You're Just Not A Serious Listener Without SWM!

shortwave magazine

November 1996 £2.50 ISSN 0037 - 4261

SPACE SPECIAL

IMIR, the Shuttle and the ISS
GOES-8 - the Ultimate WXSAT!
Readers' WXSAT Pictures

Optoelectronics Xplorer Reviewed

60 Years of BBC Television

THE JOHN WILSON REVIEW - AKD Target 3
Entry Level Communications Receiver

pwp 9 770037 426043 11

AIRBAND SATELLITES BROADCAST DXTV SCANNERS

AOR AR8000

Still the No.1 seller

- 500kHz-1900MHz
- Computer control
- Data clone
- 1000 Memories
- C/w NiCads & charger

£349

AOR AR2700

- 500kHz-1300MHz
- 500 Memories

SPECIAL PRICE
~~£269~~ **£189**

YUPITERU MVT7100E

NEW EMC version of this popular radio.

- 530kHz-1650MHz
- AM/FM/WFM /SSB/CW
- 1000 Memories
- C/w NiCads & charger

£299

TRIDENT 2400

One of the most comprehensive scanners on the market with a superb Rx front end.

- 100kHz-2060MHz
- 1000 Memories
- AM/FM/WFM
- Data clone
- C/w NiCads & charger

£299

SCANNERS

We've got them

ALL!!

COMMTEL 202

Airband scanner.

- 66-512MHz (with gaps)
- 50 Memories
- Covers UK Civil Airband

£99

COMMTEL 204

Top of the range handheld.

- 68-1000MHz (with gaps)
- 200 Memories
- AM/FM
- Requires NiCads & charger

£169

TRIDENT 980

Triple conversion sensitive receiver.

- 5-1300MHz
- 125 Memory storage
- AM/FM/WFM
- Direct keyboard /rotary control
- C/w NiCads & charger, DC cigar lead, earpiece, carry strap

£249

BEARCAT UBC 3000XLT

New top of the range handheld from Uniden with TURBO SCAN

- 25-1300MHz (with gaps)
- TURBO SCAN
- 400 Memories
- AM/FM
- Supplied c/w NiCads & charger

SPECIAL PRICE
£225

uniden

BEARCAT UBC 220XLT

Easy to use with a good receiver.

- 66-956MHz (with gaps)
- 200 Memories
- AM/FM
- Supplied c/w NiCads & charger

£189.95

uniden

BEARCAT UBC 120XLT

Airband handheld that is easy to use with TURBO SCAN.

- 66-512MHz (with gaps)
- 100 Memories
- AM/FM
- Supplied c/w NiCads & charger

£139

uniden

BEARCAT UBC 65XLT

Best value for money scanner on the market. Covers Marine, Police etc

- 66-512MHz (with gaps)
- 10 Memories
- AM/FM
- Required: 5 x AA Batteries

SPECIAL PRICE
£89.95!!

UBC 9000XLT

A new 500 channel base station model covering 25MHz to 1.3GHz in two continuous bands (25-550MHz and 760-1300MHz). Featuring Twin Turbo scan & search modes with 10 user definable priority channels. Easy to read large LCD display and manual tuner together with direct frequency keypad make up a very professional front panel. User selectable modes covering AM, FM and Wide FM modes. Selectable receiver attenuator, delay and data options are available direct from the keyboard. Automatic tape recorder ON/OFF and tape output feature! Accessories included: AC mains power adapter, telescopic antenna and owners manual.

£325.00

Optional CTCSS board £49.95

BEARCAT UBC 860XLT

Wideband base scanner with TURBO SCAN. COVERS CIVIL AIRBAND.

- 66-956MHz (with gaps)
- 100 Memories
- AM/FM
- 12V DC
- Mains adaptor supplied.

£139.00

BEARCAT UBC 80XLT

Low cost scanner covering UHF telephone band.

- 66-956MHz (with gaps)
- 200 Memories
- AM/FM
- Supplied c/w NiCads & charger

£149.00

new!

uniden

REALISTIC PRO 50

Low cost scanner covers Marine, Police, etc.

- 66-512MHz
- AM/FM
- 20 Memories
- Requires 6 X AA Batteries

£99

REALISTIC PRO25

- 20 Memories
- Hyperscan
- 68-88, 137-174, 406-512, 806-956MHz

£169.95

REALISTIC PRO 2037

A NEW Base scanner with triple conversion receiver.

- 66-960MHz (with gaps)
- 200 Memories
- AM/FM
- Hyperscan
- 240VAC or 12V DC operation

SPECIAL!! £179.99

WELZ WS1000E

Pocket sized scanner covering 500kHz-1300MHz.

