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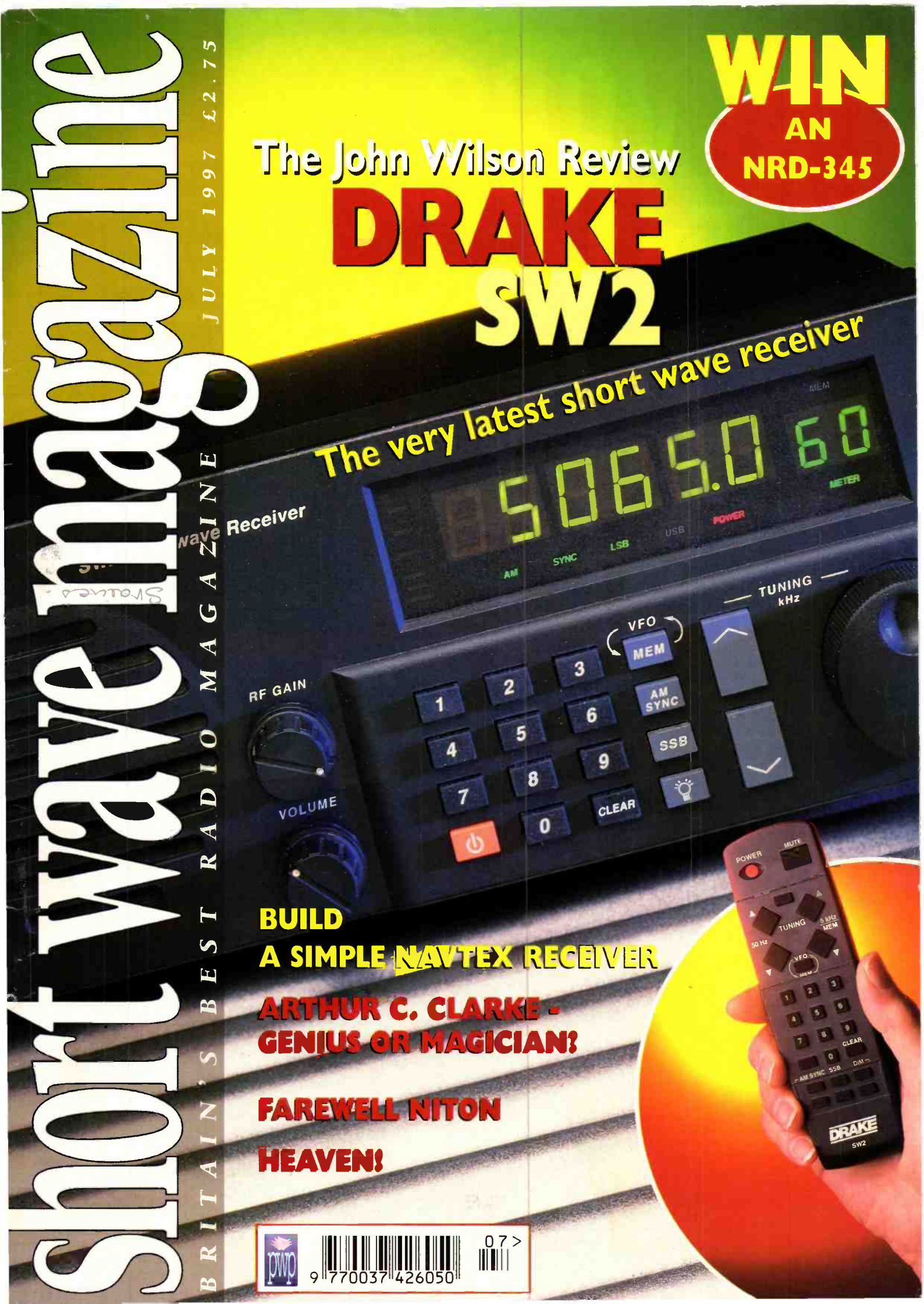

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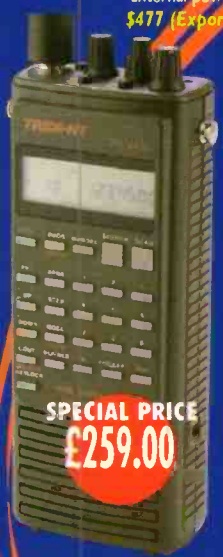

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SPECIFICATIONS	
Freq. Range	30MHz - 2GHz
Modulation	FM Deviation
Freq. Response	50 - 3000Hz
Auto Sweep Time	<1 second
Input 50 Ohm	-59dBm @100MHz -25dBm @1GHz
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Cover Subject
John Wilson unwraps the secrets of the new 'black magic box'.

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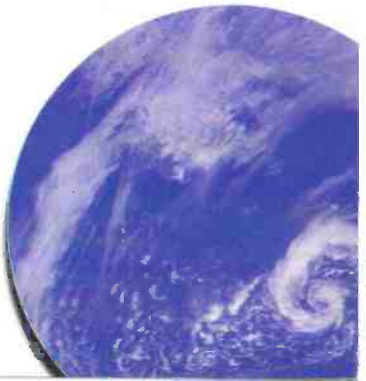


Communiqué

TELSTAR 5 LAUNCH A SUCCESS

Telstar 5, Loral Skynet's newest broadcast video and data communications satellite, was successfully launched to a geosynchronous transfer orbit at 1:00 p.m. US Eastern Time) 24 May, 1997 from Baikonur Cosmodrome in the Republic of Kazakhstan.

Manufactured by Space Systems/Loral (SS/L) of Palo Alto, California, Telstar 5 was launched aboard a Proton rocket manufactured by Khrunichev State Research and Production Space Centre of Moscow, in association with International Launch Services (ILS), a joint venture company of Lockheed Martin Corporation, and Russian companies Khrunichev and RSC Energia.

Owned and operated by Loral Skynet of Bedminster, NJ, the satellite will be located at 97°W, and will be one of the most sophisticated and powerful communications satellites available to broadcasters and programme distributors in North America, covering the continental United States, Puerto Rico, the Caribbean, and into Canada and Latin America.

"The successful launch of Telstar 5 is a significant milestone in our strategic plans to expand and to grow Loral Skynet," said Terry Hart, president of Loral Skynet. "The state-of-the-art Telstar 5 satellite will provide our broadcasting, education and news gathering customers with the clearest, and most interference-free broadcast video and data communications transmissions available in the industry today. "Telstar 5, which carries a total of 52 transponders - 24 at C-band and 28 at Ku-band - is based on SS/L's three-axis, body-stabilised FS-1300 bus, whose modular design has proven its worth during 270 years of cumulative on-orbit service, close to one-half of the total of 600 years amassed by SS/L satellites to date.

The satellite will generate a total of 3.2kW of r.f. from its transponders. Lightweight composite materials and highly efficient techniques for dissipating thermal energy and for generating and storing electricity allow for a substantial increase in the spacecraft's abilities with almost no increase in size and weight.

When it is officially turned over to Loral Skynet on 1 July, Telstar 5 will feature a network broadcast/syndication distribution neighbourhood anchored by the ABC and the Fox networks. In addition, the satellite will be used by the direct-to-home (DTH) service provider, AlphaStar, and by TelQuest, a program distributor based in Philadelphia, that provides digital video services to wireless and traditional cable head-ends.

Other Telstar 5 customers will include such value-added service providers as The SPACECONNECTION, GlobeCast (formerly Keystone Communications), Broadcast Satellite International, and Fifth Dimension Television, who will use the satellite to distribute an array of full-time and part-time analogue and digital applications.

Loral Space & Communications Ltd. acquired AT&T's Skynet Satellite Services in mid-March and renamed the company Loral Skynet. Loral intends to add resources and to expand Skynet into an international network of geostationary satellites that will provide global capacity for Skynet's transponder leasing customers around the world, and will connect with other networks to provide seamless, multimedia accessibility to the information superhighway.

In addition to Telstar 5 and the already orbiting Telstar 4, which provides C-band and Ku-band coverage over the continental US, Hawaii, Alaska, Puerto Rico and the US Virgin Islands, Loral Skynet's vigorous growth plan includes future launches of Telstar 6, 7, 8 and 9. Telstar 6 and Telstar 7, two high-powered satellites being built by Space Systems/Loral, are expected to be in service in 1998 and 1999, respectively.

Based in Bedminster, NJ, Loral Skynet is a leading US satellite communications service provider that owns and operates the Telstar satellites. Loral Skynet's customers lease transponder capacity to distribute network television programming to local affiliate stations, to collect live video feeds for the reporting of news and sporting events, and to offer direct-to-home subscription and pay-per-view television programming, distance learning and educational and other business television services.

Lord Provost Mervyn Rolfe and MEGS members celebrate the anniversary of Samuel Morse aboard RRS Discovery.

BIRTHDAY CELEBRATIONS

The **Morse Enthusiasts Group Scotland** (MEGS) celebrated Samuel Morse's birthday back on the 27th April aboard RRS *Discovery* in Dundee. A total of 120 contacts were made with Japan, Canada, USA and all over Europe.

Lord Provost Mervyn Rolfe cut the cake and toasted Samuel F. B. Morse. **Jack Nicholson GM0MFE**, MEGS chairman, proposed the toast 'Dundee - City Of Discovery' and **Stewart GM3YCG** presented a MEGS plaque to RRS *Discovery* by way of thanks for hosting the party.

The **Stirling & District Amateur Radio Society** have kindly agreed to host the party on April 27th next year, in their shack at Menstrie, mid Scotland. All c.w. operators are made welcome to the MEGS annual get-together.

RADIO AND TVDX NEWS

Sweden carried out some of the first experimental digital terrestrial TV transmissions (DTT) and SVT are now to launch into the first trial programmes using DTT with an initial five channels "as soon as possible". First regions nominated are around Gothenburg and Malmo with further towns in Northern Sweden. Channels will comprise 24-hour news, repeat programming (re-runs from recent SVT), regional programmes plus local news, 'best of the past' (Guldkanalen) and a cultural/arts offering with input from ARTE and the BBC.

There's an unidentified (and unlisted) ch. A0 Australian TV channel on-air relaying ABC at 46.250MHz vertically polarised and has been received via tropos and Sporadic E. Thought to be located in N.W. Victoria.

All RTBF Tele-21 transmitters in Belgium are now renamed 'eurosport 21' and transmit in encrypted video but clear audio. Check out the ch. E63 transmitter at Tournai. And in Germany many digital audio broadcast transmitters (DAB) will be coming on-air this next year using the channels E11-E12. TV spectrum, now vacated with TV transmitters retuned to u.h.f. channels. DAB is also transmitted in L-Band around the 1.5GHz

spectrum. Hardly good news for TVDXers!

Uganda's most popular radio station - Capital Radio - now is available over much of the World after taking capacity on the Russian Express 2 satellite with MPEG delivery of their programmes into Africa, Europe, Middle East and much of the Americas. Uplinked out of Kampala the signal is received at several remote Ugandan transmitter sites for retransmission such as Mt. Elgon near Mbala by a 1kW transmitter and a site near the Rwandan border to cover SW Uganda and N. Rwanda. The long term plan is to provide nationwide coverage via satellite delivery.

Canal+ France is negotiating with Kirch to buy part of their holding in the Italian PAY-TV channel Telepiu thus gaining a major shareholding and an increased penetration into Italy. Less happy times in Spain where state broadcaster TVE viewing figures have slumped to an average 24% and new kids on the block Antena 3 and Tele5 pressing ahead with viewing at 23.3% and 22.8% respectively.

Bad news also from Australia's ABC with cuts of A$55 million in the 1997 budget, 700 job losses and reductions in both domestic radio/TV and overseas services from Radio Australia and Australia Television. The radio broadcaster is now reduced to transmissions in the English language only.

Band I TVDXers are strong recommended to read the EMC column in the RSGB journal *Radio Communication*, June 1997 issue. Revealed within the article is a new form of interference reaching to 50MHz, that originates from an electronic water conditioner - a device which radiates varying square wave audio frequencies as 'conditioning signals' from coils wrapped round water pipes, with harmonics across the r.f. spectrum up into low v.h.f. The water music apparently modifies the mineral and crystal structures in the conditioned supply!

SATELLITE PORTABLE RADIOS

Hitachi, Panasonic, Sanyo and JVC have announced that they have agreed with WorldSpace to develop and mass produce a new kind of portable radio that will be able to receive large numbers of broadcast programmes directly from satellites.

"The production agreements here will lead to a new generation of global audio entertainment and information," said WorldSpace Chairman and CEO Noah Samara. He added "Our new Japanese partners are the world's consumer electronics leaders and we are delighted that they see the global market opportunities for satellite digital radio technology."

A joint statement by the Japanese companies and WorldSpace noted that "Together we will launch a new generation of radio receivers of exceptional quality that are compact, noise-free and fade-free, as well as affordable for the first time to hundreds of millions of people."

Mr. Samara said "In my view the agreements signify the real start of the satellite digital radio era." He added "These new radios will be the vehicles through which national broadcasting companies in developing countries, international public sector radio corporations, private entertainment and news companies will be able to directly reach audiences of unprecedented size. Our first targets are the 4.6 billion people of the developing countries whom we will reach with satellites being launched from mid-1998."

WorldSpace will launch its first satellite in mid-1998 over Africa and the Middle East. Within the following 12 months Asia, Latin America and the Caribbean will have their own satellites.

The portable radios will be able to receive around 100 broadcast channels and will use new processing 'chips' that will allow them to make fullest use of the WorldSpace system. SGS-Thomson and ITT Intermetall in Europe are under contract to produce two million chips for the new radios. Other partner companies working to develop the new system include Alcatel Espace, Arianespace, Matra Marconi Space and the Fraunhofer Institute of Germany.

"Our technology development plans and our satellite launch schedules are on target. The creation of a new radio era depends on the availability of radios to receive direct from the satellites. Now this is possible and this is why today's agreements here in Japan are of fundamental importance for consumers across the globe," said Mr. Samara.

WorldSpace, 11 DuPont Circle, NW, 9th Floor, Washington, DC 20036 USA.
Internet: www.worldspace.com

BUDGET PRICED SCANNER

The PRO-29 is the latest budget priced scanner from Realistic. With the airband frequencies covered, this 60-channel handheld scanner has all the 'bells and whistles' an enthusiast would expect to find, including monitor memories to store six frequencies located during a 'search'.

Frequency coverage is in four bands, 66 - 88, 108 - 174, 406 - 512 and 806 - 965MHz. The PRO-29 can search 20 steps per minute and scan 15 memory channels pr minute.

Powered by six AA size dry cells, NiCads or a d.c. power supply, the PRO-29 is supplied complete with antenna, belt clip and manual and retails at £189.99.

Link Electronics, 216 Lincoln Road, Peterborough PE1 2NE. Tel: (01733) 345731. FAX: (01733) 346770. Internet: http://freespace.virgin.net/link.electronics

SUCCESSFUL OPEN DAY

On a hot, but windy Sunday, back on the 1st June, **Waters & Stanton** held their 7th annual Open Day - the most successful yet. Their whole car park was covered with marquees, packed with a mixture of junk, clearouts, ends of line, bargain second-hand goods as well as representatives from Kenwood, Icom, Yaesu, *Practical Wireless*, *Short Wave Magazine*, RSGB and *Ham Radio Today*.

The usual large queue was formed early in the morning and the enthusiastic crowd was entertained by four free raffles during the day and Mark Francis' unique auction.

Plans are already underway for an even bigger event next year, which will be Waters & Stanton's 25th anniversary year. Watch this space!

Peter Waters G3OJV and Mark Francis G0GBY take time out for a quick bite to eat!

YORKSHIRE DAY 1997

The **Scarborough Special Events Group** will be on the air as **GB2YD** from 1st-3rd August, as part of the annual county-wide 'Yorkshire Day' celebrations. The main h.f. station will be active around 3.725MHz, plus activity on c.w. and 2m.

The full colour QSL will be 16th in the Group's series of souvenir cards and will feature Robin Hood's Bay in North Yorkshire. All contacts will be acknowledged via the Bureau and listener reports are most welcome.

Anyone requiring a direct card call can reply via club call **G0OOO**.

AIRBAND RADIO

Anyone keen to get into the now increasingly popular pastime of airband radio, or indeed any airband enthusiasts themselves, will be interested to hear about the very first airband radio to be launched by **Morphy Richards**, a very competitive 4-band version.

With a price tag of just £16, it represents exceptional value for money - offering users a choice of m.w. (530-1600kHz), f.m. (88-108MHz), airband (117-137MHz) and marine band coverage (140-162MHz).

Features include 3 switch positions, rotary squelch control and a telescopic antenna. An earphone socket allows for private listening.

The radio is available from Argos and good electrical retailers. For further details of your local stockist, contact Morphy Richards direct on **(01709) 585525.**

CYBERSTAR GETS AUTHORISED

NEW YORK - May 19, 1997 - The US Federal Communications Commission (FCC) has granted Loral Space & Communications Ltd. a licence to build, launch and operate CyberStar, a worldwide broadband satellite delivered digital communications system being designed and developed by Space Systems/Loral (SS/L).

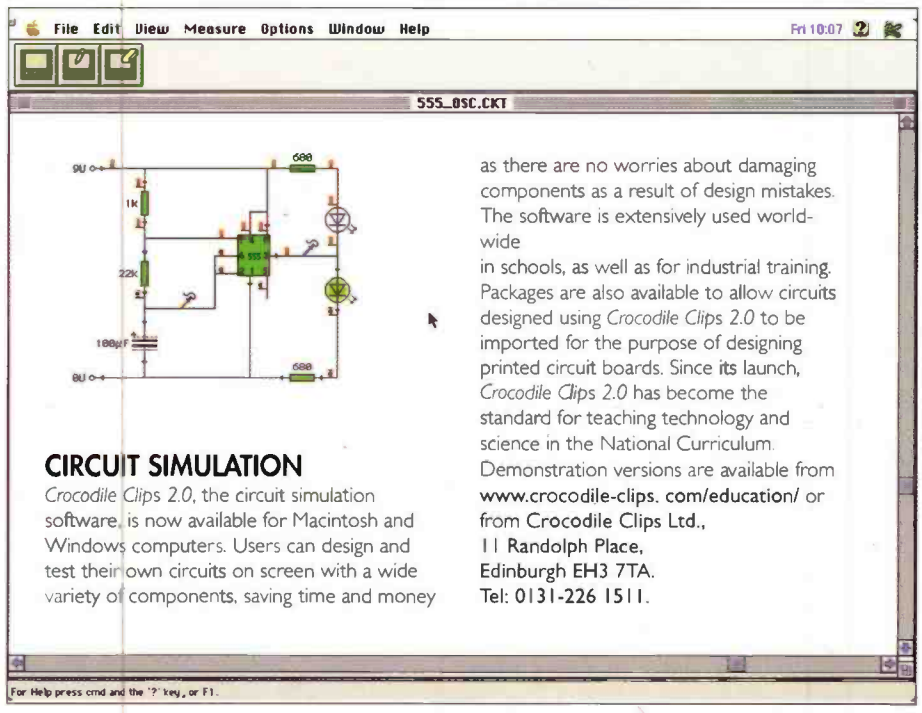
The $1.6 billion CyberStar system is a geostationary satellite-based digital telecommunications system that will offer a variety of low-cost, high-speed, data and telecommunications services worldwide from leased Ku-band transponders satellites beginning in late 1997, and through a dedicated constellation of geosynchronous Ka-band satellites beginning in 1999.

CyberStar services will include low-cost, high-speed Internet access, broadband interconnection, real-time streaming, video-on-demand, and other data services that will be delivered to consumers, businesses and private networks around the world through a network of local and regional service providers.

CyberStar services will be delivered through a constellation of three interconnected geostationary satellites positioned over the Americas, Europe and the Middle East, and Asia. The first of three CyberStar satellites is scheduled for launch and operation in 1999.

"High speed digital systems are driving the need for communications channels to become integrated," said Ron Maehl, president of CyberStar. "The convergence of various information appliances, as well as the need to connect and share information with the desktop computer, has created a terrific market opportunity for the complementary, seamless, and interoperable CyberStar hybrid network system. We are designing CyberStar to be the most economically feasible way to bring the Global Information Infrastructure (GII) to the world's consumer and business markets."

Space Systems/Loral (SS/L) will provide the CyberStar satellites. SS/L is a full-service provider of commercial communications satellite systems and services, including launch and insurance procurement and mission operations from its mission control centre in Palo Alto, California SS/L currently has a total backlog of more than 76 spacecraft. In addition to building the three CyberStar satellites, SS/L is the prime contractor for Globalstar's constellation of low-earth orbit satellites, the N-STAR, Mabuhay, APSTAR, PanAmSat. Telstar, L-STAR, M-squared-A, INTELSAT FOS-II and CHINASAT communications satellites, as well as two digital audio radio satellites for CD Radio, the latest series of US weather-watch satellites, GOES (Geostationary Operational Environmental Satellite), and the Japanese MTSAT, the next-generation Japanese air traffic control and weather-watch satellite.



CIRCUIT SIMULATION

Crocodile Clips 2.0, the circuit simulation software, is now available for Macintosh and Windows computers. Users can design and test their own circuits on screen with a wide variety of components, saving time and money as there are no worries about damaging components as a result of design mistakes. The software is extensively used worldwide in schools, as well as for industrial training. Packages are also available to allow circuits designed using *Crocodile Clips 2.0* to be imported for the purpose of designing printed circuit boards. Since its launch, *Crocodile Clips 2.0* has become the standard for teaching technology and science in the National Curriculum. Demonstration versions are available from **www.crocodile-clips. com/education/** or from **Crocodile Clips Ltd., 11 Randolph Place, Edinburgh EH3 7TA. Tel: 0131-226 1511.**

NATIONAL TRANSMITTER NEWS

Kylerhea Kyle of Lochalsh, a new television relay station opened 30 April. Located at Kylerhea, about 6.5km south of the Kyle of Lochalsh in the western Highlands.

Provided jointly by Castle Transmission International Ltd on behalf of the BBC, and NTL on behalf of the Independent Television Commission (ITC), it is designed to bring good television and teletext reception to approximately 240 people in the Glenelg and Kylerhea area.

Station Details:

Channel:	BBC 1 (Scotland)	51
	BBC 2	44
	ITV (Grampian)	41
	Channel 4	47
Antenna Group:	B	
Polarisation:	Horizontal	
ERP:	50W	

Unlike most television relay stations, Kylerhea broadcasts with horizontal polarisation, so receiving antennas must be mounted with their elements in the horizontal plane.

Viewers wishing to use the new Kylerhea relay should consult a local television dealer or antenna contractor, but reception advice is also available from BBC Engineering Information and ITC Engineering Information.

Further information is available from:
BBC Engineering Information
Broadcasting House,
Queen Margaret Drive
GLASGOW G12 8DG.
Tel: 0141-338 2284.

Bevendean East Sussex, a new television relay opened 28 April located about 3km north east of Brighton town centre. It is designed to bring good television, NICAM and teletext reception to approximately 1500 people in Bevendean. This includes, Auckland drive, Hornby Road, Lower Bevendean Avenue, Plmouth Avenue, Taunton Road, The Hyde, Upper Bevendean Avenue and Walmer Crescent; also most of The Avenue and part of Bodian Avenue and Leybourne Road.

Station Details:

Channel:	BBC 1 (South)	40
	BBC 2	46
	ITV (Meridian)	43
	Channel 4	29
Antenna Group:	W (wideband)	
Polarisation:	Vertical	
ERP:	12.6W	

START OF NICAM STEREO FOR BBC1 AND BBC2

Both **Limavardy** television transmitter, located on Coal Hill, some 8km north east of Limavardy. Together with its relay stations - serving over 200000 viewers in Co. Antrim and Co. Londonderry including Londonderry, Portrush, Ballymoney, Coleraine, Limavady and Portstewart. And **Redruth** television transmitter, located at Four Lanes about 2.5km south south west of Redruth serving about 200000 viewers in Camborne, Helston, Isles of Scilly Newquay, Penzance, Redruth, St Ives, St Just, Truro and the surrounding areas of west Cornwall. Are now equipped for broadcasting BBC1 and BBC2 television programmes with stereo sound, using the BBC developed NICAM 728 digital system. This system uses an additional signal which is independent from the normal - mono - TV sound signal

BBC Television started its NICAM stereo service with launch of the autumn programme schedules at the end of August 1991. thirty main television stations and over 600 of their relays have now been equipped to transmit the NICAM stereo signal.

NICAM is an acronym for Near Instantaneously Companded Audio Multiplex.

Further engineering information about the BBC's services can be found on Ceefax page 698 (BBC1 or 2) and via the Internet at:
http://www.bbc.co.uk/enginfo/
Further engineering information may also be obtained from the following addresses:

ITC Engineering Information
Kings Worthy Court, Kings Worthy, Winchester
Hants SO23 7QA. Tel: (01962) 848647

BBC Engineering Information
Villiers House, The Broadway,
Ealing, London, W5 2PA. Tel: 0181-231 9191

BBC FM TRANSMITTERS

27 March Bilsdale, located about 29km south east of Stockton-on-Tees commenced a period of test transmissions which are now complete. The new BBC transmitting station now delivers good f.m. national radio reception, including stereo, to an extra 300000 people in Hartlepool, Middlesborough and the surrounding areas; including Darlington, Guisborough, Newton Aycliffe, Northallerton, Richmond Sedgefield and Stockton-on-Tees. The maximum e.r.p. of this **vertically** polarised station is 5kW.

Frequencies:

Station	MHz
Radio 1	98.6
Radio 2	89.0
Radio 3	91.2
Radio 4	93.4

21 March Membury Berkshire, located about 3.5km south west of Lambourn commenced a period of test transmissions which are now complete. The new BBC transmitting station now delivers good f.m. national radio reception, including stereo, to an extra 8500 people in the surrounding areas including Hungerford, Lambourn, Knighton, Great Shefford and Kintbury. The maximum e.r.p. of this **vertically** polarised station is 125W.

Frequencies:

Station	MHz
Radio 1	98.4
Radio 2	88.9
Radio 3	91.1
Radio 4	93.3

29 April Gogwell Devon, located about 2km south east of Tiverton, entered service. The new BBC transmitting station, built by Castle Transmission International Ltd. now delivers good f.m. national radio reception, including stereo, to an extra 14000 people in Tiverton and the surrounding area including Cullomton and Halberton. The maximum e.r.p. of this **vertically** polarised station is 300W.

Frequencies:

Station	MHz
Radio 1	99.2
Radio 2	89.6
Radio 3	91.8
Radio 4	94.0

WORLD MUSIC RADIO

Saturday 31 May saw the start of a brand new radio station broadcasting to the whole of Africa.

World Music Radio (WMR) is using 3.345 and 6.290MHz as its two frequencies. The lower frequency, 3.345MHz, is intended for reception in southern Africa only, but 6.290MHz, with its 250kW transmitter working into an antenna system with 21dBi of gain and an azimuth of 342°, should be able to b heard world-wide. Initially WMR will be broadcasting between 1800 and 2200UTC on just Saturday and Sunday evenings. It is hope that the station will become popular enough to be able to expand to a daily service on 1 November.

The station describes itself as "the first English speaking non-government, international music radio station in Africa" and its slogan is "Come along with us - we've got a good thing going." With no political or religious aims, WRM is a truly international station with programming designed to bring people together.

Although the broadcasts originate from transmitters in South Africa, the headquarters and management of WMR has been moved from The Netherlands, where it started back in 1967, to Denmark.

World Music Radio ApS, PO Box 112, DK-8900 Randers, Denmark. Tel: +45 70 222 222. FAX: +45 70 222 888. E-mail: wmr@cybernet.dk Homepage: www.wmr.dk

RAE COURSE

The **Trowbridge & District Amateur Radio Club** are running an RAE course in the area of West Wiltshire and surrounding districts. The Radio Amateurs Examination Course CGLI 765 will be offered to prospective Radio Amateurs at the Trowbridge Radio Club headquarters, starting in September 1997.

Further details can be obtained from the course tutor, **Chris Parnell G0HFX** on **(01225) 764874** or the club secretary **Ian Carter G0GRI** on **(01225) 864698.**

SUBSCRIPTIONS

Don't forget that our Subscription Department is holding the price of a subscription to *Short Wave Magazine* at the old rates for another two months. Subscribing now will save you £8 over the cost of twelve issues bought from a newsagent. Use the Order Form on page 91 - why not do it now while you remember?

STOP PRESS

Just as we close for for press we have been advised by Hoka Electronics that they are no longer using Multicom 2000 as distributor for any of their products i.e. the Code3 Gold, etc. range of decoders. Unfortunately the Multicom 2000 advert on page 36 of this issue still features the Hoka range. All orders for Hoka products should be sent direct to **Hoka Electronics UK** at **26 Bury Road, Shillington, Hitchin, Hertfordshire SG5 2NY. Tel: (01462) 711600 or FAX: (01462) 711769. E-mail info@hoka.com**

SEND YOUR NEWS TO KEVIN NICE AT THE EDITORIAL OFFICES

Europe

Peter Shaw
c/o SWM Editorial Offices
Broadstone, Poole
Dorset BH18 8PW

Bandscan

When is a broadcaster not a broadcaster? A riddle to which the answer, perhaps, is when the broadcaster does not own the transmission equipment needed to get its programmes to its audience.

In years gone by, a good number of tiny radio stations have hired time from transmission providers. For example, Nexus-IBA in Italy transmits a range of programmes from a variety of radio stations that do not own their own short wave transmitters. And in the United States, the commercial short wave stations have long hired time to broadcasters who wanted to spread the word - whatever that word was!

BIGGEST BROADCASTER

Now the world's biggest broadcaster has, by government order, sold off its transmission arms to private companies. It has plenty of programmes, but has to hire time on transmitters which used to be its own.

The broadcaster in question is the BBC, and since the beginning of April transmission has been in the hands of two private companies. All of the BBC's domestic radio and television transmission is run by Castle Transmission International, a company owned partly by the American Castle Tower Corporation and TIdiffusion de France, the national transmission company in France. The BBC World Service transmission is now in the hands of Merlin Communications International, a company formed by a management and employee buy-out of the former World Service Programme Delivery Services department.

Merlin now owns all the BBC's UK short wave sites, and runs the overseas transmitting stations (although ownership of these continues in the hands of the BBC). As part of the £32 million deal, Merlin has also gained ownership of the key Global Distribution System. This gets the BBC's 45 language services around the world by satellite for onward transmission by local f.m. and a.m. stations, cable systems and the BBC's own foreign-based relays.

Merlin and the BBC have a ten year contract for World Service transmission, and since most of the staff have transferred from World Service, it is likely to be business as usual. But already around 10% of Merlin's business comes from sources other than the BBC.

I am sure that it will not be long before other broadcasters', programmes are beamed from former-BBC transmitters, with the revenue ending up in Merlin's coffers.

EXTENDED TRANSMISSIONS

The BBC's Arabic Service has extended its transmissions to run continuously from 0330 to 2115UTC, filling a gap around lunchtime that has existed for many years. This new extension means that the Arabic Service is second only to World Service English in the number of hours a day it is on the air.

The last vestiges of Deutschlandfunk (DLF), the former West Germany's European, broadcaster before the fall of the Berlin Wall, will cease at the end of this year. DLF handed its foreign-language programme production to Deutsche Welle after the reunification of Germany.

But now Deutsche Welle is to close the remaining European language services, with the exception of English. This includes Danish, Dutch, French, Italian and Norwegian.

Deutsche Welle is now investing more heavily in its global television service which is on the air for 12 hours every day in German, ten hours in English and two hours in Spanish. The Cologne-based broadcaster is working to increase the television channel's take-up by cable systems across Europe which it believes is a more effective way of informing European citizens about Germany than short programmes via medium and short wave. Deutsche Welle is also looking hard at its Japanese language service, which may well close later this year.

Like the BBC, Deutsche Welle does not own its short wave transmitting stations in Germany. The three sites at Wertachtal, Julich and Nauen are operated by Deutsche Telekom which has just commissioned four new 500kW short wave transmitters at the Nauen site which is near Berlin. Telekom inherited the Nauen site from the former East German authorities; Radio Berlin International was transmitted from there.

The equipment used by Radio Berlin was hugely inefficient and antiquated, requiring a vast army of engineers to keep the transmitters on the air, and to change frequencies. The new transmitters at Nauen are fully automatic, and like most modern h.f. sites need very few people to keep them operational.

Deutsche Welle is concentrating its short wave transmission at Nauen and Wertachtal (where there are another four new 500kW senders), with the Julich site available for other broadcasters to rent from Telekom. DW has a contract for the Nauen site until 2016.

A plea for help has gone out from the head of the Voice of Russia to listeners world-wide.

Rallies

* Short Wave Magazine & Practical Wireless in attendance

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

***June 27-29:** Ham Radio '97 - Europe's largest Hamfest will take place in Friedrichsafen, Germany. Enjoy a holiday by Bodensee as well as visiting one of the best rallies anywhere.

***June 29:** The 40th Longleat Amateur Radio Rally in the grounds of Longleat House. Doors open at 10am. Further details from the bookings manager **Gordon Lindsay** on **0117-940 2950**.

July 6: The 8th York Radio Rally will be held in the new Knavesmire Building, York Racecourse, York. Doors open at 10.30am and admission is £1.50. Children accompanied with an adult go free! There will be ample free parking, amateur radio, electronics and computers. Morse tests and repeater groups, refreshments and a licensed bar. Talk-in on S22. Further details from **Pat Trask G0DRF** on **(01904) 628036**.

***July 12:** Cornish Radio Rally. Penair School, Truro. Talk-in on S22. Doors open 10.00am for disabled visitors. More information from **Ken G0FIC** on **(01209) 821073**.

July 13: The Three Counties Radio & Computer Rally is to be held at a new venue, the Perdiswell leisure Centre, Bilford Road, Worcester. Features include amateur radio, computer and electronic component traders, Bring & Buy stall along with RSGB Morse Tests (please book on arrival and remember two passport photos will be required), refreshments and a licensed bar. Free car parking. Doors open 10.30am to 5pm and admission is £1.50. **Eddie G4PQZ** on **(01905) 773181**.

July 13: The 17th Sussex Amateur Radio & Computer Fair will take place at the Brighton Race Course from 10.30am to 4pm. There will be free on site parking and admission to the event is £2. The rally is one of the largest in the south of England with well over 100 trade stands, covering amateur and CB radio, computers, electronics, etc., and also a large Bring & Buy display area. There will also be refreshments and bars at reasonable prices with a picnic area with views over the South Downs - certainly a rally not to be missed! **(01323) 485704**.

July 27: The Colchester Radio & Computer Rally with a hobbies and leisure fair is to be held at St Helena School at 10am. This is a family event. Further info. from **Frank Howe G3FIJ** on **(01206) 851189**.

July 27: The Rugby Amateur Transmitting Society are holding their 9th Amateur Radio Rally at the BP Truckstop on the A5, three miles east of Rugby, 24 miles NW from junction 18 on the M1 Motorway. Doors open from 10am and admission is £1 per car. Facilities include a cafe and toilets. Talk-in on S22 by GB8RRR. Pitches are £7 pre-booked before 14 July or £10 on the day. **Arthur M0ASD** on **(01788) 550778**.

***July 27:** The Scarborough Amateur Radio Society is holding its annual Radio, Electronics and Computer Rally in The Spa, South Foreshore. Doors open at 11am. The rally features all the usual traders, radio, electronics, components, computer hardware and software. Morse Tests are available on demand, but please remember the fee and two passport type photographs. Further details from the Rally Manager/Secretary **Ross Neilson** on **(01377) 257074** after 6pm.

Grassroots

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

AVON

Bristol International RC: Tuesdays, 8pm. The Little Thatch Country Club, 684 Wells Road, Whitchurch, Bristol. All visitors are welcome. The club has been formed so that all radio enthusiasts, whether they be Licensed Amateurs, s.w.l.s or CBers can get together and have a good natter and do things that you do in radio clubs. PO Box 28, Bristol BS99 1GL.
RSGB City of Bristol Group: last Tuesdays, 7pm. New Friends Hall, Purdown, Bell Hill, Stapleton, Bristol BS16 1BG. June 29 - Longleat Rally. Robin Thompson G3TKF on (01225) 420442.
South Bristol ARC: Wednesdays, 7.30pm. Whitchurch Folkhouse Assoc., Bridge Farm House, East Dundry Rd, Whitchurch. June 29 - Longleat Rally. July 2 - Preparation for National Field Day. 6th - VHF National Field Day. 9th - Sale of fuchsias (if ready for sale). 16th - Magazine evening - donate or exchange. 23rd - Computer activity. For more information ring (01275) 834282 on a Wednesday evening.

BUCKINGHAMSHIRE

Aylesbury Vale RS: Wednesday evenings, 8pm. Hardwick Village Hall. (Hardwick is situated off the A413 between Aylesbury and Buckingham). July 2- Discussion evening. 16th - HTML by Mike Clift G7FDL. Gerry Somers G7VFV on (01296) 432234.

CHESHIRE

Mid-Cheshire ARS: Meetings held every Wednesday, 8pm, at Cotebrook Village Hall, North of Tarporley, Cheshire. July 2 - Final preparation/plans for NFD, 7th - Committee meeting (Alvanley Arms 8.30pm), 9th - HF on air G3ZZT plus construction night, 16th - Video night, 'Beautiful Canals' by Ted G0RBA, 23rd - Club station G8ZTT on air (v.h.f.) plus construction. Ted Bannister G0RBA on (01606) 592207.

DERBYSHIRE

Derby & DARS. Wednesdays, 7.30pm. 119 Green Lane, Derby. July 2 - Junk sale, 7th - Committee meeting. Martin Shardlow G3SZJ on (01332) 556875.

DEVON

Appledore & DARC: 3rd Mondays, 7.30pm. Appledore Football Clubroom. July 21 - Talk on local Geology by D. Sheldon. Den Williams G0UMT on (01237) 471802 for more information.
Exmouth ARC: Alternate Wednesdays at the Scout Hut, Maripool Hill, Exmouth. July 2 - Metal Detectors - talk by G1UAN, 7.30pm at Scout Hut, Maripool Hill, 16th - BBQ at 7.30pm at Woodbury Common. D. Fox G0NRR on (01395) 271880.
Torbay ARS: Fridays, 7.30pm. ECC Social Club, Highweek, Newton Abbot. July 18 - Talk about Dartmoor. Peter G4UTO. (01803) 864528.

EAST SUSSEX

Hastings Electronics & RC: 3rd Wednesdays, 7.30pm. West Hill Community Centre, Croft Road, Hastings. The club runs courses for the RAE and Novices and is approved as an examination centre for City & Guilds exams. Doug Mepham G4ERA, 8 The Close, Fairlight, E. Sussex TN35 4AQ or 'phone on (01424) 812350.

GREATER LONDON

Southgate RC: 2nd & 4th Thursdays. Winchmore Hill Cricket Club, The Paulin Ground, Firs Lane, Winchmore Hill, London N21 3ER. June 26 - Radio on the air. July 10 - Scott McCintosh urban alternatives. 24th - Radio on the air. Dave Michael G0ASA on 0181-482 6795, FAX: 0181-807 5366.
Wimbledon & DARS: 2nd & last Fridays, 7.30pm. St Andrews Church Hall, Herbert Road SW19. July 11 - Aerial erection techniques. J. Gale G4WYJ on (01737) 356745.

HAMPSHIRE

Horndean & DARC: 1st & 4th Tuesdays, 7.30pm. Lovedean Village Hall, Lovedean Lane, Lovedean, Hants. July 1 - Natter night, 22nd - American supper. S. Swain (01705) 472846.
Southampton ARC: Mondays, 7pm. This club is now up-and-running after some years of inactivity. New members welcome. Harold McIntyre on (01703) 737715.

HEREFORD & WORCESTER

Hereford ARS: 1st & 3rd Fridays. 8pm. Many talks and interesting evenings including. July 4 - Three Counties Rally arrangements, 18th - Talk on Radio Data Systems by Tim Bridgland-Taylor G0JWJ. Tim G0JWJ, QTHR. Tel: (01432) 279435 or Paul G0DJF on (01432) 353765.
Malvern Hills RAC: 2nd Tuesdays. Red Lion, St. Annes Rd. July 8 - RSGB video and natter night. Dave Hobro G4IDF on (01905) 351568 evenings and weekends.

HERTFORDSHIRE

Hoddesdon RC: Alternate Thursdays, 8pm. Conservative Club, Rye Road, Hoddesdon. July 3 - Talk on 'Back To Basics, Soldering' by Don G3JNJ. 17th - Natter night. Don G3JNJ on 0181-292 3678.
Verulam ARC: 2nd & 4th Tuesdays, 8pm. RAFA Club, New Kent Road, St Albans. New members and visitors welcome. July 22 - BBQ and radio station. Ian Forsyth G0PAU on (01923) 222284.

KENT

Bromley & DARS: 3rd Tuesdays, 7.30pm. The Victory Social Club, Kechill Gardens, Hayes. July 15 - Mast erection by Andy Brooker/John Stockley. A. Messenger G0TLK. 0181-777 0420

NORFOLK

Norfolk ARC: Wednesdays, 7.30pm. Formal and informal meetings at The Norman Centre, Bignold Road, Off Drayton Road between 'Asda' and Three Mile Cross Roundabout, Norwich. July 9 - Night on the air, construction QRP and Morse practice. 16th - My Career by John G0VZD. 23rd - Night on the air, construction QRP and Morse practice. Mike G4EOL (01603) 789792.
West Norfolk Airband Monitoring Group: Regular informal meetings on Thursdays. 7.30pm. Dave Jon (01485) 578183 for details.

NORTH YORKSHIRE

Hambleton ARS: All meetings held at Allertonshire School, Northallerton, 7.30 to 9.30pm. July 3 - Operating 6m, 10th - Informal. More details from John G0VXH on (01845) 537547.

NOTTINGHAMSHIRE

Mansfield ARS. 2nd Mondays, 7.30pm. Novices particularly welcome. July 14 - Microwaves - not a cookery demonstration, but a talk by Richard Drabble G1SLE about operating in frequencies above u.h.f. David Peat G0RDP on (01623) 631931.

SHROPSHIRE

Salop ARS: Thursdays, 8pm. The Telesports Club, Abbery Foregate, Shrewsbury. July 3 - VHF National Field Day final preparations, 5/6th - VHF NFD, 10th - Night on the air/NFD post mortem, 17th - Third 2m fox hunt, 24th - Night on the air and natter night. Ian Davies G7SBD, QTHR or @ GB7PMB.

TAYSIDE

Dundee ARC: Tuesdays, 7pm. Dundee College, Graham Street, Dundee. July 1 - Visit to RAF Leuchars. Allan Martin GM7ONJ, 11 Langlee Place, Broughty Ferry, Dundee, Tayside DD5 3RP.

WARWICKSHIRE

Mid-Warwickshire ARS: 2nd & 4th Tuesdays, 8pm. St Johns HQ, Warwick Div, 61 Emscote Road, Warwick. July 8 - Fox hunt. 22nd - History of Microwave links by Harry Hyamson G8XDL on (01926) 498115.
Stratford-upon-Avon & DRS: 2nd & 4th Mondays, 7.30pm. Home Guard Club, Main Street, Tiddington, Stratford-upon-Avon. July 14 - Summer social evening. The Society are again organising a course of instruction for the Radio Amateur Examination of the City & Guilds of London Institute and further details can be obtained by writing to the Chairman of the Society, Mr J. Harris G8HJS, enclosing a stamped addressed envelope. The address to write to is: 57 Evesham Road, Stratford upon Avon, Warks CV31 2PB.

WEST MIDLANDS

South Birmingham RS: West Heath Community Association, Hamstead House, Fairfax Road, West Heath, Birmingham. July 2 - Getting ready for field day - equipment and tent check, help is needed, please try to attend, 8pm. Don Keeling on 0121-458 1603.

WILTSHIRE

Salisbury ARC: 2nd and 4th Tuesdays. 8pm The Scout Hut, St Marks Avenue, Salisbury, Wiltshire. Prospective members and visitors are welcome. A club Net held daily at 6.30pm local time and additionally 8.30pm Fridays S.16 (V32) 145.000. RAE tuition available. June 29 - Club trip to Longleat Rally. July 8 - How to use club h.f. rigs - correct preliminaries and operation, 22nd - Club BBQ at QTH of Rex G1SSZ. Jamie G7WAA on (01772) 334935 (business hours).
Trowbridge & DARC: 1st & 3rd Wednesdays, 8pm. The Southwick Village Hall, Southwick, Trowbridge. June 29 - 40th Longleat Rally talk-in. July 2 -Treasure hunt or similar. 16th - Natter night. Ian G0GRI on (01225) 864698.

Armen Oganesyan made the appeal on Russia's annual Radio Day, celebrated on May 7th. He explained about the serious financial problems facing the government-funded station, which apparently now receives only 15% of the budget applied for.

If you feel strongly, drop a note to the Russian ambassador, or to Boris Yeltsin in Moscow. Who knows, it might help the cause a little.

WORLD MUSIC RADIO

If you have been listening to short wave for the last 20 or 30 years then you will probably remember World Music Radio (WMR). The station is back on the air after an absence of many years, with programmes made in Denmark but transmitted from the Meyerton facility run by Sentech (formerly part of the South African Broadcasting Corporation) which broadcasts Channel Africa.

Tests were made during early May on two frequencies: 3.345 and 6.29 0MHz. The lower frequency was beamed towards Africa and gave good reception across most of southern Africa and as far north as Kenya.

The 6MHz channel is reported to have given excellent, interference-free reception across the whole of Africa, and reasonable signals in Europe although there was some RTTY interference. This channel also reached North and South America, South Asia and the Pacific with fair reception.

WMR will be on the air at weekends between 1800 and 2200UTC and will use a 250kW sender at Meyerton. You can find WRM on the Internet at **www.wmr.dk** and can send E-mail to **wmr@cybernet.dk** Conventional mail can be sent to **WMR, PO Box 112, DK-8900 Randers, Denmark**. Enclose an international reply coupon to help with postage costs.

