The John Wilson Review

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### SCANMASTER ACTIVE Discone
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- A cracking new receiver aimed at the Broadcast and Shortwave listener. JRC builds some of the World’s finest receivers and this is no exception. Designed to give clarity and interference free reception.
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- Noise blanker
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- 100 memories
- Clock/Timer functions
- Supplied complete with AC mains adaptor
- **£795.00**
The Iffer Test when speed, perform

For Commercial and Mobile Radio testing, the Optoelectronics Xplorer stands alone. Let the Xplorer perform all your quick radio checks, instantly determining the radio’s frequency, CTCSS, DCS, DTMF, deviation or signal strength. The Xplorer automatically locks on to any nearfield signal from 30MHz-2GHz in less than a second.

There is no setup necessary—whether you’re in the field or in the shop, the Xplorer is the portable, compact and economical solution for any two-way communications business.

FEATURES

- Nearfield receiver, sweeps 30MHz-2GHz in <1 second
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- Auto Sweep Time >1 second
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- Frequency Response 50-3000Hz
- Input 50 Ohm
- Input 50 Ohm -59dBm @100MHz -25dBm @1GHz
- Display 2 line LCD
- Power Internal NiCad

SPECIFICATIONS

- Frequency Range 30MHz-2GHz
- Modulation FM
- Deviation 50-3000Hz
- Auto Sweep Time <1 second
- Input 50 Ohm
- Input 50 Ohm -59dBm @100MHz -25dBm @1GHz
- Display 2 line LCD
- Power Internal NiCad

Check out our Web Site

www.optoelectronics.com

Specifications are subject to change without notice or obligation.

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MADE IN U.S.A.

Xplorer includes:
- TA100S antenna, Nicads,
- Charger, PC downloding cable and software.

When speed, performance, and reliability are an issue!

The Xplorer Test Receiver: The Professional Choice
Regular Columns

70
Competition

Zoe Clapp

Roberts CR930 - Review

Robert Commodity G117X

Navigational Systems

Robert Commodity G117X

Skywave Shop - Reviewed

Ruth Line

Genius of Magicman

Mike Rowe Cafe

Compact NAVTEX Receiver

John Griffiths

Heaven

David Bailey

Fawell Niven

John Wilson G3PCY

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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. U.S. 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 rf 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 July 1, 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 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.

Radio and TVDX News

Sweden carried out some of the first experimental digital terrestrial TV transmitters (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 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/artists offering with input from ARTE and the BBC.

There's an unidentified (and unlisted) ch. AO E63 transmitter at Tournai. And in Germany many digital audio broadcast transmitters (DAB) have now launched into the first trial programmes using DTT with an initial five channels "as soon as possible". First regions nominated are 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/artists offering with input from ARTE and the BBC.

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.

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

Radio and TVDX News

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Lord Provost Mervyn Rolfe and MEGS members celebrate the anniversary of Samuel Morse aboard RRS Discovery.
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 IAW 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 Plus France is negotiating with Kirch to buy part of their holding in the Italian PAY-TV channel Telepiù 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 TeleS pressing ahead with viewing at 23.3% and 22.8% respectively.

Bad news also from Australia’s ABC with cuts of AS$5 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 1 TVDXers are strongly 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 harmonics across the rf spectrum up into low vhf.

“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 and 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, Aranespaece, 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.

Waters & Stanton held their 7th annual Open Day next year, which will be Waters & Stanton’s 25th anniversary year. Watch this space!

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, clear-outs, ends of line, bargain second-hand goods as well as representatives from Kenwood, Icom, Yaesu, Proxible Wireless, Short Wave Magazine, RSGB and Home 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 G30JV and Mark Francis G0GBY take time out for a quick bite to eat!
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.

“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

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 G6000.

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.

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designing CyberStar to be the most economically
feasible way to bring the Global Information

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 world-
wide 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.

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), fm. (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.

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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: BBC1 (Scotland) 51
- BBC 2 44
- ITV (Grahampan) 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: 0141-138 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, Horsham Road, Lower Bevendean Avenue, Plimouth Avenue, Taunton Road, The Hyde, Upper Bevendean Avenue and Waimer Crescent; also most of The Avenue and part of Bodian Avenue and Leybourne Road.

Station Details:
- Channel: BBC1 (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, Portstrthur, Ballymoney, Coleraine, Limavardy and Portstewart. And Redrush television transmitter; located at Four Lanes about 2.5km south west of Redrush serving about 200000 viewers in Camborne, Helston, Falmouth, Helston, Penzance, 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 Compressed 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 fm. national radio reception, including stereo, to an extra 300000 people. In Hartlepool, Middlesbrough 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 fm. national radio reception, including stereo, to an extra 85000 people in the surrounding areas including Hungerford, Lambourn, Kingston, Great Shefford and Kirtling. 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 fm. national radio reception, including stereo, to an extra 14000 people in Tiverton and the surrounding area including Culmhort 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

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

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 21dB of gain and an azimuth of 342°, should be able to be 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, WMR 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 Parrnell G0-HFX on (01225) 764874 or the club secretary Ian Carter GOGNI on (01225) 864698.

SUBSCRIPTIONS

Don’t forget that our Subscription Department is holding the price of a subscription to Short Wove 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?

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Tel: (01462) 711600 or FAX: (01462) 711769.
E-mail info@hoka.com

SEND YOUR NEWS TO KEVIN NICE AT THE EDITORIAL OFFICES
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 Tidifusion 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 £22 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 fm. 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.

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**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.
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 applied for.

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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 be published in printed form. I have grave reservations about the heading dash into publishing using CD-ROM technology instead of conventional printing. I am no Ludite - 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 1996 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 hate 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 your envelopes 'SWM Computers'. Of course, you can always E-mail me at dick@wpwb.demon.co.uk with 'SWM Computers' as the subject of the message.

Dick Ganderon G8VHF

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 loop antennas, 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 the loop is so dependent on the electric-field, immunity to local electric-field transmissions. Having increased my interest in the subject I am now keen to listen in to more transmissions. 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 have 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 BBC's Here And Now programme broadcast on 22 April 1997 and I found it very interesting, especially seeing an old valved receiver used for listening to this stuff. It's ironic that old technology is being used to listen to 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 - DT726
Ayrshire

DEAR SIR

I am attempting to receive radio stations via satellite. I have a Philips STL/80/1258 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.

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 hobby using an MTV-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 to more distant transmissions, e.g. Oceanic h.f.

However, I understand that the MTV-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 ‘Co-Operative Civilian Shore Wireless Service’, sometimes referred to facetiously as the Co -Operative ‘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 distinguished 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 JTM LNOX. Submarines could only transmit when 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, also 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 Bismarck would not have been sunk but for h.f.d.d. 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 1980, 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 Beaumarson Park in Leicester. Later, as a Special Operator in the Royal Corps of Signals and returning as a civilian to Beaumarson 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.

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1997 July SWM 11
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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PAY DECEMBER
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.

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 Edystone 1650 receiver.

the moonlight, with a fox intruding 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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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.
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 Squadrons/CPS 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 brief 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.

**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 ungraceful 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 ceremoniously 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.

Here they go through a waterfall 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 Pinnacle 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 Pinnacle - 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 forms 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 trying 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 kitted 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 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 seasroom.

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.
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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

The vision of Arthur C. Clarke

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.
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 "indispensable 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".

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

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 rue’d 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
Genius or Magician?

An Inmarsat-3 satellite in the test chamber.

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

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.

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 systems 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 womanned 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".
C.M. HOWES COMMUNICATIONS  
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Multiband SSB/CW Receiver  
The DXR20 covers 20, 40 & 80M bands as standard. You can add any other SW band with optional plug-in band modules (same type as DC2000). Versatile and popular!