£349

NEVADA

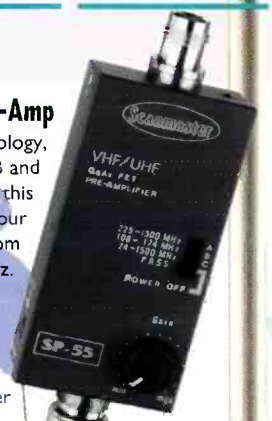
Retail & Mail Order
Trade & Export
Fax

01705 • 662145
01705 • 698113
01705 • 690626

Europe's Number 1 Supplier

SCANMASTER Base Stand
A fully adjustable desk top stand for use with all handhelds. Fitted coaxial fly lead with BNC and SO239 connectors.
£19.95

SCANMASTER SP55 Pre-Amp
Using latest surface mount technology, with variable gain - 6dB to + 20 dB and three selectable bandpass filters this top range Pre-Amps will boost your scanners performance from 24 -1500 MHz.
£69.95



SCANMASTER GW2 Pre-Amp
Wideband variable gain low noise G and A's FET pre-amp to boost reception on your scanner.
£59.95

SCANMASTER Mobile Mount
Mounts on the air vent grills on a car dashboard to allow easy and safe operation of most hand-helds.
£9.95

SCANMASTER On Glass
Window mounting mobile scanner antenna 25 - 1300 MHz with cable.
£29.95

SCANMASTER® by NEVADA

SCANMASTER Drill-Thru Mount Mobile Antenna
A low profile discreet scanner antenna optimised for the UHF bands c/w 10' cable. Receives 25 - 1000 MHz
£19.95

SCANMASTER TSC 2601
Handheld scanner high gain antenna, 29cm long, covers 100 - 1000 MHz with 3.4 dB gain @ 900 MHz
£15.95

SCANMASTER Mobile
A top quality Wideband Antenna 25 - 1000 MHz with rubber boot protected magnetic mount and cable/BNC connection.
£29.95

SCANMASTER Desktop
A complete desktop antenna covering 25 - 1300 MHz just 36" high with 4 mtrs of cable and BNC plug.
£49.95

SCANNER ANTENNAS THAT REALLY WORK!

SCANMASTER Discone
A quality wideband stainless steel discone with frequency range of 25-1300MHz. Fitted Low loss 'N' type connector. Able to transmit on 2m and 70cms.
£49.95

NEW!
SCANMASTER Active Discone
As left with 20 dB Pre-Amp available august
£69.95

BEWARE LOW COST IMITATIONS!

SCANMASTER Double Discone
A High performance wideband antenna, offering gain over a conventional discone. Stainless steel construction with standard PL259 connector, mounting pole plus brackets.

Superior performance on Air, Marine and PMR bands.
* 25-1300MHX
* Ultra wideband TX Capability
£59.95

SCANMASTER Base
Receives 500 KHz - 1500 MHz
- MARINE
- CIVIL AIRCRAFT
- MILITARY AIRCRAFT
- AMATEUR RADIO
- PMR
- 900 MHz BAND
- PLUS MANY MORE PUBLIC SERVICES

Transmits 2m & 70cm Amateur Bands
£39.95

NEW!
SCANMASTER Active Base Antenna
As above with 20 dB Pre-Amp available august
£59.95

Reaction Tune

Connect the SCOUT with your AOR AR2700*

Recommended Accessories

DB32 Antenna

CC30 Carry Case

The Scout, with its revolutionary Reaction Tune feature, can tune the AOR Model AR2700 to the frequency it captures in less than one second. No more scanning through an entire band of frequencies, hoping to find that one elusive unknown signal. The Scout will lock onto and capture into memory all nearfield frequencies, up to 400, while simultaneously tuning the AR2700 to the recorded frequency. Take it along to a sporting event, amusement park, shopping mall, or downtown, and start building your own frequency database. See below for list of other compatible Scout Reaction Tune receivers.

- Automatically tunes the AR2700 to the frequency captured
- Takes guess work out of scanning for active frequencies
- Records and saves up to 400 frequencies in memory
- Records up to 255 hits on each frequency in memory
- Interface to a PC for frequency download using the optional Optolinx PC Interface
- Distinctive beeps indicate frequency hits, pager style vibrator for discreet recording
- Automatic EL backlight for night operation
- 16 segment RF signal strength bargraph
- Frequencies are automatically saved when unit is turned off
- 10MHz - 1.4GHz Frequency Range
- Also Reaction Tunes: AOR AR8000
  ICOM R7000, R7100, and R9000. Radio
  Shack Pro 2005/2006 (OS456 installed)
  and Radio Shack Pro 2035/2042
  (OS535 installed)

AOR AR2700 scanner not sold by Optoelectronics

**Modification to AR2700 required for Reaction tune. Instructions included in Scout manual.*

Order now!