Let's hope that WMR is more successful than another broadcaster beamed from South Africa by Sentech. The Investment Channel was launched in March beaming on a large number of frequencies to Africa and the Middle East.

The format was news about stocks and shares and provided a link to an investment company which could handle the sale and purchase of shares. The organisation seemed to be based in both the United States and Liechtenstein, and quoted an on-air address in Vaduz, capital of the European principality.

On 12th May, The Investment Channel came off the air with no reason cited for the station's closure. But is it surprising that a station trying to promote share transactions in Africa is short-lived when a majority of the continent's population lives below the poverty line?

That is all for this quarter. I'll keep my ear on the short wave dials and report back to you in the October edition of *Short Wave Magazine*.

Good listening! ■

Editorial

I have just heard that the 1997 edition of the *North American* and *International Callbooks* and the *1998 ARRL Handbook* will be the last to published in printed form. I have grave reservations about the headlong dash into publishing using CD-ROM technology instead of conventional printing. I am no Luddite - the fact that *SWM* was one of the first magazines anywhere to use desk-top publishing is a testament to that. No, my reservations are about the decision to completely forsake the majority of their customers for what I believe to be the minority with a computer of a particular variety. As from 1998 anyone without an IBM Compatible PC fitted with a CD-ROM drive and running *Windows* will be denied the means to look up the details of amateurs around the world or read one of the most useful reference books published! Even those with a suitable computer may find it difficult to read in bed - or other places where it is convenient.

I fully expect a flood of irate letters from readers with computers telling me that I am wrong. However, I would far rather you wrote to me telling me what computer you use, exactly what you use it for and whether or not you have an Internet connection. If you don't have a computer I would still like to hear from you. I will let you know the results of my 'survey' in a future issue. Please mark you envelopes '*SWM* Computers'. Of course, you can always E-mail me at **dick@pwpub.demon.co.uk** with '*SWM* Computers' as the subject of the message.

Dick Ganderton G8VFH

Letters

DEAR SIR

Scanning the pages of May's *SWM*, I stumbled across 'Magnetic (?) Loops For Receivers'. My initial thoughts were "great, something at last on loop antennas."

However, the euphoria was short lived. I soon became a little bemused as to why so much space had been dedicated to an academic analysis of the validity of using the expression 'Magnetic Loop'. Surely this is just 'nit picking' on what is now an accepted term by radio enthusiasts.

I would suggest that the expression ideally describes the loop antenna when considering its behaviour in the near or induction field. Furthermore, the so called 'Magnetic Loop' has recently been used by manufacturers of transmitting loops to emphasise the intense magnetic field that surrounds the loop, also the term is used for some receiving loop antennas to describe the near field characteristics.

I enclose a conceptual illustration of the difference between a mono-pole and a loop antenna in near field taken from a handbook published by a world famous EMC and environmental test house. Also, the article appears to have absolutely no connection with receivers, the title would suggest otherwise.

Moreover, the article failed to discuss the most important attributes of loop antennas, such as reduced susceptibility to local electric-field interference, immunity to electric-field absorption by surrounding buildings. Also, the relationship of loop output voltage to frequency, field strength and *Q* was not considered.

Furthermore, the article begs the question, if the loop is so dependent on the electric-field, then why does a 'magnetic loop' work when surrounded with a electro-static screen? Finally, I have considerable practical experience in designing and manufacturing receiving loop antennas and I can assure readers that the concept 'Magnetic Loops' is valid.

Andrew H. Ikin G8LUG
Christchurch
Dorset

DEAR SIR

At first glance of the front cover of the May issue of *SWM* I thought perhaps it was another April issue, until I realised that the typesetter and proof reader must have been disoriented by all the political hustlings leading up to the election. **Ashdown**-on-Mersey School DX Club! Still, we are all prone to mistakes I suppose, and one must take a 'liberal' view of things.

I would like to say how much I enjoy *SWM* and eagerly look forward to my copy dropping through the letterbox each month, but would like to add my voice to those who have recently complained about those pages with heavily tinted backgrounds which make it difficult to read some of the articles. Please try to avoid this in future issues.

Robert Allen
Urmston
Manchester

DEAR SIR

I was wondering if through your magazine I could ask somebody if they know a contact address for ENIGMA - the group that does research on numbers stations. I first heard about them over three years ago and after listening to several references to them and numbers stations on Radio Netherlands Media Network programme with Johnathan Marks and co., also I've heard them for myself around the dial on several occasions and would like to know more.

There was a short documentary involving Chris Midgley from ENIGMA about the numbers stations on the BBCs *Here And Now* programme broadcast on 22 April 1997 and I found it very interesting, especially seeing an old valved receiver used for listening for this stuff. It's ironic that old technology is being used to listen for old cold war style spy stations....

This above programme has rekindled my interest in the subject and I would certainly like to contact the group, if anybody could give me a contact address. I would be most grateful if you could publish an appeal for the ENIGMA group's contact address.

Ian - DT226
Ayrshire

The address you need is **EMIGMA Newsletter**, *17-21 Chapel Street, Bradford, West Yorkshire BD1 5DT. They publish a very interesting quarterly newsletter. We published an extensive feature compiled by the EMIGMA Group in the October 1996 issue of SWM. Back issues are available at £2.60 inc P&P - KN.*

DEAR SIR

I am attempting to receiver radio stations via satellite. I have a Philips STU/801/25R receiver, but, unfortunately, I don't have a manual for it. I was hoping that a *SWM* reader might have one they could spare or copy. I am not sure what is required to be able to listen to the many programmes that are broadcast via satellite - can you help, please?

Mr BJ Wilson
Warrington

To receive radio stations with your satellite receiver you need to select an appropriate audio sub-carrier, which is used to carry the alternative sound channel. I suggest that you request the August 1994 SWM back issue , from the SWM Book Store. In this issue of the magazine we covered the subject of satellite radio reception and featured an extensive list of stations broadcasting at that time. There have been some changes since, but it will give you a good idea. KN.

DEAR SIR

I would be most grateful if you or your readers may be able to offer me some advice or alternatively suggest some reading material which may alleviate my problem.

I embarked on my new hobby using an MVT-7100 listening largely to v.h.f./u.h.f. aircraft transmissions. Having increased my interest in the subject I am now keen to listen in to more distant transmissions, e.g. Oceanic h.f.

However, I understand that the MVT-7100 is not ideally suited to reception at these relatively low frequencies and this is borne out by my lack of success. I have tried various antenna configurations including a long wire balun with a Howes a.t.u., and more recently a dedicated vertical loop h.f. antenna. But, even with the attenuator on, I am doing well to pick up Shanwick VOLMET, never mind Gander!

I am now considering purchasing a dedicated h.f. receiver such as a Lowe HF-150 in the hope of attaining crystal clear reception(?). Alas, inevitably, the hardware is expensive, however, I am wondering whether I can, with the addition of an interface and some software, reduce my hardware costs by involving my (up-to-date) PC in the operation of a new piece of kit.

Incidentally, I also have overheard power lines running above my garden, parallel to the rear of my house. I am told this shouldn't make any difference to the quality of reception, does anyone out there know differently?

Chris Sloan
Cupar Muir, Fife

DEAR SIR
We often see letters in *Short Wave Magazine* praising the various dealers who advertise in your (may I say our?) magazine, but I don't recollect ever seeing any thanks to the guys who keep the monthly - sadly, in the case of 'Shackware', quarterly - columns going.

As I am in my mid-seventies, I never thought that I would ever have a computer even though I have been actively s.w.l.ing since my RAF days as a Wop/Air. However, my eldest granddaughter recently gave me her ageing Amstrad which certainly gave me something else to think about besides frequencies and antennas.

So, a cry for help went out to Jerry Glenwright, your 'Shackware' columnist and within a short time I received a reply that gave me a lot of information that was a great help. I will certainly act on the information that Jerry gave me.

So, the bottom line is that your columnists, and in my case particularly Jerry, deserve our thanks for giving up a lot of their time to use us a lot of pleasure. And in your case, of course, many thanks for a great magazine.
Keith Anderson
Freshwater Bay
Isle of Wight

I'm very pleased to hear that you have 'taken the plunge' and tackled the use of computers at the tender age of seventy something young. It just goes to show that there really is nothing to fear from what some believe to be technological monsters. I wonder how long it will be before you are trying to hijack your granddaughter's new machine - KN.

DEAR SIR
I thoroughly enjoyed the articles over the past year written by David White on Radio Secrets of the War, particularly the one in the May edition on DF Stations.

My late father worked in some of the DF Stations mentioned. He was a civilian Radio Operator employed by the Admiralty in the 'Civilian Shore Wireless Service', sometimes referred to facetiously as the Co-Operative Wholesale Society because of the similarity of initials.

The work was interception of enemy naval signals and taking direction finding bearings on enemy ships and submarines. The German Radio Stations controlling the Battle of the Atlantic were Lorient RXU and Berlin ADA. Four letter code was used and naval ships used no callsigns, transmitting their messages on the same frequency as the shore station and using a prefix which distinguised between a weather report WW and an enemy sighting report EE.

There were also other prefixes for other categories of message, e.g. German ship sending enemy sighting report EE ZMPQ CLRB FXDS JTLM RNOX. Submarines could only transmit while on the surface and when then surfaced, they had to dry out their antennas. They did this by pressing their Morse key which made a particular sound which the operators had been trained to recognise.

My father worked at the station at Cooling Marshes and Wick mentioned on page 27. At Cooling Marshes, they were having air raids every night and he had some anxious moments with enemy bombs exploding nearby. At the end of April, they got instructions to close up the radio station and transfer to Lydd, where a better site had been found.

In the early summer of 1942, he was selected to go to Bermuda. On the way to Bermuda via New York, he was transferred to Kingston, Jamaica, where he spent two and a half years.

The Bismark would not have been sunk but for h.f./d.f. and many, many convoys were kept clear of U-boats, or at least given some advance warning of an impending attack because of their efforts.
Michael Kirwan
Limerick
Ireland

DEAR SIR
I see that in spite of letters having been received regarding the overprinting of articles with coloured backgrounds making very hard reading, you have done exactly the same thing again on page 39 of the May issue, the WinRadio bit. The last three columns on this page are almost unreadable, surely somebody has the job of checking for this before sending copy to the printers?

Please, please, do not keep overprinting what is nice clear type with these terrible coloured backgrounds, your readers do not like it and I thought you took notice of our complaints?

Otherwise, an excellent magazine, but it will not be if the above continues into future issues!
Peter Lepino
Surrey

A cursory glance at this issue will show that we do listen to what our readers say! The Art Department has re-designed the entire magazine and one of the items that I tried to impress on them was that any background used should be very light, so as not to detract from the legibility of the essential text - Ed.

DEAR SIR
Dennis White, ex-Royal Navy 'Y' radio operator asked about (HMS) *Flowerdown* (*SWM* April 1997) in which he served during the war. After the war ended it returned to civilian control as did most of the other Service 'Y' stations, both in the UK and overseas. Most closed down by the 1980s, *Flowerdown* finally being 'sunk' in the 1970s.

During WWII, I started as an 'Experimental Wireless Assistant' with the War Office 'Y' group, a mixed civilian and ATS service, first at Fort Bridgewoods, Chatham, which then moved to Beaumanor Park in Leicestershire. Later, as a Special Operator in the Royal Corps of Signals and returning as a civilian to Beaumanor Park shortly after the war ended.

After various moves, finally to *Flowerdown* in 1968 until 1972, ending my service at Cheadle in Staffordshire, one of the former homes of the RAF 'Y' Service. *Sic transit gloria mundi.*
N. L. Smith
Stoke-On-Trent
Staffs

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.

IF YOUR LETTER IS PUBLISHED YOU WILL RECEIVE A £5 VOUCHER TO SPEND ON ANY SWM SERVICE.

SWM SERVICES

SUBSCRIPTIONS
Subscriptions are available at £25 per annum to UK addresses, £30 in Europe and £32 (Airsaver), £37 (Airmail) overseas. Subscription copies are despatched by accelerated Surface Post outside Europe. Airmail rates for overseas subscriptions can be quoted on request. Joint subscriptions to both *Short Wave Magazine* and *Practical Wireless* are available at £45 (UK) £54 (Europe) and £58 (rest of world).

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, 87 Blackberry Lane, Four Oaks, Sutton Coldfield B74 4JF. Tel: (0956) 374918 (Mon.-Fri.9am-5.30pm).

PHOTOCOPIES AND BACK ISSUES
We have a selection of back issues, covering the past three years of *SWM*. If you are looking for an article or review, or whatever that you missed first time around, we can help. If we don't have the whole issue we can always supply a photocopy of the article. Back issues are £2.85 each, photocopies are also £2.85 per article, plus £1.00 for subsequent parts of serial articles.

Binders, each taking one volume are available for £6.50 plus £1 P&P for one binder, £2 P&P for two or more, UK or overseas. Please state the year and volume number for which the binder is required. Prices include VAT where appropriate.

Orders for back numbers, binders and items from our Book Service should be sent to: PW Publishing Ltd., FREEPOST, Post Sales Department, Arrowsmith Court, Station Approach, Broadstone Dorset BH18 8PW, with details of your credit card or a cheque or postal order payable to PW Publishing Ltd. Cheques with overseas orders must be drawn on a London Clearing Bank and in Sterling.

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

Lowe Elec

JRC NRD345G

JRC need no introduction to most SWL's but their new receiver does! An all-mode receiver, the NRD345G includes synchronous detection as standard, offering low signal distortion and clear sound. Direct Digital Synthesis is employed in a phase locked loop circuit to enhance the carrier to sideband noise ratio. The RF amplifier and the first mixer in the front end stage incorporate 4 low-noise junction-type FETs with excellent cross modulation characteristics respectively to ensure high sensitivity with wide dynamic range. Other features include a variable level noise blanker, clock and timer functions and a built-in RS232 interface for computer control. We'll be writing a driver for our RCON control software just as soon as we have our first European spec samples! This will enhance the NRD345G's 100 memory channels and scanning capabilities. The new receiver offers great value for money at just £899.00 (subject to exchange rates etc.).

STOP PRESS!

Our first shipment has now arrived and selling fast! The NRD345G is the CE approved model, complete with UK power supply and this is the only version you should consider buying. Beware of *grey imports* which will not have factory approved warranty via ourselves as official JRC distributors for the UK. The NRD345G is available directly from Lowe Electronics and through our dealer network. Give us a call and we'll let you know who your local approved dealer is so you can buy with complete confidence.

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Need more info? We've got some great info packs available to help you choose the most suitable products for your needs. Packs of interest to amateur radio operators include HF transceivers, VHF transceivers, Antennas, Data Comms and Amateur accessories. We also have packs dedicated to GPS receivers, scanners and decoding. To order any of our packs, just send us four first class stamps for each pack requested plus your full name, address and telephone number to our Matlock address and we'll do the rest!

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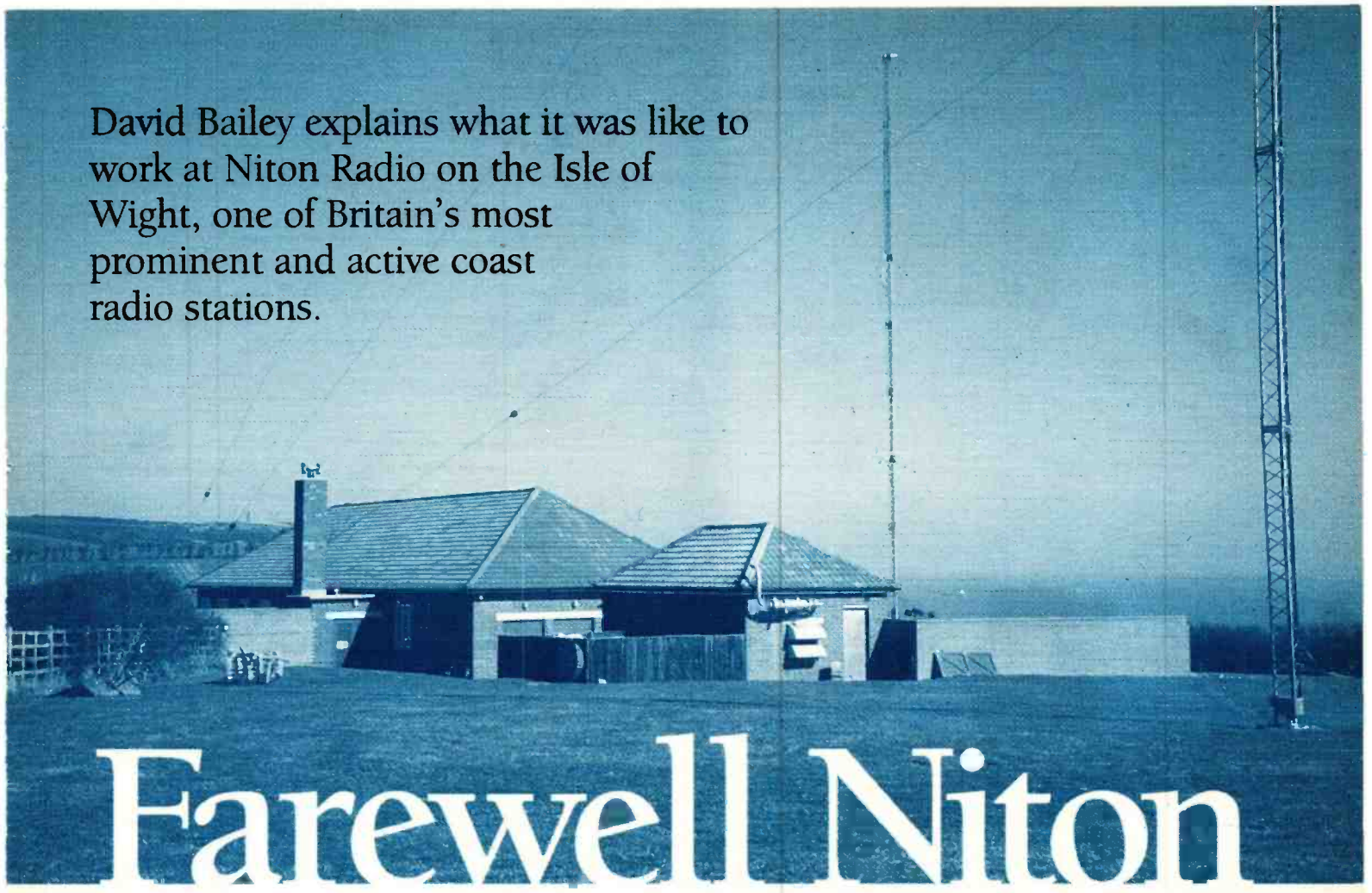
David Bailey explains what it was like to work at Niton Radio on the Isle of Wight, one of Britain's most prominent and active coast radio stations.



Farewell Niton

On an Isle of Wight cliff top, there's a building that looks like a fairly ordinary bungalow, the roof can just be seen from the main road. Not seen from the road is the little out-building that ought to be the garage, but behind the double doors, instead of the family car is an engine, a diesel engine, big enough to drive a generator that could power an entire radio station, with enough fuel underground to keep it on the air for a month without the mains supply.

A radio station is what the apparent bungalow happens to be, one of just a few of its kind around the coast of Britain, a meeting place for ocean wave and wireless wave. Now, in the 1990s, they are just nodes on a computer network, operating as one large radio station spread out around the country in little clusters, with people in Scotland controlling transmitters in Southern England as if they were in the next room.

Only a few years ago, though, they were very separate places, with just telephone and Telex lines to keep them in touch with one another as the need arose. They were rather different in character too, the stations in the north would be working with deep sea fishing fleets and oil platforms and those in the south with cargo and passenger ships in and out of the ports of Western Europe.

And in the days before its virtual extinction, the 'Dirty British Coaster' would be known to them all. But above all else, they would be listening, listening 24 hours a day, every day of the year - an SOS or Mayday call was never missed.

BUSY PLACE

I worked at the station perched on the Island hill top, and it was a busy place, but during the night, the radio traffic dwindled to a trickle. Shipping offices were closed, and friends and relatives had gone to bed.

At 2300, just two of us came on night duty, and our colleagues went home. Already it would be reasonably quiet and in the summer a few yachtsmen would fall back into their boats after a night at the pub, and call their wives to reassure them that they were safe and well following the adventures of the day.

After that there would be an occasional ship's call to a pilot station, or a gale warning to be broadcast. Most of the time, though, we just listened.

We kept a loudspeaker watch on v.h.f. channel 16 (156.8MHz), but our attention was principally upon the two m.f. distress frequencies, 500kHz and 2.182MHz, and during the darkness hours, as the ionosphere brought us signals that the daylight denied, we could hear clearly ships and coast stations many hundreds of miles away. Signals from Norway and the Baltic would be heard with those from Casablanca, Gibraltar, and beyond.

One such ordinary night was well into its routine, with its usual sounds, the chorus from the Mediterranean alongside the precision Morse and laconic announcements from Scandinavia, and in our own surroundings, the occasional noise from the sheep and cattle in the nearby fields. Through the open windows we could see the local rabbits grazing under

The Niton Radio Station building looking out over the English Channel. The station was relocated here from the old building near the village of Niton in 1975. St. Boniface Down in the background rises above Ventnor and was the site of the wartime Chain Home Radar station. An RAF bunker from that time serves as home for the Niton v.h.f. equipment.

Inside Niton Radio today. The occasional ship still comes up with Morse so the old art of key bashing survives (just) alongside modern computer technology. Hidden behind the Radio Officer is the only piece of radio equipment in the operating room, an Eddystone 1650 receiver.

the moonlight, with a fox intrud ng just now and again.

The rabbits always appeared to be totally unconcerned about the foxes, and the foxes never seemed to show any interest in the rabbits, they plodded across the antenna field looking just about as pleased as we were to be up at that time of night.

NOISE & ACTIVITY

Gradually, the noise and activity abated as the night progressed, until it became sporadic, and distant isolated voices could be heard - quietly, but with great clarity. And then we heard the voice that stood out from the rest, and we heard the word for which we were always ready, even without being consciously aware of it: "Mayday".

In the past, some of us had heard the very occasional hoax distress call, they had to be treated as genuine and acted upon, of course, but somehow we could always identify the false; experience had developed an instinct that identified the phoney - there's just something in the voice.

That something was unmistakably in the voice that we heard just then. It was crystal clear, and it was controlled, but there was an anxiety in it that said, "I'm in real trouble".

The ship was a small foreign registered coaster, and the voice was that of the British captain, who had good reason to be anxious. The ship was in heavy seas under gale force winds, and it was taking water quickly, it was going to sink.

AREA OF RESPONSIBILITY

The position that he gave put the ship in the cold coastal waters of Iceland, way beyond our area of responsibility. An Icelandic coast station answered his call, so we kept quiet, and listened on.

That's what you do, all stations not directly involved keep silent. No other ships were nearby, so there were just the two voices on the air; one in desperate need of help, and the other the only link with that help.

As the drama was played out, there was an intensely attentive audience, silent stations listened in Ireland, Britain, France, Belgium, Holland, Germany, Denmark, Sweden and Norway, in an arc around a stage set by wind and wave, like ancient Romans surrounding a life and death struggle in the amphitheatre. And like them, too, I guess, we dipped into our snacks and refreshments as the struggle went on.

IONOSPHERE STIRRED

It happened not a great while before dawn, and the ionosphere stirred with the approach of a new day and before long signals began to fade, rising and falling very slowly, but we understood that there were difficulties in effecting a rescue. The ship wanted a helicopter, but that wasn't possible, a boat would be sent, but it would take some time to reach the ship.

"Thank you," the captain said, "But quickly, please." The voice was still clear, still polite, haunting.

We heard no more. If anything else was said, I don't know. The sun was soon up, our reception area contracted to normal daylight range, and we had the dawn chorus of ships clamouring for calls and messages all over Europe.

With just the two of us on duty until 0900, our tired minds were fully occupied with the job in hand, and the voices of the night were forgotten for a while.

At 0905, my headphones were hung up in the locker, my empty sandwich box was picked up, and I stepped out into the beautiful sunny morning. The fields were green, the sky was blue, the birds were singing, and it was good to be finished, and great to be alive, with just a ten minute drive home.

NEWS BULLETIN

There was a news bulletin at 10 o'clock on the kitchen radio. The third or fourth item mentioned a ship that had sunk off Iceland.

The rescue boat eventually got there, but the ship had gone. They picked up the captain and some of the crew, they were floating dead in their lifejackets. In those icy waters, nobody would have lasted long.

Did I hear his last words? Was he married? Had his wife awoken to the same glorious morning that I had seen arrive, to learn that she had lost her husband hundreds of miles away in a grim black night?

HAPPY MEMORIES

Time has passed, and I have many happy memories of that place where I used to work; it was interesting and varied, and we had a good team, with plenty of laughter and good natured talk amongst us.

But along the way, I collected a few sombre memories, too. As the morning came, those years ago, that lonely voice faded, but the memory of his voice - that will remain, and not fade.

NITON TO CLOSE

Just short of completing 100 years of service, Niton Radio on the Isle of Wight is to close at the end of June. The call, 'Niton Radio' will still be heard on the air, because certain facilities will remain, but they will be entirely controlled from elsewhere.

It will be a sad day for all of us who remember the place as one of Britain's most prominent and active Coast Radio Stations. ■

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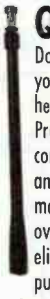

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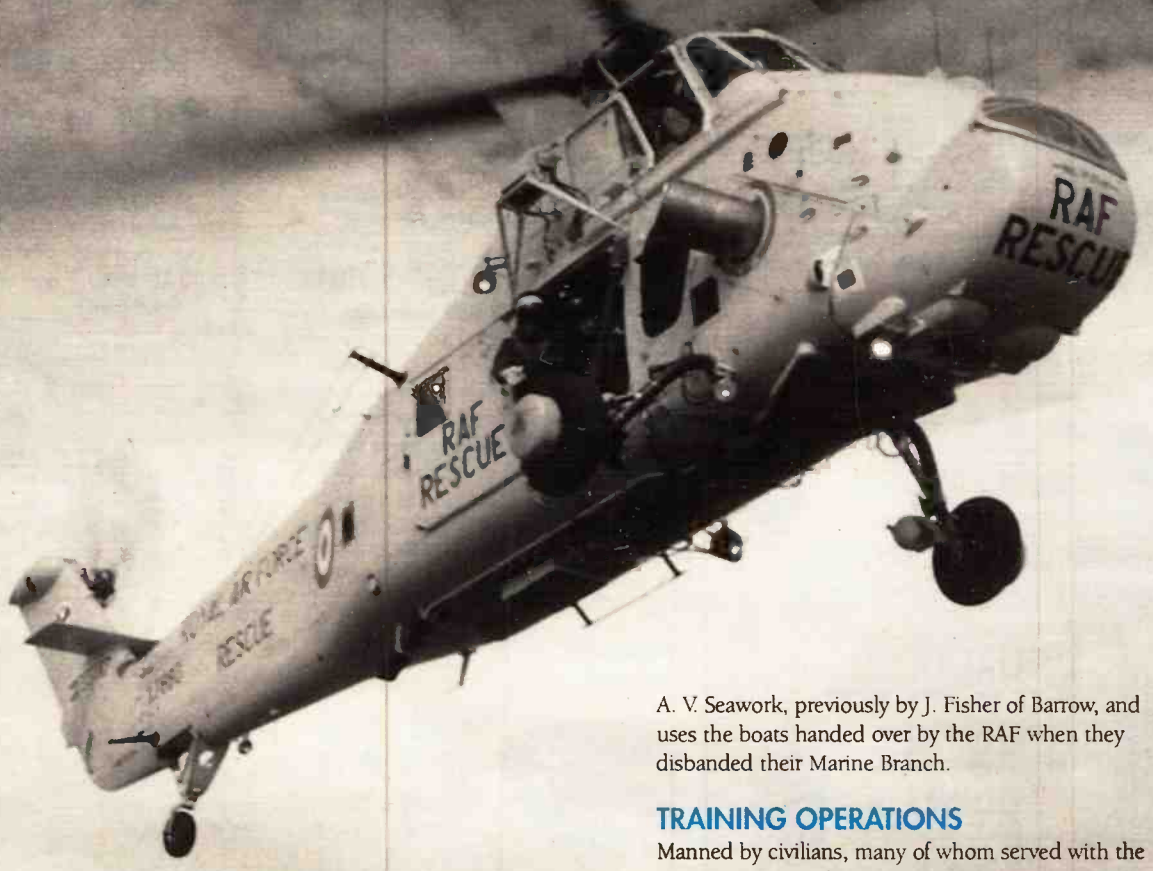
Heaven!

Regular 'Scanning' author John Griffiths reflects on his time as a Fast Rescue Coxswain and looks back on that time as a brilliant opportunity to work with the experts and also to work with the Wessex.



If you live near to the coast then the chances are that you've seen the helicopters of the Royal Air Force practising their demanding trade on a variety of passing ships and boats. Given the particularly stressful and highly demanding scenario presented by any SAR task, daily sessions are something helicopter crews get accustomed to.

To be good, as the RAF's SAR wings are, then you've got to practice, because not only does it make perfect, it also ensures that, when the time comes, it'll be professional as well.

Many people still believe that the RAF retains its Marine Craft Branch when, in fact, this is now handed over to civilian operators who work the long standing support element of training operations around the UK coastline with 202 and 22 Squadron, as well as with SARTU. At the time of writing this was performed by A. V. Seawork, previously by J. Fisher of Barrow, and uses the boats handed over by the RAF when they disbanded their Marine Branch.

TRAINING OPERATIONS

Manned by civilians, many of whom served with the RAF Marine Branch, the training operations continue at the practical ex-MCU bases. Four main bases still carry out the tasking and these are as follows: Plymouth/Great Yarmouth/Invergordon/Holyhead.

Boat types in service at Holyhead are Pinnaces, being numbered '1374' and '1392', standard 63' types of general purpose craft exclusively designed for the RAF to carry out support of flying operations,.target towing and other allied tasks. Although now quite long in the tooth, the craft are maintained to RAF/RN standards and kept operational on a 365 days-a-year basis.

As an ex-seafarer used to more modern tonnage, service with 'boats' came as both a surprise and a look back at what was, in these days of electronic navigation systems, pretty basic kit! Not withstanding such strange jobs as steering by an aircraft compass as opposed to a boat's compass *per se*, service aboard the boats was sometimes quite different to what I was used to, and very soon came to love.

Wessex XT680 SARTU.

RAF Valley is home to 'C' Flight of 22 Squadron Royal Air Force and also of Search And Rescue Training Unit (SARTU). It is also home to 4 FTS/208/74/19 Sqds/CFS and Standards Flight (all 'fast movers') and also hosts various other military types, from C-130s through to exotica such as F-111s and A-10s, throughout a typical year.

Valley's Hawks feature predominately, however, and the on-going training of 'baby pilots' takes place alongside the refresher programmes of their more experienced instructors and aircrew. The boats figure heavily in this programme.

SUPPORT CRAFT

Operating as support craft for operations such as 'para dragging', about the only chance an airman is going to get to throw a more senior officer overboard! - wet dinghy drills, deck operations, casualty operations, 'drums' and now and again exercises with aircraft seldom seen, in the UK at least, operating within an SAR defined role.

Helicopter operations involves using the venerable RAF Wessex HC.2, with machines operating from SARTU - dedicated training machines - to those operated by 'C' Flight of 22 Squadron. There were also other Wessex machines used - 72 Sqn and 2 FTS machines ex-Shawbury, and types such as the Puma and Chinook.

Some cross training has seen Army machines used, but this would only be on an 'opportunity' basis, i.e. if a detachment was at Valley and fancied a 'play' then the boat would be ordered for the task and the machine slotted into the programme, which is centred around the requirements of SARTU in the main, with 22 Squadron 'pinching' slots as and when they could.

For an aviation enthusiast, working with the bright yellow Wessex types and then others was akin to being in heaven, as well as its more practical side, which enabled me to brush up on techniques such as hi-lines, providing invaluable to my other role as crew on Trearddur Bay Lifeboat.

The unit, as it is still known, operates to the specific requirements of the RAF. The on-going training of helicopter crews meant boats were tasked with various exercises which had to reflect the training needs of the service itself.

TYPICAL WEEK'S PROGRAMME

A typical week's programme took in 'decks', 'drums', wet dinghy drill, PLBs and sometimes Cat Boards for aircrew being examined. There were also exercises using the unit's 4.5m Rigid Inflatable and Gemini, these designed to train aircrew in the vagaries of operating with small, fast boats.

This programme is designed to put aircrew through the demands of SAR work. For the boat's crews this would mean a 'slip' from the moorings in the early morning with a full programme often going onto nightfall. Night exercises are built in and are practised on an *ad hoc* basis, depending on the demands of each course coming through the Valley.

Each element demands a different task for the boats concerned. 'Drums' means a stand-by with the boat in support of a helicopter and its crew. 'Drums' is the name given to an exercise where a dayglo orange drum with a loop attached is dropped into the sea.

The aircraft then flies in and recovers, either by means of a winchman or by just using the winch hook. It involves precision flying as the drum is often raced across the sea surface by the downwash of the helicopter and recovery requires excellent team work by the helicopter crew.

AFV '1374' in recovery.

WET DINGHY DRILL

Wet Dinghy drill involves an aircrew 'survivor' being placed in a one man dinghy and then recovered by the winchman. It can also be an empty dinghy but more often than not had a person in it!

The boat would close up during these operations and provide both a reference point as well as being on hand for an emergencies or for recovery of the dinghy should the aircraft have to abort or due to weather. A winchman holding a semi-inflated dinghy to his body as he is hauled into the helicopter has to have a strong stomach due to the 360° turns made by wind on the ungainly dinghy on recovery! Dinghy drills also involve aircrew, mostly during a para-drag operation when the two elements are combined.

The aircrew are fastened into a parachute harness and, with the boat going ahead at 5 knots, are then unceremoniously thrown off the stern! They are then tasked with releading themselves from the drag, which simulates what would happen should they bale out over water, before clearing the boat and inflating their one man dinghies and climbing in.

Multi-seats.

Here they go through a water ditch drill until they are floating in their survival kit and await recovery by helicopter. The units 4.5m RIB acts in close support of the *Pinnace* during these operations, carrying an RAF Survival Instructor with the two man crew should any dinghy fail to inflate. If this occurs, the aircrew are recovered and put back on board the *Pinnace* - often to do the whole scenario again! There are no compromises made for what could be a life and death situation.

RECOVERY TECHNIQUES

'Decks' trains aircrew in recovery techniques in a variety of situations. Standard decks is a forward or aft recovery from the boat, which can be motionless or steaming at speed. For the winchmen this may involve single or double lifts, stretcher recovery or equipment recovery from a moving boat. It is augmented by 'Cross Decks'

which, again, involves the boat either motionless or at speed.

For this operation, the helicopter formates on the boat, coming across wind and boat, to facilitate a recovery. It trains aircrew in recovery operations where fore and aft techniques are not feasible, perhaps due to vessel construction or weather conditions, and requires eyes everywhere!

Boats have a massive variety of hazards in-built, and the winchmen and pilots have to be able to cope with these factors on top of weather! Look at the average fishing trawler and then try to imagine the problems faced by aircrew tying to *casevac* a crew member.

PERSONAL LOCATOR BEACONS

Personal Locator Beacons (PLBs) are worn by all aircrew. This training scenario may involve the boat maintaining a listening watch on her moorings or while she is engaged with another machine. It is often a 'dual machine' operation.

A Wessex may rotate from Valley and be booked for drums with the boats when, *en route*, she will deploy a PLB. While she then undertakes her original slot, another Wessex will be looking for the PLB. The banter exchanged between the aircrew during these operations is quite illuminating and competitive!

CAT BOARDS

Cat Boards are one of a series of 'finals' for aircrew. An instructor will be winched down to the boat and will brief the crew on the scenario. It involves a full weight, fully kited out dummy in flying gear who can be placed anywhere aboard, the more difficult the better!

The trainee then follows up the scenario by arriving aboard and being briefed on what's wrong. During his execution of the mission he or she will be followed by the eagle eyed instructor and carefully marked on his or her performance.

A typical scenario could involve a casualty who has fallen into a hold and is unconscious. The scenario may then change, depending on the instructor, who will inform the trainee that the casualty has just stopped breathing! This is usually whilst the stretcher is being sweated up a ladder to the deck!

Pressure is also put on the trainees by their aversion to a boat which wallows and pitches, sometimes alarmingly, most aircrew suffer from *mal de mer* seriously and then confined, sometimes heated, spaces of a small boat that is being rocked and rolled by the sea is an additional complication for them!

INFLATABLE GEMINI

Fast boat work involves the units Rigid Inflatable, or the Inflatable Gemini. Here the boat joins in formation on the helicopter and winchmen are dropped in and taken out. A small boat at speed in a choppy sea is not stable and this tests the skills of both pilots and winchmen, as well as the skills of the boat coxswain who has to maintain a steady course below a clattering Wessex which is whipping up the sea into a maelstrom of foam!

Watching the wheel of the helicopter and making station so that the pilot has the boat in sight at all times takes consummate seamanship for, in addition to watching the helicopter, the coxswain has to watch his crew, the winchman and his vision for other craft. Many a small pleasure boat has decided to short cut ahead of the exercise, necessitating an abort, and another try when there is more searoom

INFO

Communication channels used during ship-air, air-air and ground-air-ship ops, all frequencies in MHz.
Marine: Channel 73 - 156.675. Callsigns used: Sartu Base (RAF Valley)/Seawork Base (Holyhead)/both boats and helicopters (Zulu 74 and Zulu 92).
Hand-helds used in RIB and inflatable (Rib or Gemini).
Channel 16 - 156.800. Marine calling channel.

Aircraft u.h.f. channels

243.000	Military Rescue D&D cells
245.100	PLB training
252.800	NATO Training/Scene of search/SAR training
282.800	NATO SAR

Helicopters will be fitted with standard Mountain Rescue Team channels, with h.f. for Edinburgh/Plymouth Rescue and with all marine channels.

MY CONCLUSION

During my time with the unit I worked with the venerable Wessex, which remains my favourite machine, as well as with Chinooks and Pumas, this latter aircraft proving to be highly nimble and extremely agile when working with boats, so much that, after an afternoon's exercise with one Puma which had executed its slot perfectly, a request was made by the Officer of the Watch for another Puma...in Rescue Yellow!

The experience bought together all of my own training as a qualified Fast Rescue Coxswain and member of the lifeboat, adding to the transferable skills I needed to work in harmony with the RAF SAR squadrons and keeping them sharp. Now I'm no longer involved, having taken a mature student's place at Oxford for a Diploma in Social Work (a rather long story as to why! though readers of 'Scanning' will be up-to-date), I look back on my time and realise it for what it was. A brilliant opportunity to work with the experts and also to work with the Wessex. You don't get opportunities like those twice.

If you're ever near the sea and you watch them flying offshore then at least you have a better idea as to what they're doing. Note as well, that such training goes a long way in making the crews of the RAF SAR flights the best in the world. I'm glad I was involved. ■

Puma Silhouette.

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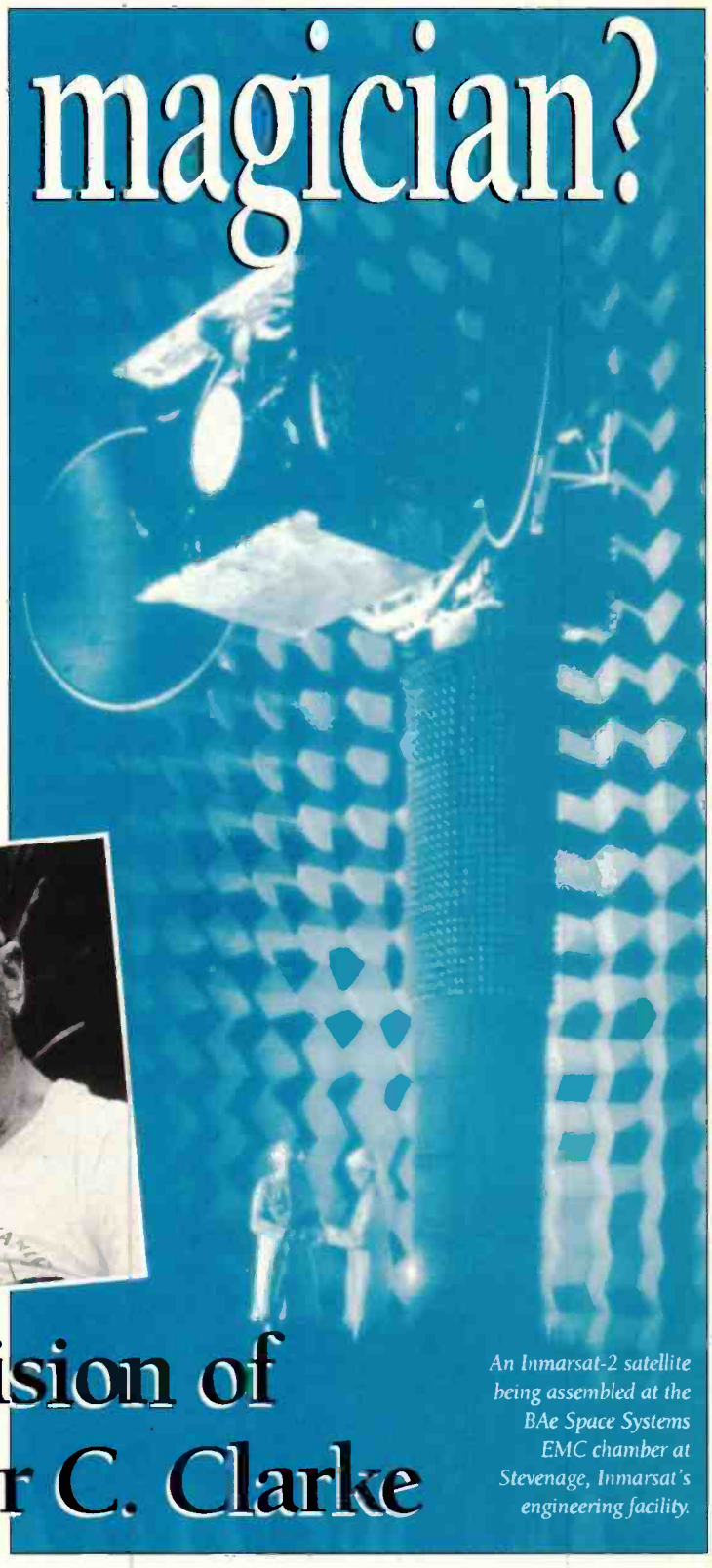
Talk 540	£100.00	540 minutes

All phones sold are subject to a 12 month contract, connection fee at £30 + VAT and subject to status

Genius or magician?

The vision of Arthur C. Clarke

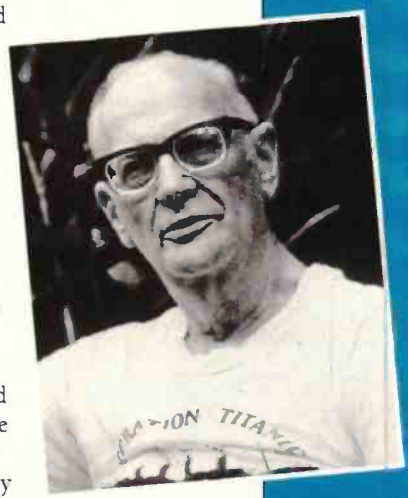


An Inmarsat-2 satellite being assembled at the BAe Space Systems EMC chamber at Stevenage, Inmarsat's engineering facility.

Fifty-two years ago the journal *Wireless World* published an article called 'Extra-Terrestrial Relays' by a 28-year-old Englishman, Arthur C. Clarke, who was later to make his name as one of the world's greatest science fiction writers.

But this was no work of fiction. It may have been tapped out on the same old sit-up-and-beg typewriter on which Clarke went on to write his popular sci-fi novels. It may have come from the same mind that created *2001: A Space Odyssey*, the book that spawned the hit film of 1968. But, although readers at the time could have been excused for thinking it was just a flight of fancy, Clarke's article was to change the nature of communications around the world - and, in fact, the world itself. It took 19 years for his vision to be realised, but even that was far sooner than he had thought was possible.

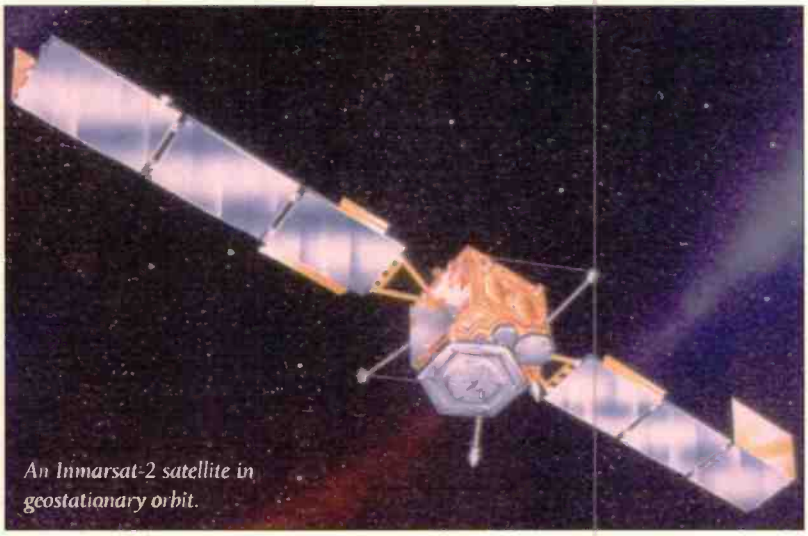
As he was to write in 1961 in an essay titled *A Short Pre-History of Comsats; or How I Lost a Billion Dollars in My Spare Time*, "It is with somewhat mixed feelings that I can claim to have originated one of the most commercially valuable ideas of the 20th century, and to have sold it for just £12". (That was the fee he received from *Wireless World*.)



