During test transmissions, colour bars and the Philips PM5537 'block-board' test pattern are shown. The latter bears the identification 'TALLINN' across the centre. The Estonian news programme is called 'AK'.

The Eesti TV logo can be somewhat confusing. At first glance it resembles a large figure '4' perched in the top-right of the screen. It is actually a stylised 'tv' with the word 'EESTI' below! Tom Crane has seen an 'ET-1' logo on R2. Could this be an alternative logo?

Éire: **D. Reade** of Dromara in County Down (Northern Ireland) tells us that the Clermont Carn transmitter is now broadcasting four programmes. These are:- RTE-1 on Ch52, Network-2 on Ch56, TV3 (independent commercial) on Ch66 and TVnaG on Ch68. The latter two stations display logos in the top-right of the screen.

Elsewhere in Éire, some channel changes are taking place in order to accommodate four u.h.f. channels within the same antenna group. Some transmitters are using the familiar 23, 29, 29 and 33 channel sequence while others are using 40, 43, 64 and 50.

We have also discovered that close to the border with Northern Ireland, many unofficial relays are operating

beaming BBC and ITV signals into parts of Éire. Many years ago in the south of the country, Caradon Hill signals were collected by gigantic stacked antenna systems consisting of up to 32 wideband grids and fed into cable systems. Be warned: do not try this at home for DX reception because the neighbours may well object!

United Kingdom: The Middleton relay, north of Manchester, now carries Channel 5 on Channel 22. The relay has recently undergone upgrading with an increase in power to generally improve reception in the area, particularly to the west of the town. The temporary channels (22, 25, 28 and 32) have now been switched off. These were used as a 'filler' for Emley Moor viewers in the town suffering digital co-channel interference from the Saddleworth relay.

Sporadic-E Log For September

The compilation log features Sporadic-E (Sp.E) reports from Peter Barclay (Sunderland), Peter Barber (Coventry), Tom Crane (Hawkehill, Essex), Stephen Michie (Bristol) and Simon Hockenhull (Bristol). Times shown are in UTC.

| Day | Log |
|-----|---|
| 1 | Italy (RAIUNO) IB (Sp.E at 1148). |
| 2 | Italy (RAIUNO) IA and IB; Italy (VIDEO private station) E2; Italy (TV private station) IA; Spain (TVE-1) E2 and E3; Corsica (Canal Plus) L2; Switzerland (TSR) E4; Hungary (RTL KLUB) R2; Slovenia (SLO-1) E3; Croatia (HRT) E4 (Sp.E between 1600 and 1930). Netherlands, Belgium and France (via enhanced tropospheric conditions). |
| 3 | Denmark, Germany, Netherlands, Belgium (Tropospherics). |
| 4 | Sweden, Denmark and Germany (Tropospherics). |
| 5 | Netherlands, Sweden, Denmark and Germany (Tropospherics). |
| 6 | Italy (RAIUNO) IA; Italy (VIDEO) E2; Italy (TVA) IA (Sp.E from 0900). Denmark, Germany and Netherlands (Tropospherics). |
| 7 | Italy (RAIUNO) IA and IB; Spain (TVE-1) E3; Slovenia (SLO-1) E3; Croatia (HRT) E4; Germany (ARD) E3; Switzerland (DRS SF-1) E3; Hungary (RTL KLUB) R2 (Sp.E between 1700 and 2130). |
| 8 | Spain (TVE-1) E3 (Sp.E at 0730). Netherlands (Tropospherics). |
| 10 | Norway, Sweden and Denmark (Tropospherics). |
| 11 | Netherlands, France, Belgium, Denmark and Germany (Tropospherics). |
| 12 | Spain (TVE-1) E2 (Sp.E at 1215). |
| 22 | Ukraine (YT-1) R2 (Sp.E at 0900). |
| 27 | Italy (RAIUNO) IA; Italy (TVA) IA (Sp.E at 1843). |
| 29 | Spain (TVE-1) E3 (Sp.E at 1139). |

NZ TV Received In Spain

Startling news has come via **Roger Bunney** (Romsey) that a Spanish amateur heard New Zealand TV audio at 50.75MHz on June 15th via the long path. The same month, Channel E2 (48.25MHz) and Channel R1 (49.75MHz) video signals were heard by several Australian amateurs. Reception has usually occurred between 2100 and 2200UTC.

This has helped confirm that reception by **Tim Bucknall** of New Zealand and Australia on TV channels NZ1 and AU0 on June 3rd would have been a possibility, even though it is outside the season we normally associate F2-layer activity within the northern hemisphere.

Keep On Writing!

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

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THREE REVIEWS!

Richard Newton reviews the new **Yaesu FT-90R "Micro Commander"** courtesy of **Yaesu UK Ltd.**

Katherine Taylor 2E1HFX reviews **SIX** pieces of 144MHz equipment suitable for the Novice operator including: an **ADI AT-600** hand-held; the **Hora C-150** and the **C-408** hand-helds; an **AKD 2001** transceiver, an **Alinco DJ-V5** and finally an **Alinco DJ-195!!**

Rob Mannion G3XFD reviews the **Carlton receiver kit** from **Lake Electronics** which had to be held over from last month's magazine due to a packed issue!

EVEN MORE ON MICROWAVES! After discussions with the Editorial department, it has been decided that the 'Get Going On Microwaves' series be extended to a fourth and final part in which **David Butler G4ASR** brings you information on where to obtain components, kits and surplus equipment for use on the microwave bands.

ANTENNAS IN ACTION

Tex Swann G1TEX has more antenna related news, reviews and projects for you next month.

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Scanning

Before I go any further, I have to correct a mistake I made in October's column, regarding the legality of listening to transmissions on the PMR-446 band. Basically, I said that it was OK to listen to transmissions on this band as it is licence exempt, **but this is not the case** - licence exemption does not equate to it being OK to listen. Specifically, according to the Radiocommunications Authority's RA169 *Receive Only Radio - Scanners, etc.* information sheet - viewable at www.open.gov.uk/radiocom/ra169.htm - the only transmissions you can legally listen to are those meant for **general reception**. These include CB, amateur radio and licensed broadcast radio, but not a lot else, and not PMR-446.

Interestingly, pirate radio transmissions are also specifically mentioned as being illegal to listen to. If you want further information and don't have Internet access, you can contact them on the Agency's 24-hour Enquiry Point on **0207-211 0211**.

Good News

Well, that's the bad news over with. There is some good news this month though. A regular correspondent to this column, who had better remain anonymous as I've not had a chance to check if would be OK to mention his name, has been in contact with the CAA. He asked them for clarification on the legality of listening to transmissions to and from civil aircraft, and received a very interesting reply.

In essence, he was told that although he could not be given permission to eavesdrop on such transmissions, the CAA would not support any prosecution for such activity. This is very interesting indeed, but I would advise caution - not too long ago, some scanner enthusiasts listening to airband transmissions near an airport caused something of a security alert and even made the national news.

Now In UK

There's some more good news too, at least if you are a trunk radio enthusiast such as myself. The Uniden Bearcat 245XLT trunk tracking scanner can now be found in the UK, thanks to Martin Lynch & Sons. For those of you who don't know, this scanner is the only one compatible with UK-based Motorola Type II trunked radio networks, (*see page 49 for review - Ed.*).

There are a couple of catches though. The first is that the models in question are imported directly from the US, and do not have CE certification. This means that they cannot be sold for use in the UK, or anywhere else in Europe for that matter. You can, however, legally buy one as long as you undertake to export it to a non-EU country.

The second catch is the price - £299, a lot of money to pay, more, in fact, in pounds than you would pay in dollars for it in the US. Still, I've managed to get my hands on a unit, so you can expect a review in the not too distant future. If you can't wait for the review, you can contact Martin Lynch & Sons on **0208-566 1120**.

Satellite TV

At this point I'm going to digress slightly, and talk about satellite TV. I'm not talking about the usual, UK-centric fixed dish Sky or Sky Digital type of

satellite TV. Rather, I mean the international type of setup, involving no subscription fees whatsoever. All you need is a receiver and a dish, which together needn't cost more than a good quality hand-held scanner. Point the dish in the right direction, 13°E (of South) is a good place to start, and you'll get an awful lot of free TV channels. These include English, Arabic, Polish, Bulgarian, German, French and Italian channels transmitted in both Analog and Digital formats.

What's more, after some experimentation, I've discovered that you can get very good reception even if you mount the dish **indoors**, at least as long as you can point it out of a window. I'm not talking about a large dish either - a 600mm model will do in the South of the UK for some satellites.

I'm telling you all this for two reasons. Firstly, I'm trying to illustrate a point about antennas - you don't really need a garden full of huge antennas to receive relatively weak signals. Admittedly, the vast majority of people wanting satellite TV would be better off with an external antenna. But for scanner users, an internal antenna is often more than sufficient. This is particularly true if you live in a large city, as transmissions tend to be quite strong.

In my experience, you can also get surprisingly good reception with an internal antenna, even if you tune down to the very low frequency bands. I'm not trying to say that an external antenna isn't a good idea, mind you. Just don't assume that you need a '£500, 13m UltraSignalCatcher Deluxe Mark XXI' when you might be able to make do with a £50 DeskScan discone.

The second reason I'm telling you about my experience with indoor satellite TV antennas is to encourage you to experiment. I'll bet few of you would have thought it possible to receive satellite TV transmissions with an indoor antenna! You don't have to spend huge amounts of money experimenting either.

Some inexpensive copper wire arranged in various ways around the house, or outside it, can offer better reception quality than a costly custom made scanner antenna, especially if you use a Balun to match the arbitrary impedance of the wire with the 50Ω antenna input most scanners have. And if you aren't particularly creative, there are books aplenty to give you ideas, many of which can be purchased directly from the *SWM* Book Store.

Can You Help?

Talking of experimentation, can anyone help a reader with his 30 year old Antiference Band 1 & 3 TV antenna which has disintegrated? He needs to know the proper distance to attach the Band 3 elements from the dipole centre in order to rebuild the antenna using copper pipe. Any information on the requirement for any electrical connection between the antenna's elements and its main dipole would also help. I know this isn't directly related to scanners, but the reader in question has helped me a great deal with answers to some technical questions for this column, and deserves any help I can give him in return.



SCANNING

Interesting Sites

On to a very scanner specific subject now, though. News has just reached me of two very interesting Web sites. The first is the Strong Signals Web site (www.strongsignals.net), which contains masses of interesting information, frequencies, hints and tips for scanner users. The second is the Frequencies Galore web site at www.acmecity.com/nikita/levelfive/284. There are some interesting frequencies in this one too, and worth a visit to see if there are some you don't already have.

Web Watch

The Strong Signals Web site can be found at www.strongsignals.net. Check out www.acmecity.com/nikita/levelfive/284 - the Frequencies Galore web site. View the RA's RA169 information sheet at www.open.gov.uk/radiocom/ra169.htm

Usual Warning

Finally, there's just room for my usual warning - listening to any radio transmission you are not licensed to receive (and not meant for general reception) is a criminal offence. In plain English, this means that if you listen to something you should not be tuning in to, you risk a fine, confiscation of your equipment, and even imprisonment.

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MilAir

8.33kHz Is With Us!

With military aircraft operating regularly in civilian controlled Upper Airspace, this subject is very much a prominent 'MilAir' issue. I have therefore taken a large section of this month's column to explain in detail the first step into the future of 8.33kHz spacing. Hopefully, it will give readers an insight into this new system and will brace them for its introduction into the UK next year.

On the 7th October, 8.33kHz spacing was introduced by the first countries within the ICAO European flight region for aircraft entering their airspace above Flight Level 245. From the 7th October, the French introduced changes to the frequencies used for Upper airspace within the five primary Civil Air Traffic Centres - Brest, Bordeaux, Marseille, Paris and Reims. As listeners in the South of the UK can hear aircraft talking to Brest and Paris Control, I have included the changes not only for reference, but also to help explain how this system works.

Paris: 130.225 becomes **130.23**, 135.3 becomes **135.305**. New u.h.f. frequencies in use are: **235.15, 292.7, 342.5, 366.05, 386.95, 389.5** (only 292.7 and 386.95 were previously in use).

Brest: 128.5 becomes **128.505**, 129.0 becomes **129.005**, 131.175 becomes **131.18**, 131.275 becomes **131.28**, 132.0 becomes **132.005**, 132.125 becomes **132.13**, 132.825 becomes **132.83**, 133.0 becomes **133.005**, 133.475 becomes **133.48**, 134.825 becomes **134.83**, 134.875 becomes **134.88**, 135.8 becomes **135.805**. New u.h.f. frequencies 277.6, 315.45, 344.3, 371.4 and 388.6, (only 388.6 was previously in use).