DXR20 Kit: £39.90. DC52 “S meter” Kit: £10.90. HA22R hardware pack: £28.90

Top Value Receiving ATUs  

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HOWES DC2000  
Beginner’s SSB/CW Receiver Kit – £22.90  
The ease of construction, the sensitivity and the low quiescent current consumption make this a great little receiver for both the first time builder and for holiday and portable use. It covers a single band at a time, but uses interchangeable band modules to give the choice of any HF band on a simple plug-in basis. Choose from 160, 80, 40, 30, 20, 15 & 10M amateur bands. Also suitable for BM11 and BM54 HF air-band modules. The DC2000 can interlink with many of our other kits including digital counters, “S meter”, sharp CW filtering, and TX2000 transmitter. There are many reasons why building the DC2000 is a great way to start your station!

HOWES Active Antennas  
AM2, 15kHz to 30MHz active ant. amplifier £18.90  
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AM118, 8kHz reception on YHF air-band £18.80  
AM156 8kHz reception on HF Marine £18.50  

TRANSMITTERS  
AT140 £24.99  
TX2000 £54.99

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HOWES KITS are supplied as PCB kits with screen printed construction instructions, for mum and dad to build, plus all components mounted on the boards. Most kits can also be supplied as assembled PCB modules. Optional hardware packs are available for many kits. Please enquire for details.

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- World's smallest scanner
- FM, WFM, & AM
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- Fast scanning speed
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- 500kHz - 1900MHz
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- Illuminated Display
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Price Match

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Special

- 100kHz - 1300MHz
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- 200 Memories in 10 banks
- 20 channels per second speed
- Programmable Steps
- Illuminated Display
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- Ni-cads and AC charger.

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- 100kHz - 1650MHz
- NFM, WFM, SSB, AM
- 1000 Memories
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- Illuminated keypad - display
- 300 Ch. pass memories
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- Unique mode scan
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Yupiteru MVT-7200 Scanner

Special

- 100kHz - 1650MHz
- WPM, NFM, SSB, AM
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- Illuminated keypad - display
- Signal Strength Meter
- Built-in ferrite AM aerial
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Ham Radio Today Review says "Lovely little set - very sensitive receiver"
A quality British made communications receiver at an affordable price.

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- All modes
- 500kHz-1300MHz no gaps
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ICOM R8500
Covers 100kHz-2GHz
All modes
Includes IF shift, APF direct
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The first of a whole new range. Target HF receiver for the shortwave listener.
- Frequency range 30kHz-30MHz
- 1kHz steps with clarify control
- Audio output 2 watts
- Bandwidth SSB = 4kHz, AM = 6kHz
- Modes USB/AM/LSB
- Signal strength meter
- Favourite frequency memory
- Large, silky smooth tuning control knob
- Fully synthesised employing a phase lock loop VCO to ensure stable and accurate signal reception
- Headphone socket.

£159.95 inc VAT. Add £6 P&P.
THE ABOVE PRICE INCLUDES 12V POWER SUPPLY AND AERIAL.
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 switch, switched it on and was immediately impressed by the way it lit up. This is not a shy, shering voice 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 give an impression with traditional ‘S’ units. Below 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 to dim the readout to a lower level. To the left of the frequency display 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: QAM, 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 remember 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. For any receiver in tuneable mode. No less than twenty different bands are stored within the receiver, and the band in use is automatically shown.
The keypad is laid out in standard telephone format, and as possible. The front panel and this makes the tuning arrangements as complete very useful feature for tuning short wave broadcast bands where measured it at 200kHz/second). Pressing either pad forces the up and down arrows which tune the receiver in 5kHz steps. If playing with a ball of wool to get around, whilst at the same smoothness of the encoder which it drives the light weight which means that you don't have to spin the knob like a kitten 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 bloopcs 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 turning 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.

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.

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/RECO', 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 bloopcs 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 turning 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 signal, 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

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Table I.

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<th>Spacing from</th>
<th>Reciprocal dBc/Hz</th>
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<tr>
<td>wanted signal (kHz)</td>
<td>mixing ratio</td>
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<tr>
<td>20</td>
<td>104</td>
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SWM July 1997

34
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 i.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 i.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 c.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 c.f. board next to the antenna socket.

On the test bench the SW2 surprised me with its good c.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 separation between 50 from S9, but within the limited readout facility provided by a vernier 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 hall, 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 Eurocom 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 c.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 wide 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.
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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.

AVTEX 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.
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 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 comparator 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.

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.

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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. Return 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.
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<th>Price</th>
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<tr>
<td>Compact SO239 Balun</td>
<td>£39.95</td>
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### ScanMaster

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<tr>
<th>Model</th>
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<tr>
<td>ScanMaster 1000</td>
<td>£45.00</td>
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### Oriental Antennas

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<tr>
<td>End Fed Wire (s/waves)</td>
<td>£59.95</td>
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### EFW - Shortwave Antenna

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<td>20 meter v/w receive &amp; fed wire antenna</td>
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### books

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<thead>
<tr>
<th>Title</th>
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</thead>
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<tr>
<td>The 56th Dimension</td>
<td>£18.50</td>
</tr>
</tbody>
</table>

### Low Prices, Friendly Advice, Fast Delivery, Service Back Up

Use your credit card for same day dispatch!

**NEW DRK SW2 SHORTWAVE RECEIVER**

- AM/SSB
- 100 memories
- Easy tuning
- 100kHz - 30MHz
- Selectable Sideband
- Synchronous detection
- Dual antenna inputs

**EUROPEAN SONY 5W77 DIGITAL WORLD RECEIVER**

- Price £499
- Optional Extras: Infrared remote control £49.95
- Mobile mounting kit £14.95

**NEW YAESU FRG100 COMMUNICATIONS RECEIVER**

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRG100</td>
<td>£429</td>
</tr>
</tbody>
</table>

**LOWEST PRICES, FRIENDLY ADVICE, FAST DELIVERY, SERVICE BACK UP**

Use your credit card for same day dispatch!

**NEW DRK SW2 SHORTWAVE RECEIVER**

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**EUROPEAN SONY 5W77 DIGITAL WORLD RECEIVER**

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</tr>
</thead>
<tbody>
<tr>
<td>FRG100</td>
<td>£429</td>
</tr>
</tbody>
</table>
Want to improve performance on the AM broadcast band both MW and SW?

We now have available a small PCB that fits internally within the AR8000 and allows the narrower SSB filters to be selected when in AM mode. This can greatly assist with AM listening on crowded shortwave bands. Once the PCB is fitted the narrower filters can be selected by pressing the LOCAL button and deselected in the same way. For further details please give us a call.

Included FREE with all AR8000 orders

LEATHER CARRY CASES £15.00

AR8000 owners

NEW VHF/UHF Frequency Guide with Callsigns

Much delayed (our apologies) our new VHF/UHF Airband Guide together with a comprehensive callsign section is now available. Expanded to 280 pages it has been fully revised for 1997. Ring bound as before and available for £12.50 inc. postage.

ACTIVE ANTENNAS – THE NEW ARA RANGE

A country radio

ARA 40

Technical performance

Frequency range

Output impedance

Connector to Rx

Gain

Intercept Point

DC power supply

Mast diameter

Dimensions

40MHz-40MHz at full performance 40MHz-108MHz 2.3dB gain

50-75 ohm coaxial

PL comes as the standard. Other standards can be fitted upon request

5dB +/-0.2dBs

11.5-13 volt DC at 70mA typ.