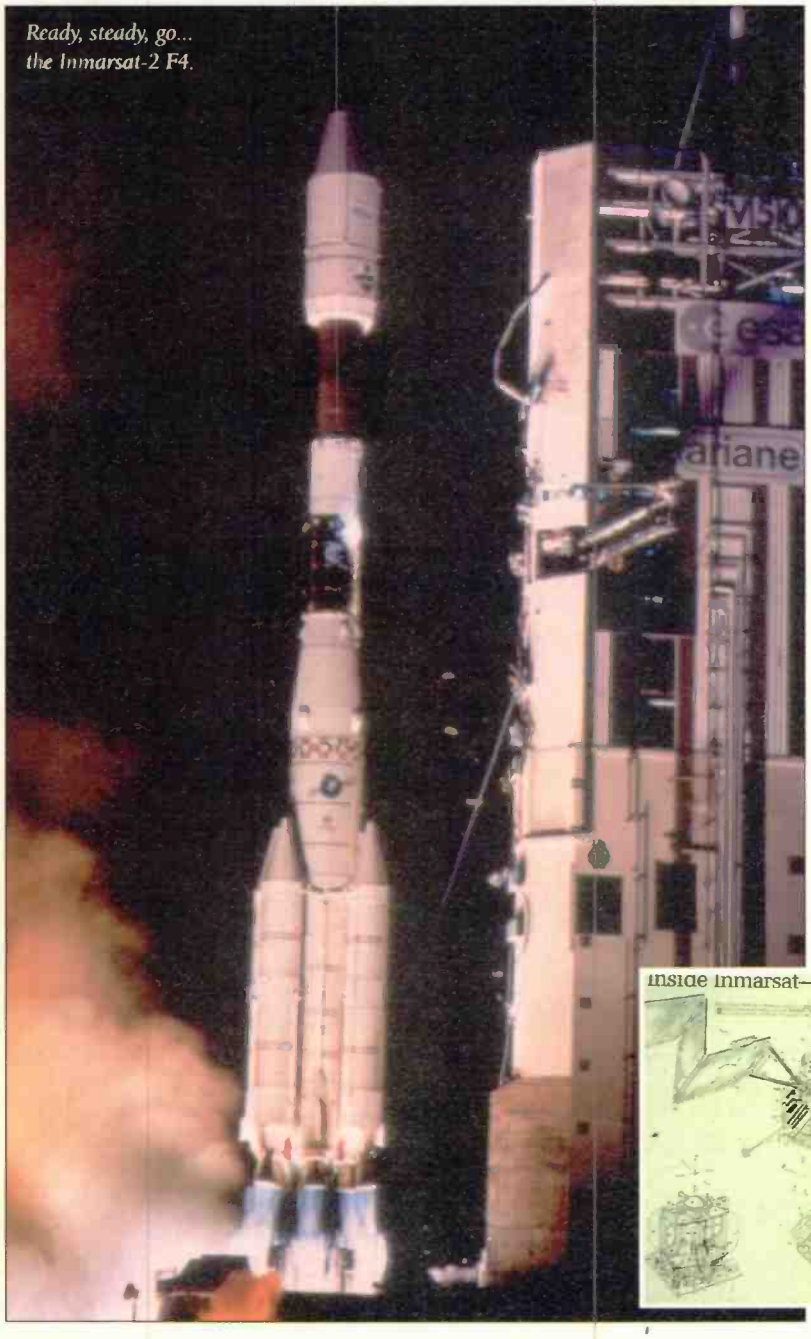
Indeed he *had* come up with a winning idea. In the four-page article (sub-titled 'Can Rocket Stations Give World-Wide Radio Coverage?' and published in the October 1945 issue of the journal), Clarke had introduced the notion of using satellites to relay radio signals around the earth. He had estimated the energy needed to put a satellite into orbit 35000km above the Equator. At that distance from earth, a satellite orbits the planet exactly once every 24 hours, at the same angular rate as the earth, thus appearing from the ground to be in a fixed position. This is what we know now as a geostationary satellite.

It was 12 years later, in 1957, that the very first satellite, the Russians' Sputnik, was launched, but that was in a low earth orbit (around 240 to 800km above the

In the dying days of the Second World War, a young English RAF officer wrote an article that sketched out the idea of geostationary orbital communications satellites. More than half a century later, Arthur C. Clarke is being recognised for the phenomenal influence he has had on global communications, Ruth Ling of Inmarsat tells more.



An Inmarsat-2 satellite in geostationary orbit.



Ready, steady, go... the Inmarsat-2 F4.

earth).

Anyone who remembers *Telstar*, the foot-tapping pop hit of 1962 by the Tornadoes, should also recall that Telstar was the talking point of that year. The first communications satellite capable of relaying messages immediately - in 'real time', as contemporary jargon has it - Telstar was launched in 1962. It circled the earth at a height of between 950km and 5600km, an orbit known as 'highly elliptical', but one which became redundant within a few years as it permitted only an hour or two of transmission every day.

It was another two years before a geostationary satellite was put into orbit; the earliest was the American Syncom 3, the first truly synchronous or stationary TV satellite, which was successfully launched on 19 August 1964 - just in time for the Tokyo Olympics. The experience of watching a sports event as it happened on the other side of the world was indescribably exciting.

CLARKE'S VISION OF THE FUTURE

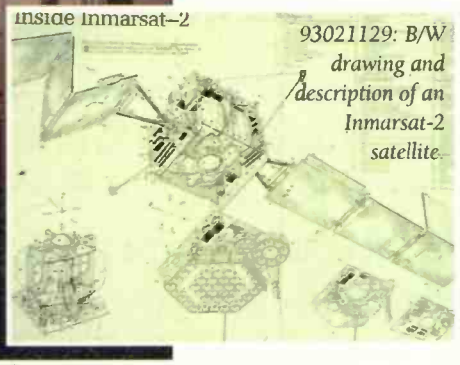
Clarke wrote his article in May 1945, while serving as a flight lieutenant in the Royal Air Force near Stratford-on-Avon, where he was training airmen to maintain the Ground Controlled Approach Radar gear used to talk down aircraft during bad visibility.

The paper, which included four diagrams, began with a brief discussion of the problem of long-range radio and TV. Although a choice of frequencies and routes could provide telephony circuits between any two points on the Earth for a large part of the time, Clarke said, "long-distance communication is greatly hampered by the peculiarities of the ionosphere, and there are even occasions when it may be impossible". A true broadcast service would be "indispensible in a world society", he wrote.

For television, Clarke said, coaxial microwave cables or relay links would be necessary, though even these could never provide transoceanic services - and they would be too expensive, costing 'millions' for a relay chain several thousand miles long. (Of course, in 1945, such cable links didn't exist,

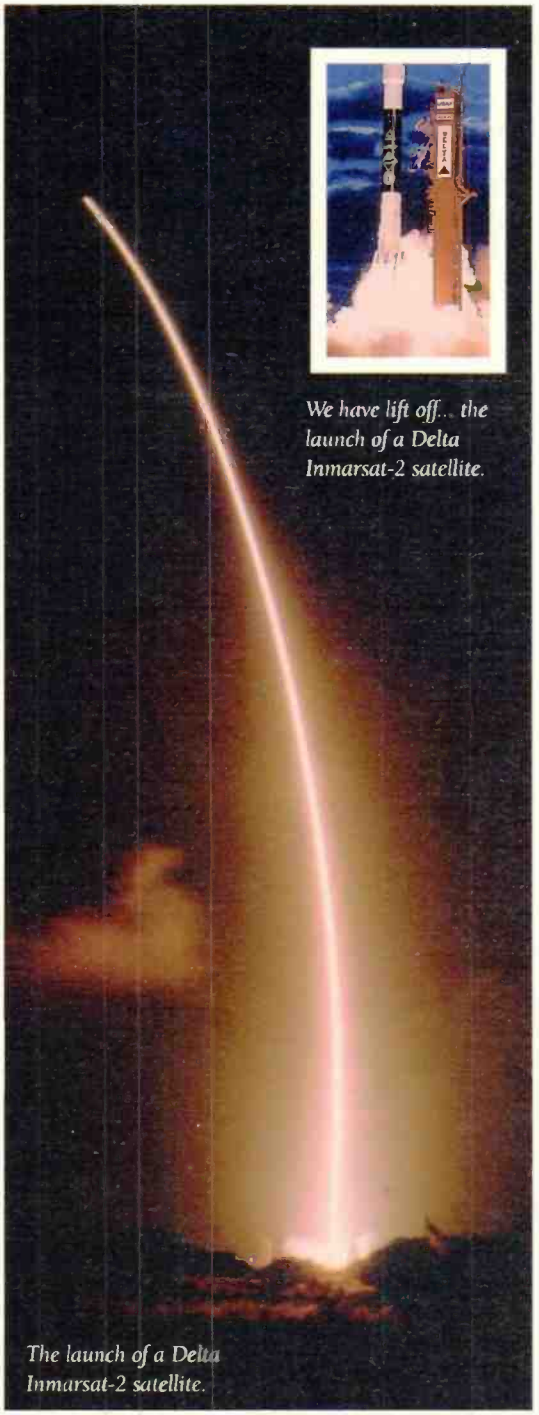
Although a satellite could be established at any altitude, its "most interesting and valuable orbit" would be outside the atmosphere. At a height of 42000km from the centre of the earth, a satellite would take exactly one day to revolve around the earth. Placed above the Equator, it would appear to be fixed in the sky.

He went on to predict that, in the following few years, it would be possible to build "radio-controlled rockets which could be steered into such orbits beyond the limits of the atmosphere and left to broadcast scientific information back to earth. A little later, manned rockets will be able to make similar flights with sufficient excess power to break the orbit and return to earth".



93021129: B/W drawing and description of an Inmarsat-2 satellite.

Clarke described how it would be possible to build a 'space station' in such an orbit, using material ferried up by rockets. Onboard would be laboratories,



We have lift off... the launch of a Delta Inmarsat-2 satellite.

The launch of a Delta Inmarsat-2 satellite.

receiving and transmitting equipment, living quarters and everything needed for the crew's comfort. The station could act as a repeater to delay transmission between any two points on the hemisphere. And, since a station would provide coverage to only half the globe, Clarke suggested three stations, at equidistant points around the Earth. These would be at 30° East to provide coverage for Africa and Europe, 150° East for China and Oceania and 90° West for the Americas.

He calculated that a world-wide f.m. system would need "no more power than the BBC's London TV transmitter". The relay stations would be solar powered because, apart from brief spells around the equinoxes when they would enter the shadow of the earth, they would be in continuous daylight and would intercept a flood of radiation which could be used to operate a heat engine coupled to an electric generator. Clarke also suggested that "thermoelectric and photoelectric developments may make it possible to utilise the solar energy more directly". This came to happen only a few years later, when the solar cell was invented at the Bell Telephone Laboratories. Solar cells now power almost all satellites and space probes.

Although modestly claiming that "everything envisaged here is a logical extension of developments in the last 10 years - in particular, the perfection of the long-range rocket of which V2 was the prototype", Clarke admitted that "many may consider the solution proposed in this discussion too far-fetched to be taken very seriously".

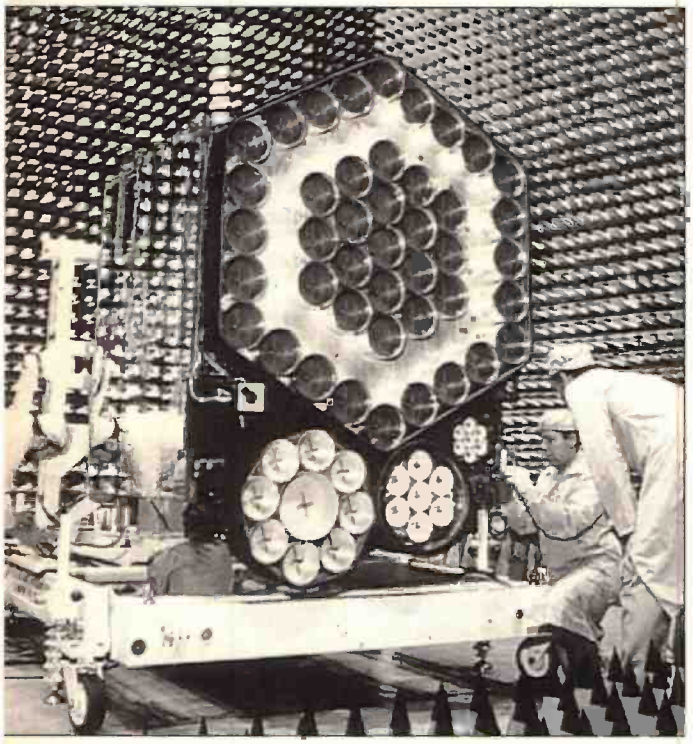
As we can see now, much of what Clarke proposed in his 1945 paper has become commonplace. One fact he missed, though, was that developments in electronics would make unmanned communications satellites possible long before there were any permanent manned space stations. He had pictured his 'extraterrestrial relays' as large structures with their own operational and maintenance crews, but in fact miniaturisation and the invention of the transistor made human presence unnecessary.

Clarke, however, still believes that space communications would be much more reliable with personnel out in space, saying that "a troubleshooter who knows how to replace a component costing a few cents can put a multi-million dollar satellite back on the air". Quite a lot of the space debris languishing in orbit - "junk costing many times its weight in gold" - could, he says, "be fixed by a screwdriver and a good mechanic".

During the 1940s and 1950s, Clarke propounded his theories about communications satellites extensively in books and articles. His first novel, *Prelude To Space* (1950), plugged communication satellites, and in 1952 his earlier work *The Exploration Of Space*, about the synchronous satellite network, was published as a Book Of The Month Club edition. In this way, by the end of the 1950s, anyone seriously interested in space travel would have been aware of the potential of these satellites. Clarke himself has admitted, though, that "probably few knew where the idea originated". He has subsequently rued that he didn't patent his idea, while realising that it wouldn't have been possible even if he had made the effort - and that, in any case, a patent's life span is only 17 years, and his would have expired just as the Communications Satellite Corporation was set up in 1962.

Telstar, launched in the same year, was funded entirely by private investment and was a significant step toward the commercial realisation of Clarke's idea. But the principal contributors towards the development of satellite communications in the 1960s were not private investors but space agencies such as NASA in the USA, the European Space Research Organisation (now the European Space Agency), NASDA of Japan and Intelsat (the International

The BT coast earth station at Goonhilly, Cornwall.



An Inmarsat-3 satellite in the test chamber.

Telecommunications Satellite Organisation, based in Washington, DC).

In 1979, Inmarsat was established to serve the maritime community by pioneering the use of satellite technology for mobile communications. It has since evolved to become the world's leading provider of global mobile satellite communications for commercial and distress and safety applications at sea, on land and in the air. An inter-governmental organisation with 79 member countries and headquarters in London, it offers various mobile satellite communications systems (Inmarsat-A, B, C, E, M, mini-M and Aero), which can support all-digital and direct-dial telephone, telex, facsimile services, electronic mail and data communications. Applications of these services include data reporting and polling, position reporting, safety and emergency alerting, remote monitoring, control and data collection. There are more than 80000 Inmarsat terminals commissioned for use worldwide.

A prototype of the ICO global hand-held phone and the intermediate circuit orbit (ICO).

Is Arthur C Clarke impressed by these giant strides that mankind has made in the past 50 years? Perhaps the highest accolade comes when he says: "Any sufficiently advanced technology is indistinguishable from magic".

THE RENAISSANCE MAN

Clarke's invention of communication using satellites in geostationary orbit has brought him the nickname "Grandfather of Satellites" and such official honours as the 1982 Marconi International Fellowship, a gold medal of the Franklin Institute, the Vikram Sarabhai Professorship of the Physical Research Laboratory, Ahmedabad, the Lindbergh Award and a Fellowship of King's College, London.

The Arthur C Clarke Centre Award is given in his honour for distinguished services to satellite communications and the International Astronomical Union has named the geostationary orbit the Clarke Orbit.

Probably the most celebrated science fiction writer of the 20th century, Clarke has written more than 60 books, with 50 million copies in print. Among the many prizes he has won are the Kalinga Prize for science writing, which is administered by UNESCO (1962), the AAAS-Westinghouse science writing prize (1969) and the title of Grand Master from the Science Fiction Writers of America (1986). In 1968 he shared an Academy Award nomination for an Oscar with director Stanley Kubrick for the film version of his book *2001: A Space Odyssey*. The Arthur C Clarke Award is given annually to the best British science fiction novel.

Clarke is a member of the Academy of Astronautics, the Royal Astronomical Society and many other scientific organisations, and is a past Chairman of the British Interplanetary Society.

He co-broadcasted the Apollo 11, 12 and 15 missions with Walter Cronkite for CBS.

In 1995, the phenomenal influence he has had on global communications was recognised in the exhibition *Eye To The Future* at the Science Museum in London.

His recent non-fiction book, *How The World Was One*, is a history of global telecommunications, and has spawned a Japanese TV series which he hosted. In the book, he proposes that telephone companies should abolish all long-distance call charges. Clarke believes that the Next Big Thing in global communications will be the personal telephone. He told *Wired* magazine: "That's it - when everybody has his or her own personal communications devices. It's started with the cellular telephones, and it'll go further with the cellular satellite telephones."

At the age of 82, he can see just that happening. Inmarsat is following his prediction with the formation of ICO Global Communications. A private company with its origins in Inmarsat, ICO is developing what should be the world's first global hand-held mobile telephone. The ICO telephone should become commercially available in 1999 - just 54 years after Clarke made what must have seemed his astounding claims on the future of global communications.

Earlier this year, he officially opened the Arthur C. Clarke Building of the Defence Evaluation and Research Agency at Farnborough - from the comfort of his own home in Sri Lanka.

Speaking via a satellite link from his home in Sri Lanka to those present at the ceremony in Hampshire, Dr Clarke said: "I never believed or expected that we would see men on the Moon while I was alive. We have seen the exploration of all the solar system except Pluto, and I hope to see that. The images coming in from the satellites of Jupiter, for example, are a revelation. The big disappointment is manned and womaned space exploration.

"There is a hiatus now, but we will go back into space with cheaper, better, safer systems sometime in the next century, and that is when the real space age will begin". ■

All pictures courtesy of Inmarsat

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73 from Dave G4KQH, Technical Manager.

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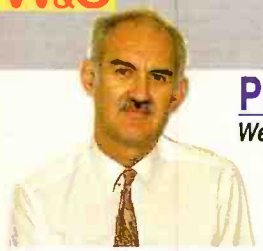

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PRICE DOWN

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- Passband tuning
- Enhanced AGC
- Noise spike compression
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W&S £1449

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- SSB CW FM WFM AM
- 1000 Memories
- 4 IF Bandwidths
- Alphanumeric
- Analogue S-meter
- RS-232 interface
- IF shift & Audio filter
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- Min tuning step 10Hz
- Sleep timer & record
- 12v DC supply

AOR AR-5000

SAVE £400

W&S £1349

PRICE DOWN

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- 1000 Memories
- 2100 Pass channels
- 5 Independent VFOs
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Price Match

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* Computer control outlet
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* Illuminated Display
* Programmable Steps
* Ni-cads and AC charger.

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* Illuminated Display
* Audio and Carrier Search
* Signal Strength meter
* RF atenuator switch
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Great Value **W&S £269**

Price Match

* 100kHz - 1650MHz
* NFM, WFM, SSB, AM
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* Illuminated keypad - display
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* 30 Ch. per second speed
* Unique mode scan
* Ni-cads & AC Charger

Yupiteru MVT-7200

Special **W&S £359**

Price Match

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* 1000 Memories
* Illuminated kepad - display
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* Improved SW reception
* Improved selectivity & batt drain
* 30 ch. steps per second
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W&S £348

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* Ni-cads and charger

OptoElectronics Xplorer

PRICE DOWN

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* Computer interface option
* Ni-cads & AC charger

WATSON FC-128 Counter

W&S £79.95

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This new model has a wide frequency range and is powered by internal ni-cads. External BNC socket with aerial makes it very sensitive. Supplied with AC charger, it is very well built. Don't be fooled by the price!

WATSON QS-400

NEW **W&S £9.95**

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Drake SW2 Receiver

When I had the pleasure of reviewing the Drake R-8A I gave a brief history of the background to its development. The Drake company started out its manufacturing life with a high performance receiver, and despite their expansion into other manufacturing fields, someone in the company is keeping alive the skill and expertise in the designing and making of h.f. receivers. This is demonstrated by the SW2, which clearly shows a design balance between cost, performance and features which will be hard to beat.

TWO FIRST IMPRESSIONS

It's said that first impressions are important, but with the SW2, as in other receivers, you get two first impressions; one when you unpack it and sit it on the bench, and the other when you first switch it on. Unpacking the SW2 reveals a pleasant looking radio with very obvious controls and a forward facing loudspeaker - that's always a good sign for the listener because that's where you need the speaker, isn't it? Lifting it out of the box is easy because it weighs a modest 2.6kg, including the mains adapter - but that, presumably, refers to the American model because the UK version comes with a very chunky power supply, which is a bit heavier. The receiver is a very convenient size, measuring 276(W) x 111(H) x 194mm (Depth including front panel knobs). This gives a decent front panel area in which to lay out the controls, so that you don't need a pencil to poke at dinky little knobs and buttons. Even my clumsy fingers coped easily. The front panel, as you can see from the photographs is uncluttered, the back panel even more so, the only connectors being the SO-239 and terminal block antenna connectors, a power input socket, and a 6mm jack socket for an external loudspeaker. There is also a sneaky little headphone jack socket lurking on the left hand panel edge, which you only discover when you read the handbook - and we all read handbooks, don't we?

IMPRESSED

So - I connected the power supply, switched it on and was immediately impressed by the way it lit up. This is not a shy, shrinking violet of a receiver; it leaves you in no doubt as to what it is doing and where it is going because the main frequency display comes up with large, bright yellow digits against a coal black background. In contrast (that's intended to be a pun) to many receivers these days, I found that I could read the frequency from 5m away at the other side of the room, which, when I used the infra red remote controller, made operation ever so easy. I decided there and then that this was a cheeky little radio that anyone would enjoy using. So I used it, and here is how I found it.

SIMPLE

The front panel is simple but comprehensive, with no dual or triple function controls apart from the tuning knob which doubles as a memory channel selector, of which more later on. As I said, the main display is outstandingly easy to read, with the frequency displayed to 100Hz at all times. The brightness and the colour make it the best display I have seen in a long time, but if it's too bright for the user, Drake provide a button marked with the symbol of a light bulb which, when depressed, dims the readout to a lower level. To the left of the frequency readout is the signal strength meter - but it's not a meter, it's a vertical row of yellow lights, calibrated more in hope than expectation with traditional 'S' units. Below the frequency are five smaller legends which indicate mode in use (AM, Sync, LSB, USB) and a power 'on' lamp which is lit whenever power is applied to the rear panel socket, whether or not the receiver is switched on. This is useful, because most other receivers using external power supplies (the AR7030 is an exception) give no indication that your little black brick plugged into the mains socket is still delivering power to the receiver - with dire consequences for your insurance claim should it decide to burst into flames when you are away on holiday - or do real enthusiasts take their radio with them? One thing to mention here is that the SW2 still draws 400mA from the supply even when the receiver is switched off, and 650mA when switched on. No wonder the power supply is chunky. I was initially concerned to see that the supplied power unit had a facility to switch the output polarity, but when I took off the receiver covers I found that the power input socket was not connected directly to the receiver supply lines and ground, but to a diode bridge. This told me that (a) the US a.c. adapter was in fact just a mains transformer, and (b) it didn't matter what polarity an external d.c. supply was, because the diode bridge sorts it out automatically - think about it. However, if one side of the external d.c. supply is inadvertently connected to the same ground as the chassis of the receiver you stand a fair chance of zapping one of the bridge diodes, so perhaps it's as well to keep the polarity as stated in the owner's manual.

To the right of the frequency display are two smaller (but equally bright) digits which indicate memory channel from 00 to 99 when using the memory store and recall system, or the broadcast or amateur band in use when using the receiver in tuneable mode. No less than twenty different bands are stored within the receiver, and the band in use is automatically shown

SPECIFICATIONS

Frequency range:	100kHz to 30MHz continuous	
Sensitivity:	a.m.	<2.0µV (10dB (S+N)/N, 1kHz, 30% mod.)
	s.s.b.	<0.5µV (10dB (S+N)/N)
Selectivity:	a.m.	6kHz @ -6dB
		<12kHz @ -60dB
	s.s.b.	2.3kHz @ -6dB
		<5kHz @ -60dB
IF Frequency:	1st IF	55.845MHz
	2nd IF	455kHz
Readout Accuracy:	to nearest 100Hz	
Antenna Inputs:	SO-239 socket 50Ω	
	Screw terminals 50Ω	
Power:	12V d.c. @ 1.5A	
	Mains using supplied adapter.	
Size:	276 x 111 x 194mm	
Weight:	2.6kg (Includes a.c. adapter)	
Optional Extras:	Carrying handle, Mobile mounting kit, Infrared remote control.	

We are all aware of the fierce battle going on between receivers in the £799 price bracket, but lower down the scale there has been a huge gap in which the Lowe HF-150 and HF-225 have had things all to themselves. However, Drake have spotted the opportunity and their new baby, the SW2, looks like shaking things up a bit and giving the short wave listener a real alternative to consider. Is the SW2 a worthy contender? Read on and find out what John Wilson thinks.

when you tune within the limits stored. However, the amateur band limits are those used in America, and there are differences in Europe - for example, the 80 metre band stops well below the 4MHz shown on the SW2. However, where an amateur band overlaps a broadcast band, as in the case of 40 metres where the SW2 starts its broadcast band at 7.1MHz but also has the 40 metre amateur band carrying on to 7.3MHz, the band in use changes according to the receiver mode in use, so if you listen above 7.1MHz in s.s.b. mode, the display shows '40', indicating the 40 metre amateur band. If you change mode to a.m. or Sync. a.m., the display changes to '41' indicating the 41 metre broadcast band. Despite these little quirks, it's a neat feature and shows that the designers put some thought into defining user needs. Finally, to remind you what the two digits are showing you, a legend appears reading 'MEM' when in memory mode, and 'METER' when showing the band in metres. I will repeat what I said before about the difference between 'Meters' and 'Metres'. Who was it who said "Britain and America are two nations separated by a common language". My electricity and gas consumption are measured by two meters, but when I want to go on the air as G3PCY I often use two metres...

MEMORY CHANNELS

100 memory channels are provided in the SW2 and these store frequency, mode and sync on/off. Drake pre-programme the first 32 channels with typical short wave frequencies just to get you going, but any or all of these can be erased and overwritten if you wish. When in memory mode, either the tuning knob or the up/down pads can be used to scroll through the memory contents, and any channel which has no data in it is ignored. Once a memory channel is recalled by holding down the 'MEM' button for a second or so, the receiver can be tuned away from the recalled frequency without affecting the contents of the memory store. There are no scanning or searching facilities provided for the memory function, but this is not a real drawback because in my experience most listeners prefer to use short wave receiver memories as an electronic notebook in which to list favourite frequencies.

Table 1.

Spacing from wanted signal (kHz)	Reciprocal mixing ratio (dB)	dBc/Hz
5	70	104
10	80	114
20	93	127
50	104	138
100	111	144

TUNING KNOB

The main tuning knob is a lightweight affair, but because of the smoothness of the encoder which it drives the light weight doesn't seem to matter. The receiver tunes in 50Hz increments which means that you don't have to spin the knob like a kitten playing with a ball of wool to get around, whilst at the same time with a tuning rate of about 1.2kHz per knob revolution it's easy to pin point any signal you are likely to hear or want to hear. Alongside the tuning knob are two large pads marked with up and down arrows which tune the receiver in 5kHz steps. If you hold either pad down the 5kHz step rate increases rapidly until the receiver is racing across the spectrum at high speed (I measured it at 200kHz/second). Pressing either pad forces the tuned frequency to the nearest whole 5kHz step, and this is a very useful feature for tuning short wave broadcast bands where each press of a pad automatically drops you exactly on to the next broadcast frequency. However, there's also a keypad on the front panel and this makes the tuning arrangements as complete as possible.

KEYPAD

The keypad is laid out in standard telephone format, and frequency entry couldn't be easier. Simply enter the frequency you require in kilohertz followed by either of the up/down tuning pads used as an 'ENTER' key - or if you are idle like me you don't have to press the tuning pads because the receiver will automatically go to the frequency you have keyed in after a short delay. Incorrect entries can be deleted by the 'CLEAR' key - and that's all there is to it. Impressively easy to use and very conveniently located.

The only other keys on the panel are the 'MEM'/'VFO', the use of which is obvious, and the mode select keys. Pressing the AM/SYNC key once puts the receiver into normal a.m. mode, whilst a second press enables the a.m. synchronous detector, after which the button toggles between the two modes. The a.m. performance is very good, but the synchronous detector is outstanding. Listening to a signal which is suffering from frequency selective fading and pressing the SYNC button causes the 'SYNC' legend on the display to flash whilst lock is achieved, after which the received signal just stands out from the noise and distortion like a lighthouse in a stormy sea. There are no bleeps and bloops whilst the detector locks, and once locked, the receiver can be tuned about 2kHz either side of the frequency whilst the detector hangs on to it for grim death. To make the system even better, Drake have designed the detector so that you can select either sideband of the received a.m. signal by pressing the 'SSB' mode button and toggling between u.s.b. and l.s.b.. Although not mentioned in the operator's manual, I also found that by slowly off tuning to one side or the other whilst the detector stays firmly in lock, you can use the main tuning knob as a pass band shift control to great effect.

TOGGLES

To change to s.s.b. reception you must remember to come out of 'SYNC' mode before pressing the 'SSB' button. This then toggles between upper and lower sideband reception with the receiver staying spot on frequency at all times. I found both frequency accuracy and stability to be excellent, and could confidently go to any frequency knowing that the receiver readout was telling the truth. Received s.s.b. quality was very good on either sideband, and both amateur radio stations and commercial traffic were easy copy, aided by the larger than normal front facing loudspeaker. The volume control operated smoothly and there was more than enough audio to make the neighbours notice, and in case you thought I had forgotten to mention it - there is an 'RF Gain' control.

RF GAIN CONTROL

Drake's communications background shows through everywhere in their receivers, and although the 'RF Gain' control is not of the 'pedestal' type, it provides a well graduated reduction in receiver gain when signals are stupidly strong - but doesn't reduce it to zero. I was curious about this and asked the Drake distributors, Nevada, if they had a circuit of the SW2 so that I could find out how things worked. I was somewhat taken aback by the arrival next day of a long tube containing no less than four A2 size sheets of circuit drawings. This may be a smallish receiver, but my word, there's more in it than you could imagine, and I really enjoyed seeing how clever Drake have been in their design. As far as the 'RF Gain' control is concerned, it operates by changing the gain of an amplifier stage between the first i.f. filters and the second mixer, thus giving a reasonable gain range (I measured it at 37dB) without shutting down the receiver totally.

Although there is no a.g.c. speed selection available to the operator, there are in fact two a.g.c. time constants selected by mode (actually selected by the i.f. filter switching line when you take a quick peek at the circuit). Time constants are not quoted in the specification, but it's the normally accepted slow decay for s.s.b. and not so slow decay for a.m. The a.g.c. worked well, with no sign of overshoot or signal distortion on any signals that I could find. Two i.f. bandwidths are provided by high quality 455kHz ceramic filters having nominal 6dB bandwidths of 2.3kHz for s.s.b. and Sync.a.m., and 6kHz for a.m., and both

filters have excellent shape factors. There is no provision for fitting additional filters, but since the dimensions of these filters are fairly standard I imagine that it would be an easy job to substitute other filters if you wished - but only by a competent person with some experience in these matters.

Additional selectivity is achieved by the first i.f. roofing filter operating at 55.845MHz but the bandwidth was not quoted on the circuit so I can't enlighten you on that. The front end of the SW2 has been designed for good r.f. performance, using a classic pair of 2SK152s in a balanced mixer fed with high level local oscillator injection from the main frequency synthesiser. Masses of filtering both before the mixer and in the local oscillator feed again show attention to design detail, and the SW2 clearly shows its design heritage in the overall excellent r.f. figures given later. Protection at the antenna input has been provided by both a diode network and a neon discharge lamp.

UNCLUTTERED

Taking a look inside the SW2 reveals well laid out circuit boards with the r.f. and i.f. sections at the top of the enclosure and the synthesiser section on a separate board at the bottom. There is room enough to achieve an uncluttered look to everything, and all the connectors used are of high quality. I noticed what appeared to be an assembly inspector's mark with the name 'Al' and alongside it a pen written '73'. Well, 73 to you too, Al, but you forgot to put a fixing screw in the corner of the r.f. board next to the antenna socket.

On the test bench the SW2 surprised me with its good r.f. performance. Using the by now standard 'JT' method of measuring third order intermodulation distortion gave a very creditable +11dBm with an intermodulation free dynamic range of 91dB at 20kHz spacing. This is better than either the HF-225 or HF-150 receivers in the same price bracket, and actually better than the NRD-345 that I reviewed recently. Sensitivity was just right at -118dBm for s.s.b. and -109dBm for 60% modulated a.m., and the gain was flat within about 1dB across the whole receiver tuning range, including the medium wave where so many Japanese receiver manufacturers stick the dreaded 20dB attenuation. The reciprocal mixing performance was equally good (and better than many) as can be seen from the table (opposite left) .

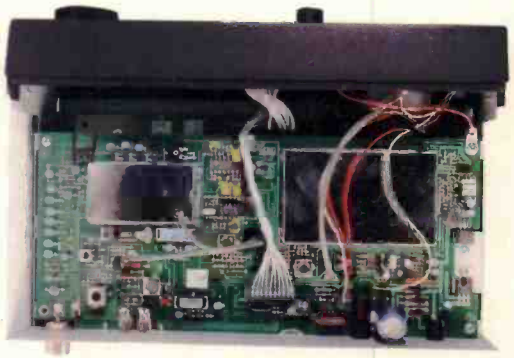
'S' METER

The 'S' meter calibration was far from accurate, with only 6dB separating S1 from S9, but within the limited readout facility provided by a vertical row of lights perhaps I expected too much. However, the calibration was the same at all frequencies, so it's consistent even if strangely wrong. I can't believe that this was a normal result, bearing in mind the quality of the rest of the design, so don't take this as a serious complaint. At least it proves that this was not a carefully prepared 'review sample' receiver.

Tuning the receiver around with no antenna connected revealed a small number of low level spurious signals, but few even registered on the 'S' meter, which means that they were below half a microvolt or so and not worth considering when you connect any kind of antenna - even a few feet of wire. In fact the receiver performed well on a few feet of wire even allowing for the lack of a high impedance input. However, the connection of a MyDel Balun from Martin Lynch solved that problem and made the receiver even more lively. It also gave me the chance to try out the balun, which proved just how useful these little accessories can be.

REMOTE CONTROLLER

Sorry - back to the subject in hand. I mentioned earlier that I had used the Drake infra red remote controller, and I did find it useful. The controller looks like any of the units we find on TV sets these days and provides all receiver functions including direct frequency entry, tuning in 50Hz or 5kHz steps, memory recall, mode switching, light dimming and so on. There is no control over receiver audio volume, but if your dearly beloved tries to talk to you whilst you are listening with breathless anticipation to *Media Network*, you can silence Jonathan Marks instantly by use of the Mute button on the controller. The infra red beam seemed to work from anywhere in the room, even when I pointed the handset at the ceiling or the floor and I can see this as a 'must have' accessory for the SW2.



CE MARKING

One final point is that the SW2 handbook, which is aimed at the non-technical user, contained an extremely detailed certificate of conformity showing not only that the SW2 has been tested for compliance with European standards for CE marking, but listed every single Euronorm standard which had been applied. As with JRC and the NRD 345 that I reviewed recently and which was also correctly CE marked, it seems that the better manufacturers are taking great care to supply their representative suppliers with properly certified equipment.

CONCLUSIONS

As always, I try to put receivers in their particular market slot and compare them with competing models, which is relatively easy in the £799 bracket because there are several to choose from. Because Drake have come into the £400 - £500 region, the SW2 comes head to head with the highly respected HF-150. I understand from the local Lowe branch that the HF-225 is now out of production, but that would be the only other unit in the same bracket. The SW2 is clearly at home at home - which is a strange way of saying that it looks friendly on the operating bench. The SW2 wins hands down on display legibility and control convenience, and has a built-in keypad frequency control, which comes as an extra cost option with the HF-150, although the HF-150 list price is cheaper than the SW2. The frequency readout is not only easier to see on the SW2 but also reads to 100Hz unlike the 1kHz of the HF-150. In r.f. performance, the SW2 is somewhat better than the HF-150, and I just found it so much easier to use because all the controls on the SW2 were clearly marked with their function and fulfilled those functions admirably. However, the HF-150 has a wider selection of i.f. bandwidths and a high impedance wire antenna input - add another £23 to the Drake price for a Balun - so it's a matter of personal choice at the end of the day.

I do believe that Drake have a real winner here, and if you are contemplating a new receiver this year, I advise you to take a close look at the SW2. You will be pleasantly impressed. ■

My thanks go to **Nevada Communications, 189 London Road, North End, Portsmouth, Hants PO2 9AE. Tel: (01705) 662145** for loaning me the receiver for review and being unbelievably helpful when I asked for more technical information. The SW2 costs £449. The infra red remote control costs an extra £49.95, the carrying handle is £7.95 and the mobile mounting kit £14.95.

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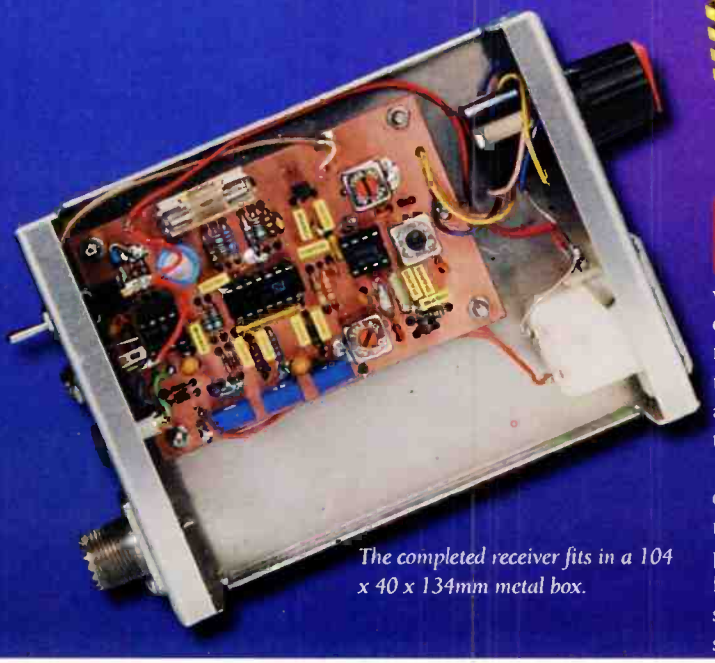
THE COMPACT NAVTEX

Mike Rowe G8JVE, fed-up with having to leave his main station receiver monitoring a single channel, solved the problem by designing this handy, dedicated NAVTEX receiver.

BUILD ME!



The completed receiver fits in a 104 x 40 x 134mm metal box.

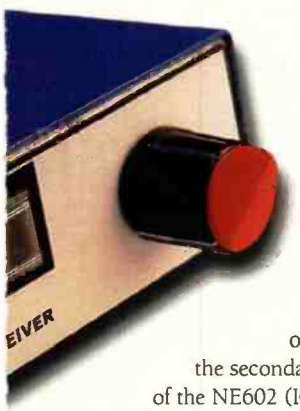
NAVTEX transmissions on 518kHz are transmitted regularly throughout the day and night by coastal stations all around the world. All transmissions use the same frequency as each station is allocated a specific time slot for its main transmission of weather forecast and navigational warnings. Additional transmissions are also made of immediate warnings in between the regular time slots.

I have monitored these for a considerable time, but due to the intermittent nature of the transmissions, this meant tying up my main station receiver for long periods. As a result of not being able to listen to other frequencies whilst monitoring 518kHz, I designed this simple but effective NAVTEX receiver to receive the local stations.

RECEIVER

THE RECEIVER

The receiver, which operates from an external 12V supply, is a direct conversion type with a limited tuning range, it features a single audio i.c. which functions as i) a fixed gain audio amplifier, ii) a 1275Hz filter, iii) a 1445Hz filter and iv) a combining fixed gain audio amplifier. An operational amplifier is used to produce a square wave signal suitable for the RS-232 serial port of your computer.



THE CIRCUIT

Signals arriving from the antenna are coupled by a bandpass tuned circuit consisting of T1 and T2 - see Fig. 1. These are different types of transformer, T2 has more turns on the secondary to match the input impedance of the NE602 (IC1) mixer chip.

The onboard oscillator of the NE602 is used, T3 is tuned to 518kHz by C5,C6, with a small amount of variation (about 15kHz) provided by the Varicap D1. The voltage used to drive the Varicap and the NE602 is derived from a 78L05 voltage regulator, IC2, this makes the circuit independent of the supply voltage.

The resultant output from the mixer (at audio frequency) is capacitively coupled to the first audio amplifier IC3a. This has a fixed gain of approximately 40dB. Any remaining r.f. from the mixing process is removed by the low pass filter comprising C11 and C13.

At this point the signal is split into two identical paths, IC3b and IC3c. Each section is an identical tuned filter, one is to be adjusted to 1275Hz and the other to 1445Hz. These are the only two frequencies we are interested in NAVTEX, any other frequency will simply cause interference to the received signal.

The outputs from both filters are recombined in IC3d and given a further 40dB amplification.

The output of IC3d is also split into two paths, one feeding a simple signal level meter, and the other the computer interface.

The interface is a simple *HAMCOMM* type interface as described in the auxiliary files supplied with *HAMCOMM*. The comparitor interface is powered from the serial port of the computer running *HAMCOMM*. I make no claim for originality for this part of the circuit! The only difference is the addition of D9, an 8.2V zener diode to limit the input voltage to pin 3 of IC4. This could occur on a strong signal when the output lines of the computer supply approximately 10V to IC4.

The signal level meter has a voltage doubler to improve meter response.

CONSTRUCTION

The whole receiver is designed around one double-sided p.c.b. track, component layout and details of the ground plane are shown in Fig. 2.

Before beginning construction, carefully check the p.c.b. for any hairline cracks or whiskers which can form short circuits between the tracks.

If you are making your own p.c.b., please make sure that you pay attention to the key on the earth plane, as many tracks and components are connected to both the earth plane side and the track side of the board. It is essential that the earth plane has no clearance around these connections.

Construction proper is best started by fitting the integrated circuit holders for the three i.c.s, followed by the two wire links. These should be made with insulated wire to prevent short circuits to the ground plane.

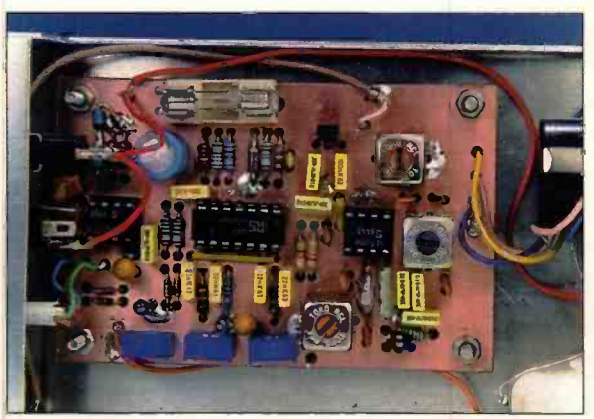
This will give you some reference points for fitting the rest of the components. I would recommend you fit the resistors and diodes next, making sure the diodes are the correct way round. The Veropins and the fuse holder can be fitted at this stage.

The following voltage readings were obtained on the prototype with a supply of 12V:-

	Pin	V
IC1	1 & 2	1.25
	8	5
	4	3.6
	6	4.8
	7	4.2
IC3	1,3,5,7,8,10,12,14	6

Now fit the capacitors, again making sure of the polarity of the tantalum and electrolytic types. Take extra care when fitting the polystyrene types (C5, C6) as these can be easily damaged by too much heat.

The transformers are standard Toko 468kHz i.f. transformers, with the internal tuning



Prototype p.c.b. mounted in case, interconnections are made via Veropins.

YOU WILL NEED

Resistors

Carbon film 0.25W 5%

1.2kΩ	2	R2, R13
2.2kΩ	2	R11, R12
10kΩ	2	R14, R15
22kΩ	1	R3
47kΩ	2	R5, R6
100kΩ	6	R4, R9, R10, R16, R18, R19

Potentiometers

10kΩ *lin*	1	R1 (see text)
Miniature Preset		
500Ω	2	R7,8
10kΩ	1	R17

Capacitors

Polystyrene

220pF	1	C6
560pF	1	C5

Disc ceramic

12pF	1	C2
47pF	1	C8
150pF	2	C1, C3
1nF	1	C13
10nF	2	C7, C11

Min. polybox

22nF	4	C14, C15, C16, C17
100nF	8	C4, C9, C10, C12, C21, C22, C25, C26

Tantalum 16V

1µF	1	C23
10µF	3	C18, C20, C24

Electcolytic 16V

220µF	1	C19

Semiconductors

Diodes

BB204	1	D1
1N4001	1	D8
BYZ88C8V2	1	D9
1N4148	6	D2, D3, D4, D5, D6, D7

Integrated Circuits

NE602	1	IC1
78L05	1	IC2
LM324	1	IC3
LM741	1	IC4

Wound Components

Transformers

YHCS1098AC	2	T1, T3 Toko (Cirkit)
YHCS1100AC	1	T2 Toko (Cirkit)

Miscellaneous

Fuseholder (20mm p.c.b. type); 250mA, 20mm fuse; tuning meter (Cirkit 900 series); SO-239 socket; Veropins; case; co-axial power input socket; s.p.s.t. min. switch; connecting wire; 9-pin or 25-pin D-type to suit serial interface.

capacitors removed. This is best done by 'scrunching' the existing capacitor with a pair of fine pliers and cutting off the small 'end' wires.