INNOVATIVE PRODUCTS FOR A MODERN PLANET

OPTOELECTRONICS

5821 NE 14th Avenue • Ft. Lauderdale, FL • 33334

Haydon Communications
132 High Street • Edgware • Middlesex • HA8 7EL
TEL: 0181•951•5781 **FAX:** 0181•951•5782

Nevada Communications
189 London Street • Portsmouth • Hampshire • PO2 9AE
TEL: (01705) 662145 **FAX:**(01705) 690626

Waters & Stanton Electronics
22 Main Road • Hockley •Essex •SS5 4QS
TEL: (01702) 206835 **FAX:** (01702) 205843

Internet: www.optoelectronics.com

Made in U.S.A

REACTION TUNE REACTION TUNE REACTION TUNE REACTION TUNE REACTION TUNE REACTION TUNE REACTION TUNE REACTION TUNE REACTION TUNE REACTION TUNE REACTION TUNE REACTION TUNE

short wave magazine

Vol. 54 ISSUE 11 NOVEMBER 1996

ON SALE OCTOBER 24
Next issue on sale NOVEMBER 28

EDITOR: Dick Ganderton, C. Eng., MIEE, G8VFH
ASSISTANT EDITOR: Kevin Nice, BRS95787, G7TZC
EDITORIAL ASSISTANT: Zoë Crabb
ART EDITOR: Steve Hunt
PAGE LAYOUTS: Jon Talbot, Paul Blachford

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

If you wish to send E-mail to anyone at *SWM* then our Internet domain name is:
pwpub.demon.co.uk
Simply add the forename of the person you wish to contact. For example:
dick@pwpub.demon.co.uk

BOOK SERVICE, SUBSCRIPTIONS, BACK ISSUES, ETC.:
CREDIT CARD ORDERS: (01202) 659930
(Out-of-hours service by answering machine)

ADVERTISEMENT DEPARTMENT
ADVERTISEMENT MANAGER: Roger Hall G4TNT
Telephone: 0171-731 6222
Facsimile: 0171-384 1031
Mobile: (0585) 851385

ADVERTISEMENT DEPARTMENT (Broadstone)
Lynn Smith (Advertisement Sales)
Carol Trevarton (Advertisement Production)
Paul Orchard (Administration)
Telephone: (01202) 659920
Facsimile: (01202) 659950

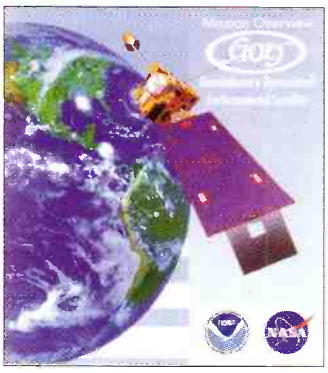
 Short Wave Magazine, USPS No. 006996, is published monthly for £25 (UK) per year by PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. Second Class Postage paid at South Hackensack. Postmaster: Send USA address changes to Royal Mail International, c/o Yellowstone International, 2375 Pratt Boulevard, Elk Grove Village, IL 60007-5937.

Cover Subject

Space - the final frontier? Maybe, but listen-up there's lots out there.

Picture courtesy NASA.

Contents



Regular Columns

Good Listening

Communiqué

SEND YOUR NEWS TO KEVIN NICE AT THE EDITORIAL OFFICES

WRN Appoints Director of Corporate Affairs

World Radio Network's Director of Corporate Affairs, a new position with responsibility for marketing, public relations and sponsorship development, is Simon Spanswick, formerly with BBC World Service.

Simon Spanswick had worked in the BBC for ten years, and before that was a freelance broadcaster. During his career in the Corporation, he has worked both in the domestic services and in World Service. He joined BBC Monitoring in 1986, and since then has gained experience in a wide range of areas, including domestic Corporate Affairs and World Service Strategic Planning where he was part of the small team that developed the BBC World Service's funding case submitted to government.

"Simon's combinations of skills and experience, both as a broadcaster and in corporate affairs, will be of immense value to World Radio Network," said Karl Miosga, WRN Managing Director. "He joins us at a time when we are launching new services for our contributing broadcasters, and expanding into new markets across the world."

In addition to his roles in the strategy and corporate affairs areas, Simon Spanswick worked in World Service Engineering during the preparations for the 1992 World Administrative Radio Conference, and in World Service Press, Publicity and Marketing. Since 1992, Simon Spanswick has presented *Waveguide*, the weekly communications programme on BBC World Service.