30.50mm can be fitted

ARA 40 TEL 125cm total length

with telescopic whip extended

23cm minimum length. Antenna tube 40mm x 140mm

ARA 40 TELE 125cm total length

with telescopic whip extended

23cm minimum length. Antenna tube 40mm x 140mm

ARA 60

Technical performance

Frequency range

Output impedance

Connector to Rx

Gain

Intercept Point

DC power supply

Mast diameter

Dimensions

40Hz-60MHz (full performance) 60-120kHz

50-75 ohms coaxial

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

10dB +/-0.2dBs

+50dBm IP 3rd order

+12V power

75.50mm can be fitted

ARA 60 TELE 125cm total length

with telescopic whip extended

50mm x 160mm

ARA 2000

Technical performance

Frequency range

Output impedance

Gain

Noise figure

3rd order IP

Power supply

Dimensions

50-2000MHz

50-75 ohms coaxial

Gain 2.5dB

+10dBm

+2000MHz 1.5-2dB

12V DC at 160mA

115cm total length. Antenna tube 50mm x 160mm

Ideal for base stations

Available from: CELEBRITY COMMUNICATIONS 191 FRANZIS ROAD, LEYTON E10 6NQ

Tel: 0181-558 0854/0181-556 1415. Fax: 0181-558 1298.

E-mail: celcomms@aol.com Internet HTTP://DRESSLER@digit.de
Operating the Receiver

This receiver is designed to be operated with the excellent Hamcom 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.
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!

**MyDEL ML-2Q Passive Preselector**

Now includes scanner/receiver lead.

- Designed to reduce the impedance of a long wire to a low impedance more closely matching that of the scanner. The ML-2Q has a selectable attenuator. Works with any wire antenna.
- The new ML-2Q will peak random wires, coaxial feeds and loop antennas over the entire shortwave spectrum, 500kHz-1299.999MHz
- Includes scanner/receiver lead.

**Price:** £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-2Q Passive Preselector.

**Price:** £22.95 (p&p £3.50)

**MyDEL Shortwave Antenna**

Only 40ft (12 metres) in length, this simple to install feed 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.

**Price:** £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 lit LCD TV type screen.
- 50 to 905MHz with no gaps
- AM/FM&WFM
- 1kHz,5kHz,10kHz,12.5kHz,20kHz,25kHz,29kHz steps
- 100 memories
- Memory scan
- 10 search banks
- Band Scope built in
- housed in strong steel case

**Price:** £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
- Runs off two AA batteries

**Price:** TBA

**MVT-7100**

New Icom ICR-8500 with two years RTB warranty
- Icom FL-52A 500Hz CW & Data Filter
- Improved SW selection
- 9kHz resolution
- AM/FM&WFM
- Narrow band SSB filters
- 35 channel steps per second
- NiCads and AC charger

**Price:** £439

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

**MVT-7200**

- 100kHz - 1650MHz
- AM/FM&WFM
- 1kHz-100kHz step sizes
- Narrow band SSB filters
- Improved SW selection
- Improved selectivity
- Battery drain
- 35 channel steps per second
- NiCads and AC charger

**Price:** £1615

**MVT-7200**

- 100kHz - 1650MHz
- AM/FM&WFM
- 1kHz-100kHz step sizes
- Narrow band SSB filters
- Improved SW selection
- Improved selectivity
- Battery drain
- 35 channel steps per second
- NiCads and AC charger

**Price:** £1429

**NEW Icom ICR-8500**

The new IC-R8500 has proved itself to be the professional choice for all band monitoring. Covering 100kHz to 2GHz with no gaps and all mode fitted as standard.
- 100kHz to 2000MHz
- Incredible 10Hz resolution
- All modes including USB/LSB, CW, AM, FM & WBFM
- Built in TCXO for unrivalled frequency stability
- IF Shift & Audio Peak Filter
- Noise blanker, RF Attenuator & selectable AGC
- Digital AFC
- 1000 memories including Alpha Numeric tagging
- RS-232C serial Port
- Versatile Scanning functions
- 12 different tuning steps
- Optional Voice Announcement

**Total value £1900, ML Price £1615**

Available on Low Cost Finance, £175 deposit and 36 payments of £52.31, Cost of loan £443.34

---

**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 Shortwave Magazine? Simple! It 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

**Price:** TBA

Supplied with Malnes PSU for receiver operation. **ML Price £1329**

Available on finance, £229 deposit and 36 payments of only £39.96, cost of loan £338.86
NEW MVT-9000

“A thoroughbred amongst scanners”

Now established as THE handheld scanner to own (along with the ICR-10E), the MVT-9000 offers an excellent Bandscope facility, full coverage to 2039MHz (with no gaps) and all mode. The price is down and you can buy on our special LOW COST Finance.

RPR £489
ML Price £409
Deposit £49 and 12 payments of £33.06, cost of loan £36.74.

DIGITAL SIGNAL PROCESSORS

NEW LOW PRICES

DSP 9+ DSP 59 * DSP 599xk * MFJ-784B
Digital Signal Processing will enhance any receiver performance by removing one main ingredient - NOISE! If you haven’t heard a DSP unit work, then call into the London Showroom for a demo. MFJ-784B All mode Tunable DSP - £249
DSP 9+ All mode DSP at only £189
DSP 59+ As above but more features - £249
DSP 599xbx NEW! Hyper speed processor, alpha display and more - £349

JRC NRD-345

THE NEW JRC RECEIVER IS NOW IN STOCK!!!
“The NRD-345 is a little honey of a good receiver” says John Wilson SWM May 1997.
RPR: £795. Deposit £79, 12 payments of £64.28, cost of loan £71.45 or 24 payments of £35.07, cost of loan £141.68.

Opto Electronics Scout

The most innovative product for scanners of 1997? Connect this little frequency counter up to your AR-6000 and see it make the scanner jump onto a frequency that it literally just “sniffed” out of the air Termined “Reaction Tune”, it has many uses both for the hobbiest and commercial user.
RPR: £449. ML Price: £369
Super low cost finance available from only £27.50 pm!

AR-8000 UK

The best scanner on the market. Don’t argue. My scanner man Graeme said so. To find out why, give him a call. Even if he does spell his name rather strangely.
ML PRICE SLASH: NOW ONLY £309
Super low finance available from only £27.50 per month!

5th EDITION UK SCANNING DIRECTORY

Available from stock. Order yours now, before they ban it from sale! ONLY £18.50 P&P £2

Garmin GPS-12XL

Includes Active Compass

Similar spec to its predecessor, the GPS 45XL, except this one works at aircraft speed!

ONLY £249

AR-7030

FROM ONLY £13.77 PER WEEK

Probably the best engineered receiver in the world.

RPR: £799
ML PRICE: £729
Deposit: £79. 12 payments of £59.69. Cost of loan £66.35

AKD TARGET RECEIVER

The ideal way to start off the wonderful hobby of Short Wave listening. Offered with mains PSU, Short wave aerial wire and operating manual.

£159.95 p&p £7.50

AOR IC-10E

- All mode FM, WFM, SSB, CW, AM
- 600KHz-1300MHz Real Time Bandscope
- 1000 memories
- Alphanumeric tag to each memory
- Tunable bandpass filters employed for excellent RX performance

ML Price: £499

OPENING TIMES MON - SAT: 9.30 - 6.00 LATE NIGHT THURSDAY BY APPOINTMENT
Nautical 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 G7IVX 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).

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 points 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 LED, 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.