After modifying the transformers these can now be fitted, note that T2 is different from T1 and T3.

Finally fit the voltage regulator and the three ICs (noting orientation).

The p.c.b. is fitted into the case on small mounting pillars.

Although I used a multi-turn tuning control (R1) to give slightly better tuning, there is no reason why a standard control could not be used if preferred.

ALIGNMENT AND TROUBLE SHOOTING

Before switching on, check the 12V and 5V lines for any short circuits and if any are discovered, remove them before proceeding. The most likely cause is whiskers of copper not cleared from the holes on the ground plane.

If all is well, connect the interface to the computer. Check that IC4 has about -12V on pin 4 and +12V on pin 7.

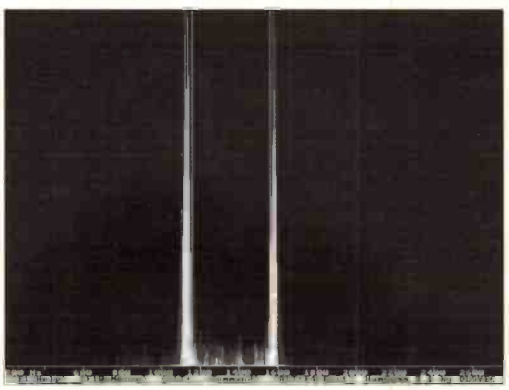
Set the tuning control to about 50% rotation and connect 12V to the receiver. Using a frequency counter connected to TP1, or a second receiver, tune T3 to 518kHz.

Set the three presets to 50% rotation.

Feed a 518kHz signal into the antenna socket, and using the *Hamcomm* display (F7) tune until the signal is seen on the left hand one of the fixed frequency lines (1275 & 1445). Tune R8 for maximum response both on the *Hamcomm* display and the tuning meter, adjusting R17 as necessary to keep the reading on the scale. Retune the receiver until the signal is seen on the right hand line of the *HAMCOMM* display. This time tune R7 for maximum.

Both of these should occur around about 50% rotation, but a false reading can occur if either of the presets are at the extreme end. Next adjust R17 to give f.s.d. on a strong signal.

Finally adjust T1 and T2 for maximum reading on the meter.



Example of the spectral display produced by Hamcomm whilst receiving a signal, ideal for use during aligning the receiver.

Continued on P45

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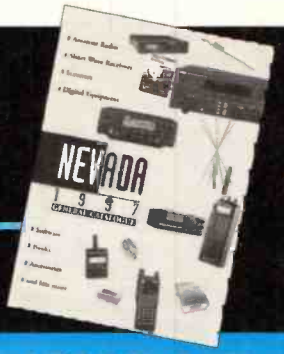

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- 12V or 240V operation with power supply supplied
- Sensitive receiver
- 2W audio output
- 10/12.5/20/25kHz scanning steps

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SCANNING RECEIVER WITH PANORAMIC DISPLAY

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• 10 MHZ - 1.4 GHz • 400 memories • Software for PC inc. • Supplied c/w antenna, Nicads & charger.

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1 MHz - 2.8 GHz 9 digit LCD. Supplied c/w Nicads & charger.

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Improve the reception of your scanner with this Japanese made low noise pre-amp.

- 24 - 1500MHz
- Variable gain (+20 to -3dB)
- 3 bandpass filters
- Battery or 12V operation

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- Power supply: 12V DC @ 350mA
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If your scanner is suffering from overloading, blocking or breakthrough then the SNF-170 could help. Its a tunable notch filter from 85-175MHz that will eliminate broadcast or public service breakthrough. Notch approx 30dB plus 70dB rejection below 1.7MHz.

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Vastly improves reception on short waves - fully adjustable to suit your room, attic, garden and extends to 45ft if required. Supplied c/w fitted BNC plug, support line and insulator ready to go.

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ACTIVE WIDEBAND ANTENNA

For the serious listener, active antennas give the ultimate reception.

- Variable pre-amp gives 20dB gain
- Covers 500KHz - 1500MHz
- Japanese high quality

12V SUPPLY REQUIRED

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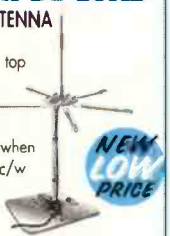
500kHz - 1500MHz

A beautifully engineered top performance desktop antenna. Should substantially improve your scanners reception when used at home. Supplied c/w 4.4mtrs of good quality cable & fitted BNC plug ready to go. May be mounted on the floor, ceiling, wall or desktop



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- AM/SSB
- 100 memories
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A new low cost receiver from this famous American manufacturer with exceptional sensitivity, selectivity and dynamic range. A ruggedly built radio that is easily transported with optional carrying handle or vehicle mounted for mobile use.

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WE CAN NOW OFFER THIS RADIO AT AN EXTRA LOW PRICE!

The receiver provides solid coverage from 50kHz to 30MHz with all mode reception of AM, SSB and CW. 50 fully tuneable memory channels store frequency, mode and filter selections. The FRG100 has twin 12 hour and 24 hour programmable clocks with on timer and sleep timer. The set requires 12V DC.

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SANGEAN ATS818

- 150kHz -29.99MHz
- 87.5MHz - 108MHz
- 54 memories
- AM/FM/SSB
- AM Wide/Narrow filter
- RF gain control

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Professional *DIGITAL MULTI BAND* Radio

Portable Shortwave & VHF FM radio with RDS & SSB reception

- MW/LW/SW /FM STEREO
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- 307 memories
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- AM/SSB/FM (VHF)
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YES, we've got them IN STOCK!

This receiver is everything we hoped it would be, covering 100kHz - 2GHz and lots of features including computer control.

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An excellent, British made SW receiver, boasting more than 100 dB of dynamic range in AM mode!

- Razor sharp selectivity
- Better than 0.3µV sensitivity
- Remote control included

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EFW	End Fed Wire	(s/waves)	£59.95
DLB	Long Wire Balun		£39.95

Plastic coated flex weave wire 75p per metre

G5RV FOR THE PERFECTIONIST
- uses 450Ω ladderline & balun for coax feed.

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EFW - Shortwave Antenna
20 meter s/w receive end fed wire antenna. Balun fed, uses high quality "Flex Weave" copper wire. 1-30MHZ.

Price £59.95 £4.75 P&P

DLB - Shortwave Balun
Matches end fed long wires to 50Ω coax, helps on rec. to reduce noise & interference. Transmits up to 100W. Fully moulded for full weather protection.

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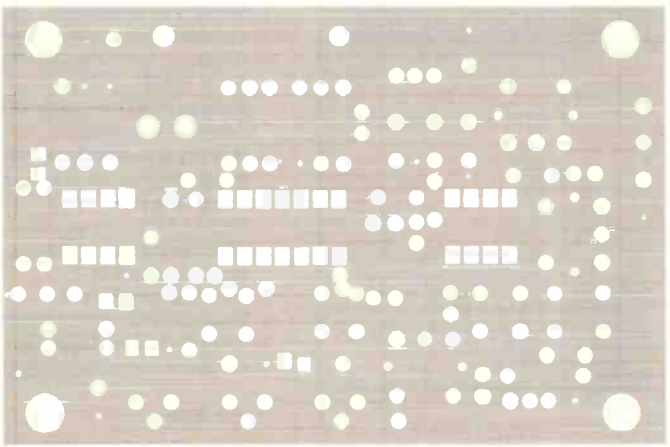
Continued From P.41

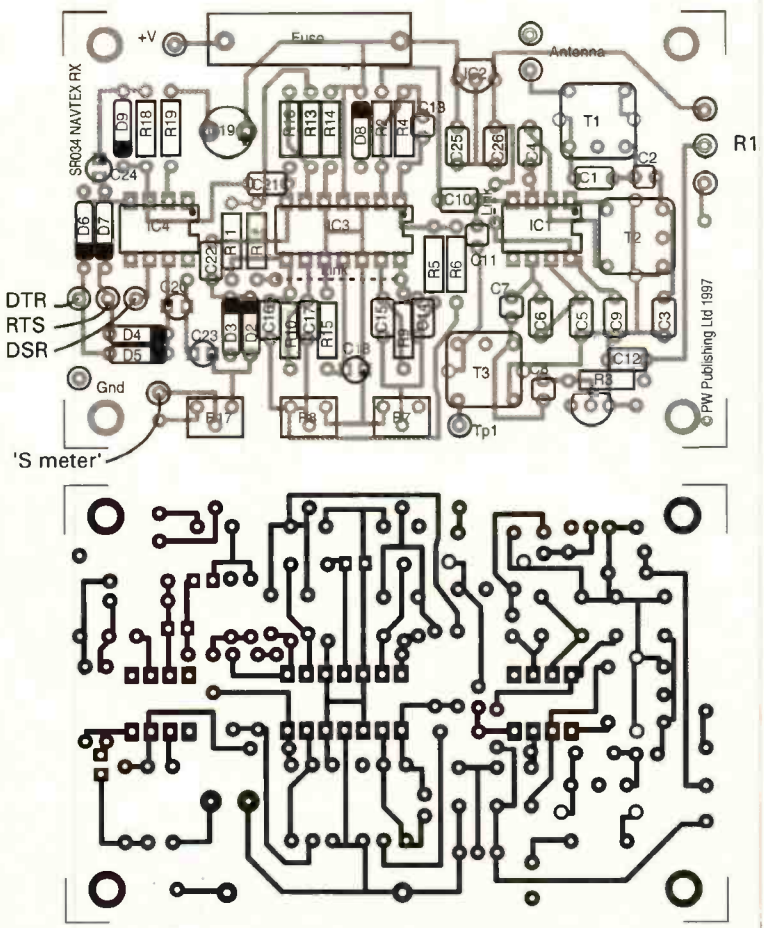
OPERATING THE RECEIVER

This receiver is designed to be operated with the excellent *Hamcomm* software obtainable as shareware see 'Decode' page 79 of this issue, or via the UK distributor, Pervisel Ltd. Because of this intended method of operation, there is no monitor loudspeaker included in the design, (although there is room for a miniature amplifier and speaker in the case).

Tuning is best carried out using the 'F7' key which gives a spectrum analyser display using the two vertical markers at 1275 and 1445Hz as tuning indicators.

If a monitor is required, a simple amplifier using, for example, an LM386 could be connected across the output of IC3d via a suitable coupling capacitor. ■





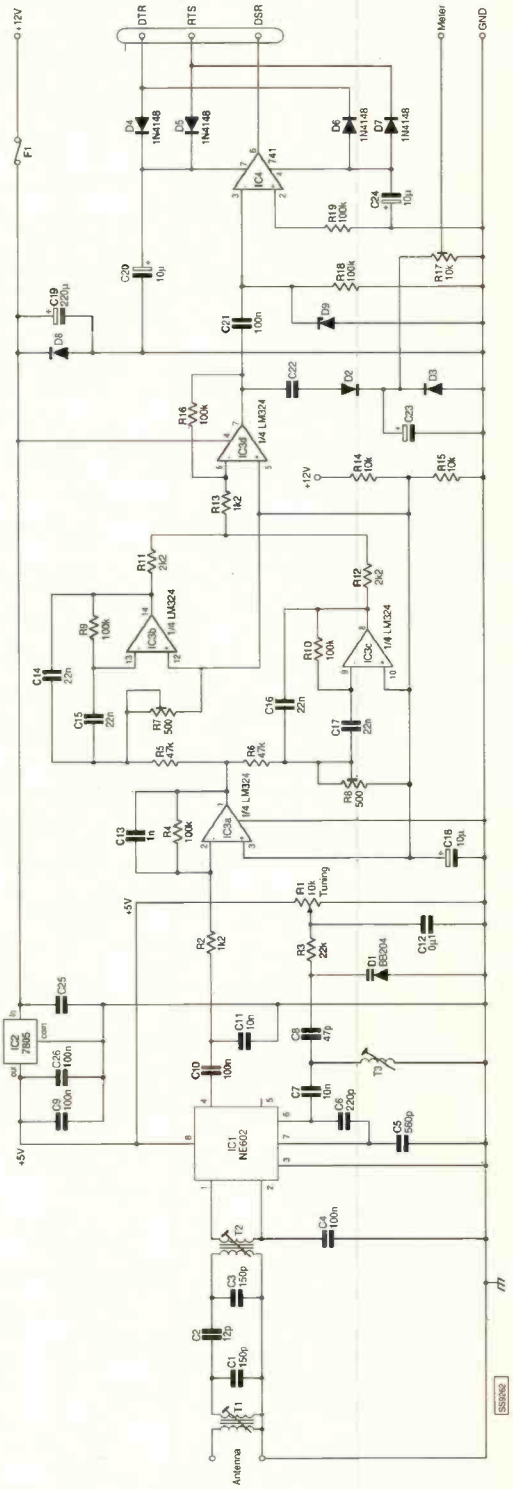


Fig. 1: Circuit diagram of the complete NAVTEX receiver.

Fig. 2:Full size Printed circuit board layout for the receiver, detailing track organisation, component locations and both earth plane connections and clearances.

BUY NOW AND BEAT THE ....NEW PRODUCTS....

Calling all HAND HELD & BASE SCANNER USERS!!!

We know that any user of hand held scanners would like to improve the performance on medium wave and shortwave, especially when used at home. Martin Lynch & Son can offer two new products to assist in boosting the usability of your scanner today!

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By offering a tuned circuit to the frequency you want to listen to on medium or shortwaves, the new ML-2Q will reject most of the rubbish that "overpowers" the scanner. The ML-2Q provides a sharp tuning "peak" at the desired frequency (set by you), simply rejecting interfering signals from other bands and I.F. Images. The unit also has a selectable attenuator. Works with any wire antenna.

£49.95 incl. VAT.
Now includes scanner/receiver lead.

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The new ML-AT2 will peak random wires, coaxial feeds and loop antennas over the entire shortwave spectrum, 500kHz - 30MHz. In addition, the ML-AT2 employs a variable "Q" Control which increases the selectivity of the tuning for better interference rejection and cross modulation.

£59.95
Now includes scanner/receiver lead.

MyDEL Long Wire Balun

The Mydel Balun is designed to reduce the impedance of a long wire to a low impedance more closely matching that of the receiver or scanner's input circuit. Will help reduce electrical noise from internally generated sources within the home. Ideal when used with the MyDEL ML-Q2 Passive Preselector.

£22.95 p&p £3.50

MyDEL Shortwave Antenna

Only 40ft (16 metres) in length, this simple to install end fed wire antenna is ideal for the newcomer to ShortWave Listening. Supplied with 15ft of coax cable and terminated with a PL-259 plug, this is ideal to use with any receiver.

£39.95 p&p £3.50

AX700mk 11

The only base scanner on the market with panoramic display at a realistic price, enabling the user to view a whole 1MHz on the built in bright-ly lit LCD TV type screen.

- 50 to 905MHz with no gaps.
- AM/FM&WFM
- 1kHz,5kHz,10kHz,12.5kHz,20kHz, 20kHz,25kHz steps
- 100 memories
- 10 search banks
- Band Scope built in
- Memory scan
- Housed in strong steel case

AX700mk11
£449.95

AX400 mk 11

The smallest and lightest handheld scanner in the world.

- 500kHz-1299.999MHz
- AM/FM/WFM
- 1kHz-100kHz step sizes
- Only 16mA in Battery save mode
- Dual watch function
- 800 memories
- 20 search bands
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Price: TBA

MVT-7100

- 100kHz - 1650MHz
- NFM/WFM/SSB/AM
- 1000 memories
- Signal strength meter
- Illuminated keypad - display
- 500 channel pass memories
- 30 channel per second speed
- Unique mode scan
- NiCads and AC charger

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Deposit £39 & 12 x £28.47 or 24 x £15.53 (19.9% APR)

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- RS-232C serial Port
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- 13 different tuning steps
- Optional Voice Announcement

RRP £1695

ML Price: £1429

...or go for our super "8500 Package"

- New Icom IC-R8500 with two years RTB warranty
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- Icom FL-52A 500Hz CW & Data Filter

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KENWOOD TS-570D/M

One of Martin Lynch & Son's best selling HF rigs is the new TS-570D, from Kenwood. So why mention it in a Short Wave Magazine. Simple! Its got the best receiver for short wave we've come across for many years. We have disconnected the transmit section (easily re-enabled) to safe guard against accidental transmission and to ensure non licensed users can legally own and use the transceiver.

- 16 bit AF-stage DSP delivers superb audio quality
- Digital filtering gives you the edge when the going gets tough
- Large clear easy to read display, showing all major operating parameters
- Set up operator engineered features using the new menu system
- CW auto tune - A world first, altering the VFO to your preset pitch
- 100 memories. Extensive Memory functions including browsing of contents
- Compact size 270x96x271. Weight 6.8kg

Supplied with Mains PSU for receiver operation.
ML Price: £1329
Available on finance, £229 deposit and 36 payments of only £39.96, cost of loan £338.66

WEB SITE: http://www.martin-lynch.co.uk

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VAT INCREASE

ICOM ICR-10E

- All mode FM, WFM, SSB, CW, AM
- 500KHz-1300MHz
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- 1000 memories
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- Full Computer access capability.

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RRP £379.

ML Price £329

Also available on Low Cost Finance, Deposit £39 & 12 payments of £26.63, Cost of loan £29.56

BAYGEN "FREEPLAY' WIND-UP RADIO

Exclusive to Martin Lynch £69.95. p&p £10

AR-3030

If you've been looking for the bargain of the year then you've come to the right spot. The AR3030 was one of the first receivers to be offered with Collins filters as an accessory.

Classically styled, the compact receiver from AOR is a DDS receiver with A TCXO fitted as standard and tuning rate of only 5Hz.

Awarded FOUR STARS by Radio Netherlands & World Radio & TV Handbook.

List price £699. A limited quantity offered at only £499 and is available on FREE FINANCE.

ML Price: £499

Deposit £99, 12 payments of £33.33, ZERO APR.

NOISE REDUCTION

Suffering from power line noise? Got a noisy street lamp or thermostat clicking away? Slip in line the ANC-4 and see it disappear. If not send it back and get a refund!

RRP £195 incl. p&p.

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Navigational Systems

Most of us have heard about them, some of us have listened to some of them, and even a smaller number of us have used them operationally. However, the majority of us have no idea on how these aids to navigation work or what they do. In this article R.A. Connolly GI7IVX explains the function and fundamentals of these various aids.

NON-DIRECTIONAL BEACONS (NDB)

Non-Directional Beacons are used by aircraft and ships in conjunction with Automatic Direction Finders (ADF) to establish their position by dead reckoning. NDBs use the m.f./l.f. band and transmit no coded information other than their Morse code ident. Generally, within Europe, the aero n.d.b.s are within the frequency range of 320 - 490kHz, although some are to be found above and below this frequency range. Marine n.d.b.s generally lie within the 284 - 320 kHz frequency range, although again there are some exceptions. The system has an operational accuracy of 5 - 10°. The ground station transmits a signal that is horizontally radiated in all directions using around 25W for an *en route* aid (see **Fig. 1**).

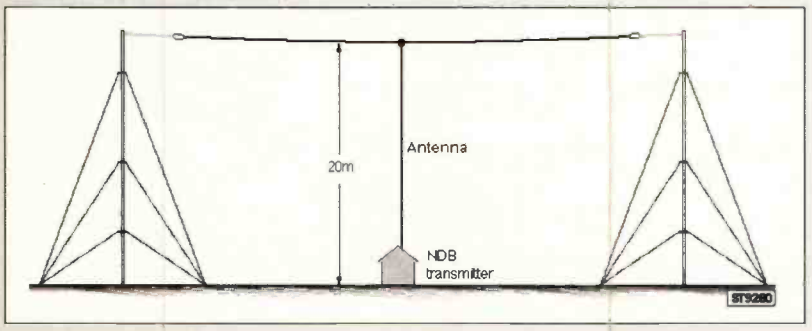

Fig. 1. Typical non-directional beacon antenna set-up.

The installation at the transmitter usually involves the use of a main and standby transmitter in order to give continuous service, along with monitors for each transmitter which gives the engineers an alarm if the transmitted carrier is reduced by more than 50%, the Morse ident has failed, or if there is a failure in a monitor. Any of these circumstances will automatically trigger a change over to the standby transmitter and send an alarm via telephone to the remote engineering station.

AUTOMATIC DIRECTION FINDERS (ADF)

Originally used for maritime purposes Automatic Direction Finding was adapted for aviation use in the early 1930s. ADF is the receiving end of an NDB system and operates using a loop antenna. Turning the loop when tuned to a specific NDB frequency causes two point of maximum reception and two points of minimum reception. This forms the basic set-up locating your position using an NDB. However as there are two points of maximum reception care has to be taken to avoid being 180°out. When the signal from a separate vertical antenna is mixed with that from the loop the maximum and minimum signals are reduced to only one.

In an operational mode, when the loop antenna is turned a remote - reading bearing indication (Radio Compass) displays the heading to the operator and moves in step with the antenna while it is being turned. The aircraft/ship can then home on the beacon or fix its position using at least three beacons.

VHF OMNI - DIRECTIONAL RADIO RANGE (VOR)

The VOR consists of a transmitting station on the ground which operates within the 108 - 118MHz frequency range and have a line of sight range of over 200 nautical miles. The system provides the pilot with bearing information related to the position of the ground station and Magnetic North. The information is sent as a coded signal which can only be decoded by a special VOR receiver. Like an NDB the signal is transmitted through 360°, however the bearing information is much more accurate. However unlike an NDB the receiver in the aircraft can select the bearing to or from the VOR.

The transmitter system uses two antenna radiation patterns. One, known as the reference phase, is constant throughout 360°. The second, known as the variable phase, is made to rotate through 360° at a fixed rate thus causing its phase, relative to the reference phase, changes as it rotates in space. The receiver on the aircraft then splits the two signals and they are compared on a meter to produce the bearing information.

There are two main types of VOR, the standard and the newer Doppler VOR (DVOR). The operation of both types is basically similar and a monitoring system is used to detect faults.

DISTANCE MEASURING EQUIPMENT (DME)

The DME is a u.h.f. system which produces a constant slant range between the ground station and the aircraft. They are mainly co-located with VOR sites and their frequencies are paired with those of the VOR concerned. This enables the pilot to automatically select the DME frequency when selecting the VOR frequency. The received information is shown on a digital display in the cockpit as nautical miles. As in VOR this information can be selected as to or from the ground station.

The working principle of the ground station consists of a transmitter and a receiver called a Transponder In the aircraft is a similar system called an Interrogator. The Interrogator transmits coded pulses to the ground station on its allocated frequency. This is then used to trigger a reply signal from the ground station which is received by the Interrogator between its transmissions. The Interrogator then measures the time difference between the interrogations and replies and displays that information as distance.

Up to a maximum of 100 aircraft may receive distance information at any one time from the same transponder.

Continued on page 53 →

Decoding and Plotting System

Robert Connolly GI7IVX, takes a look at Skyview System's *Synop* and is pleased with the results.

Skyview *Synop* is a commercial METEO - RTTY decoding and plotting system for IBM compatible computer types PC/XT or 286 or higher equipped with EGA or VGA display cards. *Synop* supports the EGA/VGA format of 640 x 480 pixels in 16 colours and runs under DOS. Synop can be run from floppy disk after de-compressing the files on the master disk, although it is recommended that it is installed on a hard drive The complete system is supplied on floppy disk along with the demodulator and a comprehensive 51-page, A5 manual in an A5 two-ring binder.

The demodulator supplied incorporates a software protection module (dongle). As a result this *Synop* will not function unless the system detects the demodulator connected to your computer's serial port. An l.e.d., to indicate functionality, and a shift switch, which should be set at either the wide or narrow position, depending on the transmission being received, are fitted to the demodulator. The other end of the 1m long demodulator cable is fitted with a standard 3.5mm jack, which is then connected to the receiver socket.

MENUS

The menu bar in the program, contains eight drop down menus; DATA; MAP; TIME; GO!; RTTY; PCX; UTILITIES; and QUIT. The four stages required (collect the RTTY data; select the RTTY file to be plotted; select the Map area; set the date/time for the data and press Go) to show are all accessed by the menu bar. On line help is also available using the F1 key. The function of the menus is summed up as follows:

DATA - select files; delete files; change data directories and drives, help system, about Synop, and free memory information.

MAP - This menu has sub-menus within it. Firstly in 'Select Map' there is a drop down menu listing various maps for the version purchased along with the facility to select your own map area from the world map in the program. This section also has the facility to bypass the map and list the required data in a text table format. Secondly the 'Select Features' selection also has a sub-menu where you can choose the type of features which you wish to see on the map. this ranges from all features to just the station numbers with options for pictorial, pressure, temperature, rainfall, cloud, weather, tendency or wind. This sub-menu also has selections for isobars and isotherms, which when selected will after a minute or so plot the isobars or isotherms on the selected map with a fair degree of accuracy. Within the map menu there is the option to select longitude and latitude grid lines.

TIME - This allows you to input the date and time for the data which you want displayed. An additional feature is an 'Auto on/off' selection which is used for real time plotting in conjunction with that selection in the data menu.

GO - when selected and 'enter' is pressed the system will plot the selections you have previously made. The result can then be printed out using print screen on the keyboard.

RTTY - with this menu you can view the RTTY live - useful to check that you have correctly tuned your receiver, review the buffer, clear the buffer, input enabled/disabled, PK-232 mode enabled/disabled (if you are using this type of data controller), auto dump enabled/disabled, set the baud rate, and select the com port.

PCX - this menu allows you to select a .PCX image to display. At this point I should point out that the system can save data as a .WXD extension, in which case it just saves the received data; or it can also be saved as a .PCX extension, where it not only saves the data but also the map and any other selection made, as an image file. The menu here also allows you to delete images, change drives and directories. There is also a sub-menu for making, showing and deleting slide shows from saved .PCX images.

UTILITIES - this menu allows you to change the system colours if you wish; select printer types; input your UTC offset; and shell to DOS.

QUIT - is self explanatory as it exits the program.

The manual also carries basic information on RTTY weather frequencies, speeds, station numbering system, Synop terms, Synop weather symbols and pictorial symbols explanations, along with a trouble shooting guide and recommended book list.

WORKS WELL

In practice I have found that the system works well, particularly for data from Bracknall and Offenbach. I have managed to use it to decode other Synop. RTTY signals from Moscow and Rome although a larger number of errors occur with the data received from these further away stations. Although a reasonably good chart can be generated after about an hour of reception, I find that it is much better to set the system up and let

Continued on page 53 →

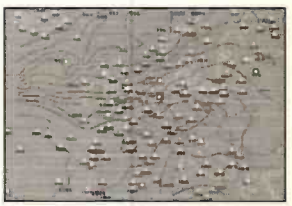

Fig 1: Example of a Synop chart using the 'Pressure With Isobars' feature.

Fig 2: Example of a Synop 'Pictorial' Chart.

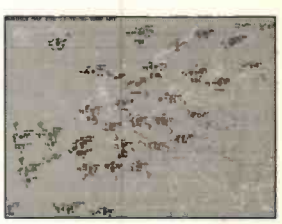

Fig 3: Example of a Synop 'All Features' Chart.

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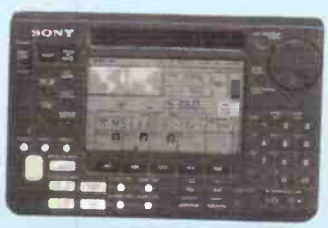

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→ Continued from page 49

Decoding and Plotting System

it run itself for either the three hours required for a full plot or even longer to build up several charts which can be run under the .PCX slide show to give a good idea of the current weather changes. If you leave the system for several hours, it will save the data automatically every three hours a couple of minutes before the next main Synop broadcast is due to begin.

I have found this system much easier to operate than cheaper shareware versions of Synop. decoding and give superior results. The main difficulty I came across was actually tuning my receiver so that the signal would decode. For the newcomer to Synop this requires some trial and error but is soon mastered. Also I recommend that once you have tuned the receiver correctly and begin to receive the Synop. code - using the 'view RTTY live' option - that you go away and come back to view the results later. If you don't, there is a temptation to try to save and view the data after several minutes. This does not work as there has not been enough data received, RTTY, like FAX, is fairly slow and complex. However using the real time option one can see the chart building up over the period.

Although just under £100 seems a lot of money for a computer-based Synop. decoding system, I must say that once you have got the hang of it - which does not take long - it is a very versatile and easy system to use which produces good results. This is important if, like me, you are not too technically minded and easily baffled by software. ■

Skyview Synop is available, priced at £99, from Nevada or direct from **Skyview Systems at 9, Church Field Road, Sudbury, Suffolk CO10 6GT.**

Tel: (01787) 883138 or FAX: (01787) 883139

→ Continued from page 48

Navigational Systems

The system has an accuracy of not more than 0.5 nautical miles and again the system has a monitoring system.

INSTRUMENT LANDING SYSTEM (ILS)

The ILS is a system which enables pilots to land on the airfield runway, even under poor weather conditions. The system operates using two components, a localiser which is used to keep the aircraft on the correct approach track (operating in the v.h.f. frequency range of 108 - 112MHz); and a glide slope which is used to keep the aircraft descent rate correct (operating in the u.h.f. frequency range of 328 - 336MHz)

The ILS at an airport can be one of three different categorys, categories 1/2/3, depending on the importance of the airport, installed ILS and monitoring equipment, and approach lighting. Category 1 is normal use and systems can be used as category 3 in poor weather conditions, subject to the serviceability of the ground equipment and lighting, aircraft equipment and flight crew certification.

The localiser operates using modulated 90 and 150Hz tones transmitted along the extended runway centre line which generate a horizontally polarised opposite field pattern. By the variation of the modulation of these tones which are received in the aircraft and fed to a meter indication, the pilot can decide if he is left or right of the centre line and adjust accordingly. The glidepath system gives elevation guidance by using a similar method to the localiser set up and again the information is fed to a meter for the pilot to see and use.

The ILS also has three v.h.f. marker beacons, (outer, middle, and inner), which radiate signal at a carrier frequency of 75MHz modulated by a coded audio tone, the frequency and code depending on the position of the marker beacon. This is received in the aircraft and usually activates a lamp and is also heard via the pilots headset. Many airfields now use DME linked to their ILS system to give distance touch down information.

OTHER NAVIGATION AIDS

We have looked at the basics of the most common navigational aids. However, there are some others which are, or have been, used *en route*.

Loran is now obsolete, but was used for long range navigation until the late 1960s and operated on either m.f. or l.f. frequencies, depending on type.

Decca is another system that is almost obsolete in the aviation area, but is still widely used in the maritime environment by some ships and in particular fishing trawlers, who use it to maintain their course while trawling their nets. This system also operates on l.f.

Omega was developed to operate on v.l.f. frequencies (10 - 14kHz) as a possible replacement to Loran and is again used in the main by shipping.

Inertial Navigation System (INS) is totally contained within the aircraft using three spinning giros and a computer to keep track of all changes of time, speed, and direction. The system involved inputting the co-ordinates of the flight path, including the aircraft parking stand, into the computer, which then issues commands to the autopilot during the flight to make the necessary changes in course.

Doppler Navigation uses microwave frequencies to transmit narrow beams of radio waves from the aircraft to the ground. These are reflected back to the aircraft and the speed and distance travelled by the aircraft can be calculated. It is also possible to calculate the wind speed using this system.

Global Positioning Satellites (GPS) is a newcomer, only appearing in the past few years. The GPS receiver makes use of information received from satellites to calculate current position, memorise previous positions, plot courses to further positions, etc. The equipment can display the position in several formats ranging from latitude and longitude co-ordinates to National Grid readings. ■

Most of us have heard about them, some of us have listened to some of them, now you know the function and fundamentals of these various aids.

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Roberts CR950 Review

News & Production Editor Zoë Crabb takes a look at the Roberts CR950 Digital Clock Radio.

When the Editor of *SWM* walked over to my desk on Friday afternoon, just before I was about to leave, and placed a Roberts Radio in front of me, my initial thought was that maybe Christmas had come early this year. Then it struck me, I was about to be asked to write a mini review on it.

Once I'd got it home, I was eager to see just how it differed from the clock radio which I already own and which sits patiently by my bed, waiting until 7 o'clock every weekday morning, when it takes great delight in waking me up!

FIRST IMPRESSIONS

After unpacking the clock radio, I was surprised to see such a clearly laid out front control panel. My reason for being surprised? Well, it didn't look like any clock radio that I'd owned before. Everything seemed nicely set out, no fumbling around at the side, back or top of the unit. It was all clearly marked out on the front of the unit and it definitely looked user friendly!

The clock is a 3-wave band radio, receiving m.w., l.w. and f.m. frequencies. It also offers two different alarms, one is of a higher tone than the other. As with most clock radios, there is a snooze function (for those of you who, like me, think that an extra five minutes in bed makes all the difference!). So, you can wake up to the alarm buzzer or the radio. Quite a good thing to note here is that the radio or buzzer will continue to operate during a mains power failure - assuming of course you have installed a back-up battery!

The unit also displays the date, a sleep countdown timer, it has a two-stage green illumination (which controls the brightness of the display) and, best of all I thought, an automatic weekend alarm canceller - great for those of you who enjoy those Saturday and Sunday lie-ins!

The clock also has the useful function of automatic summer to winter time switching. This saves you the hassle of resetting the time, which you have to do with most other clocks, videos, microwaves, watches, etc.

PUT TO TEST

Well, I've told you all about what the clock radio can do, but how did I actually get on with putting it to the test. The first step was to plug it in, of course - after the fight as to which side of the bed it was going to go on, mine or my husband's - I won!

The built-in microprocessor automatically activates the receiver of the radio controlled clock and initiates a search for the time signal. When the CR950 receives this signal, the seconds digits appear in the display panel and the colons flash.

When this process has been completed, the exact time and day of the week appear in the display. This only takes about 2-3 minutes to complete - amazing!
On checking the manual, I discovered that the signal is actually transmitted from the official UK standard frequ-ency and time signal transmitter MSF located at Rugby.

Well, with the time set accurately, the next step was to tune in the radio. This was very simple to do and no different from any other radio, really. I thought the radio sounded good, not at all tinny, like on some clock radios.

THOROUGHLY IMPRESSED

Overall, I was thoroughly impressed with the Roberts CR950 digital clock radio and I enjoyed being given the chance to review it. The CR950 really is a nice looking, easy to use clock radio. It sits quite comfortably on a bedside table, I just wish it could sit permanently on mine! I'll just have to put it down on my Christmas list and see what Santa can do.

The CR950 costs £50.00 and is available from your local Roberts Radio stockist. If you're not sure who this is, then ring (01709) 571722. ■

SPECIFICATIONS

Frequency Coverage:
f.m. 87.5-108MHz
m.w. 525-1610kHz
l.w. 147-284kHz

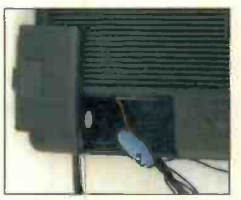
Clock:
MSF synchronised 4.19MHz internal quartz time base

Output Power:
400mW RMS

Power Requirements:
Mains
AC 230-240V, 50Hz only
Back-up Battery
IEC size 6LR61 (6F22, PP3)

Loudspeaker:
75mm diameter 8Ω

Antenna System:
f.m. Trailing Wire
m.w. Built-in Ferrite Rod
l.w. Built-in Ferrite Rod



AOR (UK) LTD

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AOR MANUFACTURING LTD
WORLD RADIO CENTRE
e-mail: info@aor.co.uk
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Fax: 01773 880780
Tel: 01773 880788

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BELPER, DERBYS DE56 2UA

Prices correct at time of going to press and include VAT
All trade marks acknowledged
E&OE

★ ★ ★ ★ ★ **Table top receiver of the year 1996/7** - World Radio TV Handbook
★ ★ ★ ★ ★ **Awarded Five Stars** - Passport to World Band Radio 1997

AR7030

★ ★ ★ ★ **Four star rating** - Radio Netherlands / World Radio TV Handbook
★ ★ ★ ★ **Awarded Four Stars** - Passport to World Band Radio

AR3030

AOR AR7030 & AR3030... a wider choice of short wave listening

AR7030 - High dynamic range short wave receiver £799

The AR7030 has established itself at the top end of the high performance short wave receiver league as "the" set to have and operate. UK designed & built to high standards, 0 - 32 MHz, all mode, built-in RS232 port and more. Innovative features include auto-tune synchronous detector and automatic filter alignment.

PLUS PERFORMANCE Higher performance is now available in the form of the ***'AR7030 PLUS'***, enhancements which surely make ***excellent*** into the ***ultimate***.

- ✓ Increased balance of the mixer for greatest IP2 & IP3
- ✓ High tolerance 0.1% components if DDS ladder for low noise
- ✓ Enhanced RF attenuator operation for minimal intermod
- ✓ Higher spec wire aerial input transformer for minimal mixing products
- ✓ Ceramic metal cased 4 kHz (displayed) AM filter fitted as standard
- ✓ Bourns optical encoder for the smoothest DX tuning
- ✓ Features CPU fitted, 400 memories, multi timers & alpha tag

If you already have an AR7030 receiver, our UK workshop can upgrade your existing unit so that you are not left behind in the race for the ultimate DX performer, please phone for details and prices.

In addition, there are many options available including:
NB7030 noise blanker / notch filter / features CPU, **Collins** mechanical filters, ceramic & crystal filters, **FL124** daughter board for mounting crystal filters, **BP123** internal battery pack, **SM7030** service kit, **Data-Master** PC control software & data-base and more...

AR3030 - Short wave receiver 30 kHz - 30 MHz £499

The **AR3030** receiver combines a classical appearance on the outside using aluminium extrusion & cases with a high-tech low noise DDS (Direct Digital Synthesizer) design inside with the legendary **Collins** 6 kHz AM mechanical filter fitted as standard, the result is **the short wave "CLASSIC"** from AOR.

Due to its continuing success, you can now own a "CLASSIC" for as little as £499

If you are looking for an easy to use quality short wave receiver, then look no further.

Short Wave Column: Whips and wires

The antenna stages of an AOR radio will exhibit some kind of electrical characteristic. This is a Complex Impedance, usually edited down to "impedance" - the resistance offered to the radio signal - for the sake of common usage. If you follow the suggested designs in the instruction manual, then the burden of thought rests with the set maker and the aerial will be a good match. This has little to do with Dateline - our "good match" is the best transfer of energy from the aerial to the radio which is all we are trying to achieve. This can be done without the slightest knowledge of the radio's input impedance, offering more reassurance to the beginner.

The AOR Whip Antenna Option, a small telescopic antenna will deliver a signal, albeit at a very high impedance and at a low level, to input stages designed to cope with all this. No antenna wires leave you free to listen anywhere, locations near windows giving best reception without the screening effects from any metalwork used in the building.

The best reception is to be had from an outdoor aerial, as we get away from electrical interference inside the house - we always recommend The Long Wire. This is a simple single length of wire of a thickness strong enough to support its weight, insulated or not, as long and high as the local geography allows. Technocrats will call this an inverted L as the longer limb of the capital letter L is the bit that runs down the garden, the shorter limb swinging down to form the downlead to the radio.

Technophobes will say it is easy to put up. Simply use insulators at each of the three points of the L and you are away. If you feel this prose is labouring toward a "What the 'L' punchline, then there it is, with all the feeling of inevitability... Antenna Jokes and WHY to **bob@aor.co.uk** **©Bob Ellis 1997**

AR5000

Cyber Scan®

AR5000 £1495 AR5000+3 £1749

Government departments on both sides of the Atlantic have carried out extensive trials against rival units and we are pleased to find they are placing orders for the AR5000, good sensitivity at frequency extremes, excellent range of facilities, compactness & light weight leading to great flexibility in operation. Features include **automatic electronic preselection** between 500kHz - 999.999999MHz. 'True receive' throughout it's range, not an up-converter above 1GHz.

PLUS PERFORMANCE Capabilities have been further increased with the launch of the ***AR5000+3*** providing three enhanced facilities: **A.F.C.** switchable automatic frequency control for accurate tracking of unusual bandplans, **noise blanker**, switchable to help reduce the effects of ignition noise especially while mobile, **synchronous AM**, featuring double and selectable sideband with an easy to use wide lock range.

See the full technical review in HAM RADIO TODAY magazine, Vol.15 No.6, Chris Lorek concludes *"...I must admit that I'm a fan of AOR's receivers, and having tested the AR5000, even more so. If I could afford the £1,749 price tag, there would be one in my shack. For the keen listener, or indeed the professional monitor, this receiver is worthy of very careful consideration..."*

- Very wide frequency coverage 10kHz - 2600MHz
- All mode reception: AM, FM, USB, LSB & CW
- Automatic electronic preselection of the front end
- Excellent strong signal handling
- NCO (Numeric Controlled Oscillator) with tuning steps down to 1Hz
- TCXO fitted as standard
- Multiple I.F. bandwidths 3, 6, 15, 30, 110 & 220kHz (500Hz optional)
- Auto mode bandplan selection
- Multi-function LCD with 8 character alpha-text comments
- Extensive search & scan facilities
- *"Cyber Scan"* fast search & scan speeds up to 45 channels /increments per second
- Analogue S-meter
- 1000 memory channels and 20 search banks with EEPROM storage
- Auto memory store
- Extensive RS232 command list
- Sleep timer / alarm
- Standard DTMF decode / display
- Optional CTCSS search & decode
- Two aerial inputs with programmable switching from the front panel
- Flexible BANK LINK menu with enhanced features such as DELAY, PAUSE, VOICE etc
- Built-in squelch tone eliminator
- Audio and discriminator out plus tape recorder control
- SDU ready
- More, more, more...!

AR3000A *Evolution at its very best*

It all started in 1983 with the AR2001 which represented the world's first "no-gaps" high performance wide range receiver. In 1985 the AR2002 became the worthy successor extending the frequency coverage into the UHF band. In 1989 AOR released the revolutionary AR3000 providing all mode receive AM, NFM, WFM, USB, LSB & CW with smooth tuning in 50 Hz steps and unbroken coverage from 100 kHz - 2036 MHz... Building on this success AOR continued the EVOLUTION to bring the AR3000A to the market in 1992, smooth tuning, faster scan / search rates & more. The AR3000A became an overnight success and demand continued to steadily increase, to-date over 70,000 units have been sold worldwide. Simply there has never been a serious competitor to the range anywhere close to the price... truly excellent value for money. Even the world's armed forces including the largest Airforce and Navy has employed the AR3000A in its up-to-date high-tech hardware for backup purposes, performance, quality, reliability and performance-cost-factor being excellent...

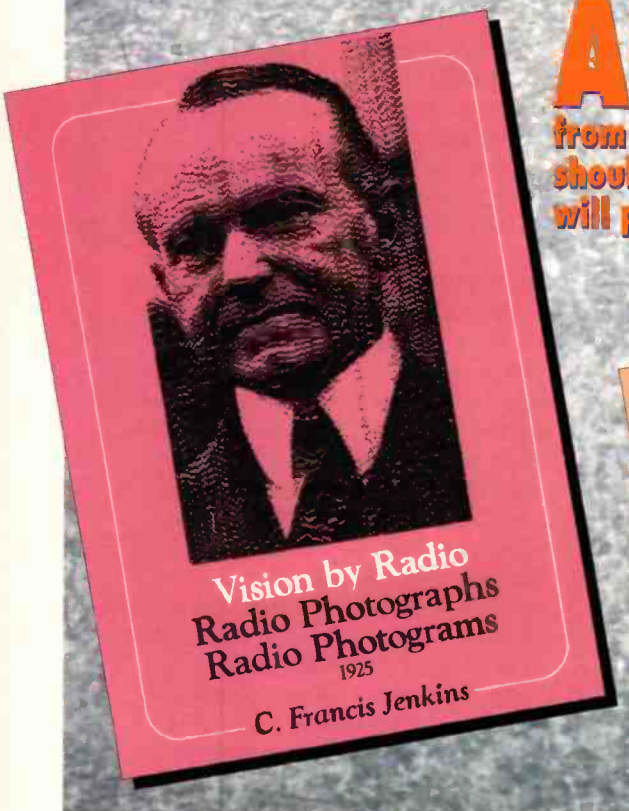
Now is YOUR chance to own an amazing AR3000A receiver at the extremely attractive price of £799

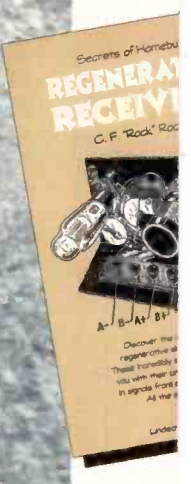
AR8000UK *wide band hand held receiver*

The **AR8000UK** provides a frequency coverage from **500 kHz to 1900 MHz** without gaps in the range (actual acceptable frequency input from 100kHz). The AR8000 combines full computer compatibility with advanced wide-band radio receiver technology. The all-mode reception provides AM, USB, LSB, CW, NFM and WFM. An independent ± 2.0 kHz SSB filter is fitted as standard and the USB/LSB modes use true carrier re-insertion with correctly calibrated frequency read-out (not offset by 1.5 kHz). Step size is programmable in multiples of 50Hz for smooth tuning. A custom manufactured ferrite bar aerial is neatly internally installed at the top of the receiver's cabinet to enhance receive performance when listening in population centres to Medium Wave services. The high visibility dot matrix LCD provides great detail including a signal strength bar meter, band-scope, twin VFO frequencies displayed simultaneously, ALPHANUMERIC comments stored along with frequency, mode & attenuator status simplifying the job of recalling and identifying memory channels, password protection etc. **Computer control** and clone of data between two AR8000UK receivers (optional interface required).

£349

A lot of SWM readers take a great interest in the historical aspect of radio, so this month's Book Profile highlights seven very interesting titles from the SWM Book Store. As an added incentive - should you need one - order any three titles and we will pay the postage (UK only).