Simon Spanswick is also co-ordinator of Digital Radio Worldwide, the consortium of international broadcasters (including the eleven most prominent international radio stations) which is working on the implementation of satellite-delivered digital radio as the ultimate replacement for short wave broadcasting. He has also been involved in the development of Digital Audio Broadcasting [DAB] in the UK where BBC domestic radio launched its introductory public service - the first in the world - in September 1995.

"Working for the BBC has been enormously satisfying, particularly since I have been able to combine a role behind-the-scenes with one at the sharp edge of broadcasting in front of the microphone," Simon Spanswick said. "But now at a time of great change and opportunity brought about by new delivery methods and the increasing pace of digital development, it seems the right point to help develop one of the most successful independent organisations in the international broadcasting industry," he added.

Welcome Accessories from Wellbrook

A true 10:1 balun and a feeder isolator are two exciting products from Wellbrook Communications. The Balun, UMB130, which unlike many 'longwire MLBs' provide the user with the facility to earth the antenna feeder at the feed point, when used with an end-fed set-up. The UMB130 is also ideal for use with the T2FD antenna (see page 26 September *SWM* and this month's 'Decode' on page 76) because the feeder winding is isolated from the antenna itself. This prevents the feeder from interacting with the antenna and reduces noise pick-up. This isolation will also reduce mains borne noise.

The application sheet provided with the UMB130 gives construction details for both the T2FD and a terminated 'inverted V' antenna.

The UMB130 is waterproof due to it being encapsulated. The antenna connections are via screw terminal posts, the feeder is connected by an integral SO-239 socket. The UMB130 has a frequency range of 100kHz to 30MHz and costs **£18.95 plus £2 P&P**.

The matching antenna feeder Isolator - AFI5030 - has a frequency range of 50kHz to 30MHz. The small plastics case is compact, featuring two BNC sockets for both feeder and receiver, earth connection is by way of a screw post. The AFI5030 reduces noise by isolating the antenna feeder from the receiver/mains earth. The units eliminates the problem of mains borne noise being coupled to the antenna/feeder. The Isolator is most effective when used with longer type antennas and "longer baluns'.

The claimed typical noise rejection at low frequencies is 40dB. The Isolator is very effective in reducing noise in the new 73kHz amateur band. A static discharge path to earth is provided. The input/output is 50Ω. Price of the AFI5030 is **£18.95 plus £2 P&P**.

To either use one antenna with two receivers, or feed one receiver with two (diversity) antennas, you need the new ACS5030. This is a four port device with a unique feature of a phase switch, which allows a phase reversal to be applied to one of the antennas when used in the diversity mode to reduce interference and fading. The port isolation of the ACS5030 is up to a stated 30dB. The insertion loss is said to be negligible. Connection to the unit is by 50Ω BNC connectors, the frequency range is 50kHz to 30MHz. The ACS5030 costs £27.95 plus £2 P&P. All the above products are available from **Wellbrook Communications, Wellbrook House, Brookside Road, Bransgore, Christchurch, Dorset BH23 8NA. Tel: (01425) 674174.**

Radio and TVDX News

The stop-go plans for regional TV in Holland currently are in a 'go' state with the government promising the ten provinces a share in the FL40 million budget (about £16 million). Originally regional inserts were to be fed into opt-outs on the NOS network TV but the latest plan will favour cable fed carriage.

Finland

Helsinki, Finland, may have a new terrestrial broadcaster - 'City-TV' -

broadcasting to the 20-45 years age range of the population. MTV-3 is seeking the 4th national terrestrial network licence. In Tampere, Finland, 'TV Tampere' is starting 16:9 transmissions for several hours weekly.

Pakistan

'Shaheen PAY TV' is a Karachi/Islamabad based MMDS (microwave distribution at 2.5GHz) network operated by the Pakistan Air Force and offers eight channels of satellite delivered programming. The service is expanding into Lahore and subscribers pay 2950 Rupees for the decoder and programme viewing currently is free.

France

Problems in France for the ARTE/La Cinquieme networks and financial measures mean that the services currently run independently will combine early '97 into a common programme service - they already share the same transmitter channels. The combined channel budget will now drop to nearly £230 million. Next in discussion is the possible merging of the 'France 2' and 'France 3' networks.

United Kingdom

Edinburgh may soon have its own text and sound channel - 'Channel 6' - on ch.E34 once permission is obtained from the DTI for the terrestrial service - which may be on air by late December '96. The text service may offer up to 800 pages of public information and news, sourced from various Scottish newspapers and local radio. The UK's Channel 5 is seeking DTI clearance to expand into ch.35 for network expansion and higher population coverage, particularly in the Southern UK region which has sparse transmitter representation.