I can assure you that the listing above is not a mis-print! As you can see, all of the frequencies have been increased by 5kHz, which does not logically tie up with true 8.33kHz spacing. For example, the range from 129.0 to 129.025, should in theory have become 129.0, 129.0083, 129.0167, 129.025, etc. I have to admit that these new frequencies had me puzzled, so I delved into the Internet, and after ploughing through reams of information, I eventually came up with the answer, (I hope!).

The 25kHz sectors will continue to pass on **frequencies with two decimal places** as per the current system. Consequently, an aircraft being transferred to 132.025MHz on a **25kHz** sector will be told to '**contact frequency 132.02**'. (One Three Two decimal Zero Two).

To identify 8.33kHz airspace, all frequencies are to be referred to as '**channels**', with the channel being passed with **three decimal places**. Should 132.025MHz have been in use on an 8.33kHz sector, then the aircraft would have been told to '**contact channel 132.030**', (One Three Two decimal Zero Three Zero).

Confused, don't worry - you soon will be. Now the fun starts. As you can see from this example and those below, on the 8.33kHz sectors, although the channel name is directly linked to a frequency, it is not actually that frequency. For example:

| Frequency (MHz) | Channel | Frequency (MHz) | Channel |
|-----------------|---------|-----------------|---------------|
| 132.0 | 132.005 | 132.0417 | 132.040 |
| 132.0083 | 132.010 | 132.05 | 132.055 |
| 132.0167 | 132.015 | 132.0583 | 132.060 |
| 132.025 | 132.030 | 132.0667 | 132.065 |
| 132.0333 | 132.035 | 132.075 | 132.080, etc. |

You can see that in future when listening to an 8.33kHz sector, you will initially need a channel to frequency conversion chart to identify a frequency, (or a very good memory!). As I type this, I have been listening to aircraft being handed off from London Control to Brest on **Channel 133.480** (133.475MHz), **Channel 129.005** (129.0MHz) and **Channel 133.005**, (133.0MHz). These are the easy ones, as all you have to do is deduct 0.005 to get the frequency - wait until you have to remember that **Channel 132.015** is actually frequency 132.0167MHz!

Looking at the French changes noted above, it can be seen that Brest has converted quite a lot of sectors whilst Paris has started with just two. This is just the first step in converting frequencies currently in use to channels and is therefore not actually the introduction of new 8.33kHz frequencies.

My understanding of the 8.33kHz introduction is that most frequencies with this spacing will be allocated from the sub-band 132.0 - 134.8MHz, with 25MHz spaced frequencies being re-allocated away from this band by the end of 2000. You will note that I said **most** frequencies, as there is provision in the Eurocontrol plan for exceptions to be made.

Consequently, although the French have started by converting their current frequencies, I would expect them to start re-allocating new frequencies from this sub-band in the future. I have not yet been made aware of any other countries who have started to change/convert their Upper Airspace frequencies, perhaps, like the UK, they are waiting to see how the French get on!

A great deal of planning is needed with this introduction, especially with frequency management. One of the biggest problems will be frequency blocking caused by transmissions from a 25kHz radio affecting newly allocated 8.33kHz frequencies nearby in the band.

Because of the v.h.f. line of sight principal, there also has to be a great deal of co-operation between the European countries so that 8.33/25kHz frequency allocations do not overlap. Hence the need for the introduction of the sub-band. It's certainly going to be interesting and you can be certain that we have not heard the last of this topic.

London Mil

My comments last month regarding a new primary ATC London Military frequency have now been confirmed, (I am always a little cautious when I note a new frequency during an exercise). **278.075** has been in regular use during the past five weeks with an area of coverage from mid-south Wales down across the Southwest of England. It is confirmed as transmitting from Davidstow Moor and I would be grateful if anyone could let me know which other transmitters are being utilised for this frequency. I am confident that it has replaced the old Southwest Primary frequency 277.125, as regular correspondents and myself have not heard it in use for several weeks.

Incidentally, some months ago I included a run down of Scottish Military frequencies with the intention of following this with a similar listing of London Military. Unfortunately, my request for information only produced two replies - so how about dropping me a line and let me know which London frequencies you have noted in use in the past 12 months. Don't forget, you can also E-mail me at milair@pwpublishing.ltd.uk



US Navy P-3C from VP-10 arriving at RIAT '99. I do wish they would bring back full coloured markings!

Wyton

As mentioned earlier in the year, RAF Wyton has now re-opened to be the new home of the London

University Air Squadron/No 6 Air Experience Flight who moved here from RAF Benson. Plus, the Cambridge University Air squadron/No 5 Air Experience Flight who moved here Cambridge Airport.

The frequencies in use are as follows: Tower 122.1 and 257.3, Approach 134.05 and 375.125, Ground 249.0. Plus as usual the NATO Common ATC frequencies will no doubt be used. As always, any operations or other frequencies you note in use at Wyton, please drop me a line.

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Info in Orbit

The passing of October and November sees the sun's maximum daytime elevation dropping further, and with it the contrast in mid-afternoon NOAA-14 images. For me, however, there is a compensation. The nights are getting longer and darker, so my telescope is getting more use. Weather pictures prove invaluable at identifying those troublesome clouds, and provide evidence of their direction of movement.

During a mid-October late night session at my telescope, I captured a picture of comet *Lee*, currently rather faint in Pegasus - and about 90 million miles away! With pictures from the satellites showing a few hours of clear skies, I made good use of the available time. How did we manage before METEOSAT and NOAA?

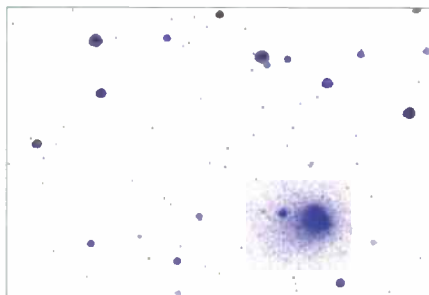


Fig. 1: Comet Lee image from my 254mm telescope on 13 October 1920UTC.



Fig. 2: OKEAN-O 24 September 0817UTC.



Fig. 3: NOAA-10 27 September hi-res image from Roger Ray.

satellites are not part of the usual WXSAT constellation, but are resource-type satellites that provide multi-spectral images and, fortunately for us, transmit much of their data in standard a.p.t. format - as used by WXSATs. Unfortunately, their transmissions are all too brief, and tend to take place over Europe, rarely letting us have more than a few minutes of transmissions, and even then they are often at low elevation.

The launch of *OKEAN-O* is a tale of problems. A mock-up was originally delivered to Baikonur Cosmodrome in July 1991, but tests with a mock-up Zenit rocket were not carried out for over two years. The flight model arrived at the launch site in 1994, but launch preparations were regularly suspended because of financial problems. It finally reached the launch pad on 6 July 1999, but *OKEAN*'s Zenit rocket spent a record 11 days on the pad pending approval of the launch by Kazakhstan in the wake of another launch failure.

The launch team had to work round-the-clock to correct problems caused by the rocket's lengthy exposure to the Sun. My thanks to **Bart Hendrickx** for this information.

Vladimir N. Astapenko of the Division of the National Space Agency of Ukraine, told me that after the launch of *OKEAN-O* there was a problem with its stabilisation system.

This problem is now solved, but testing of the on-board equipment is not complete. Until such times, we can expect transmissions of a test nature before any schedules are issued.

Novosti Kosmonavtiki

(September 1999) reported that it went out of control right after launch. On 27 July, controllers (in Korolyov) were trying to bring the satellite back to life, but the chances of that succeeding were estimated no higher than 40%. Since then, we have received some transmissions.

Figure 2 was obtained by **George Newport** of Canterbury, and I have enhanced the image to bring out detail for publication. It was received during a low elevation south-bound pass.



Fig. 4: Temporary mount for crossed-dipole - from Dave Ball.



Fig. 5: Unsynchronised NOAA morning pass - from Dave Ball.

NOAA-15, -14 & -12

Transmissions of high resolution imagery from NOAA-15 have been the subject of some debate because the signal strength has apparently given cause for concern. Effective at 0100UTC on 28 September 1999, the NOAA-15 h.r.p.t. transmission on 1698.0MHz was permanently changed to 1702.5MHz, due to failure of the primary transmitter and antenna on 1698MHz.

Some users have reported low signal strength causing the transmissions to be unusable, except during high elevation passes. As a user of a.p.t., I have not experienced any unusual problems, though my own monitoring was significantly lower during early October due to a few days of illness. NOAA-14 a.p.t. has appeared nominal. Transmissions of a.p.t. from NOAA-12 will not resume until 15 September 2000, essentially due to its footprint overlapping to various extents with NOAA-15 - the primary spacecraft.

NOAA-10 HRPT Alive & Well

Although I cannot monitor high resolution image transmissions from NOAA-10, NOAA-12, NOAA-14 and NOAA-15, I do get to see a number of image samples sent to me by readers. **Roger Ray** of Telford recently E-mailed me a few, of which Fig. 3 is the visible-light channel from NOAA-10. This particular image of the region around Greece shows little cloud, other than that seen near mountain tops.

Transmissions in the a.p.t. 137MHz band from METEOR 3-5 and RESURS 01-N4 have continued, though the approach of winter will bring the usual seasonal change to METEOR 3-5's operation. By mid November, during early morning, its orbit will have precessed towards the sunrise terminator, so north-bound passes reach darkness and it will not be transmitting when it crosses Britain.

FENG YUN-2A is in trouble again. The Chinese geostationary WXSAT FY-2A stopped transmitting in late September - the second time this has happened. A replacement satellite is scheduled for launch next year - see later.

Correspondence

Dave Ball is a recent convert to the science (art?) of WXSAT monitoring. Dave's entry started with his acquisition earlier this year of a general purpose scanner - the Realistic PRO-2042. He had the receiver scanning a wide band of frequencies, and discovered an apparent 'FAX station'.

Checking the frequency, Dave realised he was actually monitoring his first WXSAT - on 137.50MHz! The PRO-2042 is a later model than my PRO-2004 - a receiver that permitted regular monitoring of *MIR*, the identification of dozens of satellites, and the passport to hours listening to intriguing satellite transmissions.

Identifying a WXSAT transmission is one thing - getting a signal of good enough quality for decoding is another. Dave decided to change his 2m antenna, and acquired a crossed-dipole from a friend who visited a radio rally. For testing



Fig. 6: NOAA morning pass on 1 October from Dave Ball.

purposes, Dave mounted the antenna on a small rotary washing line - see **Fig. 4.**

With the dipoles feeding his receiver, he

set up his home-built (K6/350MHz) computer running **Les Hamilton's** satellite tracking program *Footprint*. He installed the sound-card decoding program *wxsat*, and waited for the next pass. On this occasion, *NOAA-12* triggered the program a few seconds after expected AOS, and a picture started to appear on the screen.

Dave was apparently using the receiver's w.b.f.m. mode - normally used for receiving f.m. radio stations - and very insensitive to WXSAT signals; these require around 45kHz of bandwidth. However, Dave still managed to obtain a fair picture - see **Fig. 5.** This was one of Dave's first attempts at WXSAT monitoring, and it is interesting to note the image 'slip'. This is fixed by setting parameters within the program. Dave's next NOAA image was set correctly - see **Fig. 6** - and the difference is evident. I am surprised at the wide geographical coverage obtained from such a low mounted antenna.

Detail In Overnight NOAA Imagery

Although I don't monitor every single pass of every WXSAT that crosses Britain, I do see quite a number. The overnight *NOAA-14* passes are interesting, particularly during summer when they provide a few minutes of visible-light imagery before switching to near-infra-red. I was curious to know just how much detail is routinely visible in the overnight *NOAA-14* pass, compared with the morning *NOAA-15* pass that follows a few hours later.

I left the computer scheduled to collect the sequence of overnight *NOAA-14* and other passes, and was very impressed with the result - see **Fig. 7.** I extracted the section around Italy and the nearby islands where there was very little cloud. I have done very little image enhancement. The Apennines are clearly seen as a cool streak along the length of Italy, and much detail is evident throughout the image. A number of trails are also identifiable in this image.

The corresponding visible-light image - see **Fig. 8** - was obtained a few hours later from *NOAA-15*. It is rather difficult to identify the Apennines in this image because they seem to leave little signature in this part of the spectrum. However, the trails stand out, particularly around the islands.

MTSAT Launch Approaches

The Japanese Meteorological Agency currently expects the Multifunctional Transport Satellite (*MTSAT*) to be launched from Tanegashima Space Center during November. This is the latest Japanese WXSAT and will follow *GMS-5*, becoming operational next spring. As with the Indian weather-imaging *INSAT* satellite, *MTSAT* carries a multiple-facility payload designed for communications.

One package is an aeronautical mission to augment air traffic control links to improve aircraft navigation and control; this plays an important role in systems for ensuring safety in air transportation. The other is the meteorological mission to replace *GMS-5* and continue

the dissemination of various data formats.