To order any of the titles mentioned on these two pages please use the Or

Vision by Radio

Subtitled *Radio Photographs and Radio Photograms 1925*, this book, by C. Francis Jenkins, outlines the history of the transmission of photographs by both wire and radio. This reprint makes fascinating reading - even if it was a big trumpet-blowing exercise for the author and his 'pioneering' work. **£7.85.**

Henley's 222 Radio Circuit Designs

Another reprint from the Lindsay stable, this fascinating book, originally published in 1924 by The Norman W. Henley Publishing Co. will transport you back to the heady pioneering days of wireless. In its 272 pages you will find everything you needed to know about wireless in the twenties. A great read for **£9.45**.

Old Time Radios! Restoration and Repair

Joe Carr is well known to readers of *SWM* as an authority on antennas. In this book he gives detailed instruction on repairing valved receivers made before 1950 and transistorised receivers of the 1950s and early 1960s. Whether you want to repair old radios for a living or a hobby, this is the book for you. **£17.95**.

Secrets of Homebuilt Regenerative Receivers

Discover the secrets of building regenerative short wave receivers. If you enjoyed the recent one-valve projects in *SWM* then you will find this book indispensable. C.F. 'Rock' Rockey W9SCH, has been building receivers since 1930 and in this book he divulges the secrets of the simple regenerative short wave receiver and how to get it to perform. **£7.95.**

Shortwave Receivers Past & Present

This is the second edition of Fred Osterman's marathon work detailing communications receivers from 1945 to 1996. Designed to provide the radio hobbyist with concise information on the value, features, specifications and performance of current and former short wave communications receivers, this new edition is more international in scope than the first. **£23.95**.

1934 Official Short Wave Radio Manual

The 'complete experimenter's set building and servicing guide', edited by Hugo Gernsback, features a complete directory of all 1934 short wave receivers - at least that's what it says on the cover! Once again Lindsay has reprinted a fascinating volume loaded with projects and circuit diagrams. A special chapter has been written T.J. Lindsay explaining how to recreate these projects using modern components and techniques. **£11.85**.

The Great Old Handbook Receivers

This book is an intriguing collection of chapters on the 'techniques of vacuum tube short wave receiver construction' taken from the 1929 and 1934 *ARRL Radio Amateur's Handbook*. If you enjoy electronics, amateur radio, collecting, or just the history of technology, this book is for you. **£6.95**.

der Form in this issue or telephone Michael or Shelagh on (01202) 659930.

Amateur Bands

Round-up

■ PAUL ESSERY GW3KFE
PO BOX 4
NEWTOWN
POWYS SY16 1ZZ

What a change in the weather since I sat down to prepare the column a month ago! Then, cold and miserable, now as warm as you like it, window open, sweater off and - alas - grass growing as fast as ever!

Which is as good a way of getting into 'static crashes' and what to do about them. Static crashes heard on your receiver are the radiated result of the discharge of large potentials cloud to cloud or cloud to ground, maybe locally, perhaps many hundreds of kilometres away.

Now, I don't think I need say that a direct hit, or very near miss, by lightning is essentially unsurvive able as far as electronic equipment is concerned. In such conditions you accept the likely equipment damage, hope the insurance is up-to-date, and rely on the household electricity earthing and PME arrangements to keep *people* safe. If the static crashes are bad, and particularly if thunder is heard, switch off and take precautions.

The other aspect to this is the possible build-up of static electricity on an antenna system. If you use an active antenna, the design provides a d.c. return path from base and collector back to emitter, else the transistor won't 'transist'. To cope with static build-up there will be some sort of connection of the element to earth, by way of a choke or resistor.

In the case of a full-size dipole or beam, the feed impedance will be of the order of 50Ω or thereabouts. Clearly, to shunt this 50Ω with, say a 1MΩ resistor at the feedpoint isn't going to cause meas-urable additional signal loss, but it will enable static charge to flow from both sides of the dipole to the braid and so down to earth. It also serves a second function - put a test-meter across the bottom of the feeder and you should read 1MΩ between the terminals; if you don't, 'summat's busted' in the antenna system and you go into mend-it mode!

So - what should we do if a thunderstorm looks to be looming? Bear in mind that static builds up, so earth the antennas **early** before the build-up is enough to bite you. Unplug the gear from antenna and the mains as well. Personally, I prefer to approach it the other way; I have to un-earth my antennas and plug into the mains before an operating session, and the last things I do at QRT time are to earth the antennas and completely disconnect the rig and ancillaries from the mains before leaving the shack. Then if the storm breaks in my absence I can happily think my kit is as safe as I can make it.

I hope these few comments reassure **Frank Lennon** in Hyde, Cheshire and others. Turning to Frank's loggings on 14MHz North America was represented by four KL7s, plus VP9V, VE7IM, PY7ZZ, 8R1Z, W7XM(Nevada), NP4TW in Puerto Rico, and W6CCP in San Diego. From the Australasian sector we note 9M2CW, XU6WWV in Cambodia VK6MV, VK5BC, VK5WP, V63KY, ZL1AV, ZL3RG, 4S7SW, HS2CRY, HS1WGR, BV5GQ, BV7GA, JS0TCL, JR6RDM, JA4ETS, while Africa gave 5Z4RL, S79MB, 5X4F, 6W1HM, 9X/RW3H, 5H3HG, 5N0T, D44BC. On 18MHz we find ZS6VDK, ZF1HF, JY5HO, XT2DP, 4S7BRG, PY2XB, HZ1AB, A41LZ, YV8CYV. Finally, on Eighty 4S7GA and TI5RLI.

Our next contributor, **Terry Johnson**, writes from Asten-bei-Linz in Austria, where he is working - and of course missing his home call of G7LIV. Terry has just set up an HF-225 receiver and on April 7 he got up to a fresh sunny morning with a dusting of snow and at 0610UTC on 7.071MHz logged G4UDK, at 0618 G0AOR calling CQ, and at 0620 up came a net with G0AOR with ZL4DJ plus someone called Bill. Alas, at 0635 a strong Italian signal on 7.098 came up and the ZL net was buried. But as Terry says, "it's nice to be 'in the swim' again, even if only as a listener for now". On the other hand, Terry re-iterates the eternal listener's cry "Why do people gabble their callsigns, particularly those working in nets?" A cry, incidentally that I recall reading in the mail for the very first column I ever wrote, thirty years ago!

Incidentally Terry's letter contained an awful warning to all contributors - a thin envelope first, and an obvious decision that it wasn't maybe quite strong enough, so a normal envelope bearing the address and stamp was added as an outer cover. Somewhere along the way, down came the rain. . . and it took me several minutes to disengage the various parts and extract the letter intact!

Next we mention **Ted Hearn** of Chesterton, Newcastle, Staffs. Ted found G4JMB/MM on the QE2 in the Med, working W4FO in Florida, ZD7HI on St Helena, plus an oddity copied as M/W2X Maritime Mobile. One wonders about this one, heard on April 5 - either a mis-copying, or possibly Maritime Mobile Slim. On Top Band, Ted mentions DJ0ABR, LA8D, LY2CX, OZ3SK, PA0RKT, UU4JDK, and UY8LL; on 3.5MHz HB9LGA, IT9KDA, SM5BRK, OH3LX, YU1XA, and 9H1PF. The pay-dirt from 7MHz included CN8RS, DL1NDY, RW4FE, SM2PSC, and UN0AA. On 21MHz YC7JKS was picked up, leaving 14MHz for the majority: AA9KT, A41LZ, A71BY, CN8VB, CN8NM, ER3AAA, G4JMB/MM, HB9JB, IG9/I4UFH, IZ2ACY, LA3PU, PA3PQW, PR8DJL, PZ5DX, S59A, TA1A, TA3D, VE1ZB, YI1RS, YU1EXY, ZD7HI, 4N1N, and 9K2GS.

Pressing on, we come to **Ted Trowell**, who as usual stuck to c.w. for his activity. On 21MHz he noted PT7WX, and on 18MHz one afternoon connected with G0SVR/MM on the QE2 at Suez for a lone try on sideband. Back on c.w. but still on this band, VQ9VK, XT2AW, 5X1P, 3B8/NK6F, 9M2AX, PT7WX, YB5QZ, and ZS6AJS. On top band, Ted mentions N6SS, AD4Z, K3BU, K2FU around 0500, while at 1900z ZL4WA. at 2000z OY3JE, and IS0/DK7ZB. Ted's covering letter notes that VK was also about on the band. On 3.5MHz 7X2DS, and on 7MHz 8P6FE, HJ6PP, both around 0500, and at 2100z 9H1EL and PY2HP. Finally, 10MHz where TF/DL8WAM was copied.

Weston-super-Mare in Somerset is a place I associate with holidays as a youngster in pre-WW2 days, but in 1997 it is the home of **Tom Parrotte**. Tom hasn't been too active this time round thanks to the domestic chores and gardening to be done, but he did find time to have a peep or two on 3.5MHz sideband, for NP3D, VE1KOI, KE1Y, VY2ROB, K2RR, AD5W, N5ML, HS1RRL, 9H1PF, RV1CC, N8XA, KB0AMY/PI5, PY2KL, 8P6DA, YN1RVR, and CO6XN. As for 14MHz, Tom noted VK3CR, BV7GA, and VU2AF.

Talking of Chinese stations, *DX News* magazine this time carries an article on Chinese amateur radio by G3SWH, from which we gather that there are several licence grades. Class 1 calls for Morse at around 14w.p.m. to operate full h.f. privileges at 500W; Class 2 with Morse at around 10w.p.m. giving restricted h.f. privileges and 100W maximum power; 'Class 3(HF)' with Morse at 8 wpm and limited h.f. privileges and 10W. 'Class 3(VHF)' is a no-Morse v.h.f.-only ticket with a 3W limit and Class 4 is an s.w.l. licence. Class 1 licencees have BA as a prefix, Class 2 have BD, Class 3 BG. BY is a club station, and BZ for the personal identification of club station operators. China is divided up into call areas on a numerical basis, like the USA, with for example '1' for Beijing municipality, '4' for Shanghai, and '0' for Tibet.

Next we head for Barnsley and **Colin Dean**. On 3.5MHz Colin offers CE8EIO, CM7LK, CP5NU, EY4AA/6, FM5DP, HP1XBI, TI4CF, TI5RLI, VQ9IE, YV0SBV, YM2KC, 8R1AK, and 9G1MR. A crank up to 7MHz yielded signals from AP2KSD, CP2BU, DS1BHE, EK8WB, EX0V, HZ1CCA, R1ANT, R1FJR, R0/UR8LV, TA4/DL6NBR, XQ1IDM, YC8TZR, YK1AO, ZA1E, ZL1PB, ZX0F, 3A7G, 4S7BRG, 4V2A, 6Y5DA, 7K1WLE, 8P9IJ, and 8R1K. Another flip of the bandswitch put Colin on to 14MHz where he found A41LQ, A61AN, DX1E, FS/JA5AUC, HS8FZ, JY5HO, KH0CG, P43A, S02R, SV2ASP/A, VQ9LV, V63KU, V85HG, XU6WV, ZA1MH, 4S7OF, 5H3DD, 5X4F, 9G1MR, 9K2/SQ5DA, 9M2AA, 9M8HI, and 9X/RW3AH.

The occasional letters from **John Collins** in Birmingham nearly always contain snippets of the unusual; this time John notes that he has a left-wing book about Marconi which suggests he was a supporter of Mussolini and his Blackshirts! Another little snippet is about the programme called *Ham Radio Today*, broadcast by HCJB which John finds a 'very boring, tedious programme'. Turning to 7MHz, and from midnight UTC onwards, A31LZ, 8R1Z, IT9PRV bending the 'S-meter' needle, KP3R, ZX9A at 0100 calling CQ Europe, G4VFU/MM around the same time with poor audio. On Sundays 4U1ITU at 1120, GU3MLR, and in the afternoon GW3RKD.

That BS7H expedition to Scarborough Reef ran into problems, reported by *DX News Sheet*. Basically they ran into territorial claims between the Philippines and the Peoples Republic of China which broke in the world's press a few hours after the expedition sailed from Guangzhou. Despite much to-ing and fro-ing by the local authorities, it was decided to withdraw and so the planned seven days was in the end only a three-day event. Why people persist in mounting expeditions in this area, in view of the dangers and indeed fatalities over the years is frankly beyond me.

The CQ WW WPX Contest was a bit of a fiasco for **Karl Drage**, of Woodford, at least as far as the h.f. bands go, though on Eighty he found an un-usual station signing WP3X - at a guess another manifest-ation of Slim. Anyone got any better suggestions?

Still with Karl Drage, he makes a very fair point when he notes how, with the help of G3RFX, he has found a new interest. Seems G3RFX sent Karl a copy of his log through RS-12 (up on 21, down on 24MHz) and stirred up the interest. Once Karl had enough information to know when a 'bird' was in range, he managed to find - on 144MHz - stations from places like K1, K2, VE1, OD5, 4L, EA9. Naturally enough Karl remarks that this has been a month to remember! Try listening between 145.912 and 145.952MHz for a starter, bearing in mind that as a 'rule of thumb' a bird will do a complete round of the globe in a couple of hours. Of course, some passes will be out of range and not audible anyway but a listen on this area for a couple of days should set you going. For the rest, a listen to the Sunday-morning AMSAT net around 3.780kHz, or - the obvious thing to do - join AMSAT yourself and get to know what it's all about. The contact is **Ron Broadbent MBE, G3AAJ, 94 Herongate Road, London E12 5EQ**. Do please include a stamped addressed envelope for your reply - every penny saved goes towards the building of the next satellite. ■

Frequency Exchange

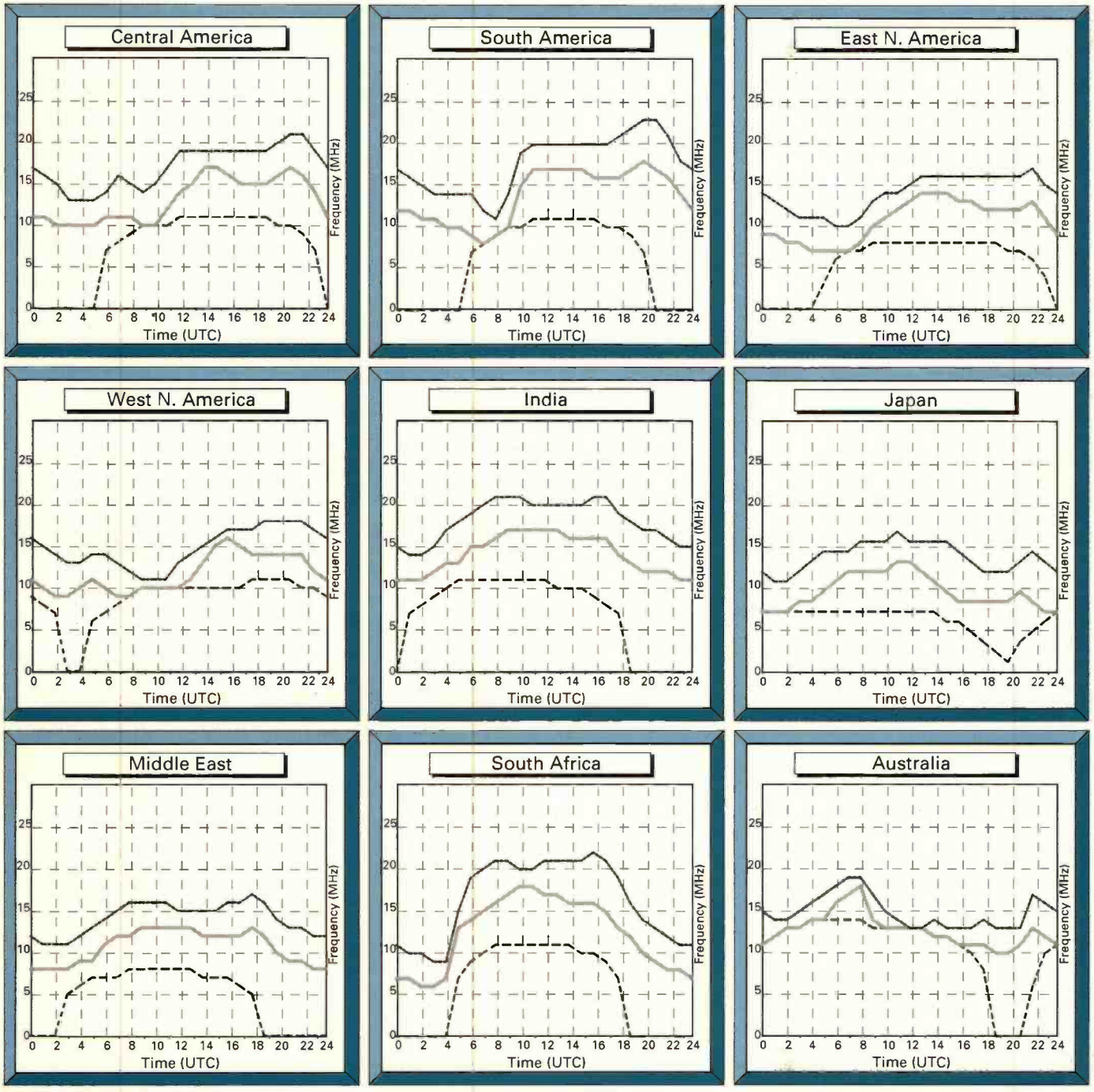
KEVIN NICE
G7TZC

Freq	Mode	Time	Call	Location	mon	Remarks
5.14400	PacTOR-I	1704	???	ICRC, Bosnia	mc	200bd/200, MSG in EE about Srebrenica.
5.15400	c.w.	1705	C***	SLHFB	mc	"C" continuously.
5.15721	MS5	1708	???	Russian Mil, ???	mc	12-tone vocoder (3300Hz pilot), idle.
5.20551	PICC-12	1826	???	British Mil, ???	mc	Piccolo-12, crypto.
5.25500	CROWD-36	1730	???	Russian Diplo, ???	mc	Crypto.
5.25600	CROWD-36	1910	???	Russian Diplo, ???	mc	tfc.
5.27701	PICC-6	1810	???	???, ???	mc	VFT: 2ch of Piccolo-6, eng ch idle.
5.27741	PICC-6	1544	???	???, ???	mc	VFT: 2ch of Piccolo-6, crypto.
5.28900	Baudot	1733	???	???, ???	mc	50bd/500, AAXX WX for UNID locations.
5.29534	RS-ARQ	1731	???	???, ???	mc	240bd 8-tone, crypto.
5.35760	MFSK	2124	???	???, ???	mc	125bps 8-tone MFSK System, RACE?
5.36750	UNID	1740	???	???, ???	mc	100bd/146 FSK UNID System, sync, cont, ACF=0.
5.45552	PICC-12	1351	???	British Mil, ???	mc	Piccolo-12, idle.
5.62150	SITOR-A	1008	RETAME***	Spanish Army, Leon	mc	100bd/400/I, MSG in SS "fm gernor (1/a sem)".
5.62150	SITOR-A	1009	RETA. **	Spanish Army, ???	mc	100bd/400/I, MSGs in SS to RETAME Leon and RETAM 46.
5.62700	Baudot	2031	???	Ukranian Army, ???	mc	50bd/200, MSGs in RR ending "u menq wse".
5.64840	ARTRAC	1600	???	Hungarian Diplo, ???	mc	125bd/170, tfc.
5.670	u.s.b.	1901	RJA126	India	tt	Wkg Madras ATC.
5.81200	FEC-100	1019	DFZG***	Serbia MFA, Belgrade	mc	144bd/400/I, Opchat "jos jednom ovaj txt qsy 155 qzn 10 k".
5.83551	PICC-6	2127	GYU	Royal Navy, Gibraltar	mc	VFT: 4ch of Piccolo-6, eng ch "de gyu gyu gyu lolololo cip cip cip".
5.83591	PICC-6	2127	GYU	Royal Navy, Gibraltar	mc	VFT: 4ch of Piccolo-6, tfc ch idle.
5.83631	PICC-6	2128	GYU	Royal Navy, Gibraltar	mc	VFT: 4ch of Piccolo-6, tfc ch idle.
5.83671	PICC-6	2128	GYU	Royal Navy, Gibraltar	mc	VFT: 4ch of Piccolo-6, tfc ch idle.
6.62550	Baudot	2045	???	Ukranian Army, ???	mc	50bd/500, crypto MSGs start "zzzzzzzjjiccciiipppddd".
6.68536	SITOR-A	2156	???	???, ???	mc	100bd/200/E, Opchat in EE mentioning location "alpha".
6.71739	SITOR-A	1708	???	Egyptian MFA, Cairo	mc	100bd/170/E, Calling selcal TVXC, Embassy Tunis.
6.72183	Baudot	1423	???	Danish Air Force, ???	mc	75bd/850, TAF for ENBR ENZV prepared by "met office ekch".
6.72404	RS-ARQ	1615	TAD	Turkish Embassy, Moscow	mc	240bd/E, Sending "08MOSK04.ZIP" binary transfer.
6.72404	RS-ARQ	2111	TAD	Turkish MFA, Ankara	mc	240bd/E, Opchat in TT begins "MOSK DE TAD".
6.77704	RS-ARQ	1604	???	???, ???	mc	240bd 8-tone, crypto.
6.79810	UNID	1733	???	???, ???	mc	250bd/170 FSK UNID System, ACF=22.
6.80150	UNID	1644	???	???, ???	mc	46.1bd/240 FSK UNID System, idle on reversals.
6.80350	FEC-100	1650	???	???, ???	mc	192bd/850/E, no sync.
6.81300	CROWD-36	1753	???	SOUD Station, ???	mc	5LGs.
6.82221	MS5	1811	???	Russian Mil, ???	mc	12-tone vocoder (3300Hz pilot), tfc.
6.83035	RS-ARQ	1559	???	???, ???	mc	228.7bd/150, ALIS bursts.
6.85251	PICC-12	1525	???	British Mil, ???	mc	Piccolo-12, crypto.
6.86173	4+4	1802	???	Chinese Diplo, ???	mc	tfc.
6.98870	SITOR-A	1811	???	???, ???	mc	100bd/170/E, idle in IRS mode.
7.98150	PSK	1805	???	???, ???	mc	2400bps PSK UNID System.
7.99400	CROWD-36	1810	???	SOUD Station, ???	mc	5LGs ends "all cfm qsl gb sk".
8.00600	36-50	1546	???	Russian Navy, ???	mc	36bd/200, idle.
8.01504	RS-ARQ	1548	???	Italian Diplo?, ???	mc	240bd 8-tone, idle in beta.
8.02200	ROU-FEC	1655	V5G***	Romanian MFA, Bucharest	mc	164.5bd/400, (bitmask=24) MSG in FF.
8.03700	Baudot	1333	???	Ukranian Army, ???	mc	50bd/200, crypto starts/ends "zzzzzz" with opchat in RR.
8.08951	PICC-6	1813	GYU	Royal Navy, Gibraltar	mc	VFT: 4ch of Piccolo-6, eng ch "de gyu gyu gyu lolololo cip cip cip".
8.08991	PICC-6	1813	GYU	Royal Navy, Gibraltar	mc	VFT: 4ch of Piccolo-6, tfc ch idle.
8.09031	PICC-6	1814	GYU	Royal Navy, Gibraltar	mc	VFT: 4ch of Piccolo-6, tfc ch idle.
8.09071	PICC-6	1815	GYU	Royal Navy, Gibraltar	mc	VFT: 4ch of Piccolo-6, tfc ch idle.
8.09860	SITOR-A	1819	???	???, ???	mc	100bd/170/E, Calling selcal YFPS.
8.13121	PacTOR	2132	???	???, ???	mc	200bd/200, ack mode only.
8.14311	c.w.	1805	OLX	Czech Intel, Prague	mc	"vvv vvv vvv de olx olx olx" before numbers by YL.
8.84921	MS5	1625	???	Russian Mil, ???	mc	12-tone vocoder (3300Hz pilot), idle.
9.04233	TT2300b	0831	???	???, ???	mc	100bd, idle on tone seq 40657231.
9.04266	UNID	1555	???	???, ???	mc	108.85bd/158 FSK UNID System, ACF=32.
9.04400	RS-ARQ	1642	???	???, ???	mc	228.7bd/150, ALIS bursts.
9.06830	ASCII-ARQ	1843	???	Bulgarian Diplo, ???	mc	300bd/500, tfc.
9.12420	GTOR	1632	???	???, ???	mc	200bd, no sync.
9.16300	CROWD-36	1745	???	SOUD Station, ???	mc	5LGs on link ID 00070.
10.22552	PICC-6	0934	GYU	Royal Navy, Gibraltar	mc	VFT: 2ch of Piccolo-6, "de gyu gyu gyu lolololololo cip cip cip".
10.22592	PICC-6	0935	GYU	Royal Navy, Gibraltar	mc	VFT: 2ch of Piccolo-6, idle.
10.27300	UNID	0827	???	???, ???	mc	75bd/250 FSK UNID System, sync, cont, ACF=0.
10.40691	c.w.	1537	VL8IPS	IPS Beacon, Darwin	mc	"vl8ips" marker plus 100bd/850 mixed FSK signals.
10.49200	81-81	1608	???	???, ???	mc	81bd/120, tfc.
10.50700	UNID	1711	???	???, ???	mc	75bd/180 FSK UNID System, sync, cont, ACF=0.
10.53000	81-81	0829	???	???, ???	mc	81bd/500, tfc.
13.13173	UNID	1005	???	British Navy, ???	mc	VFT: 2ch of 75bd/75 FSK UNID System, crypto.
13.13293	UNID	1004	???	British Navy, ???	mc	VFT: 2ch of 75bd/75 FSK UNID System, crypto.
15.85580	RS-ARQ	0858	DMK	German MFA, Bonn	mc	228.7bd/150/E, Crypto to Embassies Bujumbura.
15.85580	RS-ARQ	0859	???	German Embassy, Bujumbura	mc	228.7bd/150/E, MSG to Bonn.
15.85760	RS-ARQ	1428	???	German Embassy, Riyahd	mc	228.7bd/150/E, tfc to Bonn.
15.85850	RS-ARQ	0913	DMK	German MFA, Bonn	mc	228.7bd/150, MSGs in GG to Singapore, Tripoli.
15.94670	Packet	1519	702***	???, North Africa	mc	300bd Packet Radio, Crypto to 901.
15.94670	Packet	1520	901***	???, North Africa	mc	300bd Packet Radio, Crypto from 702.
15.94670	Packet	1521	761***	???, North Africa	mc	300bd Packet Radio, Attempting connect to 901.
118.925	a.m.		-	Cosford	tt	Approach.
122.475	a.m.		-	Tamworth	tt	Hot Air Balloons.
123.550	a.m.		-	Brize Norton	tt	Radar.
134.975	a.m.		-	Heathrow	tt	Approach.
139.931	n.f.m.		-	Tamworth	tt	Electricity Company.
146.663	n.f.m.		FB	W. Midlands	tt	Fire Brigade.
147.800	n.f.m.		-	Tamworth	tt	Fire Station.
157.486	n.f.m.		-	Tamworth	tt	Keywatch mobiles.
160.575	n.f.m.		Helpine	Tamworth	tt	OAP Warden Control.
163.962	n.f.m.		-	Birmingham	tt	City Council.
164.337	n.f.m.		-	Birmingham	tt	Data Link.
164.800	n.f.m.		-	Walsall	tt	Refuse Collectors.
167.837	n.f.m.		-	Atherstone	tt	AJ's Taxis. Mobile 172.637MHz.
168.050	n.f.m.		Alpha	Tamworth	tt	Alpha Cars. Mobile 172.850MHz.
440.150	n.f.m.		-	Birmingham	tt	Park Wardens.
453.130	n.f.m.		-	Birmingham	tt	Hyatt Regency Hotel.
456.375	n.f.m.		-	Birmingham	tt	BR Transport Police Ch.2.
461.337	n.f.m.		-	Tamworth	tt	Ankerside Shopping.
461.362	n.f.m.	1100	UNID	Birmingham	tt	Encrypted.
463.055	n.f.m.		-	Tamworth	tt	British Telecom Data.

World Propagation Forecasts

JACQUES D'AVIGNON
VE3VIA

Circuits to London



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.

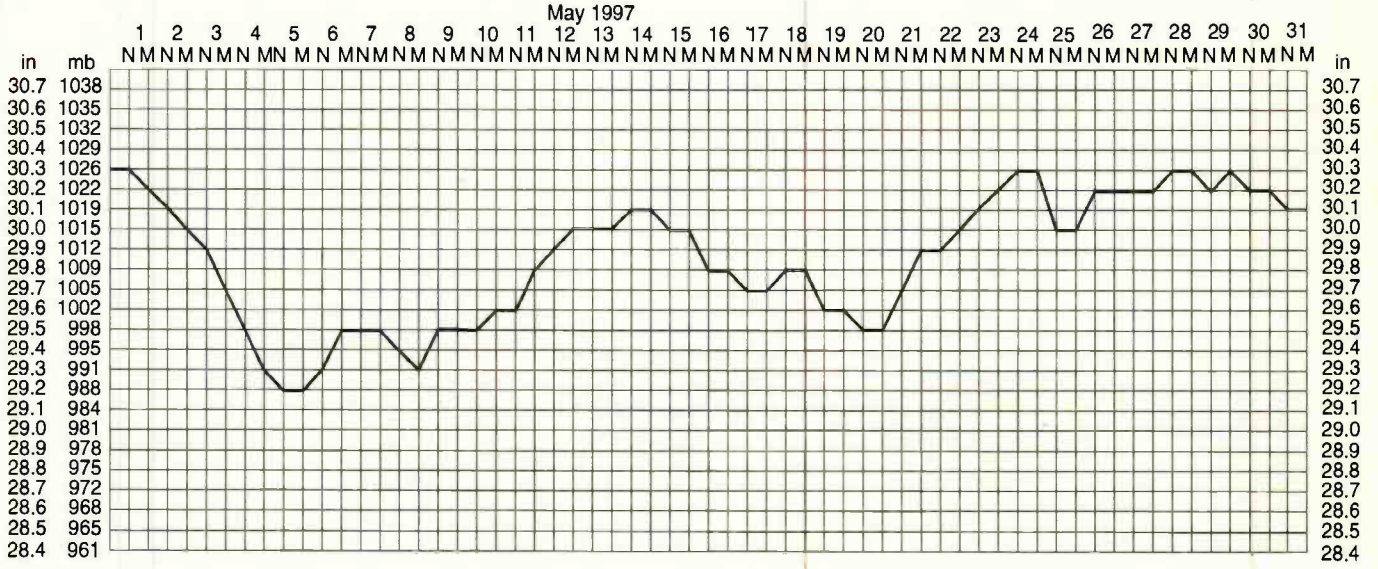
To make use of the charts you must select the chart most closely located to the region containing the station that you wish to hear. By selecting the time chosen for listening on the horizontal axis, the best frequencies for listening can be determined by the values of the intersections of the plots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

Good luck and happy listening.

Propagation Extra

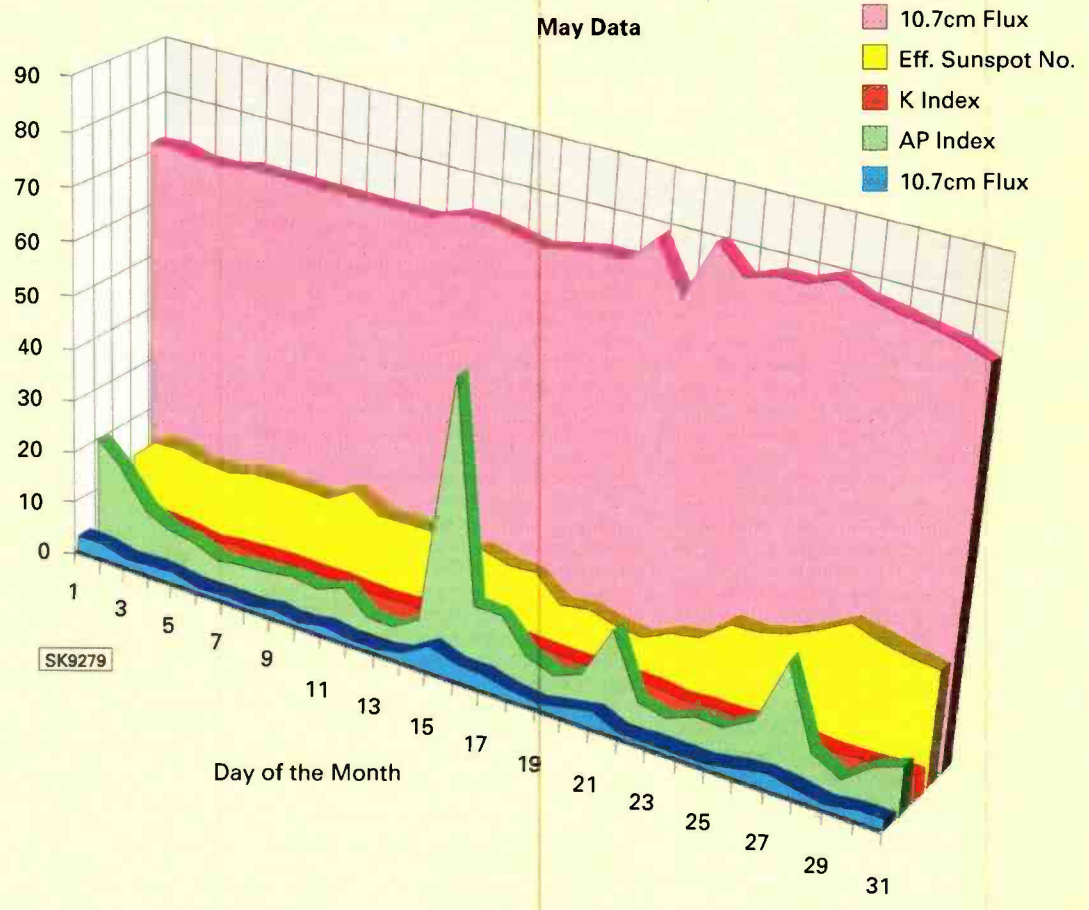
KEVIN NICE
G7TZC
SWM
EDITORIAL OFFICES
BROADSTONE

Ron Ham's barometric pressure chart, taken at Storrington, W. Sussex, May 1997.



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.



Satellite TV News

Roger Bunney

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

The satellite buzz word is digital and although MPEG digital receivers and techniques seem to change by the month, at least two of our readers have invested into Nokia 9500 D-boxes. Despite the anticipated problems of programming differing parameters into the receivers - which can be time consuming compared with say tuning an analogue receiver, it is apparent that the Nokia receiver is capable of being set up on a wide range of MPEG prameters sufficient to resolve free to air programme packages or the more interesting news feeds running a relatively low symbol rate. Unfortunately, prices at this early stage are high, typically well over £400 for imported Nokia boxes, for which there seems minimal demand in Germany (for the DF-1 package) and with an increasing interest in the UK perhaps prices will fall to a more attractive level. **John Locker** is using one such Nokia D-box and finds that having programmed one parameter set into memory for receiving a broadcast package, a new package once re-parametered wipes out the first setting group! However, there is access to a 'hidden' memory bank into which some 24 different channel settings can be stored. John has now stored numerous news feed data and can recall these for locking up received news exchanges which makes reception fairly painless. Various SCPC channels with offerings such as WTN, APTV and Reuters were all loaded into the 'hidden' menu bank resulting in a rapid access to these channels when returning to them.

Gareth Foster (Whitton) passed on a sales sheet from 'Techsat' in Dollingstown Tel: (01762) 311921. This shows that this company is modifying imported Nokia's with on-board IRDs (Irdeto), protection against downlink reprogramming and offering full reception of FTA (free to air) services, English menus and various smartcard options - this at £400 + VAT. Gareth's employer is currently testing various MPEG units and hopefully more feedback will be forthcoming.

We would appreciate hearing from readers who have become involved with MPEG digital satellite reception, equipment and operational experiences in tuning between differing digital standards.

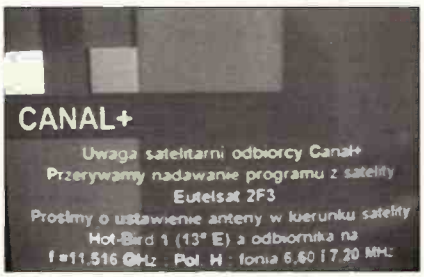
Less successful with digital reception was an old friend **Bindu Padaki** (Bangalore, India), well known in the region for his pioneering satellite work over the last 25 years. Using a loan digital Pace DVS 200 model none of the Asiasat-2 FTA services would lock up and it was impossible to load new data information. The DVS-200 is supplied mainly for the Asiasat-2 PAY-TV channels. It's thought the receiver is deliberately 'locked up' into a single parameter setting to prevent other services being received. More success on the analogue front with five new satellites available - Intelsat 801 @ 64°E; Insat 2D @ 74°E; Apstar-2R @ 76.5°E; Thaicom-3 @ 78.5°E and the Japanese B-SAT 1A @ 110°E. Bindu now uses a 3.5m C-band dish, Chapparal feed horn and Gardner 20K LNB.

A letter from **Wenlock Burton** (Victoria, Australia) with details of the recent Telstar 401 satellite loss. The AT and T bird slotted at 97°W died January 11th apparently from a 'coronal mass ejection from the Sun'. In other words a severe magnetic storm on the 11th resulting from said ejection a few days earlier, described as a 'magnetically charged cloud of helium and hydrogen'. This knocked out Telstar 401 and to cover the complete loss the elderly Telstar 302 has been shuffled into the 97°W slot as a short gap measure. From time to time satelites die, a few years back Intelsat K was hit as were a couple of Canadian Anik birds, fortunately two recovered from the power supply collapse. There's been a Maori language TV channel testing across Eastern Australasia - intended for Maori communities in New Zealand - running from the Intelsat 702 bird at 177°E during mid-May at 11.462GHz vertical in good old analogue. Uplinked out of Canada it's likely that the channel will expand the original two hours per day broadcasts later this year.

Election Day UK style May 1. I can't report any reception yet as bad weather plus weekend (and weekday!) working has terminated my own dish erection until early June, though letters suggest the Clarke Belt has been very active with satellite news feeds across the UK from the 'usual' Eutelsat 7/10/16 and 25°E birds, Orion, PAS-1 + 3, Intelsat K and even the French Telecom 2C @ 3°E were all running hot during election day and results that night into May 2nd. A query on a recent news feed with 'FUCHSST 625 PAL' caption has been answered by **Frank Lumen** (Ayr), he suggests this is a feed for the American Fox Network ex Germany, FUCHS is German for fox!

Mentions of **Roy Carman** (Isle of Wight) in the magazine has produced another nearby satellite enthusiast living at Wootton, so now experiences and problems can be shared! It seems the Echosphere 8700 receiver is very popular on Vectis! Roy comments that the PAS-3R satellite has taken on increased transponder useage in recent weeks, he checked out nine active ones between 12.520-12.731GHz over a lunchtime period recently including analogue traffic for WTN/Starbird and several corporate feeds. (WTN = World Television News, Starbird is primarily a mobile uplink/downlink operation offering editing/basic production facilities). Starbird were seen operating a new SNG unit uplinking with a UK 194 identificaiton on colour bars via the Telecom 2D recently (11.527GHz vertical, 5°W). Another interesting 'saturation' OB (outside broadcast) feed period was the recent European Football Champions League when during a single mid evening period no less than ten matches were carried across the sky from Eutelsat II F2 @ 10°E across to Orion-1 @ 37.5°W. Perhaps more dramatic was the sighting of the first (?) Croatian SNG unit with colour bars and ident 'HRT OSIJEK SNG CRO-001' via Eutelsat II F4, later on the same bird the brutal reality of Africa with an EBU relay 'EBU Kinshasa Path 1 G00095G for ITN'.

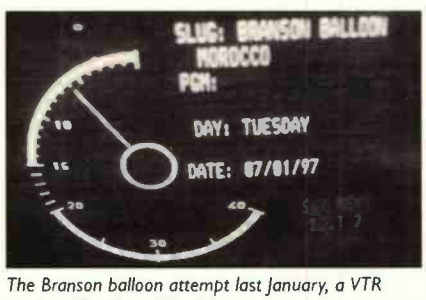
The devious route of news feeds is demonstrated with another Roy Carman logging - Telecom 2C at 3°E, 12.650GHz vertical with a caption 'NHK LONDON TO TOKIO via PAS-4' and an election report. PAS-4 @ 68.5°E can take a direct feed into Japan from the BTI Suffolk Earth station, so why this is duplicated onto a Central European spot beam isn't understood unless it's a BTI switching error or intended for European redistribution (but in Japanese?).



Canal + appears on Hot Bird 1 @ 13°E.

Can anyone identify this location, seen between video switches on NASA TV.

Count down 'clock' for the Swedish TV with an ENG insert.



The Branson balloon attempt last January, a VTR clock ex Sky News VT editing.

NEWS IN ORBIT

With the present 'hype' over the future of digital TV, an interesting report from Luxembourg's RTL reveals an increase in their turnover for the last year by 12% with profits at £51 million. MD Helmut Thoma comments on the headlong rush into digital TV and examples Kirch that only has 30000 subscribers after nearly a year, commenting that 'A kind of electronic mad cow disease has broken out'! Meanwhile Kirch are meeting with Deutsche Telekom in attempts to negotiate

carriage in the DT cable system and up subscription levels.

More protectionist legislation in France with the government passing a new bill levying 5.5% tax on foreign owned French language channels that are based on home soil - hitting eventually 40 channels though initially TeleMonteCarlo and CLT/RTL9 satellite offerings. Monies thus raised will be fed back into French TV production.

For fashion freaks check out 'Fashion TV' now on the 13°E *Hot Bird 1* @ 11.30775GHz horizontal - only catch is that it's MPEG-2 using 27.5Mb/s @ 3/4 FEC. Norway's Telenor and NetHold have formed a new group to produce both analogue and digital satellite programming across Scandinavia. Subscription management will be in Oslo. A common DVB-MPEG standard will be used to ensure compatibility with other digital broadcasters into the region.

The ongoing controversy regarding Spanish satellite broadcaster CanalSatelite Digital looks like a decision shortly as the Spanish government has told them to resolve a common encryption standard with rival digital broadcaster DTD. Favoured system is Multicrypt though CanalSatelite currently use the differing Simulcrypt. If the two rivals cannot agree then the government will enforce Multicrypt on both.

French Digital TV service 'Television Par Satellite' (TPS) is taking on their French arch rival Canal+ in both Italy and Spain - areas where Canal+ are very successful. TPS currently partners with TF1/CLT/M6 and hopes to join with the Spanish DTD group and Italy's RAI/Stet and Telepiu. CanalSatelite have recently added Euronews to their package with French, English Spanish or Italian language versions.

SES Astra is delaying the launch of their Astra 2A bird into a December launch. Sky hopes to inaugurate her digital TV services via 2A, which is scheduled to orbit from the disputed 28E slot that Eutelsat claims belongs to them rather than SES. Scheduled for this Summer is the Dutch 'Summer TV' channel, a satellite programme comprising of offerings from the Dutch NED1,2,3 services.

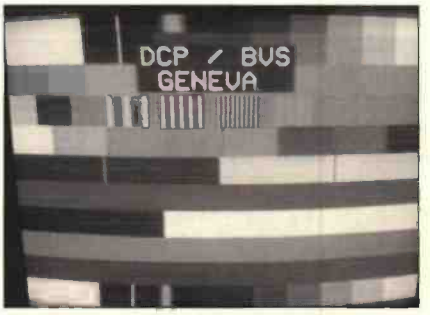
Timetabled to open Summer 1998 is the Taiwan based 'DBS Asia' which will transmit up to an eventual 500 channels via Laostar 1 and 2 birds based around simple Ku-band 600mm dishes. Total startup investment will be $US800 million and high profile names associated with this project are News Corporation, Echostar and Japan's Itochu Corporation.

In efforts to save money NetHold have cut over half of their 16 digital transponders on Astra/Eutelsat capacity including Filmnet Scandinavia and Filmnet Central Europe. Meanwhile digital expansion with HBO opting for cable distribution via Israel's AMOS 4°W satellite into Eastern European client headends - Poland, Hungary, Slovakia and the Czech Republic.

Meanwhile way out East Granada UK TV have concluded a deal with Hong Kong's Star TV (part of News Corporation) for a 24-hour general entertainment channel - in English - across India as part of the ISKYB digital package. And in the Middle East Granada will pop up with similar programming within the Star Select digital platform. India successfuly launched INSAT-2D which carries 12 C-band, 6 extended C-band and a single Ku-band transponder for television and general telecoms work. Indian state broadcaster Doordarshan, Zee and Sun TV are amongst those taking C Band capacity.

Indian Sky Broadcasting ISKYB has yet to confirm an on-air date for their Indian digital service - they're still awaiting the government DTH licence - though late April PAS-4 @ 68.5°E was airing promo channels. PAS-4 will be used for the eventual service with Star-TV booking seven Ku-band transponders. The Sky TV service includes the usual run of film offerings, sports, news and other foreign services such as ESPN, NBC, CNBC, BBC World and several Star TV channels.

Finally Taiwan based 'Space TV Systems' is planning a digital TV service aimed at Asian folk around the World, initially in SE Asia with 20 channels rising to global coverage with 120 channels by the end of 1998 covering parts of North America, Europe, Africa and the Middle East.



EBU Geneva and their colourful test card.

A familiar Reuters menu but this is now digital on Intelsat K 21.5°W.

DX Television

by Keith Hamer and Garry Smith

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

There is always a feeling of optimism among DX-TV enthusiasts around the middle of April when the first signs of Sporadic-E activity begin to show. The first reported signals were by **Shaun Taylor** (Howden) who discovered a short opening on the 18th at 1000UTC consisting of a Philips PM5534 test card on Channel E3. Unfortunately, the signal was too weak to identify. A more sustained opening occurred on the 29th between 1802 and 1826UTC when **Peter Barber** (Coventry) noted watchable pictures from Spain (TVE-1) on Channel E4.

DAILY LOPIK

Signals from the Lopik (Netherlands) transmitter on Channel E4 have been logged almost daily by Peter Barber (Coventry). Meteor-shower 'pings' and other low-level signals were also logged using a scanner but the signals were not strong enough to provide pictures on his portable TV receiver. Peter comments that when signals are strong enough to show on his TV receivers, the Roadstar portable he is evaluating synchronises faster than his Yoko, but it is not as sensitive.