Belgium

There is a new Belgium BRTN TV1 transmitter operating on ch.E10, 100kW e.r.p. at Saint-Pieters-Leeuw. Wavre now operates in Band 3 only from ch.E8 for RTBF-1 @ 100kW. Check out also from the Wavre mast Tele-21 ch.E28 and Canal Plus ch.E50.

Finally

New Band 1 Sporadic E potential for '97 - TMT-1 Turkmenstan operates at ch. R3 horizontal from Carayew at 36kW and also in Moscow the NTV channel is now 24-hours on ch.R4.

NiTech 900mA NiCads

Perhaps better known for their high power waterproof torches as used by the Police, rescue services and others, NiTech have just

Monitor The Challenge

On 29 September 1996 14 yachts competing in the BT Global Challenge around the world yacht race set sail from Southampton, embarking upon a mammoth voyage the 'wrong way' around the globe.

There is much radio traffic from the competitors, which includes 'phone patches, interviews, etc. Traffic is via national coastal stations, taking into account propagation. Here is a list of Portishead (GKA) frequencies that are being used. Dedicated monitoring will reveal those in use by other coast stations.

The bands that are most likely to be used are as follows:

Leg 1 **UK - Rio** - competitors should be able to get good communications with the UK. Probably 12 or 16MHz until crossing the equator - then they should come in well on 16MHz late afternoon/early evening. First few nights Ch.410 has been very busy from 1900UTC, as they go further south try Ch.816

Leg 2 **Rio - Wellington** - this is the most difficult leg - GKA early evening and early morning, Cape Town the rest of the way from Rio to the Cape Horn.

Cape Horn - 165°W A very good 'Grey line' path exist between this area and GKA on 12/16MHz between 0700 and 1000UTC

165°W to Wellington - hopefully they will be able to raise VIS - but VIS have problems due to relocation which may give problems. The 0700 - 0900UTC path should still be viable on most days.

Leg 3 **Wellington - Sydney** - Should be Sydney Radio.

Leg 4 **Sydney to Cape Town** - should be Cape Town (ZSC) and GKA - 16MHz 1400 - 1600UTC.

Leg 5 **Cape Town - Boston** - First couple of days Cape Town, then GKA midday onwards.

Leg 6 **Boston - UK** - GKA all the way 16MHz 1100UTC onwards.

The best channel to monitor after the first few days will probably be ch. 1602,that should be interesting during November/December around 0800UTC for a hour or so.

Frequencies in use are announced after the traffic lists sent every H+00 on 4.384, 8.764, 13.146, 17.245, 19.755, 22.711MHz (whichever is currently operational).

Those of you with WWW capability can also take a look at the Web site at **http://www.btchallenge.com** though listening to the yachts is much more interesting!

BT Global Challenge - Portishead R/T Frequencies

Ch.	Ship	Shore
410	4.092	4.384
816	8.240	8.764
1201	12.230	13.077
1202	12.233	13.080
1206	12.245	13.092
1224	12.299	13.146
1228	12.311	13.158
1230	12.317	13.164
1232	12.323	13.170
1602	16.363	17.245
1606	16.375	17.257
1611	16.390	17.272
1618	16.411	17.293
1623	16.426	17.308
1632	16.453	17.335
1637	16.468	17.350
1640	16.477	17.359
2206	22.015	22.711

*all channels are u.s.b.

BT Global Challenge
The world's toughest yacht race

Yachts talking part in the race are:

Name	MARS C/S
Toshiba	MPXJ3
Motorola	MWSE2
Ocean Rover	MPNW4
3Com	MPNV4
Concert	MPNX4
Save The Children	unknown
Group 4	unknown
Time & Tide	MWSF2
Nuclear Electric	MYPQ3
Heath Insured II	unknown
Global Teamwork	unknown
Pause To Remember	unknown
Commercial Union Assurance	unknown
Courtaulds International	unknown

Physically interchangeable with AA cells of lower capacity.

launched a new AA size cell.

The 900mA cell has been designed by the newly launched Battery Division, which has been set up to provide a much wider range of potential customers. who will benefit from the NiTech's experience in designing and sourcing all types of battery.

The new cell is ideally suited to hend-held and portable receivers and accessories. It offers superb performance and has a fast charge capability and extended cycle range. The capacity is significantly higher many of the cells currently in use in these applications - a simple upgrade to these high capacity cell will greatly enhance your listening pleasure and operating time between charges.

NiTech are an ISO9000 approved company, their customers include MoD, British Rail, BT and virtually every emergency service in the UK.

For more information contact: **NiTech Limited, 4-6 Highfield Business Park, Churchfield Trading Estate, St. Leonards-on-Sea, East Sussex TN38 9UB. Tel: (01424) 852788, FAX: (01424) 851008**.