Using *MTSAT* for both missions reduces costs and utilises a valuable orbital slot. The lifetime of the aeronautical mission is more than 10 years; that of the meteorological mission is more than five years. As with the *GMS* series, *MTSAT* will be deployed in geostationary orbit at the same east longitude of 140°. *MTSAT-1* has been constructed by Space Systems/Loral and ITT.

Physically, the satellite is similar to the *GOES-I* series of WXSATs, but carries some performance improvements, such as lower visible-light channel noise level, and higher resolution in the water vapour channel and a baffle to prevent stray-light entry at midnight!

MTSAT should provide the first taste of the LRIT digital image product sometime from March 2000. The Low Rate Information Transmission (LRIT) function will disseminate low resolution digital imagery data to Small-scale Data Utilisation Stations (SDUS), while current analogue WEFAX services continue simultaneously - for the time being. LRIT will carry products of operational analyses and forecasts, as well as meteorological observation data, in addition to the imagery data. The High Resolution Imager Data (HiRID) will be disseminated to Medium-scale Data Utilisation Stations (MDUS).

Future WXSAT Launches

The following launches are currently scheduled:

- Japan's *MTSAT* - late November 1999.
- *GOES-L* - to provide on-orbit spare capacity - December 1999 (an alternate date given is summer 2001).
- *NOAA-L* - polar WXSAT for afternoon orbit - May 2000.
- Shanghai TV reported that China will launch the second *FY-2* geostationary meteorological satellite in the first half of 2000. The new satellite will replace the first *FY-2* that was launched in May 1997.
- *METEOSAT MSG-1* - the next generation European WXSAT - late 2000.
- China's *FengYun-1D* polar orbiter - 2001.

Continued on page 71.



Fig. 7: NOAA-14 0344UTC 24 September channel IR3.



Fig. 8: NOAA-15 0717UTC 24 September visible-light channel 2.



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Fig. 9: MTSAT launch area.

Primary Data From METEOSAT - Continued

As with the WEFAX schedule, all Primary Data images - from whichever satellite they originate - are scheduled at regular intervals. The result is that at least one image is available from GMS-5, GOES-E, and GOES-W every three hours.

All these formats are unencrypted, allowing complete global coverage - except for the gap over Europe due to METEOSAT-7. The 0448UTC transmission from the Japanese GMS-5 is one of a pair - visible (see Fig. 10) and infra-red, showing Australia and the Far East. Much of China can be seen, and typhoons are commonplace. At this time of day, the sun fully illuminates the scene.

The schedule continues with the regular GOES-west infra-red - see Fig. 11 - and visible-light scans. Here, we again see virtually the whole of the Pacific ocean - the breeding ground for a large number of hurricanes. People at the American National Hurricane Center (and elsewhere) constantly monitor these images for signs of newly-forming depressions that sometimes develop. This is also the region where signs of El Nino are usually first identified - often the pre-



Fig. 10: Japanese GMS-5 visible-light image 0448UTC 15 October.



Fig. 11: GOES-W Infra-red image 0450UTC 15 October.

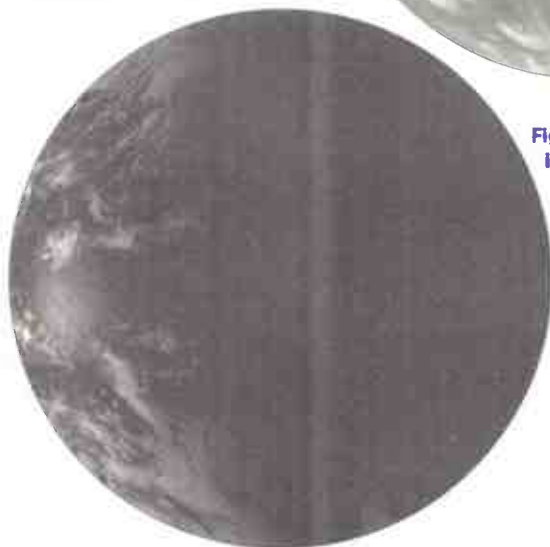


Fig. 12: GOES-W visible-light image 0452UTC 15 October.

cursor to severe weather on a global scale.

The visible-light equivalent to Fig. 11 from GOES-W is Fig. 12; with the sun high over the Far East and Australia (as in Fig. 10), GOES-W sees a crescent earth, including the western Pacific. By this time - 0500UTC - the schedule sequences are well established.

The half-hourly sequences of encrypted 'home' images occupy regular slots, and selected WEFAX formats are intermingled with test images. The hour from 0500UTC includes the first visible scans of the day from METEOSAT, but they are encrypted. INDOEX formats continue every 30 minutes.

Shuttle Launch Schedule

The last Shuttle flight produced some concerns when wiring problems were identified. A thorough checkout was scheduled and by October, wiring inspections and repairs of *Discovery* and *Endeavour* were nearing completion. Similar work then began on *Atlantis*. Shuttle program managers set new planning target launch dates for the next three Space Shuttle missions.

Target Launch Dates For Upcoming Flights:

| Mission/Shuttle | Target Launch Dates | Payload |
|---------------------------|-------------------------------------|--|
| STS-103/ <i>Discovery</i> | 2 December, 1999 | Hubble Space Telescope Servicing-3A (28.45° inc.) |
| STS-99/ <i>Endeavour</i> | 13 January, 2000 | Shuttle Radar Topography Mission (57° inc.) |
| STS-101/ <i>Atlantis</i> | 10 February, 2000 (no earlier than) | International Space Station Logistics (51.6° inc.) Assembly Flight 2A.2 |

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

Kepler Elements - WXSATs, MIR and Shuttle

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- 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.

Frequencies

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



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| JRC NRD-525 | Boxed, mint | £499 |
| JRC NRD-535 | Boxed, mint, 2yrs old | £645 |
| JRC NRD-535 | Boxed | £595 |
| Kenwood R-2000 | Boxed | £250 |
| Kenwood R-2000 | + VHF, immaculate cond | £325 |
| Kenwood R-5000 | + VHF | £495 |
| Kenwood R-5000 | + VHF | £525 |
| Kenwood R-5000 | Boxed, as new | £459 |
| Lowe HF-250 | As new | £399 |
| Lowe HF-225 | + portable case | £245 |
| Roberts R-818 | Portable | £90 |
| Sangean AT5-803A | Great portable | £75 |
| Sony CRF-320 | Fabulous set | £345 |
| Sony IC-17600D | Great portable | £65 |
| Sony SW-77 | Portable, mint, unboxed | £169 |
| Sony SW-77 | Portable, mint, unboxed | £174 |
| Target HF-3 | As new | £90 |
| Target HF-3 | Budget receiver | £90 |
| Telefunken E-127 | + TG455/2 + SG455/2 | £499 |
| Yaesu FRG-100 | Boxed, mint | £299 |
| Yaesu FRG-7700 | Great condition | £175 |
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| Yaesu FRG-7700 | Mint | £179 |
| Yaesu FRG-7700 | As new, great value | £175 |

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| MS-1000 base scanner | Great value | £140 |
| Yupiter MVT-7200 | Boxed, as new | £199 |
| Yupiter MVT-8000 | Boxed, as new | £169 |

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| ERA Micro Reader | CW + RTTY decoder | £125 |
| ERA RS-232 | Display | £90 |
| Global AT-1000 | Receiving ATU, mint | £50 |
| Global AT-2000 | Ex-display | £80 |
| JRC accessories | Most in stock | £TEL |
| Kenwood SP-230 | Speaker | £50 |
| Lake QRP tuner | TU4 | £45 |
| Lake TU-3 | Receiving ATU | £39 |
| Lowe AP-150 | Speaker, filter, mint | £85 |
| Lowe HF-150 | Software + interface | £30 |
| Lowe modemaster | Decode + software | £49 |
| MIJ 116 | Multiple DC outlet box | £30 |
| Microwave modules | MM1-144/30/LS | £69 |
| Minoreg 500MA | Bench PSU 0-25V | £25 |
| RF systems receiving | HF antenna, Cost £460 | £259 |
| Teletreader | CW, RTTY reader | £40 |
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| Veetronics AT-100 | Active antenna/pre-selector | £49 |
| W9GR top end DSP filter, pro-built | | £129 |
| Yaesu FF-5 | LF filter | £20 |
| Yaesu FF-5 | LF filter | £20 |
| Yaesu FRA-7700 | Active antenna | £49 |
| Yaesu FRF-7700 | Receiving tuner | £49 |
| Yaesu FRV-7700 | VHF converter | £49 |
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Maritime Beacons

The propagation conditions were above average during some nights in July, August and September and the sky waves from some quite distant beacons reached our shores. Those from La Isleta, Canaries (LT) on **291.9kHz** and quite a few along the coast of Morocco, Algeria, Portugal, Spain, Italy and Sicily were picked up by **Robert Connolly** in Kilkeel - see chart.

Towards the end of August, **Peter Rycraft** (Wickham Market) heard at night two beacons on the coast of Algeria which he had not received before - RAS Matifou Lt (MF) **291.5** and RAS Auguille Lt (AG) **296.5**. He also logged three beacons which are quite rare for him - Cabo Carvoeiro Lt, Portugal (CV) **287.5**; Cap Bon, Tunisia (BN) **296.5**; Senigallia Lt, Italy (SA) **311.5**.

The beacons at Mahon, Minorca (MH) **292.0** and Cabo San Sebastian, S.Spain (SN) **291.0** were among those heard after dark by **Peter Pollard** in Rugby. The sky waves from Cala Figuera, Majorca (FI) **286.5** and several beacons along the coast of Spain were picked up by **Ross Workman** in Shoreham-by-Sea but he found reception noisy.

Streams of data and a few unmodulated carriers were encountered by **Fred Pallant** (Storrington) but he logged at night some of the beacons on the coast of N.Spain and France. Along in Whitstable, **Eric Tubman** heard after dark Ristna, Estonia (RS) on **307.5**; also three beacons in N.Spain.

The Faeroes beacons at Myggenaes (MY) **337.0**; Akraberg (AB) **381.0** & Noslo (NL) **404.0** were among the entries in the reports compiled mainly at night by **Fred Wilmshurst** (Northampton) and **Brian Heath** (Stapleton). Brian heard a beacon with the callsign (AV) on **306.5**, which may have been Aveiro, Portugal - he could not find it on **290.0** as hitherto.

Over in N.Ireland **Victor Robb** (Belfast) logged at night Hel Lt, Poland (H) on **306.5** for the first time, which was masked by the potent co-channel transmission from Utsira, Norway (UT) until it was closed. **Tom Smyth** (Co.Fermanagh) added to his all time list Oostende (OE) on **312.0**, which became audible at night when local beacons were closed down.

The band was searched mainly during daylight by **Albert Moore** (Douglas, IoM). The noise level was high and only four regulars could be heard until he used a Datong FL2 audio filter with his receiver. The clear sea paths to his location enabled him to detect the ground waves from Cabo Salou (UD)

288.5 and Cabo Villano (VI) **290.5** on the coast of S.Spain.

Whilst visiting Scotland in September, **Brian Keyte** (Gt.Bookham) searched the band in Rhue by Ullapool on the 16th and was surprised to find the beacon at Prinz Christian Sund, S.Greenland (OZN) on **372.0** coming in well at 1118UTC. The Faeroes beacons (MY, AB & NL) were very strong indeed.

Beacons along the coast of N.Spain were logged during daylight by **John Woodcock** in Basingstoke. He noticed that the Channel Is beacon at La Corbiere, Jersey (CB) on **295.5** was active on

September 21. It was also reported as operational by other listeners - see chart. In E.London **Phil Townsend** found reception marred by a high noise level but he managed to pick up the ground waves from five beacons on the coast of France and Holland.

May I take this opportunity to thank most sincerely everyone who contributed to this feature during the year. With best wishes to all readers for Christmas and good DXing in 2000.