NEW ANTENNAS

Shaun Taylor (Howden) has recently installed a rotatable antenna system covering Bands I, II and III and hopes it will be in constant use this summer. Meanwhile, **Roger Bunney** (Romsey) has moved house and the lattice mast which once dominated the Romsey skyline has been dismantled. Unable to re-erect the mast at his new location, a chimney-mounted Band I system has been installed comprising a wideband dipole with reflector. Initial tests show that while Channels R1 and IA are swamped with unwanted signals, Channel E2 looks promising.

F2 ENCOUNTER

Todd Emslie (Australia) reports what could be the first signs of F2-layer activity. Signals were detected on 49.75MHz from either China or Russia during March. We may have to wait another two or three years before F2 reception really hits us but news of these initial signals are most comforting.

What does F2 reception mean in terms of what we will see? When sunspot activity is at a maximum, skip distances are created in excess of 2000km. This means that when we are striving to receive stations in the Middle East during a Sporadic-E opening, such an achievement is relatively easy via F2 reception. Further afield countries such as Thailand, China and Malaysia have been received regularly. Although signal strengths can match those of strong Sporadic-E signals, severe ghosting and video distortion is the order of the day. There is one big bonus though; F2 activity shows during the winter months between October and March in the northern hemisphere.

SERVICE INFORMATION

Laszlo Kozari (Hungary) has supplied transmitter details for the Hungarian TV networks. The information suggests a new u.h.f. transmitter will be operational in Budapest later this year airing MTV-1 programmes which are currently using Channel R1. The new outlet will have an e.r.p. of 500kW. Let us hope that the Channel R1 transmissions continue for some time. All services now transmit in PAL colour with 6.5MHz sound and vision separation.

Gösta van der Linden (Netherlands) advises that later this year there are plans to install three u.h.f. transmitters in the province of Gelderland for the proposed 'TV Oost' (TV East) regional TV service. Omroep Fryslan (ROF) is to increase the e.r.p. of its Channel E28 outlet at Irnsum. This will provide full coverage in the province of Friesland.

In Belgium, the RTBF Télé 21 service has been renamed 'Eurosport 21'. The video signal is encrypted.

In Germany, DAB (Digital Audio Broadcast) transmitters are using frequencies within channels E11 and E12 and during periods of tropospheric enhancement, strong interference to Channels R11 and R12 is being experienced.

The EBU v.h.f./u.h.f. TV Station List will no longer be published. This concise publication was once the DXer's ultimate guide with virtually every transmitter in Europe listed. Listings ran to several hundreds of pages and in its early days a transmitter map was supplied. It was originally published in Belgium and more recently in Switzerland but, unfortunately, production costs escalated making it a luxury few of us could afford every year!

CHANNEL 5 PROBLEMS

With only a few weeks of broadcasting history behind them, the technical inadequacies of the transmissions are already showing. In some locations within 15km of the Lichfield transmitter, co-channel interference is being experienced from the Emley Moor outlet. The characteristic co-channel interference effect which DXers are only too familiar with can be seen materialising over a period of several minutes with subsequent break up of the picture before the signal returns to perfection. At times the sound and vision levels of the broadcasts have been under or over modulated.

Some of the transmitters are not co-sited causing reception difficulties, especially for viewers close to the two transmitter sites where signals may arrive from completely different directions. A second antenna is required in such circumstances but diplexing the two outputs is proving unsatisfactory in some cases. Although a separate Band I and Band III antenna was necessary in the days of 405-line TV when BBC and ITA transmitters had different locations, diplexing was much easier to achieve.

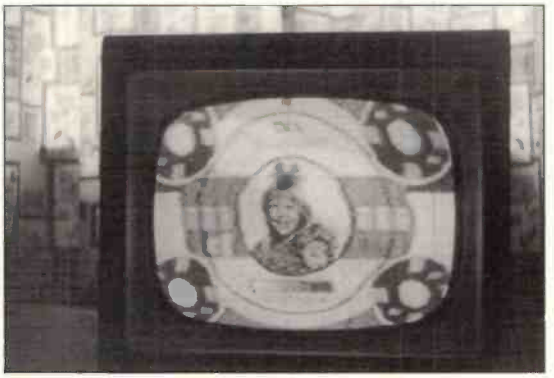


Fig. 1: Garry Smith's first DX season using a modified Bush TV56 receiver and indoor dipole. The set is displaying a Swedish test card, received in July 1969.

Fig. 2: Typical reception via F2-layer propagation. This was Thailand received on Channel E2 by Pertti Salonen in Finland.

Fig. 3: A sample page of teletext transmitted by MTV, Hungary.

BBC GRAPHICS BOOK

Regular readers of this column will know that we usually include a photograph from our collection of BBC-tv archive material. It's always interesting to see what television graphics were like in days gone by. Judging from the letters we receive, many of you find the monthly delve into the archives quite fascinating.

Those of you who are intrigued by television graphics and test cards may like to know that a book is now available from the *SWM* Book Store. It's called *This Is BBC-tv: The First 30 Years Of*

Television Graphics. The book traces the development of BBC-tv graphic design between 1934 and 1964 and includes many rare examples of test cards, clocks, tuning signals and identification symbols. There are also examples of more modern graphics including some of the special Ident Symbols used between programmes at Christmas. The book also features well researched information about the early days of television including short sections about the Baird systems and experimental colour transmissions. Details about the various designs used for BBC test cards are also include interested in BBC test cards and television graphics in general, this 38-page book is a **must** for you!

URGENT PLEA: AMSTRAD DISK DRIVE!

The authors of this column are urgently trying to locate a spare (and fully working) disk drive for an elderly Amstrad word-processor, type PCW8256. This equipment (introduced nearly 12 years ago) is used to produce the monthly 'DXTV' column, but unfortunately the disk drive has developed a fault. It regularly refuses to read information from the 3in disks. Sometimes it can take over a dozen attempts to load the Locoscript 'start of day' data. We have tried fitting a disk drive intended for the lower 'Drive B' slot in the main (top) 'Drive A' position, but without success. The two disk drive units are, apparently, not inter-changeable. *(Replacing the rubber drive band usually cures the problem. The drive uses a stock cassette drive belt available from your local repair shop - Ed.)*

If anyone has a spare 'Drive A' unit (in good working order) available, please write to the address given below or telephone (01332) 513399.

Fig. 4: The EBU Bar radiated in the Seventies by the Hungarian 2nd Network.

Fig. 5: This month's trawl through the archives! The original BBC-2 Identification Symbol used from April 21, 1964.

KEEP ON WRITING!

Please send DX-TV reception reports, equipment news, off-screen photographs and general information to arrive by the 3rd of the month to:- Garry Smith, 17 Collingham Gardens, Derby DE22 4FS, England.

Fig. 6: The transmitting tower at Alexandra Palace, home of the world's first public high-definition Television Service from November 1936.

SSB Utility Listening

GRAHAM TANNER
64 ATTLEE ROAD
HAYES, MIDDLESEX
UB4 9JE
E-Mail:
graham.tanner1@virgin.net

Every time that I mention certain subjects or books, I receive letters from readers asking where they can obtain copies for themselves. As usual, I either mention the source in this column, or I send a personal reply with full details. I never know whether the information that I pass-on is put to use, but I'd like to think that readers are following up on any leads and information that I feature.

This month's subject is the *Flight Information Handbook* from the US Department of Defence. This small, white booklet contains a vast amount of information to utility listeners, especially those who like to listen to US military aircraft and frequencies or other aeronautical traffic. The *Flight Information Handbook* is the official publication used by US military pilots, and it is issued twice a year. It contains a full listing of h.f. frequencies used in the various h.f. aeronautical networks, with maps to explain their coverage; a full listing of the USAF Global High Frequency System (GHFS); a full listing of worldwide VOLMET voice weather broadcasts, and a vast amount of information relating to flying. The booklet is published by the US Department of Defence.

So why is this booklet so important, you may ask. Well, from my viewpoint, it is the book that I receive most questions about - the most popular one being where can I get a copy? I don't know why, but some readers seem to think that I have an untapped supply, and give them away for free! The booklet is not available direct from the publishers, but it is publicly available from several sources in the UK and the USA. Over here in the UK, a single copy is relatively expensive (possibly as much as £20), but if you buy direct from the USA, its price plummets. The best people to contact in the USA are the NOAA (National Oceanic & Atmospheric Administration) in Maryland - their 'phone number is (301) 436 6990 (don't forget to add your international dialling prefix and the USA country code). There is a five hour time difference between Europe and the eastern USA, so I would recommend that you wait until the afternoon (in Europe) before 'phoning. When you get through to them, mention that you want a one-time purchase, and the item that you want is the *Flight Information Handbook*, which has order code FIHB. The most impressive thing to note is that a single issue of the *FIHB* costs just $1.60, which is about £1 - yes, **£1**. Even better, if you ask for the book to be sent at normal postal rates, there is no charge for postage and packing.

For the last few years I have been using a copy which was dated from the early 1990s, and well out of date. So, in April I decided to 'phone the NOAA and order a new copy. There were three reasons for doing this - to get an up-to-date copy, to see how long the service took, and to see how easy it was to order. I had been told that ordering through NOAA was easy, so this was my chance to see just how simple it could be. A quick (ten minute) 'phone-call with my credit card at hand, and the book was on its way. I ordered the book on a Friday, and it arrived just eight days later - quite an amazing service at such a price.

One of the most interesting additions to the latest issue of the *FIHB* is that they now list an entry for SATCOM voice for various aeronautical h.f. stations such as New York and San Francisco. This has been the subject of much debate on the Internet in recent months, with several questions about what the number really means, and how it is used. The entries for New York ATC say SATCOM voice 436623, and there have been questions about a missing decimal point, and discussions about whether it is a h.f., v.h.f. or u.h.f. frequency. However, I am able to reveal that this is in fact a satellite 'phone number for use on the INMARSAT system, and should only be used for emergency communications. This snippet of information comes from the latest RAF *En Route Supplement*, which explains exactly what the number is and how it should be used.

The latest *FIHB* also reveals that Thule GHFS in Greenland now operates on 11.175MHz for 24 hours per day, and that the only GHFS station which does not use 11.175MHz is Lajes in the Azores.

MARS

Steve Dyer writes from the West Country asking about some MARS stations he heard recently. MARS is the Military Affiliated Radio System, and is used by US military personal for (mostly) 'phone-calls to their friends and family back in the USA. The system relies on a large number of stations in the mainland USA, usually manned by people during their spare time, who use modified amateur radio equipment to pass messages.

The stations that Steve heard were all from sailors on ships 'phoning home to give Mother's Day greetings; on occasions like this, the sailors get free 'phone calls. From the tone of the conversations, the ships concerned seemed to be about half-way across the Atlantic. Steve listed the callsigns of the ships as CBE, CBD, COD, CXB and CYJ, although these are all normally prefixed with NNN0. The shore stations were AIO and ADV.

For the record, these ships are: CBE - *USS Leyte Gulf*/CG-55, COD - *USS Hue City*/CG-66, CBD - *USS Thomas S Gates*/CG-51, CYJ - *USS Stark*/FFG-51 and CXB - *USS John F Kennedy*/CV-67. Shore station AIO is in California, but I cannot find any details for ADV - can anyone help? These MARS callsigns tend to stay quite static, and remain with a ship during its lifetime. There is no official listing of ships with MARS callsigns, but there are quite a few unofficial copies around.

The MARS system uses a large number of frequencies, usually just outside the recognised amateur radio allocations. A good starting frequency is 14.4415MHz (which is where Steve started), but be ready to change to another frequency, as they always like to conduct their business away from the calling frequency.

TWA

As an example of how odd things crop-up with utility stations, Peter H. from Bristol writes with details of a series of transmissions that he picked-up in early May.

A TWA flight from Paris to New York crossing the Atlantic, and was working Berne Radio with a phone-patch to TWA Ops in Paris. They reported to their Ops that they had found a note which they could not decipher and were concerned that it was a bomb-threat. The message (as spelt by the pilot) read INALAH VA MALAYKATOVHU YOU - SALOUNA ALANABYOU YA AYOU HALJINA AMANOOU SALI-OU TALISLIMA. The crew were considering returning to Europe (probably to Gatwick), but wanted to know what the message said. Paris confirmed that all the baggage on the flight had been X-Rayed. Eventually, the flight continued to New York, and they thought that the note may have been accidentally dropped by one of the aircraft cleaners at Paris. About 90 minutes after the original call, Paris called to say that they thought that the language may have been French-African, but still could not translate it!

NEW ADDRESS

The observant ones amongst you will have noticed that my E-mail address listed at the top of the page has changed. My original ISP (Delphi) changed to a system that I was not happy with, so I have now changed to Virgin Net. Please change your address books accordingly. ■

Peter Waters captured Hawker Sea Hawk WV908 of the RN Historic Flight, Yeovilton at the recent Southend Airshow.

COMPETITION PART 1

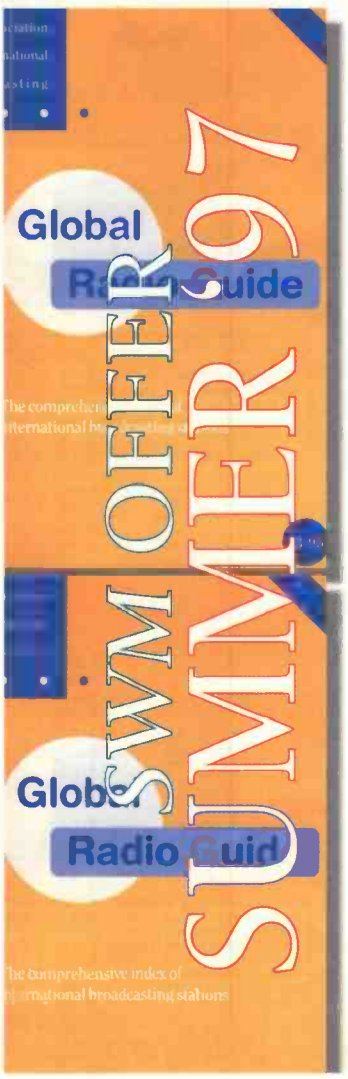
Win a JRC NRD-345 donated by Lowe Electronics.

Enter this two part competition and you could be the lucky winner of JRC's latest h.f. receiver. Reviewed in our May issue this is a highly desirable receiver is ideal for that gap in your shack.

How good is your knowledge of communications receivers? Take a look at the radio we've hand-built here at *SWM*, just identify the various components that we've used from the list

Lowe HF-250
Icom IC-R7000
JRC NRD-345
Icom IC-R9000
JRC NRD-525
Kenwood R-5000
Icom IC-R71A

Keep your answers in a safe place. We will tell you what to do next in part two next month.



Global Radio Guide Offer

WIN A SHORT WAVE RADIO!

It is difficult to find your way around the crowded short wave broadcast bands without some sort of guide to what's on the air. What everyone needs is a handy guide to world broadcasting with frequencies and transmission times, and this month we have a special offer that is ideal for every broadcast listener.

The *Global Radio Guide* is published twice a year by the Association for International Broadcasting, a non-profit making organisation that promotes international radio world-wide. The *Global Radio Guide* is the definitive directory of English-language international radio, with details of the times and frequencies, plus full contact information, of more than 80 stations from Albania to Lithuania, Mongolia to Vietnam. The *Global Radio Guide* is your key to unlock a whole world of informative, educational and entertaining English-language radio.

This handy 48-page, A5-size guide has been completely revised with the most up-to-date frequency data to help you find your favourite programme with accuracy and ease. And if you're keen on the World Wide Web and E-mail, the Guide is especially helpful since it contains URLs for all of the broadcasters on the Internet. There is also a satellite section with details of what you can hear via a dish antenna as well as by short wave.

The *Global Radio Guide* is the most current publication about English-language broadcasting that's available, and the new Summer Edition is on sale now at £4.25. But readers of *Short Wave Magazine* can buy the *Global Radio Guide* for just £3.35 post free!

Buy your copy of the *Global Radio Guide* through this offer and your name and your name will be entered in a draw to win a portable short wave radio that's ideal for your summer holidays!

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Order today by sending a cheque or postal order for £3.35 payable to PW Publishing Ltd. Alternatively you can pay by Mastercard or Visa: send your card number and its expiry date plus your name and address to Short Wave Magazine, *Global Radio Guide* Offer, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. Don't forget to mention that you're responding to this special offer to qualify for the prize draw. If you live outside the UK, please add £0.40 additional postage charges. All orders will be dispatched as quickly as possible, but please allow up to 28 days for delivery.

Scanning

JOHN GRIFFITHS
22 FFORDD BEIBIO
HOLYHEAD, GWYNEDD
NORTH WALES
LL65 2EH

Not much on frequencies this month but an interesting mail bag nonetheless. My mention of PROMA brought a good mail bag of people interested in finding out more.

I've answered a lot of personal mail with regard to this and now, for those who will no doubt hear PROMA mentioned again, here's the address to write to for more details: **PROMA, 2 Icknield Way, Baldock, Herts SG7 5AJ.**

Please remember that you'll need to enclose an s.a.e. in order for Paul to get back to you. Do I recommend PROMA? If you're into scanning then the answer is "yes - I most certainly do!".

BAND PLAN

One knuckle rap I've had this month concerns my exclusion of amateurs on 70MHz in the last band plan I put out. I apologise. This band is sorely under used, but is available.

As a mark of my shame in this I'll ask if anyone has heard any 70MHz activity to get in touch? That way we can see what's happening on the band and, maybe, revive interest in it. My thank's to **Mr. R.S. Taylor G1WEX** for his letter.

AIRBAND USERS

A note for airband users into scanning. Airscan, which used to be The Black Cat Aviation Group, has reformed. Information on this aspect of monitoring which is h.f./v.h.f./u.h.f. based and covers military and civil airbanding can be had from: **Dave Mulligan, Airscan Group Co-ordinator, 70 Monk's Close, Bircham Newton, Kings Lynn, Norfolk PE31 6RD, Tel: (01485) 578183.** Worth giving it a try. Nice to have you back, Dave!

SCANNERS MISREPRESENTED

Now, regular readers will know how I feel about scanners being misrepresented. It's a common fact of life that scanners are seen in the vein of 'folk devil' by many people and the following bit from the *Worcester Evening News* of April 25 this year got my blood really boiling, which is easy to do if you're a diabetic! Nonetheless, it shows what we're up against via the media and, I believe, the legal profession to some extent.

Apparently, a mother, who was worried about her son's drug habit, used a scanner to tap into mobile 'phones in the hope of catching the dealer. Anyway, without going into gory details, this scanner, which contained 210 channels, 56 of which were programmed with police channels and 14 into mobile 'phone frequencies, earned her a 12 month conditional discharge and £50 costs. She had bought it at a car boot sale for £50 and, here's the crunch, intended to use it 'to talk to people abroad' in conjunction with her CB equipment.

Now, as an ex-CB user many, many years back, I think I learned what you could do with a CB. Yes, when it was a.m. and s.s.b. you could, and I did, talk with other people over the water.

Ireland was a cinch, Italy too easy and, on one rare occasion, California for about five minutes. However, progressing from there to short wave radio, I found that no matter how much I wanted to, I could no longer talk to people, using a receiver.

Likewise, a scanner does not allow me to talk to anyone! Yet this mother bought a scanner to "talk to people with". What? I'm a bit confused here...was it, or was it not, a scanner?

If it had that number of memory channels the chances are it was, as it could access u.h.f. police channels and mobile 'phones. Yet even better is to come...

The paper goes on to say that, and I quote, "...she tuned in and spoke to a man...". Wow...can anyone tell me where I can get a scanner like that? I'd love to have a whizz on that sort of baby....Have, perchance, one of the big Oriental outfits made something which has passed the radio press on the blind side?

GET REAL

It's Get Real Time, folks. Like, if there are any journalists out there who aren't sure what a scanner can and cannot do, would they please get in touch to keep the facts right and square?

Likewise, the police who, it appears, got a prosecution on the ability of a scanner used as a transciever: Was she actually let off easily, by transmitting without a license she should have been done under the Wireless Telegraphy Act at least.

Her defence lawyer stated that "...at no time did she intend to use it for listening to West Mercia Police frequencies." Really? With 56 frequencies patched in?

It really does bother me that we continue to get a bad press. That journalists and the like continue to misrepresent us at a basic level. I am once again reminded of the ignorance which surrounds the hobby. If you are in a position where you have a duty to present the facts then please use your network and do some research!

I would be happy to tell you what they can and cannot do, and transmitting is certainly not in the realms of scanners! If you know of any other prosecutions, get the clippings to me.

If you're a journalist looking for answers, contact the magazine for free, impartial and correct advice. Please...?

That's the soap box into the corner for now!

SPIRIT OF CO-OPERATION

A letter from a serving Police Officer now. Written in a spirit of co-operation, the letter is extremely informative and I am indebted to the Officer concerned for his information. It reminds us that any scanner owner stopped by the Police is likely to be investigated for offences related to breaking the law.

He then goes on about a debate I've listened to on BBC Radio 4 on the use of mobile 'phones and other radio equipment in use whilst driving. Not illegal, but you can be done for driving with 'undue care and attention' if the officer believes you not to be in control of the vehicle. A cautionary note added to that states that if you have a scanner in the car, interest will be shown in it. So, remember what I've said about sensitive frequencies.

This Officer actually wrote in with regard to the bit I wrote about concerning *The Police Review*. The record is set straight, Officer, and I take note of what you say.

The Police are not out to penalise scanner owners, but they do keep a watch out for those who draw attention to themselves. Fair comment and I apologise, but also say thanks for the letter, which was interesting and very explanatory.

STRANGE ENCOUNTERS

An anonymous letter about 'strange encounters' informs me of an incident. Birmingham ATC were informed by a number of aircraft that another, unidentified, aircraft was flying in their vicinity.

Birmingham ATC had no knowledge of this...the local Police helicopter, on finals, reported close visual contact with an unidentified aircraft, which was also unknown to ATC at that point.

My correspondent asks if this was an F-117 or other 'stealth type' aircraft....and reports that there are similarities between Birmingham at night, from the air, and Bagdhad! As this was Farnborough week, could a 'training sortie' to show off such 'secret' capabilities have been put in to display the potential of the aircraft's invisibility to radar...?

I'd be interested in theories on that one. Likewise, any form of unusual experiences you have with radio, in whatever guise, can be sent in to me at my address. As usual, I'll maintain confidentiality.

Likewise, if you have heard any other unusual transmissions on v.h.f. and u.h.f. that you're not sure of, and not on airband, do get in touch. Which leads me to a letter from **Mr. A Pritchard** of Chandlers Ford. A keen astronomist, which is an adjunct to his scanning hobby, he noticed a satellite in high orbit travelling North, tracking towards Cassiopeia. He also noticed a second satellite coming in from the East, at right angles to the first. He informs me that the first satelite was at 8° from zenith when it was intercepted, indicated by both merging. He said that he then waited for the satellites to part, but they did not. Both continued in company North/South track for eight or nine seconds before the first broke clear and continued on its original East/West course. His question is: objects moving at that speed cannot abruptly make a right angle turn - can they?

He asks if any readers can assist him in determining what happened - without going into theories around non-Newtonian motion and aircraft, meteors, etc. If you think that you can assist him, then please write to him at: **A. Pritchard, 18 Swanton Gdns, Millers Dale, Chandlers Ford, Nr. Eastleigh, Hants.**

LOW VHF

This column gets more varied every month! Not a bad thing as it shows a lot of scanner owners aren't the anoraks we're painted to be by the popular press! **Tony Cromwell**, of Aylesbury, writes in to ask if readers have heard anything on low v.h.f. of late?

Tony is particularly interested in anything heard between 30 and 40MHz, particularly from Europe. Tony tells me that he has heard unidentified signals here on numerous occasions. Can anyone assist in identifying or backing Tony's observations up?

Summer is the time when 'lifts' are in evidence and I'd be interested in hearing from anyone who has heard any activity from 30 to 80MHz. It's also a good place to try scanning in during hot spells, with a high barometer reading, and if you're near to the coast. Do write in and let me know what you hear.

Until next month, good scanning! ■

Airband

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

Pic 2: Robin ATL. Christine Mlynek.

If this is the July issue then it must be showtime and the Red Arrows are scheduled to perform (dates in June) at Lyneham & Waddington (28) and Waddington (29). In July, Cranwell (3), Chichester (4), Cranwell (11), Liverpool & Silverstone (12), Silverstone (13), Aberdeen (15), Shrivenham (18), Fairford & Whitstable (19), Fairford (20), Lowestoft (24), Bournemouth (25), Culdrose & Middle Wallop (26), Lyme Regis (31).

In August, Cranwell & Skegness (1), Sunderland & Swanage (2), Sunderland & Tenby (3), St. Mawgan (6), Woodbury Park (8). Information from AIC 59/1997 published by the CAA. Changes without notice are always possible.

LET'S FLY

As you can see from this month's photos, Chris and I flew Trident 3B simulator G-AWZQ. For a photographer, Chris doesn't make a bad first officer!

Those with archive information will spot that 'ZQ was never issued to an aircraft, leaving a gap in the block of Trident registrations. Redundant from its BEA training role, the simulator features full motion and points-of-light night visual scenes.

The visual display permits straight-ahead but not across-cockpit viewing. Threshold piano keys and illumination from landing lights are simulated. On taxying to the central area of Heathrow, though, lights are suspended eerily in space and buildings are absent.

Controls are heavy in pitch and roll. This might be difficult going for beginners but has the advantage that it discourages over-controlling. Neutral ailerons are felt through the controls as a detent, which will help beginners.

Small pitch trim changes are needed with all changes of power or speed. The simulator realistically puts you in control of a jet airliner at a price that's good value compared to flying lessons or other commercial simulators.

The rate is £50 per hour (including VAT) and you get uninterrupted personal access to the simulator for that time. It's located in Surrey between Gatwick and Biggin Hill airports. To arrange a visit, telephone **Andy Mattacks** on **(01883) 652109** and mention that you read about it here.

INFORMATION SOURCES

The Black Cat Aviation Group has reappeared as Airscan Aviation Monitoring News Group. Contact the group co-ordinator **Dave Mulligan, 70 Monks Close, Bircham Newton, Kings Lynn, Norfolk PE31 6RD** or telephone on **(01485) 578183**.

The *Airband Factsheet* is now on issue 6, the two A4 sheets being free of charge from the Broadstone Editorial Offices (not from me!) if you send in a pre-paid self-addressed envelope. The main change is the closure of the CAA Chart Room in London. All charts are now from Westward Digital Ltd., but the address is the same as the CAA Cheltenham office, despite the privatised-sounding name. Don't ask me to explain this!

ON THE AIR - IN THE AIR

Talking of privatisation, I've previously mentioned that RAF basic pilot training is now done by a civilian company in Slingsby 67 aircraft from Barkston Heath. An occurrence report from the CAA raises the interesting point that these aircraft are fitted with u.h.f. transceivers, reflecting the military environment in which they operate. I suspect that no other Slingsby 67s carry this equipment, which might have been installed specially.

Following up **Sandy's** (Glenburn) question in Peter Bond's 'MilAir' (May page 60), pilots are advised to make the first distress (Mayday) or urgency (Pan) call on the frequency that they are already working. This is because they know that they are already in contact with an Air Traffic Service Unit that is already aware of the flight's position and intentions. If this fails, or no frequency is being worked, then the emergency channel (121.5 or 243MHz) should be called.

FOLLOW-UPS

As reported in September 1996 'Airband' an aircraft ran off the end of the runway during a display at Hawarden on July 7 1996. The Air Accidents Investigation Branch Bulletin 4/97 fills in the details on page 29. Venom G-VIDI was taking off in a formation.

It is possible, interpreting the report, that the pilot was distracted by following the lead aircraft and did not notice that the airspeed was too low to unstick. On leaving the ground below minimum control speed, roll authority was lost and the aircraft crashed back on to the runway.

In May I reported one reader's experience in Cyprus. Local resident **Roger Howe** (near Larnaca) tells me that all kinds of western and Soviet aircraft visit the island - not forgetting the Red Arrows on winter training detachment, and even the A300-600ST modern 'Super Guppy.' But, what calls 'Dynasty?' It's China Airlines, Roger.

RECEIVER HARDWARE

I can't give **B. Westwood** (Dagnall, 6 mile final for 08 at Luton) any hard and fast rules about antennas (following on from my comments in April). It all depends on height of antenna and if nearby metalwork is causing an obstruction or reflections.

The v.h.f. antenna at BW's QTH is a quarter-wave dipole (do you mean two quarter-waves making a total of a half-wave?). This has given better service than an Air-33, so it shows that location is just as important as sophistication of antenna design!

An active antenna would also be expensive and might work. Or, it might be prone to interference as its inbuilt amplifier is broadband and can't select the wanted frequency from other powerful signals.

Strictly speaking, 50Ω cable and connectors ought to feed the antenna but the loss with 75Ω cable won't be that great. There's no point in keeping 75Ω cable and replacing the connectors with 50Ω types. Note that TV coaxial cable has more loss than good quality communications-type feeder.

THE AIRBANDS

This column's title isn't really accurate because three separate bands contain aeronautical communications. the concept of band is purely artificial. Radio waves can be transmitted on any frequency from extremely low (just a few kilohertz) to super-high (many gigahertz).

Those of you with an understanding of physics will think of the electrons in your antenna oscillating back and forth at the appropriate frequency. Readers who only want a practical, less theoretical, approach will know that the frequency is the number to dial up on your radio set so as to be sure of receiving the wanted station - a bit like writing the correct address on a letter.

Because the range of possible frequencies is so vast, some people find it helpful to split it into bands. Long-distance aeronautical communications, for example when flying over the Atlantic, are found on various spot frequencies between about 3 and 30MHz. Radio waves are capable of long-distance propagation at these frequencies. We call this entire part of the radio spectrum the high frequency band.

Communications between 118 and 137MHz are only capable of local range and this has been adopted as the civil v.h.f. airband (part of the 30-300MHz v.h.f. range). In this case, the whole band has been reserved for the exclusive purpose of aircraft communications.

Some military communications, also short-range, are found at various points in the u.h.f. band (strictly 300MHz to 3GHz, but the military airband is really a collection of frequencies mainly between 230.3 and 398.7MHz). Although it starts below

THE VINTAGE WIRELESS LISTING

Now published every three to four months containing 100s of out of print old and collectable wireless and TV books and magazines and now incorporating "The Vintage Hardware List" that contains for sale – vintage domestic radios, communications receivers, audio equipment, valves, vintage components etc. Send six first class stamps for list No 10 or £4 for next four catalogues.

NEW BOOKS

Valve Communication Receiver Handbook. Contains circuits and technical information for valve communication receivers both commercial and of military origin. 1940s - 1960s. Incorporates a surplus/commercial cross-referenced valve guide. Large format. Approx 100 pages. **£16.50** P&P £2.50.

1950s Valve Equivalent Data. Much useful information. 68 pages. **£7.50** including postage.

Janes Military Communications 12th edition 1991-1992. A vast volume of 814pp. Large format, wraps. Contains descriptions, photographs and basic details of the world's military communications equipment. Brand new. Published at over £100. **SPECIAL PRICE £30** postage £5.50. Overseas postage extra.

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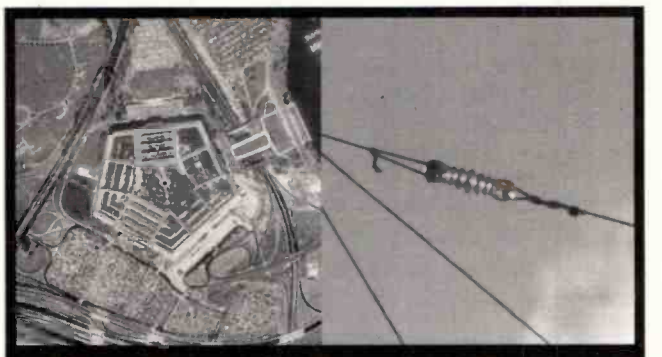

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MilAir

PETER BOND
C/O EDITORIAL OFFICES
BROADSTONE

UHF FREQUENCY CHANGES

Despite having already sent the Editor the copy for July 'MilAir', I have hastily re-written this month's column due to some late breaking frequency news. Consequently, replies to some of your letters have been held over until next month. I am greatly in debt to Photavia Press, publishers of the excellent airband directory *Airwaves*, for bringing these important changes to our attention. They felt that the quickest way to inform our readers and their customers of these changes was through the pages of, (as they put it), Britain's leading radio magazine.

In February we were informed that any mass changes of u.h.f. frequencies were not planned to take place in the near future - this still appears to be the case. However, Photavia inform us that, (by the time you read this), a minor u.h.f. change round will have taken place in June. The following are the UK Military u.h.f. frequency changes that were due to be implemented on 10 June 1997.

AIRFIELDS

		New	Replaces
Boscombe Down	Tower	386.525	370.1
	Approach	382.65	380.025
Brize Norton	Tower	396.7	381.2
Culdrose	Radar	388.0	358.7
	ATIS	282.1	372.3
Coltishall	Approach	315.325	379.275
Cottesmore	Approach	388.525	380.95
Leeming	Ground	386.525	338.85
Leuchars	Tower	259.125	258.925
	Radar	259.925	268.775
	Ground	297.9	259.85
Lintón	Radar	277.625	381.075
Llambedr	Tower	387.75	380.175
Manston	Approach	231.6	379.025
Marham	Approach	268.875	291.95
St. Mawgan	Radar	387.45	336.55
Shawbury	Approach	362.475	276.075
	Tower	340.35	269.1
Waddington	Tower	388.225	285.05
Wattisham	Tower	358.6	343.425
West Freugh	Approach	260.025	383.525
Wittering	Approach	388.525	380.95
	Radar	396.85	383.225

CONTROL CENTRES

London Military	Area Radar	254.275	231.625
ICF North/Northwest		299.8	230.05
Dover/Lydd		291.075	235.05
London Upper/High			

Apparently, it is not uncommon after a change such as this for several of the frequencies to be changed again due to logistics or problems with interference. Whether this is a one off change round or the preface to more substantial changes, only time will tell. Photavia tell us that their regular customers can get a copy of an update sheet to cover these and any other changes, free of charge by sending them a stamped addressed envelope. My thanks again go to them for the information.

ST. MAWGAN

My thanks go to **Jim** from Helston and **Andy H.** who also lives in Cornwall, they have both written in with information about RAF St. Mawgan. Despite the departure of the base's Search and Rescue Nimrods it seems that the airfield still has quite a number of aircraft movements. The reports show that a significant proportion of the current activity is Royal Navy operational and training flights, mainly to and from RNAS Culdrose and Yeovilton. There is also a very mixed selection of RAF and NATO movements - noted recently were German Tornados, USAF E-3 AWACS, RAF Hercules, US Navy P-3C, French Air Force C-135FR plus a variety of test aircraft from Boscombe Down. Frequencies noted in use recently are as follows :

Tower	123.4, 241.825
Approach	126.5, 357.2
Radar	125.55, 336.55, 360.55
Ground	376.625
Operations	260.0
DATIS	252.525

Also the London military frequencies, 275.475 (Initial Contact South) and 283.525 (Southwest Air Traffic) are used regularly by aircraft inbound and outbound to St. Mawgan.

Two forthcoming events at St. Mawgan are worth noting. The annual airshow, (unusual as it is held midweek), is on Wednesday 6th August. I have been to this show a couple of times in the past decade and it often has one or two real gems amongst the visiting aircraft. Also this autumn will hopefully see a flurry of activity, as the airfield will host exercise 'Ample Train', between the 8 -12 September. The main aim of this exercise is for air-arms to be given the opportunity to evaluate each other's aircraft and equipment. I understand from some of my correspondents that the aircraft participation in the exercise is expected to be very good, with air-arms present from both NATO and other countries. As always, if you attend and note anything of interest please drop me a line.

US PRESIDENT

By the time you read this, Mildenhall Air Show will hopefully be a pleasant memory. Unfortunately, my comments regarding the attendance of President Clinton, (as indicated by a February press release on the Internet), proved to be somewhat premature. As I write this column shortly before the Air Fete, all indications are that he will not be attending the show, (he will however be attending the summit in Amsterdam). It just goes to prove you can't believe all you read on the 'Net', even if it is on an official Web page!

FREQUENCY FOCUS

A couple of changes not related to the above list. **Keith** and **Robin**, who are Mildenhall regulars, report that a new Tower frequency came into operation during early May. 370.25 is now in use and replaces 258.825. Lastly, thanks to JBM for the London Military active frequency lists. He comments that the frequency 303.0 has been noted as both London Military and a USAF Air/Air. My records show that I have a confirmed report in 1996 of aircraft definitely calling London on this frequency. I can only conclude that it is a London discrete used mainly by the USAF for Air/Air? As always if you know differently, drop me a line - see you next month. ■

Airband (continued from page 72)

300MHz, it's conveniently referred to as the u.h.f. airband.

Do military aircraft work civil facilities, and do civil aircraft talk to military controllers? The answer to this, as asked by **A.H. Harrison** (Chester-le-Street), is yes! Many military controllers also have v.h.f.

Some of the Lower Airspace Radar Service units, for example, involve military controllers helping civil aircraft. Few civil aircraft carry u.h.f. (see the example of the Slingsby 67). Some military aircraft exclusively carry u.h.f. and can't work the v.h.f. band at all.

On the subject of h.f., I wouldn't expect propagation to be affected by weather conditions (apart from static crashes due to lightning). These frequencies diffract in the ionosphere, well above the weather (which is contained in the troposphere).

Despite this, **Robert Samuel** (Holywell) suspects that heavy rain reduces h.f. propagation. What could be happening is that the static-charged raindrops impart so much electrical noise when they land on your antenna, that you can't then hear any signals even though they are there!

Rain does attenuate microwaves, the hydrogen in water resonating at these frequencies and converting the radio waves into heat. That's how a microwave oven works.

FREQUENCY & OPERATIONAL NEWS

The new Sheffield City Aerodrome now has an Aerodrome Traffic Zone (according to *GASIL* 2 of 1997 from the CAA). When I travelled along the M1 mid-May I couldn't see it from the road. I still don't know the frequency!

Martin Sutton (CAA) kindly sent the latest changes. Chichester/Goodwood runway 14L/32R is withdrawn, a shame as it appears to be the longest one at that aerodrome. At Newcastle, the old Five Bridges name will be heard no more as the visual reference point is now called Tyne Bridges; Blaydon is a new visual point.

LATCC frequency changes affect UA29, UA30, UA37, UA47, UA56, UB5, UB10, UB11, UB29, UB71, UB105, UB295, UB317, UB321, UG1, UP6, UR1, UR4, UR8, UR12, UR14. I have an up-to-date frequency list, impossibly long to publish here.

As usual, if you need a particular frequency, write in. As none of you have done so yet, I assume you've all got the latest supplements or other information sources.

The next two deadlines (for topical information) are July 24 and August 18. Replies always appear in this column and it is regretted that no direct correspondence is possible. ■

Pic 1: Godfrey flying the Trident 3B. Christine Mlynek.

Info in Orbit

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The cost of setting up a weather satellite (WXSAT) receiving system can be a significant problem to those on low incomes. For those who have a computer of suitable power and specification (see later) the rules have changed. You can obtain free software and use a sound card for decoding an incoming WXSAT signal. This edition of 'Info' features new software for this project.

CURRENT WXSATS

The three polar orbiting craft NOAAs 12 and 14, and METEOR 3-5 have continued to provide comprehensive global coverage for anyone monitoring the 137MHz band. The geostationary scene for WXSAT monitoring continues to expand, with the American GOES-10 launched on 25 April, successfully placed in orbit in early May. Outgassing commenced on 5 May and tests will continue until late July. It will 'sleep' at 105°W until needed, this saving storage and maintenance costs. It will be used if either GOES-8 or 9 suffer a critical equipment failure.

While testing some new software I have had METEOSAT-6 imagery running constantly for several hours day and night, but had not seen any GOMS images. **Volker Gärtner** of EUMETSAT mentioned maintenance on GOMS and confirmed images should be available from June on channel 2 (1694.5MHz).

OKEAN 1-7 (or 4) and SICH-1 are rarely heard now, but a few transmissions are scheduled from OKEAN 1-7. Listen for it on 137.40MHz.

CHINESE SATELLITE SCENE

When an envelope arrived labelled 'Shangri-La Hotel', Beijing, I looked more closely. It was also stamped 'Coventry'! **Ben Ramsden** was kind enough to send me a cutting from *China Daily* about preparations to launch the FENGYUN-2 meteorological satellite on a Long March 3 rocket in early July. The article listed several Chinese satellites planned for launch, including DONG FANG HONG-3 (DFH-3A2 'East is Red'), and MABUHAY, both telecommunications satellites. DFH-3A2 was successfully launched on 11 May. Current launch date for FENGYUN-2 is June. China has become one of the world's leading space powers, with more than 40 launches and a success rate of nearly 90%.

SOUND CARD DECODING

For those who have only recently discovered the hobby of receiving signals from weather satellites (WXSATS), and producing pictures from their signals, the methods used are changing. First - back in the early 1980s - we had the framestore. This was a box of electronics into which we fed the WXSAT signal (called an a.p.t. - automatic picture transmission - signal) and out of which we got a video signal containing a 'still' image for display on a suitable monitor. Each new line of data from the satellite produces a new image line. Framestores were fairly expensive to buy from a limited number of retailers (I believe I can only recall two UK manufacturers); many enthusiasts built their own. Animations (from METEOSAT) could be displayed using modified framestores.

During the late 1980s computer decoding rapidly became the most popular way of producing WXSAT pictures. In Britain, manufacturers such as Timestep, Martelec, TH2 Imaging, and several firms in America retailed boards and software which could decode the signal. During the last year or so, a few software authors have written programs to utilise the sound card used in many computers. Sound cards are versatile add-ons which were originally designed to process audio signals in a manner akin to expensive recording studios. The cards permit extensive editing of the sound signal - a hobby in itself! So you can now use them to decode WXSAT signals.

Christian H. Bock is the author of a superb freeware program called WXSAT which has seen commentaries - invariably favourable - from users on the Internet. I obtained one of the first versions of this software some months back, but knowing virtually no German, and unable to locate a manual for my computer's soundcard, I had little success. When an English version came my way I had a second look. Software installation is easy; the program opens a new directory and installs itself, complete with a comprehensive help file and test facilities.

Fig. 1: GOES-10 first visible-light image 13 May. Image courtesy NOAA.

WXSAT requires a reasonably fast computer - if you want to use the program in the intended way. An incoming a.p.t. signal is received by the soundcard and digitised by the software to produce a sound file (for later processing if required). A real-time image can be simultaneously decoded and displayed.

A PC with an 386 processor will just suffice; you can use WXSAT to create the sound file from the incoming signal, and then process it after the pass - minimising the load on the processor. At least 4Mb of RAM, and Windows 3.1 or 95 are required. For direct recording an 80486 processor with a clock rate of at least 40MHz is necessary. I used a Pentium with a 120MHz processor, using Windows95. The higher specification computer allows signal processing in real-time as well as signal recording. The sound card should be set to 11.025kHz, mono, 8 bits sampling, and a graphic card with at least 8 bits resolution per pixel (for 256 colours) and driver software supporting Device Independent Bitmaps are also required. You may need to check that 'automatic gain control' (a.g.c.) is switched off to avoid unwanted peak-signal attenuation. Many computer users will already have a soundcard of this specification fitted to their machine.

The program's menu options are File, Recording, Edit, Bitmap, Zoom&Move, Calibrate, and Info. The accompanying 'help' file is comprehensive and provides a recommended sequence of operations. Before picture production, the satellite type must be set using (file or recording) parameters. This selects satellite, direction, calibration analysis and other parameters. The program can process all WXSAT signal formats. The Recording option includes test, a graphical display of the signal strength as seen by the software.

My first test was to get the program to 'see' the incoming a.p.t. signal. I used a tape recording for this purpose. Without a manual or instruction sheet for the sound card, I removed it and checked its rear connectors to identify sockets for speaker, microphone, and two line sockets (labelled for input and output). Under test mode (a File option) I fed a recording of a METEOR signal into the line input, but obtained no response. Checking the Windows95 installed software table showed that sound recorder (which analyses input from the connectors) had not been installed! After installing this (using the Windows CD-ROM), I confirmed that the signal being fed into the line-input connector was now being seen by the software. A little level adjustment and the program's test display showed the signal - just like a 'scope! My METEOR signal was recognised and decoded. This first image was sloping (as anticipated) with few gray scales (again as expected). The test proved that the hardware and software were working. The remainder of the process concerned optimising the parameter settings to get the best quality live images.

Having set this level, the program was left for a few minutes to produce a real-time picture. The instructions explain that you can terminate the process after a few minutes data collection, and then select calibration and histogram/values. The histogram produces a graph for you to select a suitable basic amplification setting. By this procedure (which is simpler than might appear at first sight) you can separately tune each satellite signal for optimum quality images. Once these have been optimised there is little more to do other than master the numerous facilities offered by this remarkable program.

Automated image collection can be programmed, so you can leave the computer to collect specified WXSAT images (in BMP format) during the day or night.

Steve Bonnett of Highcliffe in Dorset has upgraded his own program (called WAVSAT), to version 2.0, which also decodes a.p.t. signals using a sound card. His program includes a tracking option which displays six satellites, making it very user-friendly. Steve is proposing to upgrade further, and I plan to provide more detail about Steve's program in next month's column. Meanwhile, WXSAT can be obtained from several sources on the Internet, or I can supply a copy of both these programs on disk, together with the latest Kepler elements. Please include a stamped, return envelope, and 50p coin. Those who regularly write to me for

programs and files know that I also put a number of space images obtained from NASA on the disks (using their spare capacity), as an added extra. Recent samples have included the latest computer graphics of the International Space Station.