Channel Africa

The uncertain future of Channel Africa was mentioned in our Broadcast Special (October) issue. However, Tom Davies (South Africa) has informed us by E-mail that sufficient funds have now been found to enable the station to continue on the air until March 1997, by which time its future will have been finalised.

As always, reports Tom, money is a major consideration and the south African Government has asked for detailed budget proposals for the station's current and future operating expenses as part of a full investigation.

Tom reckons that an external service, intended for the rest of Africa will continue in one form or another.

Ultimate Customer Service

Companies always like to tell you about their fantastic customer service and Martin Lynch & Son are no exception. There is, however, customer service and Customer Service...

In August, Mr. Halley of Londonderry, Northern Ireland, sent his sick receiver to Martin Lynch & Son's workshops to be repaired. Just over a week later Customer Services Supervisor Andy Wyspianski, telephoned the Halley's residence to let him know that the radio was ready.

Mr Halley was out so Andy explained the details to Mrs Halley. Whilst doing this, Andy heard a thud, followed by what he thought was the handset being dropped. After several "Are you all right?" requests from Andy had solicited no reply from Mrs Halley, he feared the worst. Dialling 999 he explained the situation to the emergency services, who responded by sending a police car and ambulance to the Halley's home.

The police had to force entry and found Mrs Halley slumped in the hallway. She had suffered a burst ulcer while talking to Andy, fell down and knocked herself out on the hallway radiator. The ambulance rushed her to hospital where she was operated on and is now doing fine. Howszat for customer service in the extreme!

Martin Lynch said "In addition to the workshop staff who actually repair the equipment, I employ two customer service engineers. Their job is to liaise with customers before, during and after repair and what Andy did was commendable, especially the speed with which he reported the incident. He could well have saved Mrs Halley's life."

High Power Regulated Mains Adapters

Relec Electronics Ltd., distributors for Mascot, the Scandinavian power supply manufacturer, has announced a range of regulated low-voltage mains adapters.

Designed to provide an alternative power source to batteries in domestic and industrial equipment, the new range is particularly suited to applications requiring a relatively high power, stabilised output.

All three models in the range can be supplied with integral or corded, UK or Euro style mains plugs and there is a wide choice of single or multi-headed appliance plug-leads. Double insulated construction meets EN60950 electrical safety standards and they are CE marked as well.

Top of the range is the Mascot 8717, a switch mode supply in a case 100 x 51 x 63mm. Maximum output is 10W at a regulated voltage that can be set to any level between 5 and 24V. Load regulation is better than 2% over the range 0 - 800mA at 12V.

The other two units are linear supplies - the Mascot 8713 is the same size as the 8717 and has a maximum output of 7.5W at its 15V setting. Output voltage can set between 5 and 42V. The low-cost 8613 comes in a smaller 95 x 51 x 57mm case and is available in 6, 7.5, 9 or 12V at either 600 or 400mA depending on which version is chosen.

Relec Electronics Ltd., 124-126 Stockbridge Road, Winchester, Hants. SO22 6RW. Tel: (01962) 863141. FAX: (01962) 855987.

Lowe SRX-100 Communications Receiver

Lowe Electronics have just announced the latest addition to their receiver range. The Lowe SRX-100 is an entry-level communications receiver with a very respectable performance. Continuous tuning is from 30kHz to 30MHz by a flywheel tuning knob with four-speed stepping, c.w., a.m., u.s.b. and s.s.b. modes are push-button selected from the front panel. A clarifier control and on-off/volume complete the controls, making the SRX-100 easy to drive. Frequency and mode are displayed on the liquid crystal display. Power is provided by a 12V d.c. mains adapter via a standard coaxial power socket on the rear panel. A 3.5mm jack socket for headphones completes the back panel fittings.

Lowe Electronics have told *SWM* that they are targeting the SRX-100 at the Far Eastern and North American markets with the remarkably low price of $239.

Further details of the SRX-100, as well as their other receivers, can be had by accessing their Web site at **http://www.lowe.co.uk/**

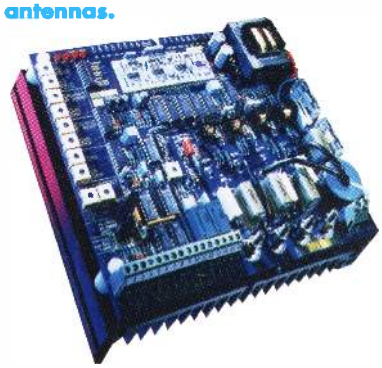
Integrated Control System

An integrated control system for a range of transportable satellite communication antennas varying in size from 1.5 to 3.2m, requires the position of the antenna to be adjusted in all three axes for satellite acquisition via a simple operator control panel avoiding menu driven commands. A number of systems are available in the market, but are more suited to static sites and not fully integrated or are applicable to one design of antenna.