Long Wave Maritime Radiobeacon Chart

| Freq (kHz) | C/S | Station Name | Location | DXer |
|------------|-----|--------------------|-------------|------------------------------------|
| 215.0 | EM | Egdesminde | Greenland | A* |
| 284.5 | MA | Cabo Machichaco | NE.Spain | A,B*,C,D*,E,F*,G*,H,I*,J*,M*,N,D* |
| 284.5 | PR | Porkkala | Finland | C*,J*,M* |
| 285.0 | NP | Nieuport W.Pier | Belgium | I* |
| 286.5 | FI | Cala Figuera | Majorca | A*,B*,C*,E*,H*,J*,M*,D* |
| 286.5 | FT | Cap Ferret Lt | SW.France | A,B*,C,D*,E,G*,H*,J*,M*,D* |
| 286.5 | PZ | Cozzo Spadaro | Sicily | A* |
| 287.3 | IB | I.Berlenga | Portugal | I* |
| 287.5 | CV | Cabo Carvoeiro Lt | Portugal | I* |
| 287.5 | MD | Cabo Mondego | Portugal | A,I* |
| 288.0 | HH | Hoek van Holland | Holland | A,C,I* |
| 288.5 | CT | Pt de Combrit Lt | France | I* |
| 288.5 | FI | Cabo Finisterre Lt | N.W.Spain | A,C*,D*,E,I* |
| 288.5 | UD | Cabo Salou | S.Spain | E,I* |
| 288.5 | YM | Ijmuiden Lt | Holland | B*,C,E,I*,K,M,N |
| 289.5 | SN | Ile de Sein NW Lt | France | C,H,I*,D* |
| 290.0 | AV | Aveiro | Portugal | A* |
| 290.0 | MR | Montedor | Portugal | A*,J* |
| 290.5 | VI | Cabo Villano Lt | N.Spain | A,B*,C,D*,E,F*,G*,H*,J*,L*,M*,N,D* |
| 290.5 | VY | Visby | Sweden | I* |
| 291.0 | SM | Pt. St.Mathieu | France | A*,I* |
| 291.0 | SN | Cabo San Sebastian | S.Spain | A*,E,G*,I* |
| 291.5 | MF | Ras Matifou | Algeria | I* |
| 291.9 | LT | La Isleta | Canaries | A* |
| 292.0 | MH | Mahon, Minorca | Balearic Is | A*,C*,E*,G*,M* |
| 293.0 | RD | Cabo Rilloiro Lt | N.Spain | A*,I* |
| 294.0 | KU | Kullen High Lt | Sweden | I* |
| 294.0 | PH | Cap d'Alprech | France | B*,C,E,F*,G*,J*,K,L,M*,N,D |
| 294.6 | NO | Cabo de la Nao | Spain | A*,J* |
| 295.0 | DV | Djivovogur | Iceland | A* |
| 295.5 | CB | La Corbiere Lt | Jersey C.I. | A,C,I*,N |
| 295.5 | CR | Cap Couronne | France | I* |
| 295.5 | RE | La Rochelle | France | A* |
| 296.0 | GR | Goeree Lt | Holland | C,E*,J*,L,M,N |
| 296.0 | KN | Skröva Lt | Norway | B* |
| 296.5 | AG | Ras Aiguille | Algeria | I* |
| 296.5 | BN | Cap Bon | Tunisia | I* |
| 297.0 | B | Cabo Trafalgar | SW.Spain | C* |
| 297.0 | FG | Pt de Barfleur Lt | France | A*,J* |
| 297.5 | MA | Manttuotuo | Finland | A*,E* |
| 297.5 | PS | Cabo Penas Lt | N.Spain | A,I* |
| 298.0 | GX | Ile de Groix | France | G*,J* |
| 298.0 | TA | Cabo Gata | S.Spain | A*,I* |
| 298.0 | AD | Ameland Lt | Holland | A,I* |
| 299.0 | BN | Les Baleines | W.France | I* |
| 299.0 | O | Tarifa | S.Spain | A*,J* |
| 299.5 | VS | Vieste Lt | Italy | A* |
| 300.0 | TI | Cap d'Antifer Lt | N.France | I* |
| 301.0 | CA | Pt de Creach | France | A,C,E,F*,G*,H*,J*,K,M,N,D |
| 301.0 | ER | Eierland Lt | Holland | C,I* |
| 301.0 | HA | Pt del Hank | Morocco | A* |
| 301.5 | L | Torre de Hercules | N.Spain | A*,C,D*,E,H*,J*,M* |
| 302.0 | RB | Cherbourg Ft W Lt | France | A,E,G*,H,I*,D |
| 303.0 | D | Rota | SW.Spain | A*,B*,C*,E,I* |
| 303.0 | MY | Cabo Mayor Lt | N.Spain | F*,H |
| 303.0 | YE | Ile d'Yeu Main Lt | W.France | A*,I* |
| 303.4 | VC | Cape St.Vincent | Portugal | I* |
| 303.5 | JA | Llanes Lt | N.Spain | A* |
| 303.5 | OR | Punta de Llobregat | S.Spain | A*,B*,C*,E*,D* |
| 303.5 | VL | Vlieland Lt | Holland | I* |
| 304.0 | BR | Cap Bear | France | A* |

| Freq (kHz) | C/S | Station Name | Location | DXer |
|------------|-----|--------------------|------------|------------------------------------|
| 304.5 | MY | Cabo Mayor Lt | N.Spain | A,B*,C,D*,E,G*,J*,L*,M*,N,D* |
| 305.7 | DA | Dalatangi Lt | Iceland | A*,D |
| 306.5 | H | Hel Lt | Poland | C*,D*,H* |
| 306.5 | KL | Kolkasrags | Latvia | A* |
| 307.5 | RS | Ristna | Estonia | A*,B*,C*,D*,E*,G*,H*,L*,M* |
| 308.0 | AK | Table D'Oukacha | Morocco | A* |
| 308.0 | RC | Cabo Roca | Portugal | I* |
| 308.0 | RD | Roches Douvres Lt | France | A*,J* |
| 308.5 | NZ | St Nazaire | France | A*,C*,I* |
| 309.5 | AL | Algiers | Algeria | A* |
| 309.5 | BA | Punta Estaca Bares | N.Spain | A,B*,C,D*,E*,G*,H*,I*,J*,L*,N*,D* |
| 309.5 | SW | M.Kheronesoskiy | Ukraine | A* |
| 309.5 | TR | M.Tarkhanutskiy | Ukraine | A* |
| 309.5 | WE | Wangerooze Lt | N.Germany | C |
| 310.0 | ER | Pt de Ver Lt | N.France | A*,B*,C*,F*,J*,K,N,D |
| 310.5 | AS | Castellon | Spain | A* |
| 310.5 | GV | Genova | Italy | A* |
| 310.5 | RO | Rozewie | Poland | A* |
| 311.5 | SA | Senigallia | Italy | A*,C*,I* |
| 312.0 | OE | Oostende | Belgium | A*,G*,H*,J*,D |
| 312.0 | SP | Cap Spatel | Morocco | A*,C*,M* |
| 312.0 | UH | Eckmuhl Lt | France | I* |
| 312.5 | AK | Almenrags | Latvia | A* |
| 312.5 | BK | Baltijsk | Russia | A*,C* |
| 312.5 | BT | Mys Taran Lt | Russia | A*,C*,H* |
| 312.5 | CS | Calais Main Lt | France | A,C,D*,F*,J*,L*,M*,D |
| 312.5 | DB | Dobskoy | Ukraine | A* |
| 312.5 | KA | Klajpeda Rear Lt | Lithuania | A*,C* |
| 312.5 | LB | Liepaja | Latvia | A* |
| 312.5 | VS | Cabo Estay Lt | N.Spain | I* |
| 313.0 | PA | Cabo de Palos Lt | S.Spain | A*,J*,D* |
| 313.5 | BR | Cap Bear Lt | S.France | I* |
| 314.0 | PQ | Porquerolles | S.France | I* |
| 314.0 | VG | Ile Verge Lt | France | A,B*,C,D*,E,F*,G*,H*,I*,J*,K,M,N,D |
| 314.5 | TL | Punta D.Penna | Italy | A* |
| 315.5 | ND | Nida | Lithuania | A* |
| 316.0 | IN | Ingolfshofthi Lt | Iceland | A* |
| 337.0 | MY | Myggenaes | Faeroes Is | A*,B*,C*,D,H*,M* |
| 372.0 | OZN | Prins Chris's Sund | Greenland | A*,D,M* |
| 381.0 | AB | Akraberg | Faeroes Is | A*,B*,C*,D,H*,M* |
| 404.0 | NL | Noslo | Faeroes Is | A*,B*,C*,D,H*,M* |

Note:
Entries were compiled during July and/or August and/or September
Entries marked * were logged during darkness. All other entries were logged during daylight or at dawn/dusk.

DXers-

- (A) Robert Connolly, Kilkeel.
- (B) Brian Heath, Stapleton.
- (C) Brian Keyte, Gt.Bookham.
- (D) Brian Keyte, while in Rhue by Ullapool.
- (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) Philip Townsend, E.London.
- (L) Eric Tubman, Whitstable.
- (M) Fred Wilmshurst, Northampton.
- (N) John Woodcock, Basingstoke.
- (D) Ross Workman, Shoreham-by-Sea.

■ MIKE RICHARDS G4WNC, PO BOX 1863, RINGWOOD, HANTS BH24 3XD

■ E-MAIL: decode@pwpublishing.ltd.uk ■ Web: <http://www.btinternet.com/~mikespage>

Decode

New Listeners - Start Here!

With the dark nights upon us, this is the prime time when listeners start to look for something new to while away the dark evenings. So why not try your hand with data utilities?

All you need is an s.s.b. receiver and a PC and you can have a whale of a time. So, the question is, how on earth do you get started? If you have Internet access, I suggest you start by taking a look at Pervisell's home page at <http://www.pervisell.com> Pervisell have been producing excellent decoders for many years now and are also the UK agents for many of the popular software packages. Programs such as *Hamcomm* and *JVFAX* make excellent starting points to enter the world of data utilities.

If you prefer to operate without any additional decoders, you could pay a visit to Oliver Welp's excellent Web page featuring an amazing range of radio orientated software that makes use of a SoundBlaster compatible soundcard to process the signal from your receiver. The site address is: <http://www.muenster.de/~welp/sb.htm>

So, what can you expect to be able to receive? On the FAX front, the main interest lays with the reception of weather charts from all over the world. For some it's the weather information that's the prime interest, whilst others will find fascination in trying to improve the quality of distant signals. As well as weather charts, you can also receive weather satellite images just a few hours after processing by the Earth stations.

If you're looking at the various teletype modes, you will find a few news stations still operational, along with many specialist stations transmitting detailed weather reports from monitoring stations around the World. There are also lots of amateur transmissions to monitor.

WUN

If you've not already discovered it and you have Web access, you really ought to take a look at the WUN site. So, what is it? WUN is an acronym for World Wide Utility News, which is an Internet based interest group, or club, for all forms of radio utilities - that means voice as well as data and FAX.

The team is made up of enthusiasts and offers some really excellent services for everyone with an interest in utilities. The original concept of producing an electronic *Newsletter* has expanded to the point where they need their own Web site to handle the range of services available. As well as being able to freely download copies of the *Newsletter*, there's a wonderful *Digital FAQ* (Frequently Asked Questions) that covers just about every mode there is.

There are specialist utility files available, as well as some excellent Special Topic reports and great links. One of my favourites is the Digital Sounds section. This contains RealAudio samples and .WAV files of most of the popular digital transmission signals. Most of these are long enough to use as test pieces for trying out decoders. However, their main use is for ear training so you can learn to recognise the different modes and so save lots of wasted time by setting your decoder close to the right settings for the signal you've heard.

The real icing on the cake is the 1999 WUN CD-ROM *Frequency Guide Plus, Vol II*. The CD contains over 400 sound files along with an html based overview for many digital modes. These are supplemented by text files showing typical outputs from utility stations. As if all this wasn't enough, there are back copies of all the WUN and Speedx newsletters, plus hundreds of Internet links to useful sites.

Finally, there's the WUN logs which contain over 30,000 loggings from members around the world. This

comprehensive collection of information is available via the WUN web site at just US \$24.99, which includes airmail postage anywhere in the World - looks like pretty good value! For more details, take a look at the WUN site which can be found at:

<http://www.wunclub.com>

System Tidy-up

Do you find that you can't resist loading the latest decoding software? Do you find yourself trawling the Web for new utilities? If so, you're rather like me and probably end-up with your PC in a real state!

If you watch the install screens when you're loading the latest software, you will probably be alarmed at the number of files that don't go in your chosen directory, but end-up being placed in the Windows/System directory. Not only that, but many programs put extra lines in the system configuration files that force your computer to load and run certain routines every time you start-up.

Now all this is a bit worrying, especially when you start to notice that your precious PC seems to be running rather slower than it used to, or maybe it's become rather more prone to those irritating fatal errors. Although later versions of *Windows* have improved the uninstall process, it's by no means fool-proof.

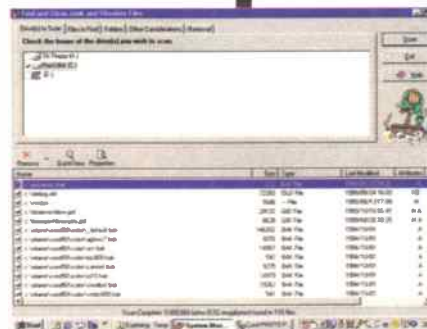
How many times have you deleted a directory thinking that that's removed the program? Whilst there have been many uninstall programs sold over recent years, I've never found a really convincing analysis program that can find time and space wasting programs for me - until now that is.