CORRESPONDENCE

Alan Jarvis sent in his first picture obtained using the WXSAT program described earlier. On 9 May he received **Fig. 2** from NOAA-14 and was intrigued by the 'question mark' appearance of the cloud formation. Alan runs WXSAT on his computer using Windows 3.1 (as well as Windows95 and NT), and adds a reminder to disable screen savers when using the program. Why do people still use screen savers? They were originally written to prevent screen phosphor 'burn-in' at a time when such phosphors were subject to this effect. Those programs have not been required for several years because monitors now use higher quality components. It does surprise me to see how many computers (in 'teaching' establishments!) still operate with these unnecessary programs!

John Hart of Tyne and Wear uses a Kenwood R-2000 receiver fed by a Maplin crossed-dipole. A Martelec interface converts the a.p.t. into computer readable signals for PC image processing. I wonder whether John's Kenwood receiver has been modified; in its original form I believe that it is designed for general purpose h.f. reception, rather than the unusually complex WXSAT signal format. John's picture of Britain's recent weather shows that his results are fine - whatever the receiver's i.f. bandwidth!

Keith Artherton of Fakenham in Norfolk uses a Martelec MSR50 (WXSAT) receiver feeding their JVfax interface to his 486DX66 PC, running the JVFAX program. He sent in a NOAA-14 image obtained on 3 May, which, when zoomed, shows the roads and rivers clearly, together with snow on the Alps. To show this more clearly I have zoomed into the image and cropped it for inclusion as **Fig. 4**.

SATELLITE TRACKING SOFTWARE

Two months ago a reader asked about the availability of satellite tracking programs for the 286 processor - the chip used in early PCs. The large majority of current software - PC Track, STS Plus, Winorbit, Traksat, Track II and Instant Track - require computers with recent, high power processors, such as the 486DX2 chip, or even a Pentium, preferably running at high speed.

I invited comments from any readers who might know of less demanding software, but I was not optimistic! **Gordon Train** very kindly responded by sending me a copy of his own program WST (Weather Satellite Tracking) - a mere 298Kb in compressed (zipped) form! Gordon told me that his program was originally written for 286 computers in GWBasic, and uses EGA (or better) graphics. I immediately installed it and had it running within about 60 seconds! The program's operation can be improved by using the computer's RAM to provide a 'RAM drive'. Full instructions are given in the file 'WST.TXT' included in the archive.

It is amazing to realise just how much can be achieved with a program occupying around 300Kb. The onscreen graphics comprise an elementary map of the world in Mercator projection, and up to 20 satellites can be displayed. The graphic screen - see **Fig. 5** - includes a selection of options such as 'fast forwards', 'real-time', 'Sun position', 'local map', 'grid', and 'all satellites'. Certain selections (for example 'local map') produce further options.

Gordon has approved my making this file available to those who send me a disk, stamped addressed return envelope, and one extra stamp. There is no charge for the program. My thanks to Gordon for responding so promptly to the request for information.

KEPLER ELEMENTS - A BEGINNER'S GUIDE

In recent months I have looked at Epoch, inclination, eccentricity and some of the associated terms. These three parameters specify the time of the measurements (Epoch), the angular tilt of the satellite's orbit to the equator (inclination), and the shape of the orbit (eccentricity).

The size of the orbit (for instance, one of its two diameters) can be quoted in different ways. The greater the diameter, the longer the satellite takes to make one complete orbit of the earth. The Moon (Earth's largest natural satellite) at 375230km distance, takes about one month to make a complete orbit. NOAA-14 at 850km distance, takes about 102 minutes. The parameter Mean Motion is the number of orbits per 24 hour period. The greater the size of the orbit, the smaller its Mean Motion. Satellites in low-earth orbit (LEO) generally have an MM of about 14 or so. MIR is in a low earth orbit and has an MM of about 15.6. Satellites having a MM near 16 are close to re-entry. As mentioned last month, satellites move faster when they are at perigee (nearest to earth) than at apogee (furthest from earth). Mean Motion is the average of these two extremes.

MM OR SMA - ALTERNATIVE PARAMETERS

To complicate matters, some computer programs require 'SMA' instead of 'MM'. The semi-major axis (SMA) is half the 'long' diameter of the ellipse. This is the distance from the apogee to the centre of the ellipse, and is related to the Mean Motion. Most programs use MM.

SHUTTLE LAUNCH SCHEDULE

STS-94 is the re-scheduled Columbia flight for launch on 1 July into a 28° inclination orbit.

STS-85 is a Discovery launch, following on 7 August into a 57° inclination orbit.

A comprehensive listing of all Shuttle flights and payloads, together with associated information is available from me as the *Shuttle Pack*. Please include a £1 and stamped s.a.e. for the A4 booklet.

KEPLER ELEMENTS - MIR AND SHUTTLE

1. For a print-out of the latest WXSAT elements, MIR, and the Shuttle (if in orbit), send a stamped addressed envelope and secured 20p coin or separate, extra stamp. Transmission frequencies are given for operating satellites. This data originates from NASA. I send Kepler elements by return-of-post.
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.
3. You can have the data as a computer disk file containing recent elements for the WXSATs, and a large file holding elements for thousands of satellites. A print-out is included, identifying NASA catalogue numbers (for the WXSATs, Amateur Radio satellites, and others of general interest), ideal for automatic updating of your tracking software. Please enclose 50p with your PC-formatted disk and stamped envelope.

FREQUENCIES

NOAA-14 transmits a.p.t. on 137.62MHz
NOAA-12 transmits a.p.t. on 137.50MHz
NOAAs transmit beacon data on 137.77 or 136.77MHz
METEOR 3-5 (or 2-21) use 137.85MHz

Fig. 2: NOAA14 from Alan Jarvis.

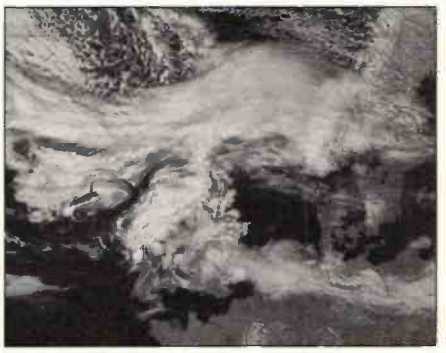

Fig. 3: NOAA2 from John Hart.

Fig. 4: NOAA-14 on 3 May from Keith Artherton.

Fig. 5: Gordon Train's tracking program screen dump.

OKEAN-4 and SICH-1 use 137.40MHz when transmitting.
METEOSAT-5 (geostationary) uses 1691 and 1694.5MHz for WEFAX
GOES-8 (western horizon) uses 1691MHz for WEFAX
MIR 145.80 and 143.625MHz. ■

Decode

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WWW: http://dialspace.dial.pipex.com/mike.richards/

HELLSCHREIBER

After stirring-up lots of interest in this 'antique' mode a month or two ago, I've discovered that the original software link I printed has changed. Rather than give you the updated link, only to find that it's moved again by the time this goes to print, I've put a new link on my Web page in the readers offers section. Several readers have also reported problems with the program not properly recognising the serial port interrupts. The solution is to download the older version of the program. Just to make this really easy I've placed a copy of that on my Web page as well. Some of you may be wondering where to find a Hellschreiber signal. In practice, the only place you'll find one is on the amateur bands, with the 14MHz band being the favourite. However, I've heard from a number of radio amateurs that are keen to start using the mode, so you may well find signals appearing in other amateur bands and even on v.h.f. The best place to look is in the data segment of the band, which is normally found where the c.w. and s.s.b. sections meet.

You can usually find this just by tuning around and noting where the signals change. You will also hear Packet stations at the top end of this segment and AMTOR or PACTOR stations at the bottom end. As for the best time to listen, I suggest you try Sunday mornings as this appears to be a favourite time for amateur radio activity. If you happen to a be a licensed radio amateur, why not send me an E-mail detailing when you're going to be on the air and I'll publish it on my Web page so others can join-in. Also if you hear of any regular Hellschreiber activity just send me an E-mail and I'll put the details on my homepage.

RED-HOT NEWS!

Ever wanted to get into receiving all those complex modes, but don't have the budget? Judging from the letters I receive, that applies to many readers. The great news is that the complex modes are now open to everyone thanks to the efforts of Francois Guillet F6FLT. Francois has just released a sensational new decoding system that's destined to excite lots of readers.

The program is called *RadioRaft* and is currently at version 2.0. It is a full featured multimode decoder that just needs a standard PC and a *HAMCOMM* type interface to give you access to a wide range of utility modes. What's more, it will run on a relatively humble 386 PC! As well as featuring a vast array of receive modes, *RadioRaft* also includes a fully automatic decoding system. This scans the input stream and identifies both the mode and the baud rate. In doing this it also self-tunes the decoding logic so you don't even have to be properly tuned-in! I was so impressed with the demo program that's available on the Net, that I contacted Francois for more information. This has clearly been a major project for Francois and has taken him some five years of development effort to get the program to it's current standard.

Whilst Francois admits it's relatively simple to write the basic decoding routines, it is sorting-out the bugs and making the program friendly for other users that really takes the time. Francois was also very keen to make the program as fast as possible. Like most of us, he gets very frustrated with today's monster programs that take an age just to start-up! What really shows through is that Francois is a radio enthusiast and has created a program that is action packed and does just what you would expect it to. This desire for speed is also reflected in the size of the program files which, even when installed, take-up a tiny 400Kb of disk space.

So, what do you need to run it? Francois recommends a 386 based PC as a minimum and you will also need a VGA screen or better, COM1 or COM2 serial port and one of the MSDOS operating systems from versions 3.3 through to 6.2. Like just about all software based decoding systems, *RadioRaft* does not generally operate properly under Windows. You can just about get away with it if you have a fast Pentium, but it's probably not worth the effort as the program runs really well under DOS.

EASY INSTALL

Installing *RadioRaft* on the PC was dead easy thanks to a built-in installation routine that, not only installed the appropriate files, but also took you through the essential set-up process. As for the interface with the receiver, I'm sure most readers will use one of the many *HAMCOMM/JVFAX* variants that are to be found on the market. The simple comparator interface is only required to square-up and limit the incoming signal but, some of the later designs do boast marginally improved performance through the use of a more modern op-amp.

I personally recommend the Interface from Pervisell simply because the build quality is really excellent, it uses a modern chip and Phil Perkins has been offering 'Decode' readers top quality service for several years now. An alternative to the simple interface is to use a radio modem such as the old ST5 series that were used for RTTY reception. Whilst they can offer vastly superior results when receiving very weak or noisy signals, there are some disadvantages that in my book make them a non-starter. The most serious problem is the requirement to set the modem to match the shift of the signal being received. Whilst this is fine if you're just tuning in to a well known mode, it's not so good if you're looking for new signals. In practice it means you have to have some other device to identify the shift before you can start decoding.

On the other hand, if you use the simple interface *RadioRaft* will automatically measure and set itself-up for the correct shift. So to see the full benefits of *RadioRaft* you at least ought to try it with the simple interface. You can of course make a significant improvement to the number of receive errors by including some variable audio filtering between the receiver and the interface. This filtering can be either one of the classic analogue devices such as the Datong FL3 or one of the newer DSP based units. In either case you should start with the filter either out of circuit or set as wide as possible.

Once *RadioRaft* has identified and captured the signal you can then experiment by closing-in the filter to give the best results. The most common mistake made by new listeners is to over filter and squeeze the signal too tight. I think I'll run a short feature on this in a future 'Decode'. With the software installed and the interface connected, decoding signals becomes incredibly easy. You are initially presented with the main decoding screen where you will see the top-line mode and speed indicators flashing through all the available options. This is *RadioRaft* operating in its default searching mode. What it's doing is repeatedly trying out all the available options to try and find a match with what ever is coming in via the interface. Because all the decoding routines have been written in machine code it is able to do this amazingly quickly. This is probably the single most significant feature that sets *RadioRaft* apart from the competition.

AUTOMATIC TUNING

Whilst you may think this is just for the experienced listener, I'm sure it will prove to be a real boon for those new to utilities as the program sorts-out the shift, speed, mode and data inversion rather than leaving it to the listener. Another really impressive point is that you don't even have to tune very accurately as *RadioRaft* has a frequency tracking option that automatically adjusts its software filters to align with the incoming signal. This will be a real benefit to those with cheaper receivers with 50 or 100Hz tuning steps. In carrying out the signal analysis, *RadioRaft* evaluates the transmission speed to within 0.5bps for synchronous signals and uses the standard baud rate for asynchronous signals. As the software identifies the mode and speed the scanning will stabilise on the selected mode.

Progress towards *RadioRaft* identifying the correct mode is shown by a pair of dotted lines that extend either side of the word SIGNAL on the top line of the screen. The right-hand line indicates the quality of the received signal whilst the left-hand shows the matching between the selected mode and the received signal. In practice this very simple indicator proved to be very useful. If you want to use a more traditional tuning indicator, *RadioRaft* includes a sophisticated frequency meter that shows the instantaneous and average frequency of the incoming signal. This is shown as a barograph type display on the third line of the screen. In operation, two curly brackets '{' and '}' show the upper and lower frequency limits of the signal whilst the current frequency is shown by a square block. This is further supplemented by a single vertical line that shows the average frequency. Although the use of alphanumeric characters for the display may seem a bit crude, it's done primarily to keep the speed up.

The modes included with the registered version are really quite remarkable and have been divided-up into five groups of transmission systems - **Fig. 1**. Starting with the asynchronous modes there's good old RTTY plus ASCII in standard, 8-bit and 8-bit with parity versions. Next comes the ARQ semi-duplex modes which includes SITOR A, SWED-ARQ, ARQ-6/90, ARQ-6/98 and SI-ARQx. Of the sophisticated full duplex ARQ modes *RadioRaft*

comes with the following ARQ-M, ARQ-M2, ARQ-M4, ARQ-E3, SI-FEC, ARQ-E, ARQ-N and POL-ARQ. Next comes the FEC broadcast modes of SITOR-B, FEC-A, RUM-FEC, HNG-FEC, CIS11, AUTOSPEC, SPREAD11, SPREAD 21 and SPREAD 51. Finally there are a few additional modes that don't fit into these categories: Packet, c.w., plus a bits-per-second meter and a clever DIGIT mode. This latter mode is intended for the serious listener who wants to take a closer look at some of the signals on the bands. This uses *RadioRaft*'s decoding systems to present the received text in digital rather than text format. Once this mode has been enabled there are several controls available to process the resultant output.

NEAT TOOL

This was a very neat analysis tool and, in the hands of an experienced listener, could be used to better understand the inner workings of some of the transmission systems. So what's it like to use? Well it really couldn't be easier thanks to the very powerful automatic decoding routines. I must admit I was very sceptical when I first heard of the program as there are few programs that successfully manage automatic mode detection. I was however, pleasantly surprised and *RadioRaft* felt to be just about as competent as any system I've tried so far. There are however, a few limitations that apply to all systems, so don't expect it to work perfectly every time. First of all you do need a clean signal. It's no good tuning into a signal that has three other stations running on top of it and expecting the decoder to choose the one you want! You also need to watch-out for whistles and whines very close to the required signal as the decoder will think they're part of the signal and get very confused. Fading is another problem area and whilst *RadioRaft* can cope with moderate fading, the more severe types make the signal very difficult to analyse.

In a typical receive set-up using Lowe HF-150 and HF-250 Europa receivers *RadioRaft* locked onto the Hamburg Met. signal on 7.646MHz in around 15 seconds. The automatic decoding was also very effective on some of the more complex modes such as ARQ-M2. However, the accuracy of decoding the more complex modes is dependant on whether or not traffic is being sent. The Packet and c.w. modes operated outside the automatic analysis systems but were none-the-less very easy to use.

Overall, I was extremely impressed with *RadioRaft* and it really represents excellent value for money. My thanks to Francois for supplying the review software. The easiest way to get hold of the demo version of the *RadioRaft* is to visit Francois' Web site at **http://ourworld.compuserve.com/homepages/F6FLT** Alternatively, you can write to Francois enclosing the modest £18 registration fee and get the full version. Francois will accept most payment methods including cheques. But remember he has to pay a bank charge of £7 for cheques, so you might like to offer a little more to ensure a fair reimbursement. The address to write to is **Francois Guillet, 17 rue Michel Delalande, F-44800, St-Herblain, France.**

SPECTRUM ANALYSIS

My recent mentions of the *sbfft* analysis program seem to have stirred-up lots of interest, so I've spent some time searching the Internet to see if there's any other audio software that could be useful to radio enthusiasts. One that has really caught my attention is *Spectrogram* written by R.S. Horne with FFT routines by Philip VanBaren. This remarkable Windows based program uses a standard PC sound system to provide very detailed signal analysis. There are currently two versions to be found on the Internet. Version 2.3 is the older version and operates with Windows 3.1 whilst the newer Version has been designed specifically for Windows '95. If you have Windows '95 this latter version is to be recommended as it includes the facility to process data in real time. To give you an idea of what *Spectrogram* has to offer the utility enthusiast I printed a couple of spectrum displays from my PC.

Before I take a closer look let's just take some time to explain what the display shows. It's simple really as the horizontal axis is calibrated in time and the vertical axis shows frequency. So a single tone of 1kHz would be represented as a single horizontal line. If you were to add a second tone at 500Hz this would show as another horizontal line rather lower than the first. If you now think back to how most utility signals are constructed, i.e. two tones that alternate in synchronisation with the data, you can start to see the potential of this analysis system. You can see this in action with **Fig. 2** showing a RTTY signal. Here you can clearly see the waveform of the RTTY signal. As if this wasn't enough, *Spectrogram* also features a mouse controlled cursor that you can use to make very accurate measurements of the signal's parameters. For example you can measure the precise shift of the signal or calculate the baud rate by measuring the period of the signal. The PACTOR signal **Fig. 3** clearly shows the station sending the acknowledgement followed by the weaker transmitting station. You will note from this that volume is represented by varying the intensity of the display, i.e. black for loud and white for inaudible.

Before you get too carried away, you need to understand the effects of the various adjustments that you can make with *Spectrogram*. Adjustment of the horizontal scale is done by changing the horizontal scale in milli-seconds with 1ms used to expose the most detail. The vertical scale is set using the FFT adjustment with 512 point offering the smoothest rendition and 2048 providing the most detail. The intensity of the display can be adjusted using the threshold over the range 0 to -6dB. You will also need to experiment with narrow-band (NB) or broad-band (BB) analysis to give the clearest image. The Windows 3.1 version of *Spectrogram* cannot handle real-time analysis so you first have to record your data signal. This is very simple as all you do is connect you receiver's line-out to the line-in socket on your sound card. You than choose the Record New option from *Spectrogam*'s file menu. To help you find a copy of *Spectrogram* I've built a link into my Web page, so please start from there. I've found one or two other systems that may well be useful for listeners so watch this space!

READERS SPECIAL OFFERS

If you'd like a copy of *HAMCOMM/JVFAX*, etc. I've arranged a very special offer with the Public Domain and Shareware Library (PDSL). They have put together a library set of all five disks for just £12.00, all inclusive. Using PDSL also makes ordering simpler as they accept all the usual credit cards so you can order by 'phone - you don't even have to write a letter. Please direct all orders and enquiries about this disk set to **PDSL Winscombe House, Beacon Road, Crowborough, Sussex TN6 1UL. Tel: (01892) 663298** and request library volume:H008739abcde. IBM PC Software(1.44Mb disks): Disk A - JVFAX 7.1, HAMCOMM 3.1 and WXFAX 3.2 Disk B - DSP Starter plus Texas device selection software. Disk C - NuMorse 1.3 Disk D - UltraPak 4.0 Disk E - Mscan 1.3 and 2.0.

Fig. 1: Lots of modes with RadioRaft.

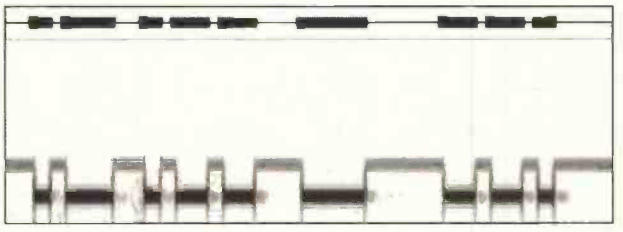

Fig. 2: RTTY Signal under examination.

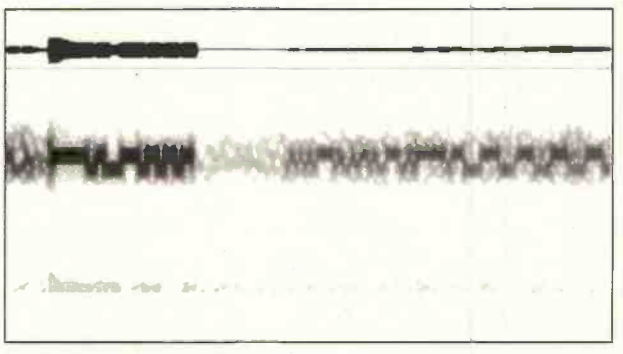

Fig. 3: PACTOR QSO with Spectogram.

LM&S

Long, Medium and Short Waves

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

On July 1 China will resume control of Hong Kong after a gap of more than 150 years. The historic handover ceremony will take place at midnight on June 30. China Radio International (CRI) will broadcast the ceremony live from Hong Kong.

There will be a special programme on the event from CRI on July 1. Some of the frequencies used by CRI are detailed herein.

LONG WAVE REPORTS

Note: l.w. & m.w. frequencies in kHz; s.w. in MHz; Time in UTC (=GMT).

Unless otherwise stated, all logs were compiled during April.

During the evenings of March 27 to April 5 the Radiotelevisione Italiana (RAI) 10kW outlet at Caltanisseta, Italy on 189kHz was heard quite clearly by Tony Stickells in Thornton Heath. Less favourable conditions then prevailed but on April 24 **Sheila Hughes** (Morden) heard on 189kHz faint voices and singing at 2135UTC. The splatter from Saarlouis on 183kHz made reception difficult. At best, the RAI transmission rated SINPO 22212. At the end of the month **Fred Pallant** (Storrington) found the broadcasts from Caltanisseta were just audible from 2040.

MEDIUM WAVE REPORTS

The increasing hours of daylight during April resulted in a fairly short period when the whole of the path over the Atlantic was in darkness, consequently the m.w. broadcasts from stations in E.Canada and E.USA did not reach our shores until 0000UTC or later.

Four stations were heard by Tony Stickells during the early hours of April 1-5. CJYQ on 930 rated 24232; WLPZ on 1440 was 41222; WTOP on 1500 was 32433; WNRB on 1510 was 33133 - see chart for locations. The conditions on April 6 enabled **Robert Connolly** (Kilkeel, Co.Down) to listen to CHAM on 820, which rated 22332 at 0110. On April 8 **Harry Richards** (Barton-upon-Humber) logged WTOP as 22222 at 0115 and WNRB as 34333 at 0135 but he was unable to identify any others.

The band was searched on April 12, 16, 18, and 29 by **David Edwardson** in Wallsend. He used a giant 2.5 x 2.5m fixed loop ahead of his Trio R-600 receiver but only four stations were identified - CJCH on 920 rated 23432 at 0321; CJYQ was 25552 at 0330; WNRB was 25552 at 0339 & WQEW on 1560 was 24542 at 0518. Some weak broadcasts in Spanish, which may have come from S.America, were heard on 770kHz around 0430 on the 12th and on 1580/1590 on the 18th at 0400.

Up in Shetland **John Slater** (Scalloway) heard CJYQ on the 5th (SIO444 at 0507), 8th (SIO322 at 0105) and 29th (SIO322 at 0415). On the 27th he managed to identify R.Dos Mil, Venezuela on 1500, which peaked SIO222 at 0430. During the next night he heard only WNRB at 0345 (SIO222).

Some of the m.w. stations in the Middle East and N.Africa also attracted the attention of UK DXers after dark - see chart. Particulary good reception of the BSKSA broadcasts in Arabic via Dammam, Saudi Arabia on 1440 was noted on April 13 by **John Eaton** in Woking. He logged their 1.6MW transmission as 45444 at 2258. The BSKSA 100kW outlet at Dammam on 783kHz was heard at 2349 by Tony Stickells. The sky waves from quite a few of the stations in N.Africa were picked up after dark by **George Millmore** (Wootton, IoW).

The ground waves from some m.w. local radio stations reached quite distant places during the day - see chart. Whilst staying near Invergarry on April 1 & 2 **Brian Keyte** (Bookham) compiled an interesting log of 21 stations, which included BBC Essex on 729 & 765 and BBC R.Devon on 801, rated 33322 at 1740. He used a CA117 car radio plus home built loops.

A new ILR station called 'Yorkshire Dales Radio' came into service on 936kHz (1kW) & 1413kHz (0.1KW) at 1200 on May 4th. **Martin Cowin** (Kirkby Stephen) says "Not only covering the Yorkshire Dales, the station aims to cover Teesdale and the Eden Valley - my area of Cumbria". In fact their transmissions are being received over a much wider area! Over in S.Ireland **Chris Ridley** (Co.Sligo) received them on 936 at 0650. Up in Scotland **Ross Lockley** (Galashiels) picked them up on both frequencies around 0930. He telephoned their Skipton based HQ, (01756) 799991, and was informed that they have had reports from central Wales and Glasgow. No doubt they would welcome reports from other areas too - send them to: **YDR House, Gargrave Road, Skipton BD23 1YD.**

SHORT WAVE REPORTS

Until the propagation conditions in the **25MHz (11m)** band become more stable it is unlikely to be used for broadcasting.

The propagation conditions in the **21MHz (13m)** band varied from day to day throughout April. Sometimes Australia's broadcast to Asia via Darwin on 21.725 (Eng 0630-1100) reached the UK. It was rated 22222 at 0810 by **Bernard Curtis** in Stalbridge; 44333 at 0950 by **Thomas Williams** in Truro; 33323 at 1030 by **Vic Prier** in Colyton.

Also noted in the reports were RFI via Issoudun 21.620 (Fr to E.Africa 0800-1500) rated 35211 at 1000 by **Eddie McKeown** in Newry; UAER, Dubai 21.605 (Eng to Eur 1030-1055) 55555 at 1030 by **Tom Winzor** in Plymouth; R.Japan via Ascension Is 21.490 (Jap to C.Africa 1300-1400) 44333 at 1320 in Scalloway; DW via Julich? 21.560 (Ger to Asia? 1000-1355) 33333 at 1345 in Kilkeel; BBC via Ascension Is 21.660 (Eng to W/E/S.Africa 1100-1700) 34433 at 1345 by **Stan Evans** in Herstmonceux & 54554 at 1535 by **Bill Griffith** while in Delphi, Greece; BBC via Cyprus? 21.470 (Eng to E.Africa 1300-1700) 24342 at 1558 by **Tim Allison** in Middlesbrough; UAER, Dubai 21.605 (Eng to Eur 1600-1640) 15342 at 1630 in Storrington; WYFR Okeechobee, USA 21.745 (Eng to Eur 1600-?) 25343 at 1601 by **Darren Beasley** in Bridgwater.

The **19MHz (15m)** band, which extends from 18.900-19.020MHz, will be allocated for single sideband broadcasting in 2007. However, Monitor Radio are already using it for an a.m. transmission from WSHB in Cypress Creek, USA on 18.930 (Eng to Eur, M.East, Africa 1600-1900). It was rated 44333 at 1745 in Herstmonceux.

LONG WAVE CHART

Freq kHz	Station	Country	Power (kW)	Listener
153	Bechar	Algeria	1000	D*,G*,I*
153	Donebach DLF	Germany	500	C*,D*,E*,F,G,H,I
153	Bod	Romania	1200	D*,I*
162	Allouis	France	2000	B,C*,D,E*,F,G,H,I
171	Nador Medi-1	Morocco	2000	I
171	B'shakovo etc	Russia	1200	B,E*,F,G*,I
177	Dranienburg	Germany	750	B,E*,F,G,I
180	Polati	Turkey	1200	I*
183	Saarlouis	Germany	2000	B,C*,D,E*,F,G,H,I
189	Caltanissetta	Italy	10	D*,G*,I
198	Droitwich BBC	UK	500	B,D,E*,F,H,I
207	Munich DLF	Germany	500	D,E*,F,I
207	Azilal	Morocco	800	G*,I*
216	Roumoules RMC	S.France	1400	B,C,D,E,F,G,H,I
225	Raszyn Resv	Poland	?	B,D*,E*,F,G*,H,I
234	Beidweiler	Luxembourg	2000	B,D,E,F,G,H,I
243	Kalundborg	Denmark	300	B,E*,F,G,I
252	Tipaza	Algeria	1500	D*,G*,I*
252	Atlantic 252	S.Ireland	500	A,B,D,E,F,G,H,I
261	Burg(R.Ropa)	Germany	200	F,I
261	Taldom Moscow	Russia	2500	F*
270	Topolna	Czech Rep	1500	D*,E*,F,G*,I
279	Sasnovy	Belarus	500	D*,E*,F,G*,I

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

Listeners:-
(A) Tim Allison, Middlesbrough.
(B) Martin Dale, Stockport.
(C) John Eaton, Woking.
(D) Sheila Hughes, Morden.
(E) Eddie McKeown, Newry.
(F) George Millmore, Wootton, IoW.
(G) Fred Pallant, Storrington.
(H) Tom Smyth, Co.Fermanagh.
(I) Tony Stickells, Thornton Heath.

The conditions also varied daily in the **17MHz (16m)** band. When favourable, R.Australia's broadcast to Asia via Darwin? on 17.880 (Eng 0100-0830) reached our shores. It was rated 33323 at 0820 in Stalbridge. Also received here during the morning were R.Pakistan via Karachi 17.900 (Eng to Eur 0800-0845), noted as SIO333 at 0800 by **Tom Smyth** in Co.Fermanagh; DW via Rwanda? 17.800 (Eng to Asia, Australia 0900-0950) 45444 at 0914 by **Tony Hall** in Freshwater Bay, IoW; AIR via Bangalore 17.387 (Eng to Pacific areas 1000-1100) 24232 at 1002 in Newry; R.Pakistan, Islamabad 17.900 (Ur to Eur 0845-1100) 54444 at 1035 in Plymouth.

After mid-day, RCI via Sackville, Canada 17.820 (Eng to Eur, Africa 1330-1400 Mon-Sat) was 32222 at 1330 in Truro; Africa No.1, Gabon 17.630 (Fr to W.Africa 0700-1600) 34443 at 1405 in Kilkeel; RFI via Moyabi, Gabon 17.560 (Eng to M.East 1400-1500) 44444 at 1415 by **E. Wiles** (Bedford) while in Malta & 43333 at 1428 by **Chris Shorten** in Norwich; REE via Noblejas 17.715 (Sp to Africa 0900-1930) 33433 at 1523 by **Peter Pollard** in Rugby; BBC via Ascension Is 17.830 (Eng to W/C.Africa 0730-2100) 43444 at 1530 in Delphi, Greece; BBC via Antigua, W.Indies 17.840 (Eng to N/C.America 1400-1700) 44344 at 1653 in Woking; R.Nederlands via Bonaire 17.605 (Eng to S/E/W.Africa 1830-2025) 44444 at 1915 in Colyton; WYFR via Okeechobee, USA 17.555 (Eng to Eur 1600-2200?) 34232 at 2032 in Bridgwater; VOFC Taiwan via WYFR 17.750 (Eng to Eur 2200-2300) 45444 at 2215 by **Michael Griffin** in Ross-on-Wye.

More reliable conditions were evident in the **15MHz (19m)** band. Logged before noon were the BBC via Masirah Is, Oman 15.310 (Eng to S.Asia 0300-0915, 1000-1400), noted as 34243 at 0640 in Woking; R.Japan via Yamata, Japan 15.590 (Eng to S.E.Asia 0700-0800) SIO333 at 0749 by **Francis Hearne** in N.Bristol; Voice of Armenia, Yerevan 15.270 (Fr, Eng to Eur 0800-0900 Sun)

54544 at 0840 in Herstmonceux; AIR via ? 15.050 (Eng to NE.Asia 1000-1100) 25332 at 1005 in Bridgwater; Voice of Russia 15.430 (Eng [WS]) 54444 at 1008 in Freshwater Bay; UAER, Dubai 15.395 (Eng to Eur 1030-1055) 32223 at 1030 by **Gerald Guest** in Dudley; WEWN via Vandiver, USA 15.745 (Eng to Eur 0900-1200) 34333 at 1100 in Morden.

During the afternoon RCI via Sines, Portugal 15.325 (Eng, Fr to Eur, M.East, Africa 1330-1500) was 43333 at 1330 in Stalbridge & 33223 at 1345 in Malta; Voice of Vietnam, Hanoi 15.010 (Eng to Far East 1330-1400) 54444 at 1350 in Plymouth; WWCR Nashville, USA 15.685 (Eng to N.America, Eur 1100-2200) 32322 at 1425 in Kilkeel; R.Nederlands via Tashkent 15.585 (Eng to S.Asia 1330-1525) 43343 at 1435 in Norwich; BSKSA via Riyadh 15.230 (Ar to SW.Asia, W.Eur 1200-1500) 44444 at 1500 in Delphi, Greece; UAER, Dubai 15.395 (Eng to Eur 1600-1640) 44322 at 1609 in Middlesbrough; China R.Int via Mali 15.130 (Eng to E/S.Africa 1600-1657) 35443 at 1642 in Ross-on-Wye; Africa No.1, Gabon 15.475 (Fr to W.Africa 1600-1900) 33443 at 1642 in Storrington.

Later, R.Pilipinas, Tinang 15.190 (Pil 1730-1930) was 44333 at 1800 in Scalloway; BBC via Ascension Is 15.400 (Eng to Africa 1500-1930) 34433 at 1830 in Colyton; RNB Brazil 15.265 (Port, Eng, Ger to Eur 1630-2020) 33333 at 1852 in Truro; R.Nederlands via Bonaire 15.315 (Eng to S/E/W.Africa 1830-2025) 24232 at 1900 in Newry; VOA via Morocco 15.445 (Eng to Africa 1900-2200?) 44444 at 1911 by **Vera Brindley** in Woodhall Spa; VOFC Taiwan via WYFR? 15.600 (Eng to Eur 2200-2300) 43333 at 2200 by **Clare Pinder** in Appleby.

Noted in the **13MHz (22m)** band during the morning were R.Finland via Pori 13.645 (Eng to Australia 0800-0827), rated 33333 at 0810 in Truro; AWR via Slovakia? 13.580 (Eng to ? 0900-0925) 33333 at 0923 in Freshwater Bay; R.Nederlands via Irkutsk 13.710 (Eng to Far East, SE.Asia 0930-1125) 25212 at 1000 in Newry; UAER, Dubai 13.675 (Eng to Eur 1030-1055) 43443 at 1033 in Plymouth; AWR Costa Rica 13.750 (Eng to C/N.America 1100-1300?) 35433 at 1134 in Ross-on-Wye.

During the afternoon R.Bulgaria via Plovdiv 13.790 (Eng to E.Asia 1200-1300) was 43433 at 1230 in Woodhall Spa; R.Prague, Czech Rep 13.580 (Eng to Eur, E.Africa, N.America 1300-1327) 55444 at 1310 in Scalloway; SRI via Sottens? 13.635 (Eng, Fr, It, Ger to SE.Asia 1300-1445) 44444 at 1315 in Kilkeel & 55555 at 1330 in Malta; UAER, Dubai 13.675 (Eng to Eur 1330-1355) 54554 at 1330 in Delphi, Greece; R.Austria Int via Moosbrunn 13.730 (Ger, Eng, Fr, Sp to Eur 0400-1800) 44433 at 1335 in Herstmonceux; SRI via Sottens? 13.635 (Fr, Ger, Eng to S.Asia 1500-1630) 34433 at 1500 in Dudley; WHRI South Bend, USA 13.760 (Eng to E.USA, Eur 1500-2057) 33333 at 1530 in Morden; Voice of Russia 13.815 (Eng [WS]) 54444 at 1535 in Norwich; UAER, Dubai 13.675 (Eng to Eur 1600-1640) 44444 at 1626 in Storrington; VOA via Selebi-Phikwe, Botswana 13.710 (Eng to Africa 1600-?) 35433 at 1644 in Middlesbrough; WWCR Nashville, USA 13.845 (Eng to E.USA 1300-0100?) 24242 at 1652 in Woking.

Later, the Voice of Turkey 13.695 (Eng to Eur? 1830-1925) was 45444 at 1849 in Bridgwater; Monitor R.Int via KHBI Saipan, N.Mariana Is 13.770 (Eng to E.Eur, M.East 1800-2000) 54444 at 1930 in Norwich; Monitor R.Int via WSHB Cyprus Creek, USA 13.770 (Eng to W.Eur 2000-2157) 55545 at 2000 in Storrington; SRI via Sottens? 13.635 (Ar, Eng to N.Africa 1845-2030) 33233 at 2000 in Appleby; RCI via Sackville 13.650 (Fr, Eng to Eur, M.East, Africa 1900?-2200) 44444 at 2045 in Colyton; R.Damascus, Syria 13.610 (Eng to Eur 2005-2105; to N.America 2105-2205) 44244 at 2110 in Rugby; Monitor R.Int via WSHB 13.770 (Eng to S.America 2200?-0000) 32223 at 2310 in Stalbridge.

LOCAL RADIO CHART

Freq (kHz)	Station BBC	ILR	e.m.r.p (kW)	Listener
558	Spectrum, London		0.80	A,C,H,I,L,M*
585	R.Solway	B	2.00	I
603	Cheltenham R.	I	0.10	C,H,I,M*
603	InvictaSG,Litt'brne	I	0.10	E,H,I
630	R.Bedfordshire(3CR)	B	0.20	A,C,D,E,H,I,L,M*
630	R.Cornwall	B	2.00	H
657	R.Clwyd	B	2.00	H,I,K*,M*
657	R.Cornwall	B	0.50	H
666	Gemini AM, Exeter	I	0.34	H,J,L
666	R.York	B	0.80	A,B,C,F,G,I,M*
729	BBC Essex	B	0.20	C,E,F,H,J,L
738	Hereford/Worcester	B	0.037	C,H,L
756	R.Cumbria	B	1.00	A,B,F,G
756	R.Maldwyn, Powys	I	0.63	C,H,L
765	BBC Essex	B	0.50	C,E,F,H,L
774	R.Kent	B	0.70	E,H,L
774	R.Leeds	B	0.50	B,C,G,I
774	3 Counties SG, Glos	I	0.14	D,H
792	Classic Gold 792	I	0.27	A,C,F,H,I,L
792	R.Foyle	B	1.00	J,K*
801	R.Devon & Dorset	B	2.00	D,F,H,I
828	Classic Gold 828	I	0.20	F
828	Magic 828, Leeds	I	0.12	C,I
828	Asian Netwk Sedgley	B	0.20	J
828	2CR CG, Bournemouth	I	0.27	H
828	Townland R, Ulster	I	0.80	J
837	R.Cumbria/Furness	B	1.50	A,F,G,I
837	Asian Netwk Leics	B	0.45	C,H,I,J,M*
855	R.Devon & Dorset	B	1.00	H,N
855	R.Lancashire	B	1.50	A,C,F,G,I,J
855	R.Norfolk	B	1.50	I,L
855	Sunshine 855,Ludlow	I	0.15	C,D,L
873	R.Norfolk	B	0.30	C,H,I
936	Brunel CG, W.Wilts	I	0.18	C,H,I
936	Yorkshire Dales R	I	?	A,G,J
945	S.Coast R, Bexhill	I	0.75	A*,H,L
945	Derby (Gem AM)	I	0.20	C,F,G,I
954	Gemini AM, Torquay	I	0.32	H,L
954	Wyvern AM, Hereford	I	0.16	C,D,E* H,I
963	Asian Sd,Manchester	I	0.80	C,G,J
963	963 Liberty (Viva)	I	1.00	F,H,I,L
990	R.Devon & Dorset	B	1.00	H,L
990	Gt.Yks G, Doncaster	I	0.25	C,I
990	WABC, Wolverhampton	I	0.09	C,F,I
999	Gem AM, Nottingham	I	0.25	C,I
999	Red Rose 9-99 P'stn	I	0.80	A,C,F,I
999	R.Solent	B	1.00	H,L
1017	WABC, Shrewsbury	I	0.70	C,F,G,I,J,M*
1026	R.Cambridgeshire	B	0.50	C,E,I,L
1026	Downtown, Belfast	I	1.70	E,J,K
1026	R.Jersey	B	1.00	H
1035	RTL Country 1035	I	1.00	C*,F,G*,H,J,K*,L
1035	R.Sheffield	B	1.00	C,I
1035	N.Sound, Aberdeen	I	0.78	A,G,J
1107	Moray Fth,Inverness	I	1.50	F
1116	R.Derby	B	1.20	A,C,G,I,K*,L,M*
1116	R.Guernsey	B	0.50	H,L
1152	Amber, Norwich	I	0.83	C*,G*,M*
1152	Clyde 2, Glasgow	I	3.06	G,J
1152	LBC 1152	I	23.50	G*,H,L
1152	Pic'ly 1152,Manch'r	I	1.50	C
1152	Xtra-AM, Birmingham	I	3.00	M*
1161	R.Bedfordshire(3CR)	B	0.10	L
1161	Brunel CG, Swindon	I	0.16	H,L,M*
1161	Big Easy Magic 1161	I	0.35	B,C,G*,I,J
1161	Southern Counties R	B	1.00	H,K*,L
1161	Tay AM, Dundee	I	1.40	G,J
1170	Amber SGR, Ipswich	I	0.28	G*,L,M*
1170	GNR, Stockton	I	0.32	B,G
1170	SCR, Portsmouth	I	0.50	H,J,L
1170	Signal G,Stoke-on-T	I	0.20	C,M*
1170	Swansea Snd,Swansea	I	0.58	G*,J
1170	1170AM,High Wycombe	I	0.25	E,L
1242	InvictaSG,Maidstone	I	0.32	E,L,M*
1242	IoW Radio, Wootton	I	0.50	H
1251	Amber SGR,Bury StEd	I	0.76	G*,I,L,M
1260	Brunel CG, Bristol	I	1.60	H,J,K
1260	Marcher G, Wrexham	I	0.64	C,G,J
1260	SabrasSnd,Leicester	I	0.29	M
1260	R.York	B	0.50	G,I
1278	B8 W.Yorks Cl.G	I	0.43	I,J,K
1296	Radio XL,Birmingham	I	5.00	A*,C,E,G,H,I,J,L,M
1305	Big Easy Magic AM	I	0.15	C,G,I,M
1305	Premier via ?	I	0.50	G*,H,J,L
1305	Touch AM, Newport	I	0.20	D,G,H
1323	S.Coast R,Southwick	I	0.50	H,L
1323	SomersetSnd,Bristol	B	0.63	D,G
1332	Premier, Battersea	I	1.00	G,H,J,L
1332	CG 1332, Peterbor'	I	0.60	C,G,I,M
1332	Wiltshire Sound	B	0.30	D,H,J
1359	BreezeAM,Chelmsford	I	0.28	L
1359	CG 1359, Coventry	I	0.27	C,G
1359	R.Solent	B	0.85	H
1359	Touch AM, Cardiff	I	0.20	D,J
1368	R.Lincolnshire	B	2.00	I,M*
1368	Southern Counties R	B	0.50	E*,H,L
1368	Wiltshire Sound	B	0.10	H
1377	Asian Sd Manchester	I	?	C,I,*
1413	Premier via ?	I	0.50	G*,H,J,L
1413	Yorkshire Dales R	I	?	G
1431	Breeze AM, Southend	I	0.35	G,H,L,M*
1431	Cl.Gld via Reading	I	0.14	G,H,I,L
1449	R.Peterboro/Cambs	B	0.15	I,L
1458	R.Cumbria	B	0.50	B
1458	R.Devon & Dorset	B	2.00	H,J
1458	1458 Lite AM Manch'	I	5.00	C,G,J,K
1458	R.Newcastle	B	2.00	G
1458	Sunrise, London	I	50.00	C*,F,H,I,J,L
1458	Asian Netwk Langley	B	5.00	B,M
1476	CountySnd,Guildford	I	0.50	C,D,G,H,J,L
1485	Cl.Gld via Newbury	I	1.00	J,L
1485	R.Humberside (Hull)	B	1.00	A,I,M
1485	R.Merseyside	B	1.20	C,J,K
1485	Southern Counties R	B	1.00	H,L
1503	R.Stoke-on-Trent	B	1.00	C,E*,G,H,I,J,M
1521	R.1521 Craigavon,NI	I	0.50	G,J
1521	Fame 1521, Reigate	I	0.64	G,H,J,L,M*
1530	R.Essex	B	0.15	H,I,M
1530	1530 AM W.Yorks CG	I	0.74	A,C,G,I
1530	Wyvern, Worcester	I	0.52	E*,G,H,J,M
1548	R.Bristol	B	5.00	H,J,M
1548	Capital G, London	I	97.50	H,J,L,M
1548	Magic 1548 Liv'pool	I	4.40	C,J,K
1548	Gt.Yks G, Sheffield	I	0.74	I
1548	Forth AM, Edinburgh	I	2.20	F,G
1557	R.Lancashire	B	0.25	G
1557	Mellow, Clacton	I	0.125	L
1557	CG 1557, N'hampton	I	0.76	I,J,M
1557	S.Coast R, So'ton	I	0.50	G,H,J*
1584	KCBC, Kettering	I	0.04	M
1584	London Turkish R	I	0.20	H,L
1584	R.Nottingham	B	1.00	C,E*,G,I,J,K,M
1584	R.Shropshire	B	0.50	H
1584	Tay, Perth	I	0.21	F,G
1602	R.Kent	B	0.25	E,G,H,L,M*

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

Listeners:-
(A) Tim Allison, Middlesbrough.
(B) Martin Cowin, Kirkby Stephen.
(C) Martin Dale, Stockport.
(D) Francis Hearne, N.Bristol.
(E) Sheila Hughes, Morden.
(F) Brian Keyte, while in Invergarry.
(G) Ross Lockley, Galashiels.
(H) George Millmore, Wootton, IoW.
(I) Harry Richards, Barton-upon-Humber.
(J) Chris Ridley, Co.Sligo, Eire.
(K) Tom Smyth, Co.Fermanagh.
(L) Tony Stickells, Thornton Heath.
(M) Norman Thompson, Dadby.
(N) Tom Winzor, Plymouth.