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 Bracknell 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 →
ROBERTS

RC-828 £195.00
R-827 £145.00
R-881 £185.00
R-817 £120.00
R-621 £49.95
R-101 £49.95

GRUNDIG

Yachtboy-500 £129.95

SW Receivers

HF-150 £385.00
KEY PAD £39.95
PR-150 £205.00
IF-150 interface £39.95
HF-250 £700.00

Frequency Guides and Books

UK Scanning Directory 5th edition £18.50
Scanners 2 £9.95
UHF/HF Frequency Guide £12.95
The Shortwave Listeners Hand Book £19.95
Passport to World Band Radio 1997 £14.95
World Radio TV Hand Book 1997 £18.95

SCANNERS

YUPITERU

VT-1251 Air band £199.95 £169.95
VT-150 FM Marine £199.95 £169.95
MVT-225 Civil & Military airband £299.95 £250.00
MVT-700 100kHz-1300MHz (no gaps) £299.95 £255.00
MVT-7100EX 500kHz-1650MHz £349.95 £265.00
MVT-8000 Home base 8MHz-1300MHz £395.95 £335.00
MVT-9000 New wide band rcrv £499.95 £450.00

UNIDEN

UBC-220xt Budget priced rcrv £229.95 £149.95
UBC-3000XTL Wide band rcrv £349.95 £215.00
UBC-65XL Pmr/Marine/UHF/HF rcrv £199.95 £65.00
UBC-9000XTL Wideband base receiver £279.00

GARMIN

GPS-38 £229.95 £145.00
GPS 40 £249.95 £130.00
GPS 45XL £299.95 £220.00
GPMi £299.95 £180.00
GPS-22 New h/held £299.95 £220.00
GPS-65 Fixed marine £399.95 £215.00
GPS-75 Fixed/portable h/h £399.95 £255.00
GPS-120 Fixed £429.95 £269.95
GPS-175 H/held plotter £799.95 £651.00
GPS-95 Aviation £499.95 £295.00

MAIL ORDERS WELCOME ON THE ABOVE PHONE NUMBERS.
FOR THE BEST PRICES CALL: 0171-637 0353

FOR THE BEST PRICES PAYABLE TO: ASK ELECTRONICS AT 248-250 TOTTENHAM COURT ROAD, LONDON W1P 9AD

PLEASE MAKE ALL CHEQUES PAYABLE TO: ASK ELECTRONICS AT 248-250 TOTTENHAM COURT ROAD, LONDON W1P 9AD

For the best prices give us a call on: 0171-637 0353
FOR ONE MONTH ONLY

SONY

ICF-SW7600G
World receiver with synchronous detector
- FM/MW/LW SW PLL synthesizer tuner
- 22 station preset
- Digital clock with timer
- FM stereo via headphones
- Single-side band

ICF SW-77
High end world receiver
- PLL synthesizer tuner for FM/MW/LW/SW
- Presets for 100 stations with 162 different frequencies
- 50Hz tuning steps for SW
- Auto scan
- AM dual super technology
- Single-side band

ICF-SW100E
Compact cassette case-sized world receiver
- Station presets for 50 frequencies with station names
- Single-side band system
- Multifunction LCD display
- FM stereo via headphones

ICF-SW55
125 preset world receiver
- PLL synthesizer tuner for FM/MW/LW/SW wavebands
- 125 station presets and 25 station names
- 100Hz step tuning for shortwave
- Auto scan
- AM double super technology

GRUNDIG YB 500
- FM (Stereo with headphones) MW, LW, SW
- SW coverage 520kHz-30MHz continuous
- RDS Radio Data System with O. meter for best RDS signal
- 40 station presets

- Synchronous detector
- Station tuning in 1kHz increments
- 2 standby function
- Key protect
- Direct tuning
- Includes: compact antenna, soft case, comprehensive shortwave handbook

- Synchronous detector
- AM band width switchover
- External AM antenna socket
- FM stereo via headphones
- Tone control
- Built-in timer
- Includes: compact antenna, stereo earphones, comprehensive shortwave handbook

- Single-side band
- AM band width switchover
- External AM antenna socket
- FM stereo via headphones
- Built-in timer
- Includes: compact antenna, stereo headphones, carrying case, comprehensive shortwave handbook

- ROM table includes 9 worldwide shortwave stations and 90 main frequencies
- Direct frequency input
- Includes: mains adaptor for UK

£120.00
£320.00
£140.00
£225.00
£129.95
Radio Receiver Trainer
An Invaluable Learning and Design Tool for all Experimenters

The manual contains complete schematics and theory of operation of all the building blocks. Use this trainer to receive frequencies from 500kHz to 110MHz!

A set of proven alternate building block designs are included in the manual to get you started with your own designs. There is no need to get your complete receiver design working all at once. Build and test each block one at a time.

Pricing:
- Complete: £129.00
- Kit: £89.00
  (Kit excludes case & headphones)

P&P is £5 (UK), £8 (EC), £12 (World)
Add 17.5% VAT to Total Price

Building Blocks:
- RF Input Tuner
- RF Oscillator
- Mixer
- IF Filter
- IF Amplifier
- AM Detector
- Beat Frequency Oscillator
- Audio Filter
- Audio Amplifier

Mail Order To: Pyramid Electronics LTD.
204 Ferndale Road, Brixton, London SW9 8AG
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Printed circuit boards for SWM constructional projects are available from the SWM PCB Service. The boards are made in 1.5mm glass-fibre and are fully tinned and drilled. For a list of boards see May '95 issue of Short Wave Magazine (p.48).

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SWM July 1997
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.

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 categories, 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 headphones. 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 kicks 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.
Yes, we are having a **SALE**

We would like to give you the best prices and service in the UK.

So, if you are thinking of purchasing any short wave or scanning equipment call either:-

**ROD, RICHARD OR MARY ON**

**0121-460 1581 or 0121-457 7788**

or please call into our retail shop. We are open six days a week – **9.30-5.30 Monday to Saturday**

Free advice always available from our expert staff.

**PLEASE PHONE**
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 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 colon 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 frequency 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.

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!

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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) 971722.

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

SWM July 1997
**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**

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 recommended 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 but a technique 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
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.

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.

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

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...

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 AR8000 UK 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).

Vision by Radio
Radio Photographs
Radio Photograms
1925
C. Francis Jenkins

Henley's
222 Radio Circuit Designs

Old Time Radios!
RESTORATION and REPAIR

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

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.

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.

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.

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.

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.
Amateur Bands Round-up

What a change in the weather since I sat down to prepare the column a month ago! Then, it was almost unendurable, 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 are hardly ever a problem. 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 nearby, by lightning is essentially unusurable 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 antennas. By using a dipole feed-on 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 50 ohms or thereabouts. Clearly, to shunt this 50 ohm with, say, a 100 ohm resistor at the feedpoint isn't going to cause measurable additional signal loss, but it will enable static charges to flow from both sides of the dipole to the braid and so down to earth. It also serves a second function - put a flow from both sides of the dipole to the braid - and so the feedpoint isn't going to cause measurable loss to earth, by way of a choke or resistor.

Clearly, to shunt this 50 ohm with, say a 1 MQ resistor at the feedpoint is going to cause measurable additional signal loss. It will enable static charges to flow from both sides of the dipole to the braid and so down to earth. It also serves a second function - put a flow from both sides of the dipole to the braid - and so the feedpoint isn't going to cause measurable loss to earth, by way of a choke or resistor.

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 hit you. Unplug the radio antenna and mains as well. Personally, I prefer to approach it the other way. I have to turn 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 at the mains before leaving the shack.

Then if the storm breaks in my absence I can happily think my kit is as safe as possible.

I hope these few comments measure Frank Lennon's in Hyde, Cheshire and others. Turning to Frank's loggings on 14 MHz North America was represented by four KL7s, plus VP9X, V87MM, PY2KL, 8P6DA, YN1 RVR, and CO6XN.