One of the best solutions I've come across is *System Mechanic*. Not only is this a very comprehensive set of system tools, but it's been made really simple and safe to use - something of a first!

When you start the program, you're presented with a bold red radiator grille with eight options. As you pass your cursor over each option, the built-in window shows a brief description of what you can expect to be able to get done. The options are



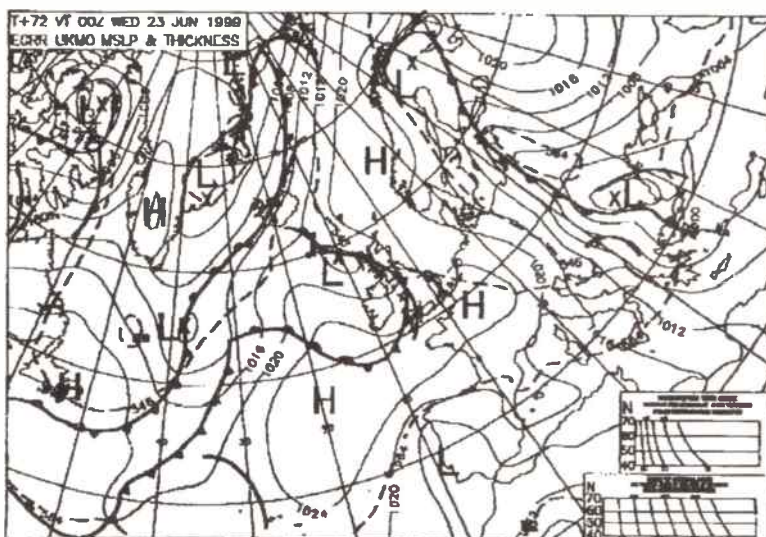
System Mechanic's novel main screen.



System Mechanic's redundant file search.

Typical weather FAX from Bracknell.

20 JUN '99 06:06 FROM MET ITOPS BRACKNELL TO 4886 PAGE 001



really well thought-out and cover all the main areas that can get in a mess for all the reasons I've described.

Fixing and removing obsolete files starts a search that roots-out all those odd files that get left behind by some poorly designed programs and system crashes. These include .BAK files amongst many.

Once the search is complete, you can look through the results and decide which ones you want to put in the Recycle bin before disposal. Privacy gets some help with a clever option that lets you clean-out tracks of where you've been whilst trawling the net as well as deleting all those cookies.

I know Shortcuts are relatively small files, but you'd be amazed at how many broken links you have on your machine - *System Mechanic* weeds them out so you can fix or delete them. Whilst looking for bogus files you can use the invalid uninstaller and duplicate files options to find yet another set of errant files.

The duplicate files option is particularly interesting and I found a huge number of files on my machine totalling around 20Mb! You do need to be careful when deleting files and I would recommend you take it step by step and keep everything in the recycle bin for a week or two just in case!

The Windows Registry tidy-up was also well worth having

and I managed to delete 128 invalid references on my PC. This was followed by a look at the Windows Start-up manager which shows-up all those programs that kick-in when you start your PC. As well as lots of essential things, you may well find bits of programs you thought you'd got rid of still running in the background. *System Mechanic* provides a safe way to disable them.

With your machine back to full performance, *System Mechanic* provides some additional features to help you keep it running well. The Safe Installer is a neat utility that takes a look at your system just before you load that new software and then checks on completion to see what's changed. Very simple but effective. This is backed-up with a Scheduled Maintenance tool that will carry-out any of the *System Mechanic's* checks at whatever interval you choose.

This is a great package that really makes it easy to keep your PC working at full capacity and recover some of that scarce hard disk space. As well as being very effective, it's also pretty well priced at around £50. For more information, visit the manufacturers Web page at <http://www.iolo.com/sm> or visit their UK agents POW at <http://www.pow-dist.co.uk/>

Table 1: Day Watson's complex mode frequency list.