In the **11MHz (25m)** band Slovak R.Int, via Velke Kostolany 11.990 (Eng to Australia 0830-0857) was 33333 at 0840 in Truro; R.Jordan via Al Karanah 11.690 (Eng to W.Eur, E.USA 1000-1630) 55544 at 1000 in Herstmonceux; BBC via Skelton & Woofferton, UK 12.095 (Eng to Eur, N/W.Africa 0400-2230) 44444 at 1000 in Malta; Polish R, Warsaw 11.815 (Eng to Eur 1200-1255) 44444 at 1253 in Woodhall Spa; Voice of Israel, Jerusalem 12.080 (Eng to Eur? 1400-1430) 54444 at 1400 in Plymouth; Voice of Russia 11.665 (Eng [WS]) SIO433 at 1430 by **Philip Rambaut** in Macclesfield; R.Australia via Darwin 11.660 (Eng to Asia 1430-1800) 44444 at 1505 in Norwich; WWCR Nashville, USA 12.160 (Eng to N.America, Eur 1400-2300) 34323 at 1655 in Woking.

Later, R.Nederlands via Flevo 11.655 (Eng to Africa 1730-2025) was SIO222 at 1830 in Co.Fermanagh; R.Kuwait via Kabd 11.990 (Eng to Eur, N.America 1800-2100) 45554 at 1840 in Wallsend; Israel R, Jerusalem 11.605 (Eng to Eur, USA 1900-1925) 32343 at 1900 in Colyton; R.Romania Int, Bucharest 11.940 (Eng to Eur 1900-1955) 54554 at 1915 in Bridgwater; Monitor R.via WSHB 11.550 (Eng to Eur, M.East, Africa 2000-2100?) 33333 at 2000 in Stalbridge; RCI via Sackville 11.690 (Eng to Eur, Africa 2000-2130) 34333 at 2007 in Freshwater Bay; R.Ukraine Int 12.040 (Eng to ? 2100-?) 44444 at 2104 in Newry; AIR via Bangalore 11.620 (Eng, Hi to Eur 1745-2230) 44433 at 2157 in Middlesbrough; HCJB Quito, Ecuador 12.015 (Eng to Eur? 2000?-2157) 54444 at 2128 in Kirkby Stephen.

Good reception from some areas has been noted in the **9MHz (31m)** band. R.Australia via Shepparton 9.860 (Eng to Pacific areas 0600-1230) SIO333 at 0741 in N.Bristol; R.Vilnius, Lithuania 9.710 (Eng to Eur 0830-0900) 43443 at 0845 in Herstmonceux; SRI via Sarnen 9.535 (Eng, Ger, Fr, It to SW.Eur 1000-1300) SIO444 at 1000 in Co.Fermanagh; BBC via Skelton, UK 9.410 (Eng to Eur, N/C.Africa 0200-2230) 55555 at 1100 in Malta; R.Nederlands via Nauen 9.860 (Eng to Eur 1030-1225) 55444 at 1138 in Ross-on-Wye; R.Norway Int, Oslo 9.590 (Norw [Eng Sun] to Eur 1300-1330) 54444 at 1325 in Plymouth; R.Denmark via RNI 9.590 (Da to Eur 1330-1355) SIO555 at 1330 in Macclesfield; Voice of Vietnam,

MEDIUM WAVE CHART

Freq (kHz)	Station	Country	Power (kW)	Listener
520	Hof/Wurzburg (BR)	Germany	0.2	P*
531	Ain Beida	Algeria	600/300	P*
531	Torshavn	Faeroe Is.	100	G
531	Leipzig	Germany	100	C*,H*,I,P*
531	RNE5 via ?	Spain	?	H*,I,P*
531	Beromunster	Switzerland	500	I,O,P
540	Wavre	Belgium	150/50	C,I,O,P,Q*
540	Solt	Hungary	2000	H*
540	Sidi Bennour	Morocco	600	C*,H*,I*,P*
540	Vitoria(EI)	Spain	10	P*
549	Les Trembles	Algeria	600	C*,D*,I*,P*,Q*
549	Thurnau (DLF)	Germany	200	C,H*,I,P
558	Espoo	Finland	100	H*,Q*
558	Tirgu Jiu	Romania	200	I*
558	RNE5 via ?	Spain	?	H*,I*
567	Berlin	Germany	100	P*,Q*
567	Tullamore(RTE1)	Ireland (S)	500	A,B,C,F,G,I,O,P
567	RNE5 via ?	Spain	?	P*
576	Muhlacker(SDR)	Germany	500	C,H*,I,P
576	Riga	Latvia	500	I*,Q*
576	Barcelona(RNE5)	Spain	50	I*,P*
585	Paris(FIP)	France	8	I,P
585	Madrid(RNE1)	Spain	200	C*,H*,I*,P,Q*
585	Dumfries(BBCScot)	UK	2	A,B,D*,H*,O,P*
594	Frankfurt(HR)	Germany	1000/400	C,H*,I,P,Q*
594	Oujda-1	Morocco	100	P*
594	Muge	Portugal	100	H*,I*
603	Sevilla(RNE5)	Spain	50	I*,P*
603	Newcastle(BBC)	UK	2	B,G
612	Athlone(RTE2)	Ireland (S)	100	A,B,C,I,O,P
612	Sebaa Aioun	Morocco	300	P*
612	RNE1 via ?	Spain	10	P*
621	Wavre	Belgium	80	C,H*,I,P
621	Batra	Egypt	2000	P*
630	Vigra	Norway	100	C*,H*,I*,P*,Q*
630	Sta. Isabel	Portugal	50	P*
630	Tunis-Djedeida	Tunisia	600	C*,H*,I*,P*
639	Praha(Liblice)	Czech	1500	H*,I,P*,Q*
639	RNE1 via ?	Spain	?	C*,H*,I,P*
648	RNE1 via ?	Spain	10	P*
648	Orfordness(BBC)	UK	500	B,C,I,P
657	Neubrandenburg(NDR)	Germany	250	H*,Q*
657	Napoli	Italy	120	I*,P*
657	Madrid(RNE5)	Spain	20	I*,P*
657	Wrexham(BBCWales)	UK	2	A,C,F,H*,P
666	MesskirchRohrd(SWF)	Germany	150	C*,H*,P*
666	Sitkunai(R.Vilnius)	Lithuania	500	H*,Q*
666	Lisboa	Portugal	135	H*,I*
666	Barcelona(COPE)	Spain	10	C*,P*
675	Lopic(R10 Gold)	Holland	120	B,C,D*,H*,I,O,P,Q*
684	Sevilla(RNE1)	Spain	500	C*,H*,I,P*
684	Avala(Beograd-1)	Yugoslavia	2000	C*,I*,P,Q*
693	Tortosa(RNE1)	Spain	2	H*,P*
693	Droitwich(BBC5)	UK	150	B,C,I,P,Q*
693	Enniskillen(BBC5)	UK	1	O
702	Flensburg(NDR)	Germany	5	I*,P
702	Monte Carlo	Monaco	40	I*,P
702	Slovensko 1 via ?	Slovak Rep.	?	P
711	Rennes 1	France	300	I,P,Q*
711	Heidelberg	Germany	5	P*
711	Laayoune	Morocco	600	H*,I*
711	Murcia(COPE)	Spain	5	P*
720	Lisnagarvey(BBC4)	Ireland (N)	10	G,I
720	Norte	Portugal	100	P
720	Lots Rd.Lon(BBC4)	UK	0.5	B,C,I,O,P
729	Cork(RTE1)	Ireland (S)	10	H*,O,P*,Q*
729	RNE1 via ?	Spain	?	C*,H*,I*,P*
738	Paris	France	4	I,P,Q*
738	Poznan	Poland	300	P
738	Barcelona(RNE1)	Spain	500	C*,H*,I*,O*,P*
747	Flevo(Hilv2)	Holland	400	C,H*,I,P,Q*
756	Braunschweig(DLF)	Germany	800/200	C,H*,I*,P*,Q*
756	Bilbao(EI)	Spain	5	I*,P*
756	Redruth(BBC)	UK	2	I
765	Sottens	Switzerland	500	C,I,P*,Q*
774	Praha	Czech Rep.	20	P*
774	RNE1 via ?	Spain	?	C*,H*,I*,P*
783	Leipzig(MDR)	Germany	100	C*,H*,P,Q*
783	Miramar(R.Porto)	Portugal	100	I*,P*
783	Dammam	Saudi Arabia	100	P*
792	Limoges	France	300	C*,I,P,Q*
792	Lingen(NDR)	Germany	5	H*,P*
792	Sevilla(SER)	Spain	20	C*,H*,I*,P*
801	Munchen-Ismaning	Germany	300	C*,H*,P*
801	RNE1 via ?	Spain	?	C*,H*,I*,O,P*
810	Madrid(SER)	Spain	20	C*,H*,P*
810	Westerglen(BBCScot)	UK	100	B,C,I*,O,P,Q*
819	Batra	Egypt	450	I*
819	Toulouse	France	50	H*
819	Trieste	Italy	25	P
819	Warsaw	Poland	300	I*,P,Q*
828	Hannover(NDR)	Germany	100/5	P*
828	Rotterdam	Holland	20	H*,P
837	Nancy	France	200	I,O*,P
837	COPE via ?	Spain	?	H*,I*,P*
846	Rome	Italy	540	I*,P*
855	R.Bucharest	Roumania	750	P*
855	RNE1 via ?	Spain	?	H*,I*,P*,Q*
864	Strakonice	Czech Rep	7	P
864	Santah	Egypt	500	I*,P*
864	Paris	France	300	I,P
864	Socuellamos(RNE1)	Spain	2	P*
873	Frankfurt(AFN)	Germany	150	A*,F*,H*,I*,P*,Q*
873	Zaragoza(SER)	Spain	20	F*,H*,I*,P*
882	COPE via ?	Spain	?	H*,P*
882	Washford(BBCWales)	UK	100	A*,C,F,I,O,P,Q*
891	Algiers	Algeria	600/300	C*,F*,H*,I*,P*
891	Huisberg	Netherlands	20	H*,O*,P
900	Brno(CRo2)	Czech Rep	25	H*,I*
900	Milan	Italy	600	C*,H*,I*,P*
900	Poprad	Slovakia	14	P
900	COPE via ?	Spain	?	H,I*,P
900	Qurayyat	Saudi Arabia	1000	P
909	B'mans Pk(BBC5)	UK	140	I,P,Q*
909	M'side Edge(BBC5)	UK	200	B,C,O
918	Plesivec(Sloven'nR)	Slovenia	600/100	C*,H*,I*,P*,Q*
918	Madrid(R.Int)	Spain	20	C*,I*,P*
927	Wolvertem	Belgium	300	C,H,I,P,Q*
927	Zakynthos	Greece	50	P*
927	Evora(RRE)	Portugal	1	P*
936	Bremen	Germany	100	P,Q*
936	Venezia	Italy	20	H*,I*
936	RNE5 via ?	Spain	?	P*
945	Toulouse	France	300	H*,O*
954	Brno (CRo2)	Czech Rep.	200	P*
954	Madrid(CI)	Spain	20	H*,I*,P*
963	Pori	Finland	600	H*,I*,O*
963	Tir Chonaill	Ireland (S)	10	O*
972	Hamburg(NDR)	Germany	300	H*,I*,P*,Q*
981	Alger	Algeria	600/300	I*,P*,Q*
981	Jihlava	Czech Rep.	7	P*
981	Megara	Greece	200	P*
981	Trieste	Italy	10	D*
981	Coimbra	Portugal	10	P*
990	Berlin	Germany	300	H*,I*,P*
990	Potenza	Italy	10	P
990	R.Bilbao(SER)	Spain	10	H*,I*,P*
990	Redmoss(BBC)	UK	1	H*,O*
999	Schwerin (RIAS)	Germany	20	H*
999	Torino	Italy	20	P
999	Madrid(COPE)	Spain	50	H*,P*
1008	SER via ?	Canaries/Spain	?	H,P*
1008	Flevo(Hilv-5)	Holland	400	C,H,I,P
1017	Rheinsender(SWF)	Germany	600	H*,I*,P*,Q*
1017	RNE5 via ?	Spain	?	I*,P*
1026	SER via ?	Spain	?	I*,P*,Q*
1035	Lisbon(Prog3)	Portugal	120	H,I*
1044	Dresden(MDR)	Germany	250	H*,P*
1044	SER via ?	Spain	?	H*,I*,P*
1053	Zarogoza(COPE)	Spain	10	H*,P*
1053	Talk R.UK via ?	UK	?	B,C,I,O,P
1062	Kalundborg	Denmark	250	B,H*,I*,P*,Q*,R*
1062	R.Uno via ?	Italy	?	F*,I*,P
1071	Brest	France	20	I*
1071	Riga	Latvia	50	H*
1071	Talk Radio UK via ?	UK	?	C,P
1080	Katowice	Poland	1500	I*,P*,Q*
1080	SER via ?	Spain	?	H*,I*,P*
1089	Talk Radio UK via ?	UK	?	B,C,I,O,P,Q*
1098	Nitra(Jarok)	Slovakia	1500	H*,P*
1098	RNE5 via ?	Spain	?	P*
1107	AFN via ?	Germany	10	H,P*
1107	RNE5 via ?	Spain	?	P*
1107	Talk R.UK via ?	UK	?	C,P
1116	Bari	Italy	150	P*
1116	Pontevedra(SER)	Spain	5	P*
1125	La Louviere	Belgium	20	H*,I*,P
1125	Deanovec	Croatia	100	P*
1125	RNE5 via ?	Spain	?	I*,P*
1134	COPE via ?	Spain	2	I*,P*
1134	Zadar(Croatian R)	Yugoslavia	600/1200	C*,H,I*,P*
1143	AFN via ?	Germany	1	H,P*
1143	R.Due via ?	Italy	10	P
1143	COPE via ?	Spain	2	I*,P*
1152	RNE5 via ?	Spain	10	P*
1161	Strasbourg(Flnt)	France	200	P*,Q*
1179	SER via ?	Spain	?	P*
1179	Solvesborg	Sweden	600	B,C*,H,I*,K,R*
1188	Kuurne	Belgium	5	H*,I,P
1188	Reichenbach(MDR)	Germany	5	P*
1188	Szolnok	Hungary	135	I*,P
1188	San Remo	Italy	6	P
1197	Munich(VOA)	Germany	300	B,H,P*
1197	Virgin via ?	UK	?	C,I,P
1206	Wroclaw	Poland	200	P*
1215	Virgin via ?	UK	?	B,C,I,O,P
1224	Lelystad	Holland	50	H,P
1224	Manningtree(V)	UK	0.5	O*
1233	Liege	Belgium	5	H,P*
1233	Virgin via ?	UK	?	C,P
1242	Marseille	France	150	H,P*
1242	Virgin via ?	UK	?	B,C,P*
1251	Marcali	Hungary	500	P
1251	Huisberg	Netherlands	10	H,P*
1260	SER via ?	Spain	?	H,P*
1260	Guildford (V)	UK	0.5	I,P
1269	Neumunster(DLF)	Germany	600	C*,H,I*,O,P*
1269	COPE via ?	Spain	?	P*
1278	Dublin/Cork(RTE2)	Ireland (S)	10	B,C,I*,O*,P*
1287	RFE via ?	Czech Rep.	400	H*,I*,P*
1287	Lerida(SER)	Spain	10	P*
1296	Valencia(COPE)	Spain	10	P*
1296	Orfordness(BBC)	UK	500	P
1305	Rzeszow	Poland	100	H*,I*
1314	Kvitsoy	Norway	1200	C*,H,I*,O,P,Q*,R
1323	W'brunn (V.Russia)	Germany	1000/150	H,P*
1332	Rome	Italy	300	H*,I*,P
1341	Lakihegy	Hungary	300	P
1341	Lisnagarvey(BBC)	Ireland (N)	100	B,I*,P*,Q*
1341	Tarrasa(SER)	Spain	2	P*
1350	Pecs	Hungary	10	P
1350	Cesvaine/Kuldiga	Latvia	50	H*,I*
1359	Arganda (RNE-FS)	Spain	600	C*,H*,I*,O*,P*
1368	Foxdale(Manx R)	I.O.M.	20	A*,BF*,G,H*,I*,MO*,P*
1377	Lille	France	300	B,F,H,I,P
1386	Athens	Greece	50	P*
1386	Ahwaz	Iran	400	P*
1386	Bolshakovo	Russia	2500	F*,H*,I*,P*
1395	Lushnje(Tirana)	Albania	1000	C*,I*
1395	TWR via Lushnje	Albania	500	H*,P*
1395	Lopic	Netherlands	120/40	B,H*,I,P
1404	Brest	France	20	I,P*
1413	RNE5 via ?	Spain	?	H*,I*,P*
1422	Heusweiler(DLF)	Germany	1200/600	C*,H*,I*,P
1431	Kopani	Ukraine	500	H*
1440	Marnach(RTL)	Luxembourg	1200	A*,C*,E*,H*,I,P*,R*
1440	St.Petersburg(RFI)	Russia	10	P*
1440	Damman	Saudi Arabia	1600	D*,P*
1449	RAI via ?	Italy	?	P*
1449	Squinzano (RAI)	Italy	50	I*
1449	Redmoss(BBC)	UK	2	G,P*
1458	Fllake	Albania	500	O*
1467	Monte Carlo(TWR)	Monaco	1000/400	H*,I*,P*
1476	Wien-Bisamberg	Austria	600	H*,J*,K*,P*,R*
1485	AFN via ?	Germany	1	P*
1485	SER via ?	Spain	?	P*
1494	Clermont-Ferrand	France	20	I*,P*
1494	St.Petersburg	Russia	1000	H*,I*,P*,R*
1503	Stargard	Poland	300	I*,P*
1503	RNE5 via ?	Spain	?	I*,P*
1512	Wolvertem	Belgium	600	C,E*,F*,H,I*,J,K,P,R*
1521	Duba	Saudi Arabia	2000	H*,I*,N*
1530	Vatican R	Italy	150/450	F*,H*,I*,P*
1539	Mainflingen(ERF)	Germany	350(700)	C,H*,I*
1539	SER via ?	Spain	?	P*
1557	Nice	France	300	P*
1566	Sarnen	Switzerland	300	C*,H*,I*,P*
1575	Genova	Italy	50	I*,P
1575	SER via ?	Spain	5	I*,P*
1584	SER via ?	Spain	2	I*,P*
1593	Holzkirchen(VOA)	Germany	150	H*,I*,L,O*
1602	SER via ?	Spain	?	I*
1602	Vitoria(EI)	Spain	10	I*,O*,P*

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

Listeners:-
(A) Tim Allison, Middlesbrough.
(B) Martin Cowin, Kirkby Stephen.
(C) Martin Dale, Stockport.
(D) John Eaton, Woking.
(E) Francis Hearne, N.Bristol.
(F) Sheila Hughes, Morden.
(G) Brian Keyte, while in Invergarry.
(H) Eddie McKeown, Newry.
(I) George Millmore, Wootton IoW.
(J) Clare Pinder, while in Appleby.
(K) Clare Pinder, Glasgow.
(L) Harry Richards, Barton-on-Humber.
(M) Chris Ridley, Cranmore, Co.Sligo, Eire.
(N) John Slater, Scalloway.
(O) Tom Smyth, Co.Fermanagh
(P) Tony Stickells, Thornton Heath.
(Q) Norman Thompson, Oadby.
(R) Thomas Williams, Truro.

Hanoi 9.840 (Eng to Far East 1330-1400) 33333 at 1335 in Stalbridge; VOA via Poro, Philippines 9.760 (Eng to Asia 1100-1700) 34223 at 1558 in Rugby.

During the evening R.Australia via Darwin 9.615 (Eng to Asia 1500-2000) was 22222 at 1845 in Truro; R.Tirana, Albania 9.570 (Eng to Eur 1830-1900) 32222 at 1850 in Colyton; Israel R, Jerusalem 9.435 (Eng to Eur, N.America 1900-1925) 55455 at 1900 in Appleby; Voice of Indonesia, Jakarta 9.525 (Ger, Fr, Eng to Eur 1800-2100) 43544 at 1900 in Wallsend; Monitor R.Int via WSHB 9.355 (Eng to E.USA, Eur 2000-2300) 32232 at 2010? in Norwich; VOIRI Tehran, Iran 9.022 (Eng to Eur 1930-2027) 54334 at 2024 in Freshwater Bay; Voice of Vietnam, Hanoi 9.840 (Eng to Eur 2030-2100) 22222 at 2030 in Plymouth; Voice of Armenia, Yerevan 9.965 (? to Eur, America 2100-2127) 55555 at 2115 by **Norman Thompson** in Oadby; R.Cairo via Abis 9.900 (Eng to Europe 2115-2245) 34433 at 2130 in Galashiels; R.Bulgaria, Sofia 9.700 (Eng to Eur 2100-2200) 44444 at 2135 in Woodhall Spa.

In the **7MHz (41m)** band RFPI Costa Rica 7.385 (Eng 24hrs) was 33333 at 0740 in Plymouth; Monitor R.Int via WSHB 7.535 (Eng [Various Sat/Sun] to Eur 0400-0958) 22222 at 0815 in Truro; VOA via Thailand? 7.125 (Eng to S.Asia? 1400-1800) 44444 at 1600 in Malta; AIR via Aligarh? 7.410 (Hi, Eng to Eur 1745-2230) 33323 at 1745 in Stalbridge; R.Tirana, Albania 7.270 (Eng to Eur 1830-1900) SIO444 at 1830 in Co.Fermanagh; R.Budapest, Hungary 7.155 (Eng to Eur 1900-1930) 43333 at 1900 in Morden; Israel R, Jerusalem 7.465 (Eng to Eur, USA 1900-1925) 44434 at 1900 in Colyton; R.Australia via Darwin? 7.330 (Eng to Asia 1930?-2100) 35553 at 1943 in Wallsend; VOIRI Tehran 7.260 (Eng to Eur, M.East 1930-2028) 43433 at 1945 in Woodhall Spa; RCI via Skelton, UK 7.235 (Eng to Eur, M.East, N.Africa 1800-2200) 34333 at 2041 in Middlesbrough; R.Romania Int, Bucharest 7.195 (Eng to Eur 2100-2156) 43444 at 2100 in Appleby; Voice of Russia

TROPICAL BANDS CHART

Freq (MHz)	Station	Country	UTC	DXer
3.200	TWR Manzini	Swaziland	1820	A
3.210	Em.Nacional, Maputo	Mozambique	0206	B
3.230	SABC Meyerton	S.Africa	1825	A
3.240	TWR Shona	Swaziland	0300	F,K
3.255	BBC via Meyerton	S.Africa	1906	A,F,G,K,M
3.270	SWABC 1, Namibia	S.W.Africa	1852	A,F,G,K
3.280	V.O.Pujiang	China	2110	M
3.287	R.Malagasy	Madagascar	2115	M
3.290	Namibian BC,Windhoek	S.W.Africa	2202	A,B,F,K
3.300	R.Cultural	Guatemala	0407	C,F,K
3.306	ZBC Prog 2	Zimbabwe	1850	A,G
3.316	SLBS Goderich	Sierra Leone	2013	G
3.320	R.S.Afrika	S.Africa	2206	B
3.320	SABC (RSG) Meyerton	S.Africa	1852	A,G,K
3.335	CBS Taipei	Taiwan	1903	G,M
3.365	GBC R-2	Ghana	2300	A,M
3.365	AIR Delhi	India	1756	B
3.375	R.Nacional S.Gabriel	Brazil	0040	A
3.380	R.Chortis	Guatemala	0030	A
3.380	NBC Blantyre	Malawi	1921	G,K
3.395	ZBC Gweru	Zimbabwe	0320	K
3.900	Hulunbei'er, Hailar	China	2125	M
3.915	BBC via Kranji	Singapore	2100	A,F,L,M,N
3.934	RRI Semarang	Indonesia	1647	K
3.950	Qinghai PBS, Xining	China	2330	K
3.955	BBC via Skelton	England	0359	F,M
3.960	Xinjiang PBS, Urumqi	China	0035	A
3.965	RFI Paris	France	1855	A,F
3.970	R.Korea via Skelton	England	2100	F,H,I
3.975	R.Budapest	Hungary	2000	E,F,H,I,M
3.980	Nexus, Milan	Italy	2130	N
3.985	R.France Int	France	2110	N
3.985	Nexus, Milan	Italy	2145	M
3.985	China R via SRI	Switzerland	2100	F,J,L,N
3.985	SRI Beromunster	Switzerland	1900	A,M,N
3.995	DW via Julich	Germany	0400	A,F,M
4.003	RRI Padang	Indonesia	1645	K,M
4.005	Vatican R.	Italy	1905	A
4.330	Xinjiang BS, Urumqi	China	0015	A
4.500	Xinjiang BS, Urumqi	China	1640	A,K
4.735	Xinjiang, Urumqi	China	1642	A,K
4.760	AIR Port Blair	India	0015	A
4.760	TWR Manzini	Swaziland	0325	F,K
4.765	R.Integracao	Brazil	0010	A
4.765	Brazzaville	Pep.Rep.Congo	1923	G,J,K
4.770	Centinela del Sur	Ecuador	2230	M
4.770	FRCN Kaduna	Nigeria	1923	F,G,J,K,M,N
4.777	R.Gabon, Libreville	Gabon	2235	E,K
4.783	RTM Bamako	Mali	1903	F,G,K
4.790	Azad Kashmir R.	Pakistan	1730	K
4.800	R.Nac.Amazonas	Brazil	0010	A
4.800	AIR Hyderabad	India	1734	G,K
4.800	LNBS Maseru	Lesotho	2106	F,G,K
4.805	R.Nac.Amazonas	Brazil	2250	K
4.815	R.Difusora, Londrina	Brazil	0025	A
4.815	R.diff TV Burkina	Ouagadougou	2013	G,K
4.820	R.Botswana, Gaberone	Botswana	2242	F
4.820	La Voz Evangelica	Honduras	0420	K
4.820	Xizang, Lhasa	Tibet	2306	K
4.825	R.Cancao Nova	Brazil	0212	B
4.828	ZBC R-4	Zimbabwe	2049	B,G,N
4.830	R.Bangkok	Thailand	1630	K
4.830	R.Tachira	Venezuela	0211	A,B,E,F,K
4.832	R.Reloj	Costa Rica	0216	B,K,M
4.835	R.Tezulutlan, Coban	Guatemala	0030	A
4.835	RTM Bamako	Mali	1946	E,F,G,K,M
4.840	AIR Bombay	India	0045	A,K
4.845	R.Fides, La Paz	Bolivia	0055	A
4.845	RTM Kuala Lumpur	Malaysia	1635	K
4.845	ORTM Nouakchott	Mauritania	1846	A,F,G,K
4.850	R.Yaounde	Cameroon	2245	F
4.850	AIR Kohima	India	1605	K
4.860	AIR Delhi	India	1917	B,G,K
4.865	PBS Lanzhou	China	2246	C,E,F,K
4.870	R.Cotonou	Benin	1948	F,G,K,M
4.875	R.Roraima, Boa Vista	Brazil	0253	A,F,K
4.885	R.Clube do Para	Brazil	0213	A,B,K
4.885	R.Difusora Acreana	Brazil	0050	A
4.885	KBC East Sce Nairobi	Kenya	1905	G,K
4.890	RFI Paris	via Gabon	0358	F,K
4.890	R.Port Moresby	New Guinea	1937	G
4.895	Voz del Rio Arauca	Colombia	0100	A,K
4.900	SLBC Colombo	Sri Lanka	1840	K
4.905	R.Nat.N'djamena	Chad	1932	E,F,G,K,M
4.905	R. La Oroya	Peru	0120	A
4.910	R.Zambia, Lusaka	Zambia	1900	B,G,K
4.914	R.Cora del Peru,Lima	Peru	0320	K
4.915	R.Anhanguera	Brazil	0105	A,F
4.915	GBC-1, Accra	Ghana	2248	A,B,F,G,K,M,N
4.915	KBC Cent Sce Nairobi	Kenya	0044	G
4.920	R.Quito, Quito	Ecuador	0312	B,F,K
4.920	AIR Madras	India	1742	G,K
4.925	R.Mozambique,Maputo	Mozambique	2200	K
4.931	R.Internacional	Honduras	0125	E
4.935	R.Capixaba, Vitoria	Brazil	0430	K
4.935	KBC Gen Sce Nairobi	Kenya	1914	G,K
4.940	AIR Guwahati	India	1615	A,K
4.945	R.Progresso	Brazil	2325	A,K
4.950	R.Nacional, Mulvenos	Angola	0330	K
4.950	AIR Srinagar	India	1610	K
4.950	VOA via Sao Tome	Sao Tome	1933	G,H,I,J,K
4.955	R.Nac. de Colombia	Colombia	0405	A,K
4.960	VOA via Sao Tome	Sao Tome	0315	F,K
4.970	PBS Xinjiang	China	0050	A
4.975	R.Uganda, Kampala	Uganda	2053	C,D,F,G,K
4.980	Ecos del Torbes	Venezuela	0055	A,F,K
4.985	R.Brazil Central	Brazil	0215	K
4.990	AIR Ext Service	India	0035	A,F
4.990	R.Ancash, Huaraz	Peru	0400	K
5.005	R.Nacional, Bata	Eq.Guinea	1930	F,G
5.005	R.Nepal, Kathmandu	Nepal	0040	A
5.009	R.TV Malagasy	Madagascar	1856	B,G,K
5.010	AIR Thiru'puram	India	0159	B,G
5.015	R.Brazil Tropical	Brazil	0218	B
5.020	PBS-Jiangxi Nanchang	China	0055	A,E
5.020	Xizang-Tb, Lhasa	China	2305	K
5.020	Voz del Upano, Macas	Ecuador	0055	A
5.020	La V.du Sahel,Niamey	Niger	2054	B,G,K
5.025	R.Parakou	Benin	2055	G,K,M
5.025	R.Uganda, Kampala	Uganda	1850	F,G,K
5.030	AWR Latin America	Costa Rica	0308	A,F,K
5.035	R.Bangui	C.Africa	0442	F
5.045	R.Cultura do Para	Brazil	0218	A,B,F
5.047	R.Togo, Lome	Togo	2055	B,E,F,G,K
5.050	Em.Jesus Gran Poder	Ecuador	0237	B
5.050	R.Tanzania	Tanzania	2059	F,G,K,M
5.055	RFO Cayenne(Matoury)	French Guiana	0010	A
5.060	PBS Xinjiang, Urumqi	China	1600	K
5.075	Caracol Bogata	Colombia	0315	A,E,F,K
5.163	CPBS 2, Beijing	China	2239	B
5.295	CNR 1	China	1655	K

DXers:-
(A) Robert Connolly, Kilkeel.
(B) John Eaton, Woking.
(C) David Edwardson, Wallsend.
(D) Bill Griffith, while in Delphi, Greece.
(E) Sheila Hughes, Morden.
(F) Eddie McKeown, Newry.
(G) Fred Pallant, Storrington.
(H) Clare Pinder, while in Appleby.
(I) Clare Pinder, Glasgow.
(J) Peter Pollard, Rugby.
(K) John Slater, Scalloway.
(L) Tom Smyth, Co.Fermanagh.
(M) Norman Thompson, Oadby
(N) Thomas Williams, Truro.

TRANSATLANTIC DX CHART

Freq (kHz)	Station	Location	Time (UTC)	DXer
USA				
1440	WLPZ	Portland, MA	0000	E
1500	WTOP	Washington, D.C.	0115	C,E
1510	WNRB	Boston, MA	0135	B,C,D,E
1560	WQEW	New York	0518	B
CANADA				
820	CHAM	Hamilton, ON	0110	A
920	CJCH	Halifax, NS	0321	B
930	CJYQ	St.John's, NF	0330	B,D,E
SOUTH AMERICA				
1500	R.Dos Mil (2000)	Cumana, Venezuela	0430	D

DXers:-
(A) Robert Connolly, Kilkeel.
(B) David Edwardson, Wallsend.
(C) Harry Richards, Barton upon Humber.
(D) John Slater, Scalloway.
(E) Tony Stickells, Thornton Heath.

7.370 (Eng [WS]) 53333 at 2123 in Freshwater Bay.

Many of the broadcasts in the **6MHz (49m)** band are intended for European listeners. Those noted came from HCJB in Quito, Ecuador 5.865 (Eng 0700-0900), rated 44444 at 0800 in Morden; WEWN Vandiver, USA 5.825 (Eng 2100-1000) 33333 at 0900 in Dudley; Vatican R, Italy 5.882 (Eng 1020-1030) 32232 at 1020 in Scalloway; SRI via Lenk 6.165 (Fr, It, Ger, Eng 0400-2000) 55555 at 1115 in Oadby; Bayerischer Rundfunk, Germany 6.085 (Ger) 55444 at 1504 in Kirkby Stephen; R.Vlaanderen Int, Belgium 5.910 (Eng 1800-1830) 32333 at 1819 in Rugby; R.Sweden via Horby? 6.065 (Eng 1930-1958) 44333 at 1935 in Truro; Polish R, Warsaw 6.095 (Eng 1930-2025) 43344 at 1940 in Colyton; R.Prague via Litomysl 5.930 (Eng to Eur 2000-2027) 44444 at 2000 in Galashiels; China R.Int 6.950 (Eng 2000-2157) 44444 at 2030 in Appleby; R.Korea via Kimjae 6.480 (Eng 2100-2200) 43433 at 2135 in Herstmonceux; R.Austria Int, via Moosbrunn 6.155 (Ger, Eng, Fr, Sp 0400-2300) 45444 at 2145 in Freshwater Bay.

Also received here were R.Nederlands via Flevo 6.020 (Eng to N.America 2330-0125), rated 33332 at 0030 in Middlesbrough; R.Nederlands via Ned.Antilles 6.165 (Eng to N.America 2330-0125) SIO444 at 2359 in N.Bristol.

QUARTERLY LIST OF EQUIPMENT USED

LM&S for $May, #June, *July'97

* Tim Allison, Middlesborough: Lowe HF-225 + r.w.
$# Darren Beasley, Bridgwater: Yaesu FRG-100 + a.t.u. + 15m wire.
$# Vera Brindley, Woodhall Spa: Sony CRF-320 or Sangean ATS803A + r.w.
$# Robert Connolly, Kilkeel: JRC NRD-525 + Datong AD370.
$# Martin Cowin, Kirkby Stephen: Hitachi TRK-5854E + built-in whip.
$# Bernard Curtis, Stalbridge: Grundig Satellit-2100 + r.w. or Tatung TMR7602 or TMR7037.
* Martin Dale, Stockport: Grundig Satellit 3000 or Sangean ATS803A or Codar CR70A + a.t.u. + 23m wire.
$# Ron Damp, Worthing: JRC NRD-525 + Mag Balun + 14m wire.
$# John Eaton, Woking: Lowe HF-225 + Datong AD270 or a.t.u. + r.w.
$# David Edwardson, Wallsend: Trio R-600 + Pi-Balun + invert V trap dipole or m.w. 2.5m X 2.5m loop.
$# Stan Evans, Herstmonceux: Kenwood R-2000 + Balun + 11m wire in loft.
$# Michael Griffin, Ross-on-Wye: Lowe HF-225 + a.t.u. + 45m wire.
$ Bill Griffith, W.London: JRC NRD-535 + 20m wire.
# Bill Griffith, while in Valencia, Spain: Sony ICF-SW55.
* Bill Griffith, while in Delphi, Greece: Sony ICF-SW55 + 5m wire.
$# Gerald Guest, Dudley: Roberts RC818 + r.w. (location 300m a.s.l.)
$# Tony Hall, Freshwater Bay, IoW: Yaesu FRG-7 + r.w. or RFB45
$# Francis Hearne, N.Bristol: Sharp WQT370 + r.w.
$# Sheila Hughes, Morden: Sony ICF-7600DS or Panasonic DR48 + 15m inverted L wire.
$ Nicola Hutchings, Wellington: Sony Walkman.
$# Rhoderick Illman, Dxted: Kenwood R-5000 + r.w. or AN-1, Sony ICF-7600DS.
$# Brian Keyte, Bookham: CA117 car radio + loops.
* Brian Keyte, while in Invergarry: CA117 car radio + loop above car sunroof.
$# Ross Lockley, Galashiels: Realistic DX-300 + a.t.u. + 40m wire or Sangean ATS803A.
$# Eddie McKeown, Newry: Tatung TMR 7602.
$# George Millmore, Wootton, I.o.W: Racal RA17L + converter + loop or Sangean ATS803A.
$# Fred Pallant, Storrington: Trio R-2000 + Howes CTU8 a.t.u. + r.w.
John Parry, Larnaca, Cyprus: Yaesu FRG-7700 or Realistic DX-400 + r.w.
Roy Patrick, Derby: Lowe HF-125 + 22m wire or inverted V.
$# Clair Pinder, while in Appleby: JRC NRD-525 + a.t.u. + r.w.
* Clare Pinder, Glasgow: Sony ICF-2001 + r.w.
$# Peter Pollard, Rugby: Sony ICF-2001D + r.w.
$# Vic Prier, Colyton: Racal RA17L or Redifon R551N + 19m horizontal loop or active vertical with ground plane, both mounted in roof.
$# Philip Rambaut, Macclesfield: Int.Marine Radio R.700M + r.w.
$# Harry Richards, Barton-upon-Humber: Grundig Satellit 700 + AD270 or r.w. or Grundig Yacht Boy or Matsui MR4099.
$# Chris Ridley, Co.Sligo, Eire; Morphy Richards R-124 + loop or Philips R242 car radio.
$ Eric Shaw, Chester: Lowe HF-225 + 7m wire.
$# Chris Shorten, Norwich: Matsui MR4099 + 10m wire.
$# John Slater, Scalloway, Shetland: Lowe HF-150 + a.t.u. + 20m wire.
$# Tom Smyth, Co.Fermanagh: Sangean ATS803A or Morphy Richards R191.
$ Tony Stickells, Thornton Heath: Yaesu FRG-7700 + 20m wire or loop.
#* Tony Stickells, Thornton Heath: AOR AR7030 + 20m wire or loop.
$# Norman Thompson, Oadby: Matsui MR4099 + 20m wire in loft.
Phil Townsend, London: Lowe HF-225 + preselector + r.w. or loop.
$# Mahendra Vaghjee, Rose Hill Mauritius: Lowe HF-225E + Dressler ARA 60 or r.w.
$ Ted Walden-Vincent, Gt.Yarmouth: Sangean ATS803A or Grundig Satellit 3400.
$ John Wells, E.Grinstead: RCA AR88D + Loop.
* E. Wiles (Bedford) while in Malta: AKD Target HF-3 + r.w.
$#* Thomas Williams, Truro: Gundig Yacht Boy 206.
$#* Tom Winzor, Plymouth: Kenwood R-1000 or Eddystone 840C + Miller ant.

Off the Record

ANDY CADIER
28 ROMNEY AVENUE
GOLDEN VALLEY
KENT CT20 3QJ

I was more than a little chuffed at receiving a complimentary invitation to Radio Caroline's 33rd birthday party held at the Flint Cross Motel, Royston near Cambridge, on the evening of Easter Saturday. I just managed to squeeze myself through an impenetrable wall of thirsty anoraks surrounding the bar when, in true Caroline tradition, the till broke down!

Normal service was, to everyone's relief, quickly restored and the party was soon under way. The turntables or should I say CDs were manned by veteran DJ **Tom Lodge** who steered the evening through the musical charts of the entire Caroline era.

A very professional and energetic performance, with wave upon wave of nostalgia, made a most enjoyable evening. On the Caroline merchandise stand author **Mike Leonard** was autographing copies of his new book *From International Waters*.

Station Manager **Peter Moore** arrived suffering from '3rd degree flu', but still managed to make a well received speech concerning the present predicament of the station and its future plans. He said that finances that had been a cause for concern were now on an even keel. Progress on the vessel was at 'slow ahead' due to financial considerations, but the point where it would be able to move under its own steam was in sight.

Of the future, he said they were looking for a broadcasting licence that would to allow them to return to the air on a permanent basis. He wanted the ship to be a base for the station, as that was their hallmark, but was not keen to use the ship in circumstances where it could be arrested or impounded, particularly in view of all the work that had been accomplished.

He said if the *Ross Revenge*/Caroline Support Group could be expanded on a European wide basis it may be possible to have the station back on-air largely supported by members subscriptions. Peter concluded his address by thanking all those that regularly give their time, effort and money in support of Radio Caroline.

RADIO KORAK

I know many readers will have heard Radio Korak International from Holland. The station started in 1980 and played Dutch music for local listeners using a 25W transmitter.

Two years later a power increase to 100W was made and then in 1984 an old American 200W rig was obtained and restored to perfect working order. The international programmes started in December 1994 on 1647kHz and led to them receiving over 200 reception reports from all over Europe.

In 1996 a frequency change to 1570kHz was made after concern that their former channel may cause interference to the local coast guard.

Radio Korak has also been active in the 48m band, via a relay in Germany and also in the 76m band from their own site in Holland, resulting in many reports from the USA. They have recently had a number of jingles made up, each giving their address in a different language, **PO Box 134, 3780 BC, Voorthuizen, Holland.**

The station operators Willem and Sandra are happy to answer listeners letters, but as they both work full-time, it may take a few weeks before you receive a reply. Future plans include continuing with the mainly oldies format, but introducing much more speech and radio related news.

80 CHANNEL CB

News that these newly approved radios will soon be available in UK shops is probably very welcome to CB enthusiasts and are licensed for use in the UK only. This is due to the fact that the EC frequency allocation is not the same as originally established in Britain.

There will clearly be a black market for these sets in mainland Europe, giving our continental friends access to the British set of frequencies. British international truck drivers will benefit most and at last be able to communicate with foreign vehicles without needing two CB sets in the cab.

I cannot believe for one moment that they will remove these sets from vehicles before venturing abroad. This is just another case of rules being made that are neither practical for users, or really realistic when it comes to enforcement.

This situation only serves to expand the 'grey areas' surrounding British communications.

RFL SIGN OFF!

Bob Marsh, of Bexleyheath, Kent, kindly sent me this item taken from the Internet service of the Swedish Report Service, concerning Radio Free London. On Sunday 20 April a motorway maintenance worker discovered an unauthorised electricity connection to an illuminated motorway sign on the M25 near Badgers Mount, Orpington. He traced the cable into some near-by woods and discovered a crate containing electrical equipment.

The police were called, so apparently was the bomb squad, the installation was declared safe and dismantled by officials from the Radio Investigation Service. The forfeited equipment included, two transmitters and their respective antennas, a cassette player, an earth rod and about 40 metres of mains cable. The station operators, who could still be charged with the theft of electricity from the Highways Department, were not apprehended.

THE LEGAL ALTERNATIVE

Trevor Brook, a director of Surrey Electronics, has been requesting a licence for an independent short wave radio station for over 10 years. Between 1988 and 1992 he operated 'Radiofax' on three frequencies from Ireland, this carried a speech based service covering such subjects as science, technology, media and technical news.

Many applications for a licence to operate openly, honestly and legally from the UK were made to those responsible for Broadcasting in Britain. Their response has been negative, to put it mildly, with a multitude of excuses why the UK is unable to have independent s.w. radio.

The USA on the other hand appear to be granting s.w. licences to almost anyone that applies, particularly to religious organisations. It is believed this unco-operative stance taken by the British government could be considered unreasonable under Article 10 of the European Human Rights Convention.

In 1993 a similar matter came before the European Court involving broadcasting in Austria, the applicants won their case and received compensation and became the catalyst through which their government effected changes in broadcasting policy. If you have had any dialogue with the British government on the subject of independent short wave radio licensing, Trevor would like to hear from you. His address is: **The Forge, Lucks Green, Cranleigh, Surrey. GU6 7BG.**

BIG L REVIVED

Ray Anderson of East Anglia Productions has organised a ship board radio station to recreate the 60s pirate Wonderful Radio London. A temporary one month licence from 18 July to 14 August will be used to broadcast from a ex-lightship anchored off Frinton in Essex, not far from where the original *MV Galaxy* was moored.

On 5 August a special tribute to Radio 355 will take place. It is hoped that many of the original radio personalities will once again be behind the microphone of Radio London.

So far, **Pete Brady, Mark Roman, Keith Skues, Tony Brandon** and **Ian Damon** have said they would broadcast from the ship. Programmes will be on the old 266m m.w. (now 1134kHz) but with considerably less power than the 50kW that they had during the 60s.

The familiar Big L jingles have been digitally re-mastered by EAP to add an audio sparkle to this exciting, nostalgic event. I will be enthusiastically participating in the live Radio 355 tribute to be hosted by Paul Graham.

The Original Radio London started on 19 December 1964, and soon captured a huge audience with its Fab 40 format. The final close down took place at 3pm on 14 August 1967 to comply with the Marine Offences Broadcasting Act that became law at midnight.

Radio London was the market leader among pirates and was the self proclaimed 'Mast with the most!'

GETTING STARTED

Last quarter I asked readers how they became involved in the s.w. radio hobby. **Andy Howlett** writing from Dukinfield, Cheshire says "Thanks for keeping me informed and entertained with 'Off The Record' . (Well a hobby has to be fun).

Andy started with batteries, bulbs and junk, then came crystal sets and single transistor circuits. This was during the mid sixties when he managed to accidentally and spectacularly destroy OC45 and AF116 transistors during his intricate experiments.

Sinclair kits came next, with their matchbox radio that pulled in Radio Caroline North better than some of the superhets of the day. Low power pirate QSOs on 1650kHz in the early 70s led to a proper land based pirate in the shape of Radio Aquarius.

This station became headline news in the north west, each and every time they were raided and prosecuted! He concludes "I've been a good boy since I got my licence in 1984, but somehow it doesn't seem the same."

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