Our next contributor, Terry Johnson, writes from Weston-super-Mare in Somerset. The set of Slim. Anyone got any better suggestions? Wendy's covering letter notes that: VK was also about on the band. On 35 MHz 7ZXS2, and on 70 MHz 8BE04, HR6F; both around 0500, and at 2100 9H1 EL and PYH16 Finaly, 10MHz where TFDLDBM was copied.

Pressing on, we come to Terry Trowell, who usually stuck to c.w. for his activity. On 21 MHz he noted PY7WV, on 18 MHz looking after 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.

Western-super-Mare in Somerset is a place I associate with holidays as a youngster in pre-WW2 days, but in 1997 8 it is the home of Tom Parrotte. Tom has been too active the time round thanks to the domestic chores and gardening to be doing, but he did find time to have a peep or two on 3.5 MHz sideband, for NP3D, VE3OF, KE1Y, V2R0B, KDR, ADSW, NSM, HU3R, KH1 PF, RY2CC, NEK, KB0AOP, PY5X, 8P6BK, YN1JR, and CK6KD. For as 14MHz, Tom noted VK3CR, BV7GA, and VLA2F.

Talking of Chinese stations, DX News magazine this month mentions a wave of interest in amateur radio by G3SWH, from which we gather that there are several licence grades. Class 1 calls for Morocco at around 14.5 MHz to operate full h.f. privileges on 500W; Class 2 has more at around 10.5 MHz. Giving restricted h.f. licences and 10W. Class 3 (2HFH) is a no-Morse 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 BK, Class 3 BG. By a station club and ZS for the personal identification of club station operators. China is divided up into call areas on a numerical basis, like the USA, with an example '1'. For Beijing municipality, '2' for Shanghai, and '0' for Tibet.

Next we have Barbsley and Colin Dean. On 3.5 MHz Colin offers CEBECI, CH7KJ, CPSNU, EY4AAL, FP6DR1, FP1XBM, THCT, TS1RL, VQ9IE, YU1UI, and in the afternoon G4UM1R. A crank up to 7 MHz yielded signals from AP2KSD, CP2BU, DS1BHE, E8KWB, EK9V, HZ6ZZ, CCA, R1ANT, R1FR, R0UR1UV, TA1/DUNEB, XQ11D, YC1ZT9R, 1KQI, ZA1E, ZL1PB, ZL9/P, 3AGT, 5BGRC, YA2, 6YSA.

The occasional letters from John Collins in Birmingham nearly always contain snippets of the following: In the event of static crashes, DX News magazine this month mentions a wave of interest in amateur radio by G3SWH, from which we gather that there are several licence grades. Class 1 calls for Morocco at around 14.5 MHz to operate full h.f. privileges on 500W; Class 2 has more at around 10.5 MHz. Giving restricted h.f. licences and 10W. Class 3 (2HFH) is a no-Morse 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 BK, Class 3 BG. By a station club and ZS for the personal identification of club station operators. China is divided up into call areas on a numerical basis, like the USA, with an example '1'. For Beijing municipality, '2' for Shanghai, and '0' for Tibet.

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Eighty 4S7GA and TI5RLI.

Eighty 4S7GA and TI5RLI.

Eighty 4S7GA and TI5RLI.

Eighty 4S7GA and TI5RLI.

Eighty 4S7GA and TI5RLI.

Eighty 4S7GA and TI5RLI.
## Frequency Exchange

### Freq | Mode | Time | Call | Location | mon | Remarks
--- | --- | --- | --- | --- | --- | ---
1704 | Packet-1 | 3.143 | CIC, Bologna | mc | 200 bd/200, MSG in EB about Sibielce.
1700 | c.w. | 3.1600 | C** | C** | "confirmed.
1708 | MFSK | 3.1572 | Russian MIL | 12-tone vocoder (3000 Hz pilot), idle.
1829 | PICC-12 | 3.2068 | British MIL | Piccolo-12, crypto.
1810 | PICC-6 | 3.2770 | Russian Dilop. | Crypto.
1733 | Baudot | 3.2630 | Russian Army | 50bd/200, AAXX WW for UNID locations.
1731 | RS-ARQ | 3.2994 | British Army | 240bd tone, crypto.
1724 | MFSK | 3.3780 | British Army | 120bd/170, FSK UNID System, race2.
1546 | PICC-6 | 3.5650 | Piccolo-8 | 120bd/200, MSG in RR ending "u mens way".
1732 | CQ VOAC-36 | 3.6150 | Spanish Army, Leon. | 120bd/200, MSG in SS to RETAME Leon and RETAM 46.
2031 | Baudot | 3.6770 | Ukrainian Army | 50bd/200, MSGs in RR ending "u mens way".
1510 | Packet-2 | 3.7760 | British Dilop. | 120bd/170, FSK UNID System, race2.
1901 | RJAI26 | 6.7760 | India. | WBF Medres ATC.
1912 | PICC-6 | 3.6120 |Serialize MFA, Belgrade | 144bd/4000 bd reset "os jednom ovla bit quay 155 qm 10", .
2127 | GYU | 3.6591 | Royal Navy, Gibraltar | Freq of Piccolo-6, "ang enq de quay givk bollto cop cop cp cp",.
2127 | PICC-6 | 3.6591 | Royal Navy, Gibraltar | Freq of Piccolo-6, 6th ch idle.
2128 | GYU | 3.6381 | Royal Navy, Gibraltar | Freq of Piccolo-6, 6th ch idle.
128 | GYU | 3.8361 | Royal Navy, Gibraltar | Freq of Piccolo-6, 6th ch idle.
2043 | Baudot | 3.6226 | Soviet Army | 50bd/200, crypto MSGs start "zzzzzzzzzzzzzzzzzzzzz!!!".
2186 | Baudot | 6.6953 | CROWD-43 | 10bd/200, DE. in EMNID ENZY prepared by "net office exc.
2170 | Baudot | 6.7183 | CROWD-43 | 240bd/600, "oof soc" bucket transfer.
... | ... | ... | ... | ... | ... | ...
World Propagation Forecasts

Central America
South America
East N. America
West N. America
India
Japan
Middle East
South Africa
Australia

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.

SWM July 1997

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Propagation Extra


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.
T he 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 parameters sufficient to resolve free to air programme packages or the more interesting news feeds running a relatively low symbol rate. Unfortunately, price 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 price will settle 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 can be reprogrammed without losing the first setting! 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 them for loading new channels, which makes reception fairly painless. Various SCPC channels with offerings such as WTN, APTV and Reuters were all loaded into the 'hidden' menu under the 'locale' menu, resulting in very easy 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 a model none of the Asiasat-2 FTA services would have programmed one parameter set into memory for receiving a broadcast package, a new package can be reprogrammed without losing the first setting! 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 them for loading new channels, which makes reception fairly painless. Various SCPC channels with offerings such as WTN, APTV and Reuters were all loaded into the 'hidden' menu under the 'locale' menu, resulting in very easy access to these channels when returning to them.

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 receiver he found that having programmed one parameter set into memory for receiving a broadcast package, a new package can be reprogrammed without losing the first setting! 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 them for loading new channels, which makes reception fairly painless. Various SCPC channels with offerings such as WTN, APTV and Reuters were all loaded into the 'hidden' menu under the 'locale' menu, resulting in very easy access to these channels when returning to them.