| FREQ | Station | Mode | Month Heard | Time Heard | FREQ | Station | Mode | Month Heard | Time Heard | FREQ | Station | Mode | Month Heard | Time Heard |
|----------------------|--------------------------|-------------------|-------------|------------|----------------------------|-------------------------|-------------------|-------------|------------|-------------------------------|---------------------------|--------------------|-------------|------------|
| ARQ/E Systems | | | | | | | | | | | | | | |
| 2.7862 | UNID | ARQ/E/140/E/170 | Mar '99 | 2045 | 19.2047 | FF UNID ? | ARQ/E/1/00/E/400 | Feb '99 | 1601 | 11.9500 | FRENCH EMB BELGRADE [G8T] | FECA/1/192/E/400 | Feb '99 | 1215 |
| 4.8320 | FF UNID | ARQ/E/184.8/E/400 | Feb '99 | 2019 | 19.2167 | FF FT DE FRANCE [RFL] ? | ARQ/E/3/96/E/400 | May '99 | 1530 | 11.1735 | MFA PARIS [RFW] | FECA/1/192/E/400 | Feb '99 | 0533 |
| 5.2470 | FF UNID ? | ARQ/E/172/E/400 | Feb '99 | 1349 | 19.2167 | FF FORT DE FRANCE [RFL] | ARQ/E/3/96/E/400 | Jul '99 | 1502 | 11.4630 | MFA PARIS [RFW] | FECA/1/192/E/400 | Sep '99 | 1425 |
| 5.2840 | GAG FLOC | ARQ/E/185.7/E/170 | Jun '99 | 1755 | 19.5302 | OTRE KERGUELEN [FJY2] | ARQ/E/3/96/E/400 | Jan '99 | 1031 | 13.5515 | MFA PARIS [RFW] | FECA/1/192/E/400 | Feb '99 | 0858 |
| 5.3010 | UNID | ARQ/E/172/E/400 | Apr '99 | 1823 | 20.1797 | FF PARIS | ARQ/E/3/100/E/400 | Jul '99 | 1523 | 14.5750 | MFA PARIS [RFW] | FECA/1/192/E/400 | Mar '99 | 1222 |
| 5.7810 | GAF FLOC | ARQ/E/185.7/E/170 | Jun '99 | 1803 | 20.6337 | FF LE PORT [RFV] | ARQ/E/3/100/E/400 | Aug '99 | 1001 | 14.9750 | MFA PARIS [RFW] | FECA/1/192/E/400 | Jan '99 | 0519 |
| 6.9290 | UNID | ARQ/E/192/E/170 | Jun '99 | 1009 | 20.7197 | FF PARIS [RFV] | ARQ/E/3/192/E/400 | Mar '99 | 1505 | 15.8730 | MFA PARIS [RFW] | FECA/1/192/E/400 | Feb '99 | 1413 |
| 7.8340 | UNID | ARQ/E/172/E/400 | Apr '99 | 2222 | 20.8137 | FF LIBREVILLE [RFTJD] | ARQ/E/3/192/E/400 | Aug '99 | 1014 | 16.2040 | MFA ANKARA [TAD] | FECA/1/144/E/850 | Jan '99 | 1528 |
| 7.7160 | FF AJACCIO | ARQ/E/192/E/400 | Jan '99 | 1951 | 20.8566 | FF DJIBOUTI [RFQF] | ARQ/E/3/200/E/400 | Jun '99 | 1431 | 16.2420 | FRENCH EMB MOSCOW [U3H] | FECA/1/192/E/850 | Jan '99 | 0535 |
| 7.8030 | FF ? LOC | ARQ/E/172/E/400 | Jan '99 | 2007 | 23.3587 | FF FJIBOUTI [RFQF] | ARQ/E/3/192/E/400 | Jan '99 | 1348 | 16.2530 | FRENCH EMB MOSCOW [U3H] | FECA/1/192/E/850 | Apr '99 | 1221 |
| 8.1050 | FF PARIS ? | ARQ/E/184.8/E/400 | Jan '99 | 1925 | Polish ARQ Systems | | | | 18.3085 | MFA PARIS [RFW] | FECA/1/192/E/400 | Jan '99 | 1555 | |
| 9.1225 | FF UNID FLOC | ARQ/E/184.8/E/400 | Apr '99 | 1954 | 4.3620 | MFA WARSAW [SNZ 99] | ARQ/POL/100/V/250 | Jan '99 | 1525 | 18.7600 | MFA PARIS [RFW] | FECA/1/192/E/400 | Jan '99 | 1512 |
| 9.2590 | FF UNID | ARQ/E/184.8/E/400 | Aug '99 | 1136 | 11.0540 | POLISH EMB ? LOC | ARQ/POL/100/E/250 | Jan '99 | 0853 | 20.5565 | MFA PARIS [RFW] | FECA/1/192/E/400 | Feb '99 | 1401 |
| 9.3635 | FF VERSAILLES [RFFXC3S?] | ARQ/E/184.8/E/400 | Apr '99 | 1410 | 13.4670 | MFA WARSAW [SNZ 99] | ARQ/POL/100/E/250 | Jul '99 | 1306 | 6.8520 | MFA BUCHAREST [V5G] | FECA/1/164.5/R/400 | May '99 | 1803 |
| 10.1325 | FF UNID | ARQ/E/184.8/E/400 | May '99 | 1622 | 13.9170 | POLISH EMB TRIPOLI | ARQ/POL/100/E/250 | Sep '99 | 1548 | 8.0270 | MFA BUCHAREST [V5G] ? | FECA/1/164.5/R/400 | May '99 | 0525 |
| 10.6290 | FF NAQOURA [RFFXK] | ARQ/E/184.8/E/400 | May '99 | 1204 | 14.6390 | POLISH EMB BAGHDAD | ARQ/POL/100/E/250 | Jul '99 | 1629 | 8.0290 | ROMANIAN DIPL O ? | FECA/1/164.5/R/400 | May '99 | 0548 |
| 10.9550 | UNID | ARQ/E/184.8/E/400 | Apr '99 | 1902 | 14.6390 | POL EMB BAGHDAD | ARQ/POL/100/E/250 | Mar '99 | 1412 | 9.1040 | MFA BUCHAREST [V5G] | FECA/1/164.5/R/400 | May '99 | 1809 |
| 12.1410 | FF UNID | ARQ/E/184.8/E/200 | May '99 | 1946 | 14.6390 | POL EMB BAGHDAD | ARQ/POL/100/E/250 | Jul '99 | 1412 | 10.4930 | MFA BUCHAREST [V5G] | FECA/1/164.5/R/400 | Jan '99 | 1144 |
| 13.4630 | FF UNID ? | ARQ/E/184.8/E/400 | May '99 | 1816 | 14.9320 | MFA WARSAW [SNZ 99] ? | ARQ/POL/100/E/250 | Mar '99 | 0831 | 11.4280 | ROMANIAN EMB ? LOC | FECA/1/218.3/R/400 | May '99 | 0638 |
| 13.5725 | FF PARIS ? | ARQ/E/184.8/E/400 | Jan '99 | 1723 | 15.0820 | MFA WARSAW [SNZ 99] | ARQ/POL/100/E/250 | Mar '99 | 1504 | 14.8780 | MFA BUCHAREST [V5G] ? | FECA/1/164.5/R/400 | May '99 | 0650 |
| 14.7980 | UNID | ARQ/E/172/E/400 | Mar '99 | 1906 | 16.3170 | POLISH EMB KINSHASA | ARQ/POL/100/E/250 | Jan '99 | 0940 | 14.8659 | ROMANIAN DIPL O ? | FECA/1/164.5/R/400 | May '99 | 0711 |
| 18.4445 | FF NAQOURA [RFFXK] | ARQ/E/184.8/E/400 | Sep '99 | 0915 | 18.0640 | MFA WARSAW [SNZ 99] | ARQ/POL/100/E/250 | Apr '99 | 1530 | 16.2368 | ROMANIAN EMB BAGHDAD | FECA/1/164.5/R/400 | May '99 | 0724 |
| ARQ/S Systems | | | | | | | | | | | | | | |
| 6.9302 | UNID | ARQ/S/192/E/340 | Jun '99 | 1143 | 8.1230 | UNID | ARQ/RS/228/E/170 | Feb '99 | 1054 | 16.3452 | ROMANIAN DIPL O ? | FECA/1/164.5/R/400 | May '99 | 1154 |
| 7.4567 | FF DAKAR [RFTJ] | ARQ/S/192/E/400 | Feb '99 | 0751 | 8.7950 | UNID | ARQ/RS/228/E/170 | May '99 | 1617 | Packet Systems | | | | |
| 7.5657 | FF CDADUOZ [RFTVIT] | ARQ/S/192/E/400 | Jan '99 | 1848 | 9.2950 | MFA ROME | ARQ/RS/240/E/170 | Feb '99 | 0844 | 11.3728 | UNHCR ? | PACT/200/-/200 | Jul '99 | 1855 |
| 7.5886 | FF CDADUOZ [RFTVIT] | ARQ/S/192/E/400 | Sep '99 | 2155 | 10.6590 | UNID | ARQ/RS/240/E/170 | Jan '99 | 1215 | 11.5277 | ALGERIAN CUSTOMS ALGIERS | PACTOR/100/-/200 | Jun '99 | 1304 |
| 7.6140 | FF MARSEILLE [RFFH] | ARQ/S/192/E/170 | Jul '99 | 1911 | 10.6590 | ITALIAN EMB TRIPOLI | ARQ/RS/240/E/170 | Jan '99 | 1443 | 13.3967 | ALGERIAN CUSTOMS | PACTOR/200/-/200 | Sep '99 | 0980 |
| 7.6442 | FF LE PORT [RFV] | ARQ/S/192/E/170 | Sep '99 | 2055 | 10.6590 | MFA ROME | ARQ/RS/240/E/170 | Jan '99 | 1455 | 13.8664 | ICRC GENEVA ? | PACTOR/200/-/200 | Sep '99 | 1129 |
| 7.8316 | ANTANANARIVO AIR (SSST) | ARQ/S/48/E/400 | Feb '99 | 2030 | 11.1260 | MFA ROME ? | ARQ/RS/240/-/170 | Aug '99 | 1018 | 14.5072 | UNID | PACTOR/200/-/200 | Jul '99 | 1551 |
| 8.3303 | FF LE PORT [RFV] | ARQ/S/100/E/170 | Aug '99 | 1846 | 12.7595 | MFA ROME ? | ARQ/RS/240/-/170 | Jan '99 | 1522 | 18.5172 | UNID | PACTOR/1700/-/200 | Feb '99 | 1041 |
| 9.0787 | FF DJIBOUTI [RFQF] | ARQ/S/100/E/800 | Aug '99 | 1842 | 13.0155 | UNID | ARQ/RS/228/E/170 | Jan '99 | 1557 | Twiplax Systems | | | | |
| 9.3767 | FF PAPEETE [RFFH] | ARQ/S/100/E/400 | Aug '99 | 0931 | 17.4610 | UNID | ARQ/RS/228/E/200 | Jan '99 | 1219 | 9.3279 | MFA COPENHAGEN [OZU2S] | TWINPLEX/100/E/- | Sep '99 | 0833 |
| 9.3837 | FF PARIS | ARQ/S/100/E/400 | Feb '99 | 1940 | 18.7630 | MFA ROME | ARQ/RS/228/E/170 | Jun '99 | 0620 | 11.3279 | MFA COPENHAGEN [OZU2S] | TWINPLEX/100/E/- | Sep '99 | 0820 |
| 10.1027 | FF UNID ? | ARQ/S/192/E/370 | Jan '99 | 0734 | 18.7710 | UNID | ARQ/RS/228/E/170 | Feb '99 | 1721 | 11.3419 | MFA COPENHAGEN [OZU2S] | TWINPLEX/100/E/- | Sep '99 | 0835 |
| 10.1777 | FF PARIS | ARQ/S/192/E/380 | Jan '99 | 0842 | 23.3740 | MFA ROME | ARQ/RS/228/E/170 | Mar '99 | 161 | 11.4199 | MFA COPENHAGEN [OZU2S] | TWINPLEX/100/E/- | May '99 | 1122 |
| 10.2813 | FF CAYENNE [RFLG] | ARQ/S/192/E/400 | Jan '99 | 1039 | Swedish ARQ Systems | | | | | 13.4579 | MFA COPENHAGEN [OZU2S] | TWINPLEX/100/E/- | Sep '99 | 0843 |
| 10.4937 | FF PORT BOUET [RFTJF] ? | ARQ/S/48/E/400 | Mar '99 | 0710 | 20.9868 | MFA STOCKHOLM (SAM) | ARQ/SWE/100/V/400 | Jun '99 | 1318 | 13.4869 | MFA COPENHAGEN [OZU2S] | TWINPLEX/100/E/- | Sep '99 | 1112 |
| 10.9177 | FF DAKAR [RFTJ] | ARQ/S/48/E/400 | Aug '99 | 2125 | 20.3870 | MFA STOCKHOLM (SAM) | ARQ/SWE/100/V/400 | Jun '99 | 1322 | 15.9465 | MFA MADRID [EAE220] | TWINPLEX/100/E/- | Jan '99 | 1604 |
| 11.1105 | FF FT DE FRANCE [RFL] | ARQ/S/192/E/370 | Jan '99 | 0901 | 20.3872 | MFA STOCKHOLM (SAM) | ARQ/SWE/100/V/400 | Jun '99 | 1054 | 16.2099 | MFA COPENHAGEN [OZU2S] | TWINPLEX/100/E/- | Jan '99 | 1110 |
| 11.5417 | FF FT DE FRANCE [RFL] | ARQ/S/192/E/370 | Jan '99 | 1151 | 20.3874 | MFA STOCKHOLM (SAM) | ARQ/SWE/100/E/710 | Jan '99 | 1600 | 18.5975 | MFA MADRID [EAE220] | TWINPLEX/100/E/- | Feb '99 | 1131 |
| 13.8467 | FF LE PORT [RFV] | ARQ/S/100/E/400 | Sep '99 | 1536 | 23.5053 | MFA STOCKHOLM (SAM) | ARQ/SWE/100/E/710 | Jun '99 | 1238 | 19.1089 | MFA COPENHAGEN [OZU2S] | TWINPLEX/100/-/170 | Sep '99 | 0847 |
| 14.4817 | FF DAKAR [RFTJ] | ARQ/S/48/E/400 | Aug '99 | 1122 | ARQ/S Systems | | | | | 19.8219 | MFA COPENHAGEN [OZU2S] | TWINPLEX/100/E/- | Sep '99 | 1318 |
| 14.4872 | FF PARIS | ARQ/S/200/E/170 | Mar '99 | 1029 | 18.1990 | FRENCH EMB DAKAR | ARQ/G/200/E/400 | Jul '99 | 1516 | Non-Standard Alphabets | | | | |
| 14.5217 | FF NDJAMENA [RFTPA] | ARQ/S/200/E/400 | Jul '99 | 0958 | 19.5100 | FRENCH EMB LAGOS [LGD5] | ARQ/G/200/E/400 | Jan '99 | 1626 | 3.3310 | UNID | ARABIC 50/N/170 | Jan '99 | 1923 |
| 14.5857 | FF NDJAMENA [RFTPA] | ARQ/S/200/E/400 | Mar '99 | 1751 | 20.5180 | FRENCH EMB KINSHASA ? | ARQ/G/200/E/400 | Jan '99 | 1554 | 6.8301 | PETRA AMMAN | ARABIC 50/N/400 | Apr '99 | 1610 |
| 14.5857 | FF NDJAMENA [RFTPA] | ARQ/S/200/E/400 | Feb '99 | 0919 | ARQ/342 Systems | | | | | 10.1625 | IN BAGHDAD (YL71) | ARABIC 75/N/400 | Apr '99 | 1350 |
| 14.5862 | FF PARIS ? | ARQ/S/200/E/400 | Aug '99 | 0840 | 5.1600 | NIAMEY AIR (SUA) ? | ARQ/342/96/400 | Mar '99 | 2230 | 8.3860 | ZMIAL RADIO (USD) | SSC 50/N/170 | Mar '99 | 0909 |
| 14.6333 | FF UNID | ARQ/S/192/E/400 | Mar '99 | 1353 | 5.2215 | COTONOU AIR (TYE) | ARQ/342/96/400 | Apr '99 | 1858 | 8.7030 | ARKHANGELSK RADIO (UCE) | SSC 50/N/170 | Mar '99 | 1125 |
| 14.8272 | FF CAYENNE [RFLG] | ARQ/S/192/E/400 | Mar '99 | 1245 | 10.3807 | FF PARIS | ARQ/342/200/E/400 | Aug '99 | 1056 | 12.5615 | SHIP SOKRAT (UBSK) | SSC 50/N/170 | Sep '99 | 1114 |
| 14.9277 | FF DAKAR [RFTJ] | ARQ/S/192/E/400 | Mar '99 | 1350 | 10.9917 | FF SARAJEVO [RFFVAY] | ARQ/342/200/E/400 | Aug '99 | 1138 | 16.8015 | SHIP KILDINSKY PROUMPSF96 | SSC 50/N/170 | Sep '99 | 1424 |
| 14.9598 | FF DAKAR [RFTJ] | ARQ/S/192/E/400 | Feb '99 | 0916 | 11.4152 | FF PARIS ? | ARQ/342/200/E/400 | Sep '99 | 1403 | 16.8020 | SHIP UNID (UAHP) | SSC 50/N/170 | Feb '99 | 1123 |
| 15.9617 | FF FT DE FRANCE [RFL] | ARQ/S/192/E/400 | Aug '99 | 1000 | 13.4797 | FF PARIS ? | ARQ/342/200/E/400 | Jan '99 | 1512 | 16.9270 | KALUNJING RAD (UWH) | SSC 50/N/170 | Feb '99 | 1049 |
| 16.1437 | FF FT DE FRANCE [RFL] | ARQ/S/192/E/400 | Mar '99 | 1930 | 16.1525 | FF PARIS | ARQ/342/200/E/400 | Sep '99 | 1512 | 16.9750 | ARKHANGELSK (RLJ7) | SSC 50/N/170 | Feb '99 | 0942 |
| 16.3102 | FF PARIS | ARQ/S/200/E/400 | Sep '99 | 1140 | 16.1832 | FF DJIBOUTI [RFQF] | ARQ/342/200/E/400 | Feb '99 | 1454 | 19.7245 | KALUNJING RAD (UWH) | SSC 50/N/170 | Jul '99 | 1538 |
| 16.3247 | FF CAYENNE [RFLG] | ARQ/S/192/E/400 | Sep '99 | 1253 | 16.2802 | FF PARIS | ARQ/342/200/E/400 | Apr '99 | 1035 | 22.3675 | SHIP NOUR (JBL2S) | SSC 50/N/170 | Mar '99 | 1552 |
| 16.3453 | FF FT DE FRANCE [RFL] | ARQ/S/192/E/400 | Apr '99 | 1151 | ARTRAC | | | | | 23.3720 | SHIP UNID | SSC 50/N/170 | Sep '99 | 1012 |
| 16.3517 | FF PARIS | ARQ/S/192/E/400 | Sep '99 | 1602 | 13.3766 | HUNGARIAN E | | | | | | | | |

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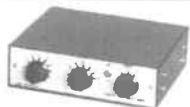
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SSB Utilities

During October, I received an anonymous letter from a reader in the southwest of England which contained a single log entry for a single frequency. Since I was able to identify the frequency and the users, and I am able to give some advance warning of activity on the frequency, I thought that it would be worthwhile expanding upon the details of the letter. The letter simply says 'Freq 5328kHz' and contains the time and date, and a list of callsigns heard, and details of some forthcoming transmission schedules.

What my anonymous contributor heard was a series of transmissions from the **Combined Cadet Force (CCF)**, which is an outfit similar to the Air Training Corps or Sea Cadet Corps. It is based mostly at public schools within the UK; pupils who elect **not** to join the Duke of Edinburgh's Award Scheme are usually enrolled as members of the school's CCF. The CCF cadets get the chance to experience all the facets of military life, including radio communications.

The letter reports that the CCF have a 'sked' during weekday evenings from 1930 (local time) onwards on 5.328MHz, and I can report that I have already heard some of these transmissions during the week. From the voices heard, these evening skeds are mostly the officers of the CCF units, as I have not heard many 'young' voices.

The CCF usually hold a communications contest for the cadets during early December, which is known as 'Christmas Cracker'. The objective of the contest is for each CCF station to work as many other CCF stations on as many CCF frequencies as possible. Hence, there are plenty of frequency changes, and lots of stations calling each other on different frequencies. The contest is usually held for a 24 hour period on a Saturday and Sunday during early December - this year it will be held on December 4th and 5th.

The CCF have a number of h.f. frequencies allocated to them, as listed in **Table 1**.

Table 1: CCF Freqs (all MHz u.s.b.).

| | | |
|-------|-------|---------|
| 4.478 | 4.953 | 4.9735* |
| 4.988 | 5.328 | 5.340 |
| 5.343 | 6.913 | 7.753 |

*calling channel

The above list should give you a general idea of where to look for CCF signals. Although 4.9735MHz is listed as being the 'Calling Channel', there is also a lot of activity around 5.328MHz.

When the CCF stations change to a new frequency, they use a series of code letters to signify the new frequency. It is quite a simple task to find their new frequency by searching around the above listed frequencies until you find them again.