As a result of this, Satellite Resources decided to undertake its own development programme. The design review examined the use of d.c. motors, a.c. motors and servo systems.

The solution finally adopted was to use standard d.c. motors, each being driven by a Sprint Electric 3600XRi Series 4Q regenerative controller and a

The integrated control system for transportable satellite communications antennas.



High Adventure Ministries Brings Gospel Radio to the Middle East

"Terrorists need to be born again!" declared George Otis, founder of the High Adventure Ministries global gospel broadcasting network, as outside the studio a battle raged between Israeli soldiers and Hezbollah fighters.

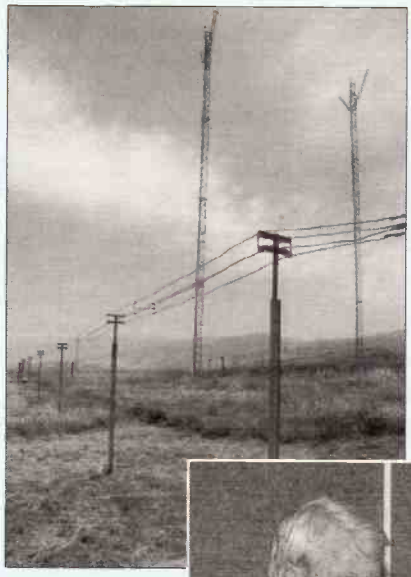
The Voice of Hope stations broadcast in English, Arabic and other foreign languages, from the Israel - Lebanon border - in spite of the ongoing fighting, which has been a familiar pattern ever since the first Voice of Hope radio station started transmitting in 1979.

Otis knows from first-hand experience that the messages transmitted from his stations are a powerful influence in the area. In 1985 terrorists stormed the studio in southern Lebanon and three of the attackers and two station staff were killed. Otis visited the surviving terrorist in hospital to forgive him and converted him there and then.

Reception of the Voice of Hope signals from northern Israel has always been difficult in Jerusalem because of the mountainous terrain. Now Otis has opened Love FM which can be heard in Jerusalem, Bethlehem and numerous Arab villages to the north of the city.

High Adventure Ministries has expanded to become what is claimed to be the world's largest full-Gospel radio network. Its powerful s.w. transmitters in California and on Palau in the Pacific, as well as the Voice of Hope ones in Lebanon offer global coverage to reach more than 200 nations in over a dozen languages.

For further information and a schedule contact: **High Adventure Ministries, PO Box 109, Hereford HR4 9XR. Tel: (01432) 359099, FAX: (01432) 263408**.



Part of the Voice of Hope transmitter site on the Lebanese - Israeli border. The station is home to a 50kW m.w. station as well as two short wave ones - a 10kW on 6.280MHz and a 25kW one on 9.965MHz.

George Otis, founder of the Voice of Hope radio station.

closed loop feedback system. The d.c. motor is preferred as it can develop 300% or more overload torque to cater for high wind conditions.

The flexibility of the 3600XRi permits motor voltage, power and r.p.m. to be optimised for the size of antenna to be driven. However, it is essential that movement of the antenna from start to finish be as smooth as possible, irrespective of the maximum speed employed.

This is done by selecting a ramp up and down profile within the common electronic area and the ramps in each 3600XRi controller matched to this profile. If the ramps are incorrectly set, the antenna will overshoot.

Each motor may have different load conditions at any given time and be subject to constant reversal during the manual satellite acquisition stage. Using individual controllers permits the armature current to be set for each motor to achieve stable axis speeds ranging from 0.075° to 4° per second.

The option exists to include tachometer control to meet specific client requirements. Should the motor stall, due to an obstruction or fault, the individual 3600XRi will signal an overload and if the stall persists, the drive is inhibited after 30 seconds to prevent motor damage.

Operational procedures have been simplified to using a joystick control to locate the selected satellite. The axis co-ordinates are displayed on three l.c.d. indicators and can also be retained in a labelled store. The stored data can be recalled via a single push button to drive the antenna to those co-ordinates to an accuracy of 0.1°.

When transmitting signals to the satellite, the controllers are limited to movements within a sector scan area to prevent the operator accidentally going off satellite during final line-up. The same sector scan limits are used for tracking of non-synchronous satellites in elliptical orbits. For more details, contact **Mike Hudson, Sales Director of Sprint Electric Ltd.** on **(01903) 730000**.

Children In Need Appeal

Twenty amateur radio clubs throughout Britain have agreed to join with the Mid Sussex Amateur Radio Society in this year's BBC Children In Need Appeal. All will be operating special event stations and many will be sponsored by contacts.