A letter from Wenlock Burton (Victoria, Australia) with details of the recent Telstar 401 satellite. 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 in said

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

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

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

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

The Branson balloon attempt last January, a VTR clock via 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 £5.1 million. MD Helmut Thoma comments on the headlong rush into digital TV and comment: 'Kirk that only has 30000 subscribers after nearly a year, commenting that "A kind of electronic mad cow disease has broken out". Meanwhile Kirk is meeting with Deutsche Telekom in attempts to negotiate
Satellite 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 through initially Tele*MonteCarlo 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 Hotbird @ 11 3075GHz horizontal - only catch is that it's MPEG-2 using 27.5Mbps @ 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 Canalsatellite Digital looks like a decision shortly as the Spanish government has told them to resolve a common encryption standard with rival digital broadcaster DTD. Favourable system is Multicrypt though Canalsatellite 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 Canalsatellite Digital in both Italy and Spain - areas where Canalsatellite Digital are very strong. TPS currently partners with TF1/CLT/RCM and hopes to join with the Spanish DTD group and Italy's RAIStet and Telepiu. Canalsatellite Digital have recently added Euronews to their package with Japanese and Italian language versions. Subscription management will be in Oslo. A common DVB-MPEG standard will be used to ensure compatibility with other digital broadcasters into the region.

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DX Television
by Keith Hamer and Garry Smith

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 PP15534 test card on Channel E3.

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 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 new book has been published in Belgium and more recently in Switzerland but, unfortunately, production costs escalated making it a luxury few of us could afford every year!

The new outlet will have an e.r.p. of 500kW. Let us hope that the Channel R1 transmission continues 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 (ORF) is to increase the e.r.p. of its Channel E28 outlet at Ijmuiden. This will provide full coverage in the province of Friesland.

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 DXers ultimate guide with virtually every transmitter in Europe listed. Listings ran to several hundred 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!

CHALLENGE 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 too familiar with can be seen materialising over a period of several minutes with subtleties of 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 in proving unsatisfactory in some cases. Although a separate Band I and Band III antenna was necessary in the days of 405-line systems, when both 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 M7V, Hungary.

BBC GRAPHICS BOOK

Regular readers of this column will know that we usually include a photograph from our collection of BBC-television 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 10 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 included. 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 DXTV 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 DE2 4FS, England.

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

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SSB Utility Listening

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 USAF, 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. 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 RAFA En Route Supplement, which explains exactly what the number is and how it should be used.

The latest FIHB also reveals that Thule GtFS in Greenland now operates on 11.175MHz for 24 hours per day, and that the only GtFS 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, CGO, COD, CXX and CYJ, although these are all normally prefixed with NNO. The shore stations were AIO and ADV.

For the record, these ships are: CBE - USS Leyte Gulf; CGO - USS Hue City/CG-66; COD - USS Thomas S Gates/CG-51; CXX - USS Stark/FFG-51 and CYJ - 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 a 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 MALAYKATOUH VI YOU - SALOUNA ALANAYSTOU YA AYIOU HALIJA AMANOCU SALI-OU TALISLUM. 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.
1. JIM PSU-101A Mk5. UK manufactured regulated 230V AC power supply with ADJUSTABLE radio base holder, combined. For use with most pocket scanners. (Please state radio type). 2 DC output sockets, one for radio the other for accessories. 12 volt DC output. A 9 volt output version for Tandy, Comtel, Netset etc available (PSU – 101ATA). PRICE £24.95. CE Approved

2. JIM PSU-101AC Mk5. As above but includes 12" fitted 50ohm coaxial cable assembly with BNC plug and socket for base antenna connection. PRICE £30.95.


4. JIM BH-A3AC. As above includes 12" fitted 50ohm coaxial cable assembly with professional BNC plugs and sockets for base antenna connection. TNC type plug available on request. Ideal RX and TX up to 4GHz. PRICE ONLY £17.95.

Payment by postal order or cheque. Price includes postage (UK). Other high quality products available: Car Holder, S Meter, Notch Filter, Flexi Antenna & Wire Antenna. For further information on SSE products, send A4 SAE to:

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Tel: (01703) 769598

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COMPETITION/SPECIAL OFFER

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

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 will be entered in a draw to win a portable short wave radio that’s ideal for your summer holidays!

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SWM July 1997
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Scanning

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 Iskennel Way, Baldock, Herts SG7 5AJ.

Please remember that you'll need to enclose a s.a.e. in order for Paul to get back to you. Do I recommend, 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 excitation with a jaunt 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 thanks 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 Midgley, 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 devils' by many people and the following is 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 I 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 there that 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, get a prosecution on the ability of a scanner used as a transeiver. 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 Flagstaff! As this was Farnborough week, could a 'training sortie' to show off these '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 form, or you know of, please write to me at my address. As usual, I'll maintain confidentiality.

As I've 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 astronomer, 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, right angles to the first. He informs me that the first satellite 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, meteorites, etc. If you think that you can assist him, then please write to him at: A. Pritchard, 18 Swanoton 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 anaraks 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, in whatever Tony's observations up to me?

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**

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 (13), Shawbost (14), Cranwell (15), Fairford & Whiteabbey (19), Fairford (20), Lowestoft (24), Bournemouth (25), Coldrose & 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 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 (Glumbridge) 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 for this runway - not forgetting the Red Arrows on winter training detachment, and even the A300-600ST modern 'Super Guppy' itself, what calls "Dynasty" it's China Airlines, Roger.

**RECEIVER HARDWARE**

I can't give B. Westwood (Dagnall, 6 mile final for DB 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 300 MHz. 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 137 MHz are only capable of local range and this has been adopted as the civil v.h.f. airband (part of the 30-300 MHz 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 300 MHz to 3 GHz, but the military airband is really a collection of frequencies mainly between 230.3 and 398.7 MHz). Although it starts below...
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**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 to be implemented on 10 June 1997.

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<td>Wittering</td>
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**CONTRIB CENTRES**

| London Military | 254.275 |
| Area Radar | 231.625 |
| ICT North/Northwest | 298.8 |
| Desert/ fjord | 230.05 |
| London Upper/High | 291.025 |
| | 235.05 |

Apprently, 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 Nimrod 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 RN4s Culdrose and Yeovilton. There is also a very mixed selection of RAF and NATO movements - notably recently were German Torpedoes, USAF E-3 AAWACS, 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, 356.55, 360.55
- **Operations** 261.0
- **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. 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 list. 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 u.h.f.

Some of the Lower Airspace Radar Service units, for example, involve military controllers helping civil aircraft. Few civilian 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 differ by a half wavelength, where the weather (which is contained in the troposphere).

Despite this, Robert Samuel (Holywell) suspects that heavy rain reduces h.f. propagation. What could happen is that the static-charged raddrops 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 GAdL 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/Gosfield runway HU32R 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, host exercise 'Ampole 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!

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**Photography Credits:**

Pic 1: Geoffry flying the Trident 3B, Christine Mlynar.
Animations (from METEOSAT) could be displayed transmission - signal) and out of which we got a using modified framestores. Manufacturers; many enthusiasts built their own. Satellite produces a new image line. Framestores was a box of electronics into which we fed the 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 NOAA12 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 into 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 GOES images. Korbinian Gartner of EUMETSAT mentioned maintenance of GOES and confirmed images should be available from June on channel 2 (1694.5MHz).

OKEAN 1-7 (or 4) and SICH-I are rarely heard now, but a few transmissions are scheduled from OKEAN 1-7. Listen for it on 137.4±0Hz.

CHINESE SATELLITE SCENE

When an envelope arrived labelled ‘Shanghai-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 list included 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 images, 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, THZ Imaging, and several firms in America released 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. Beck 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.

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 40 MHz 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 instructions 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 connections) 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. The first image was sloping (as anticipated) with few grey scales (again as expected). The result 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 the 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 BMF format) during the day or night.