In past years during contests, I have often been unable to find them after they change frequency, and found them again 20 minutes later after leaving the radio for a rest. Their frequencies are always referred to by codes - during October 5.328MHz was 'PE' and 5.343MHz was 'PJ' - but the codes change each month.

I have made a thorough search of the Internet, and I have found some other frequencies which are worth checking also. The notes attached to this frequency list mention that the CCF radios usually read 2kHz 'high', so the listed frequencies are what should be displayed on the Cadet's radio equipment.

Earlier, I mentioned the 'Christmas Cracker' contest in early December. For those of you who are really keen, you could try to catch the results of the contest when they are transmitted on Christmas Day starting at 1200 mid-day local time. The results are transmitted on 5.328MHz; there are usually several different categories of results - for voice, c.w. and data - and they are then followed by a general chat between the radio operators. In fact, there are usually several CCF stations chatting in the minutes leading-up to mid-day, so you can tell that you are on the correct frequency.

Kinloss

Mike Beaumont writes to say that he recently purchased a Realistic DX-394 h.f. receiver, and has been spending many hours listening to the RAF Kinloss Rescue Co-ordination Centre (RCC) on 5.680MHz. Mike reports that this is a very busy frequency, and it is active both day and night. He has also heard simultaneous transmissions on 4.718MHz.

Mike wants to know if 3.023MHz is still used by Kinloss RCC (or any other RCC), as he has listened at various times but found no activity at all. Well Mike, 3.023MHz is still listed as the SAR 'night' frequency in all the official RAF frequency books, and it also seems to be a world-wide frequency allocation.

However, I have never heard any Kinloss transmissions on this frequency. I know that there are several readers of *SWM* who monitor 5.680 for SAR communications, so perhaps they could get in touch with details of when they last heard any activity on the 'night' frequency.

Mike also asks if I can include some information about the UK Search & Rescue locations and callsigns in a future issue, so that he can tell exactly who he is listening to. I have just such an article planned for next year!

East Timor

By the time that you read this column, the situation in East Timor will have quietened down considerably, and even now in late October it rarely gets a mention in the nightly news bulletins. However, one month ago, the situation was very different. The United Nations (UN) decided to send-in peace-keeping forces; troops were sent from the UK (Gurkha's) and from Australia and New Zealand.

It came as no surprise that the Royal Australian Air Force h.f. frequencies suddenly became very active with flight into and out of East Timor. Flights travelling in either direction were giving regular position reports, and even weather forecasts while they were on the ground in Dili.

Tony Barrett in Devon wrote in to say that he heard a number of transmissions from 'Air Force Darwin' and 'Air Force Sydney' relating to these flights, and I can add that I heard 'Air Force Perth' also. Tony says that he got good reception on 8.974MHz during the early morning and mid-evening UK time, but he also heard east Timor being mentioned several times on 11.396MHz (ICAO networks SEA-2 and SEA-3), 11.285MHz (ICAO network SEA-1) and 8.867MHz (Brisbane ATC, ICAO network SP1).

The RAAF, through Air Force Darwin, were maintaining contact with station 'UNAMET Dili' at regular intervals (roughly each half hour to hour) since about 24 hours prior to the major evacuation of the UNAMET compound. Word has it that several RAN ships are on station near East Timor in international waters. Roughly one thousand soldiers and their materiel were moved to Darwin prior to their deployment and several RAN transports were loaded at the dock in Darwin Harbour. This was the biggest deployment of the Australian defence forces since Vietnam.

Although the situation has calmed down now, it is worthwhile bearing in mind these frequencies should the troubles flare-up again. Elsewhere on this page I have included some frequency information for the RAAF and RNZAF.

CCF Frequencies (all MHz).

| Voice (u.s.b.) | Morse | Data |
|----------------|-------------------|-----------|
| 2.275 (1) | 2.415 | 5.345 (2) |
| 4.445 | 2.770 | 6.915 |
| 4.920 | 3.850 | 7.100 |
| 4.9225 | 3.865 | |
| 5.330 (3) | 4.955 (slow c.w.) | |

(1) a.m. (2) Mailsbox (3) Calling channel

RAAF/RNZAF Frequencies (all MHz u.s.b.).

The following information comes from the *Enroute Supplement Australia* (ERSA) a publication jointly published by the RAAF and Airservices Australia, 26 February 1998 edition, Nav/Comm 1.

- The RAAF/RNZAF Air Operations Communications System (AOCS) is a high frequency radio network providing communications services for the operational control of RAAF/RNZAF aircraft and h.f. equipped marine craft [army ground stations are also commonly heard]. In addition, visiting military aircraft may use the AOCS when contact with Australia/New Zealand military authorities is required. The AOCS is not part of, and does not provide, an air traffic control service, civil or military.
- The combined AOCS consist of six Air Operations Communications Centres (AOCCs) located at Sydney, Darwin, Townsville, Perth, Auckland [NZ] and Woodbourne [NZ]. The combined AOCS provides:
 - A General Purpose Net (GPN) on which all AOCCs guard the same three frequencies. All AOCCs can transmit and receive on these three frequencies simultaneously.
 - Discrete frequencies are available (if required) at each AOCC and allocated after initial contact on the GPN.
 - Telephone patch facilities between aircraft and ground appointments.
 - Continuous monitoring of military distress frequency 5.696MHz.
 - SELCAL Available to suitably equipped aircraft.

GPN Frequencies (all MHz).

| Day (2100-0900UTC) | Night (0900-2100UTC) |
|--------------------|----------------------|
| 8.974 | 3.032 |
| 11.235 | 5.687 |
| 13.206 | 8.974 |

CCF - just search for 'Combined Cadet Force' in any search-engine
 Kinloss RCC SAR - <http://www.zen.co.uk/home/page/alan.gale/sardb.htm> and
<http://www.kinloss.raf.mod.uk/arcc/arcc.htm>
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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.

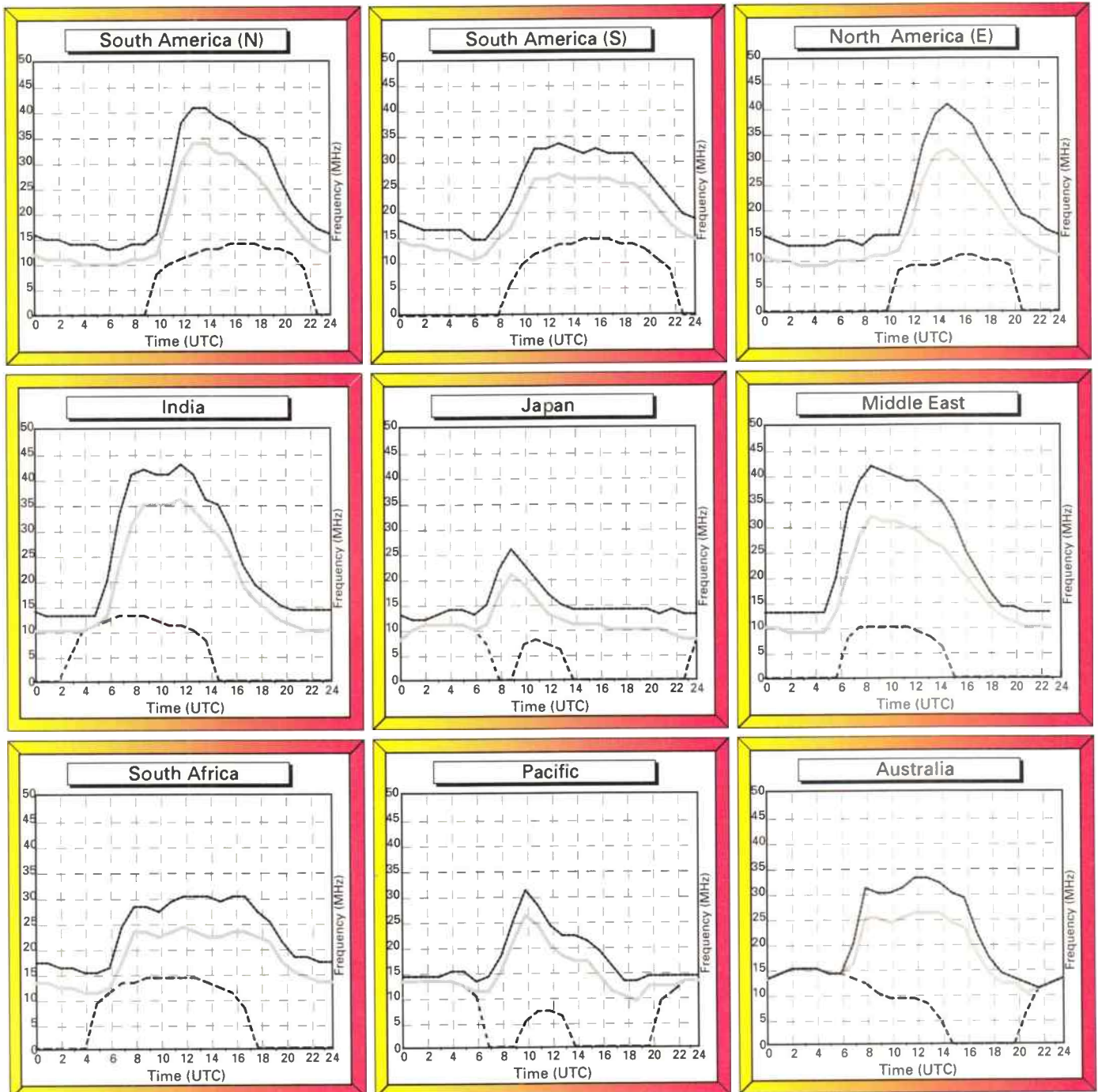
Lastly, the upper dashed line represents the maximum usable frequency (MUF), a 50%

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.

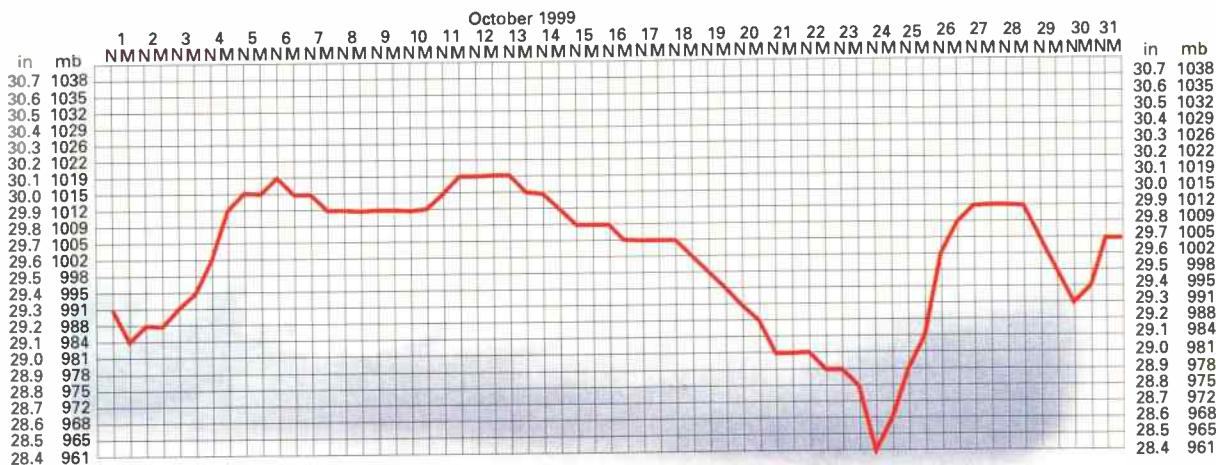
Good luck and happy listening.