Steve Bonnett of Highcliffs 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...
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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-I4 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 screen 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 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 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 f.h. 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 MARCOM/WXSAT receiver feeding their JVfax interface to his 486DX66 PC, running the JVFax program. He sent in a NOAA-I4 image obtained on 3 May, which, when zoomed, shows the roads and rivers clearly, together with snow on the ground! To show that weather forecasts are becoming 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 'WSTTXT' 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-I4 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 at the Shuttle Pool. 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-I4 transmits a.p.t. on 137.62MHz
NOAA-I2 transmits a.p.t. on 137.50MHz
NOAAs transmit beacon data on 137.77 or 136.77MHz
METEOR 3-5 (or 2-2l) use 137.85MHz

Gordon Train's tracking program screen dump.

Fig. 2: NOAA-I4 from Alan Jarvis.

Fig. 3: NOAA2 from John Hart.

Fig. 4: NOAA-I4 on 3 May from Keith Artherton.

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

OKEAN-4 and SICH-I 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.
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 between 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 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 full 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 its 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. Just like 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.

Personally I recommend the Interface from Persivell 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 and baud 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 using 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 bar graph 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 ASCL in standard, 8-bit and 8-bit with parity variants. Next comes the ARQ semi-duplex modes which includes STOR A, SVED-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, SITOR-B, SI-A110/4, SI-ARQ/5, SI-ARQ/7, ARQ-M2, ARQ-M and POL-ARQ. To the line-in socket on your receiver you can connect your microphone or other audio source. This will allow you to record your data signal. This is the easiest way to get hold of 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 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 mage. 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 your receiver's line-out to the line-in socket on your sound card. You then choose the Record New option from Spectrogram'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/FAX, etc. I've arranged a very special offer with the Public Domain and Shareware Library (PDSL). They have put together a library 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: H00873 (abcde). IBM PC Software (144MB disk): Disk A - IFVAX 7.1, HAMCOMM 3.1 and WAXFAX 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.
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Long, Medium and Short Waves

**LONG WAVE REPORTS**

Note: I.w. & m.w. frequencies in kHz s.w. in MHz; Band becomes more stable during darkness. All other entries were during daylight or at dusk.

<table>
<thead>
<tr>
<th>Station</th>
<th>Frequency (kHz)</th>
<th>Time</th>
<th>Country</th>
<th>Power (kW)</th>
<th>Listener</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arabic</td>
<td>1500</td>
<td>0400</td>
<td>Iraq</td>
<td>1000</td>
<td>Fred Pallant (Storrington)</td>
</tr>
<tr>
<td>Arabic</td>
<td>1510</td>
<td>0400</td>
<td>Iran</td>
<td>1000</td>
<td>Martin Cowin in Wootton, loW.</td>
</tr>
<tr>
<td>Arabic</td>
<td>1520</td>
<td>0400</td>
<td>Egypt</td>
<td>1000</td>
<td>Tony Stickells, Thornton Heath.</td>
</tr>
<tr>
<td>Arabic</td>
<td>1530</td>
<td>0400</td>
<td>Morocco</td>
<td>1000</td>
<td>Sasnow (Bedford) while in Malta</td>
</tr>
<tr>
<td>Arabic</td>
<td>1540</td>
<td>0400</td>
<td>Egypt</td>
<td>1000</td>
<td>Fred Pallant, Storrington.</td>
</tr>
<tr>
<td>Arabic</td>
<td>1550</td>
<td>0400</td>
<td>Saudi Arabia</td>
<td>1000</td>
<td>Tim Allison, Middlesbrough</td>
</tr>
<tr>
<td>Arabic</td>
<td>1600</td>
<td>0400</td>
<td>Egypt</td>
<td>1000</td>
<td>George Millmore, Wootton, kW.</td>
</tr>
<tr>
<td>Arabic</td>
<td>1610</td>
<td>0400</td>
<td>Iraq</td>
<td>1000</td>
<td>Fred Pallant, Storrington.</td>
</tr>
<tr>
<td>Arabic</td>
<td>1620</td>
<td>0400</td>
<td>Iraq</td>
<td>1000</td>
<td>Tom Smyth, Co.Fermanagh</td>
</tr>
<tr>
<td>Arabic</td>
<td>1630</td>
<td>0400</td>
<td>Iraq</td>
<td>1000</td>
<td>Tony Stickells, Thornton Heath.</td>
</tr>
</tbody>
</table>

The conditions also varied daily in the 17MHz (14m) band. When favourable, Australia's broadcast to Asia via Darwin? on 17.880 (Eng 0100-0830) reached our shores. It was rated 33323 at 0800 in Stalbridge. Also received here during the morning were R.Pakistan via Karachi 17.900 (Eng to Eur 0800-0845) noted as SX3133 at 0800 by Tom Smyth in Co.Fermanagh; DW via Rwanda? 17.800 (Eng to Asia, Australia 0900-0950) 45444 at 0914 by Tony Ha in Freshwater Bay, loW, via to Singapore 17.387 (Eng to Pacific areas 1000-1100) 24222 at 1002, in N.W., Pakistan, Islamabad? 17.900 (Ur to Eur 0845-1100) 54444 at 1035 in Plymouth. After mid-day, R.CI via Sackville, Canada 17.820 (Eng to Africa 1335-1400 Mon-Sat) was 32222 at 1300 in Truro; Africa No.1, Gabon 17.630 (Fr to WAfrica 0700-1600) 34444 at 1405 in Kilkeel; RFI via Mosambique 17.560 (Eng to Asia 0700-1600) 34444 at 1545 by E. Wiles (Bedford) while in Malta & 43323 at 1428 by Chris Shore in Norwich; R.EE via Noailles 17.715 (Sp to Africa 0900-1930) 34333 at 1523 by Peter Pollard in Rugby; BBC via Ascension Is. 17.830 (Eng to W/C.Africa 0900-1700) 43444 at 1530 in Delphi, Greece; BBC via Ascension (Fr to W.Africa 0800-1100) 17.840 (Eng to N.C.America 1400-1700) 44344 at 1653 in Woking; R.Nederlands via Bonaire 17.605 (Eng to SE/WAfrica 1830-2025) 44444 at 1915 in Colyton; WYFR via Oleechooba, USA 17.555 (Eng to Europ 1600-2300) 43222 at 2023 in Bridgewater; VOFC Taiwain via WYFR 17.750 (Eng to Europ 2200-2300) 45444 at 2215 by Michael Griffin in Ross-on-Wye.

**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 21.725 (Eng 0630-1100) reached the UK. It was rated 22222 at 0810 by Kenneth Curtis in Malton and 32222 at 1330 in Truro; Africa No.1, Gabon 21.490 (Jap to CAfrica 1300-1400) 44333 at 1320 in Kilkeel; RFI via Moyabi, Gabon 21.620 (Eng to W.Africa 0800-1100) 34444 at 1405 in Kilkeel; RFI via Mohabib, Gabon 21.630 (Eng to W/C.Africa 0900-1700) 43444 at 1530 in Colyton; WYFR via Oleechooba, USA 17.555 (Eng to Europ 1600-2300) 43222 at 2023 in Bridgewater; VOFC Taiwain via WYFR 17.750 (Eng to Europ 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.Africa 0300-0915, 1000-1400) noted as 34243 at 0640 in Woking; R.Japan via Yamata, Japan 15.590 (Eng to S.E.Africa 0700-0800) 35333 at 0749 by Frances Hearne in N.Bristol; Voice of Armenia, Yemen 15.270 (Fr, Eng to Eur 0800-0900 Sun)
**LOCAL RADIO CHART**