December 1999
Circuits to London



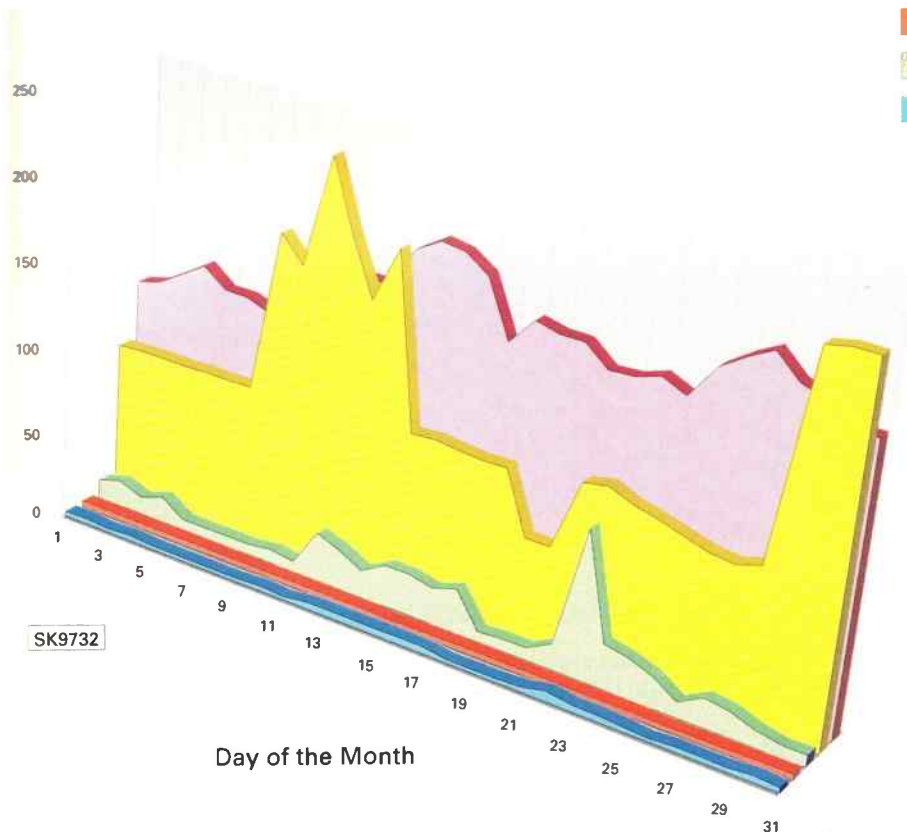
Propagation Extra

Ron Ham's barometric pressure chart, taken at Storrington, W. Sussex, October 1999.



October Data

- 10.7cm Flux
- Eff. Sunspot No.
- K Index
- AP Index
- Log X-Ray



guide to the chart

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

The K and AP indices are measures of geomagnetic activity.

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

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

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

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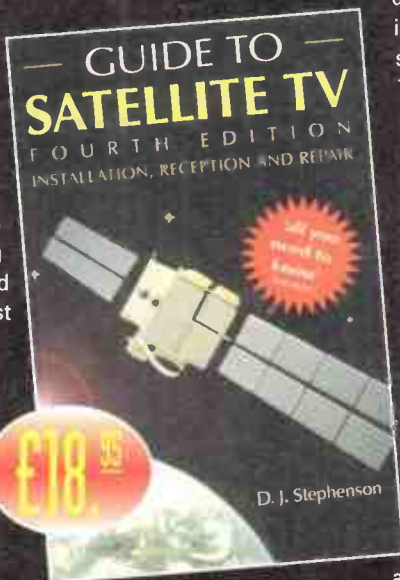
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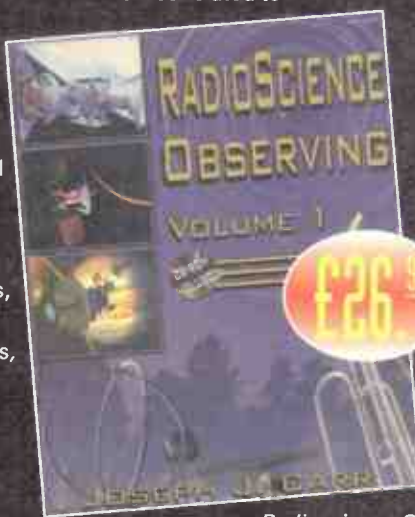
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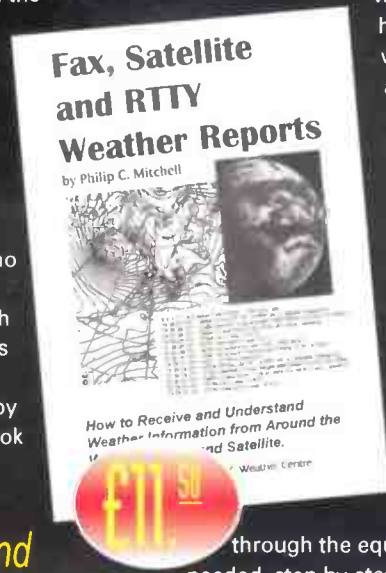
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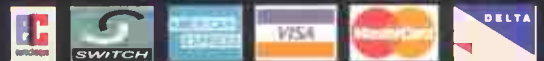
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Amateur Bands

A traumatic month! Clearing up the radio estate of a deceased amateur. The 'main' h.f. rig lost 18/21MHz to a dry joint in the v.c.o. One Sunday morning half-way through the GB2RS stint, the 2m microphone box decided to play up between a dry joint and a PP3 battery that had 'spread' its socket and become intermittent. Holding it all together while finishing the news was a pain - though maybe comic for an onlooker!

So - not a lot of listening has been done this month alas. Also, this is the time of year when the bands are at their best, so most of the news on the bands has been of events that will be history by the time you can read this.

Letters

An interesting one from **John Ford** in Dartford on the subject of 28MHz beacons - there are two full pages of 'em in the 1999 *RSGB Year Book*. He found S55RS on Mt Kum in Slovenia, giving its locator JN76MC. This particular one runs 10W e.r.p. into a quarter-wave ground-plane. The first ones were put on with a purpose, like the International Beacon Project, but one tends to suspect that many of the more recent ones serve locally or are even ego trips for their operators.

Our anonymous correspondent got hold of a 1939 *ARRL Handbook*, and her comments sent me to my shelves for my copy. In those days, 56MHz was 'u.h.f.' and polythene insulated coaxial cable unmentioned. If you wanted a coaxial cable, you used 7.5mm o.d. copper tubing and 16s.w.g. for the inner with commercially available ceramic disc spacers - home-made feeder!

Everything in the station would have been home-brew, and it was instructive to notice the 1939 standard of acceptable receiver stability - 'pulling' of a few hundred hertz on a big signal, or when the r.f./i.f. gain controls were altered. No reference to single sideband of course, though a few amateurs had been using the mode several years before. No sign of a semiconductor to be seen - the 'crystal' was obsolete and the silicon 'radar diode' was a creature of WW2 and the transistor as yet uninvented. A bit different sixty years on!

From Barton-on-Humber **Harry Richards** pops up again. He's been holidaying through September, so not too much activity. One evening though, he did hear a gaggle of East Coast Ws on 14MHz discussing the after-effects of the hurricane. I suppose that at the peak of the storm mere survival is paramount, but once the hurricane has curved off out to sea, you look around and wonder just where to make a start on repairs.

Our next stop is with **John Collins** in Birmingham, and as usual John listened almost exclusively to 7MHz telephony. An interesting one was EI2WOF for Waterford Opera Festival - Waterford is a very nice town indeed and one I'd love to revisit.

GB0AC was logged as was GW3UZS/M on the M4 motorway at RS56 with QSB. SQ6ILC was 57 at 1630 and S58WW at 1700. LX1TA at 1800 got up to 59+ and an hour later 4U1VIC was 59 calling for cards via the OE Bureau. 3Z5PW at 2000 called for cards via DL3KDC and at 2030 IT9SGN was bombing in. T50CE for the Council of Europe at 2100 called for his QSLs via F6FQK.

An interesting one was GM3PPG/P in WAB NF72, S.Uist, in the Hebrides. Lochboisdale? John sent a tape, I'll maybe comment on that next time.

Coming Up

GOVNW will be 5X1GS from Uganda for two years - cards to WB2YQH.

An item in 59(9) DX Report caught my eye. D44BC in a critical state after a heart attack. Let's hope he recovers fully - he has been the main DX representative of the Cape Verde Is for many years now.

Next May 20-30, a group of Italians intend to operate SU9DX from an island off the Egyptian coast for five days, and may also activate Tawila island.

We hear via 59(9) DX Report that FR5FD is active from Reunion, QSLs to: **Patrick LeBeaume, 40 Rue Louis Desjardines, 97411 Bois de Nefles, F-97411 St Paul, France. Do not put 'Reunion' on the envelope.**

Another interesting one is F6FCM/TY from Benin for the next seven months or so. Chatham Island will leap into life as ZL4IR/7. It is not known how long Ed will be there.

There are always wrong 'uns about and occasionally they hit amateur radio. FT5X/FR5HR was **not** physically on the island, but operated from aboard a ship, according to ARRL.

The International Listeners Association, or ILA, is based at **1 Jersey Street, Hafod, Swansea SA1 2HF**. The current issue of their *Just Listening* carries a letter on the value of earthing to a short wave listener.

Letters Again

Ted Trowell on the Isle of Sheppey notes the absence of signals on 28MHz while 27MHz CB signals are plentiful. I guess it's the same as always - either everyone on 28MHz is listening and no-one transmitting, so creating the appearance of a dead band - or the band is dead anyway!

Anyway, around lunchtime, Ted logged VU2BK, PY2NZR, FR5FD, ZP5KO, Z2/DL6DQW/P, CO2OR, ZS6AVP, 5N3CPR, LW9DKB, 5B4/G3ZEM, KP4P, 9Y4NW, PW8LF, 4Z5FC, CX8CP, JY9QJ, ET3VSC, FR5BT, ZS6AJS, PY4AR, ZS6VR, PS8CFL, ZS6ME, 9V1BG and ZP5SBE. On 24MHz we find ET3VSC, ZS6AVP, 5X1P, 5B4/G3ZEM, YB5OZ, 4X1VF, YB0AVK, while 21MHz yielded 5N3CPR, FR5BT, W6LAX, YC8TXW, ZX4C, 4X4FJ, 3B9FR, 5B4/G3VMW, LU9GBR, 4Z5IU, W0ZP, PY4FQ and VU2TMP.

On 18MHz, the input to the log came from ZG2FX, OH0RJ, YB1AQU, RV0AM and VP5/HB0CYV, plus 14MHz loggings of HL1HD, 5B4/G3ZEM, 3B9FR, OX/OZ8AE, A92G, YV1NX and 3C0R. ZL2AGY was collected on 10MHz and PT7BZ on Forty. Everything c.w.

Barnsley is the home of **Colin Dean**. Colin found E41/OK1D1D on 3.5MHz, and on 7MHz CJ3BO, C4A, EX8W, HL3ERJ, JA1JRK, JA5AQC, OY4TN, TK/DJ5MX, UN7EG, VE3AT, VK2ANS, ZG2FX and 4S7BRG. Next stop was 18MHz for AP2JZB, BA7JG, BV5BG, C56/G0SAH, DU1KT, EX8MZ, HZ1AB, JA2EWE, NL7ZH, KY2YL, OD5/9K2MU, OH0RJ, RK3BY/0 for the rare Zone 23, SU1ER, TA2BK, WZ8F/TF, UA0ACG, VK2AMM, ZA/IK0EIM, ZS6NJ, 3W7TK, 8R1AK, ZS6NJ, 3W7TK, 8R1AK, 9M2KE, 9M2RI, 9V1JA and 9V1XE.

21MHz stumped up AT-VLH, A41LZ, BT0A, BV4CN, BY4COM, BY7WGL, DS1-3-5, DU1KGJ/4, DU68HBC, D44BS, ET3AA, EX0Y, HL1-4-5, HS0/G3NOM, HS1GUV, JA1-2-4-5-6, JT1CO, JY9NX, J73BT, P29VR, SU1SK, TU5IJ, UM8BWO, UA0WL, VK2-3-5-6, VK9RS, XX9SC, YB1-3, YO4GAV/MM off YB-land, ZD7VC, ZL2AX, Z21KF, 3C0R, 4L8A, 4S7TZ, 5A1A, 5Z4FM, 9J2LH, 9M2JO, 9M2PS, 9V1PC and 9V1WK; finally 28MHz for A41LZ, BV4FH, SO1A, YB2-0, 3B8CF, 3C0R and 9K2/DL2KP.

The **Allisons, Peter and Paul** - operate the Oxford club website - try <http://hometown.aol.com/G5LO> - Paul has been asked to write up the club history - at the time of his letter he'd managed 1923-1965. Thus most of the listening was done by Peter, while Dad logged - and I'm not all sure that Peter isn't the better pair of ears! However Paul alas, has to go to work at some very late hours.

Among the highlights were EV6C/AM and VK4BYX/AM at 35000 feet over west Portugal, not to mention the East Coast Ws, VKs and whatever. Those aeronautical mobiles are of great interest - the /AM suffix used to be quite common, particularly among US stations, but these are the first ones to appear in the logs for a very long time indeed.

I've always wondered, but concluded that the advent of fly-by-wire techniques had a bearing on it - after all, if laptop computers can upset things, how much more so would a hundred watts of h.f. sideband! I wonder if anyone out there has any input on the question of why the /AM stations have become so rare?

Final thought. It'd be a more interesting column I'm sure, were you to raise more questions or comments as well as lists of calls heard. What do you think?

Finito

That's the space all gone once again. Letters please to **Box 4, Newtown SY16 1ZZ** by the first of the month.

Web Watch Try the Oxford club website at <http://hometown.aol.com/G5LO>

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