<table>
<thead>
<tr>
<th>Station</th>
<th>Frequency (MHz)</th>
<th>Power (kW)</th>
<th>Language</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LONG MEDIUM &amp; SHORT</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>54544 at 0840 in Herstonmonceux; AIR via J 7.5050 (Eng to NE.A sia 1000-1100) 25332 at 1005 in Bridgewater; Voice of Russia 15.430 (Eng [WS]) 54444 at 1008 in Freshwater Bay; UAER, Dubai 15.359 (Eng to Eur 1030-1055) 32223 at 1030 by Gerald Guest in Dudley; WBWV via Vended; USA 15.745 (Eng to Eur 0900-1200) 34333 at 1100 in Morden.</td>
<td>2200-2230</td>
<td>0.76</td>
<td>6.1PM</td>
<td></td>
</tr>
<tr>
<td>626 at 1500 in Rugby; Classic Gold 828</td>
<td>330</td>
<td>0.14</td>
<td>9.12PM</td>
<td></td>
</tr>
<tr>
<td>624 at 1500 in Rugby; Classic Gold 828</td>
<td>330</td>
<td>0.14</td>
<td>9.12PM</td>
<td></td>
</tr>
<tr>
<td>626 at 1500 in Rugby; Classic Gold 828</td>
<td>330</td>
<td>0.14</td>
<td>9.12PM</td>
<td></td>
</tr>
<tr>
<td>624 at 1500 in Rugby; Classic Gold 828</td>
<td>330</td>
<td>0.14</td>
<td>9.12PM</td>
<td></td>
</tr>
<tr>
<td><strong>Note:</strong> Entries marked * were logged during darkness. All other entries were logged during daylight or at dusk/dawn.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### TROPICAL BANDS CHART

<table>
<thead>
<tr>
<th>Station</th>
<th>Country</th>
<th>UTC</th>
<th>DXr</th>
</tr>
</thead>
<tbody>
<tr>
<td>KABC</td>
<td>USA</td>
<td>75W</td>
<td>3700</td>
</tr>
<tr>
<td>KBC</td>
<td>Canada</td>
<td>1030</td>
<td>555</td>
</tr>
<tr>
<td>KWL</td>
<td>South Africa</td>
<td>1005</td>
<td>535</td>
</tr>
</tbody>
</table>

### QUARTERLY LIST OF EQUIPMENT USED

* DXers: A, B, D, E, F, G, K, M, N

<table>
<thead>
<tr>
<th>DXer/Location</th>
<th>Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eddie McKeown, Newry</td>
<td>Tatung TMR 7602</td>
</tr>
<tr>
<td>Ross Lockley, Galashiels</td>
<td>Realistic DX -300 + usu. + 40m wire or Sangean ATS803A</td>
</tr>
<tr>
<td>Tony Hall, Freshwater Bay</td>
<td>Yaesu FRG -7 + tw. or RF.B45</td>
</tr>
<tr>
<td>Michael Griffin, Ross-on-Wye</td>
<td>Lowe HF-225 + a.t.u. + 45m wire</td>
</tr>
<tr>
<td>Martin Cowin, Kirkby Stephen</td>
<td>Hitachi TRK-5854E + built-in whip</td>
</tr>
<tr>
<td>Robert Connolly, Kilkeel</td>
<td>JRC NRD-525 + Datong AD370</td>
</tr>
<tr>
<td>Ted Walden -Vincent, Gt.Yarmouth</td>
<td>Sangean ATS803A or Grundig Satellit 3400</td>
</tr>
<tr>
<td>Mahendra Vaghjee, Rose Hill Mauritius</td>
<td>Lowe HF-225E + Dressler ARA 60 or r.w.</td>
</tr>
<tr>
<td>Tony Stickells, Thornton Heath</td>
<td>Yaesu FRG -7700 + 20m wire or loop</td>
</tr>
<tr>
<td>Eric Shaw, Chester</td>
<td>Lowe HF-225 + 7m wire</td>
</tr>
<tr>
<td>Clare Pinder, Glasgow</td>
<td>Sony ICF-2001 + rw.</td>
</tr>
<tr>
<td>Tom Smyth, Co.Fermanagh</td>
<td>KE East Sce Nairobi</td>
</tr>
<tr>
<td>John Slater, Stotfield</td>
<td>Sony ICF-2001 + rw.</td>
</tr>
<tr>
<td>Tony Jollies, Thornton Heath</td>
<td>KE East Sce Nairobi</td>
</tr>
</tbody>
</table>

### TRANSATLANTIC DX CHART

<table>
<thead>
<tr>
<th>Station</th>
<th>Frequency (kHz)</th>
<th>Location</th>
<th>Time (UTC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>W2XQ</td>
<td>Portland, MA</td>
<td>0900 F</td>
</tr>
<tr>
<td>USA</td>
<td>W2TPR</td>
<td>Washington, DC</td>
<td>0115 F</td>
</tr>
<tr>
<td>USA</td>
<td>W2WBE</td>
<td>Boston, MA</td>
<td>0115 D</td>
</tr>
<tr>
<td>USA</td>
<td>W2VUJ</td>
<td>New York</td>
<td>0115 B</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Canada</th>
<th>Station Code</th>
<th>Location</th>
<th>DXr</th>
</tr>
</thead>
<tbody>
<tr>
<td>GB8B</td>
<td>CHAM</td>
<td>Hamilton, ON</td>
<td>0110 A</td>
</tr>
<tr>
<td>GB8C</td>
<td>COR</td>
<td>Chichester, UK</td>
<td>0930 B</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>South America</th>
<th>Station Code</th>
<th>Location</th>
<th>DXr</th>
</tr>
</thead>
<tbody>
<tr>
<td>R50A</td>
<td>DX3N</td>
<td>Caracas, Venezuela</td>
<td>0430 D</td>
</tr>
</tbody>
</table>

### QUALITY LIST OF EQUIPMENT USED

* LM&S for $30, June, "July 37"
was more than a little chuffed at receiving a complimentary invitation to Radio Caroline's 33rd birthday party held at the First 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 thirsty anoraks surrounding the bar when, in true Caroline tradition, the till broke down!

More speech and radio related news.

In 1996 a frequency change to 1570kHz was made and then in 1984 an old American 200W rig was restored and the party was soon under way. The turntables or should I say CDs were manned by thirsty anoraks surrounding the bar when, in true Caroline tradition, the till broke down!

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 is due to servies to expand the 'grey areas' surrounding British communications.

RFL SIGN OFF!

Bob Marsh, of Bexleyheath, Kent, kindly sent me this item which he has been a good boy

Big L Revived

Big L has been active in the 48m

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 is due to servies to expand the 'grey areas' surrounding British communications.

George 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 17 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 pirate 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 w (now 113kHz) but with considerably less power than the 50kW they had during the 60s.

The familiar Big L jingles have been digitally re-mastered by EAP to add an audio spark 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 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 'Mat with the most'!

Getting Started

As a result of Reading Association's for sw radio hobby, Andy Howlett, writing from Dunkfield, Cheshire says "Thanks for keeping me informed and entertained with "Off The Record". (Well a hobby to has to be fun."

Andy started with batteries, bulbs and junc, then came crystal sets and single transistor circuits. This was during the mid sixties when he managed to accidentally and spectacularly destroy OC45 and AF16 transistors during his intricate experiments.

Sinclair kits came next, with their matchbox radio that pulled in Radio Caroline North better than some of the superhet 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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SWM July 1997
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The binders are produced from a heavy duty board coloured in smart navy blue with the SWM logo printed in gold lettering on both the front and the spine. Each binder also comes complete with a set of year labels and binding bars and will comfortably hold a year's worth of magazines.

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AKD .................................. 29
Altai Group ........................... 23
AOR .................................. 56/57
ARC .................................. 40
ASK ................................... 50/51
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Computer Aided Technologies ... 81
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