At the time of going to press, the GB callsigns are not known, but these will promulgated by packet and hopefully by GB2RS. All are being asked to use the word 'Narcina' as a means of identification and all stations are asked to call in and swell the number of contacts.

On h.f. and v.h.f. will be GB0KIN, the MSARS station, on Friday and Saturday 15/16 and again on Friday and Saturday 22/23 November together with other times in between. The clubs taking part are N. Bristol, Warrington, N. Wales, Hastings, Braintree, Wigan, Preston, Leicester, Grantham, Lowestoft, Thames Valley, Dundee, Horsham, Keighley, North Wakefield, Otley, Blackwood, S. Notts, Caravan & Camping and Worthing.

Any others wishing to join in will be most welcome. For further information, contact **G3LCF** on **(01903) 521152** or on packet **G0GMC @ GB7ZZZ**.

No More Squabbles!

A solution is at hand for couples who squabble over whether to watch TV or listen to the radio. Truedox Technology from Taiwan have come up with a device that allows couples with disparate tastes in music or television to pursue their preferred sounds at the same time without disturbing each other.

The IWA-900 uses wireless signals to transmit sound through walls and floors up to 150 feet. The transmitter unit is plugged into your TV or stereo's external speaker socket and stereo earphones are connected to a palm-sized receiver. This means that you are then free to roam around the house without disturbing anybody else or missing a minute's dialogue of your favourite film or radio programme!

This type of wireless receivers have been around for a decade or more, but until now they have not worked successfully. Early models picked-up garage door opener signals or CB radio signals or buzzed when exposed to certain kinds of lighting. Signals also tended to drift in and out, thus requiring retuning.

Truedox have solved these drift difficulties with patented phase lock loop technology that locks in and holds correct signals automatically. They have also added a unique auto-level control that stops sudden sound spikes from blasting in listeners' ears. Innovative circuitry automatically avoids frequencies being used by, say, a 900MHz wireless telephone or mutes the receiver altogether when range limits are exceeded.

The IWA-900 is expected to be available early next year in this country, priced around £80. More information about this device is available from **Marcus Smith** or **Emma Simpson** on **0171-329 0096**.

SEND YOUR NEWS TO:
Short Wave Magazine
ARROWSMITH COURT, STATION APPROACH, BROADSTONE, DORSET BH18 8PW.

Bandscan AMERICA

Rallies

November 1: The Bangor & DARS annual surplus equipment rally is to be held at Hamilton House, Hamilton Road, Bangor, Northern Ireland. Rally starts at 7pm sharp. Great bargains, so don't miss it! **GI3YMY** at **(01247) 466557**.

November 3: Donegal (Tir Conaill) ARS are holding their Annual Radio Computer and CB Rally in Jackson's Hotel, Ballybofey, Co. Donegal, Ireland. Admission is £1 only. More details from **Gerard Dykes EI8HO, Secretary, 30 St Benildus Avenue, Ballyshannon, Co. Donegal**.

November 3: The 6th Great Northern Hamfest (formerly the Barnsley Amateur Radio Rally) will take ploce at the Metrodome leisure complex in Barnsley Town Centre. Doors open at 10am. Talk-in on S22. Disabled car parking in leisure complex, all other parking in surrounding car parks. Admission is £1.50. More details from **Ernie Bailey** on **(01226) 716339** or mobile on **(0836) 748958**.

November 3: Thames Valley Electronics Rally is to be held at Kempton Park Racecourse, Staines Road East, Sunbury-On-Thames, Middlesex. Doors open 10.30am to 4.30pm. There will be refreshments and a bar available. Admission is £1.50 for adults, OAPs £1 and children up to 14 years old free. The entire event is on one level. There will be retailers, accessory suppliers, antenna suppliers, a Bring & Buy stall, etc. More information can be obtained from **HD Promotions** on **(01494) 450504**.

November 9: AMS '96 will take place at Bingley Hall, Stafford County Showground, Weston Road, Stafford. This event has **NOT** been cancelled and must not be confused with other similar events at this venue. AMS '96 is a computer and electronics sale, with an increasing Amateur Radio content. The event regularly attracts over 90 trade stands. For more information, log onto the web site at **promotions@sharward.keme.co.uk** or contact the organisers for further information at: **Sharward Promotions, Knightsdale Business Centre, 30 Knightsdale Road, Ipswich, Suffolk IP1 4JJ. Tel: (01473) 741533, FAX: (01473) 741361**.

***November 9/10:** The 9th North Wales Radio & Electronics Show is being held at the Aberconwy Conference & The Bew Theatre, Llandudno. The show opens at 10am, both days. **B. Mee GW7EXH** on **(01745) 591704**.

November 10: Midland Amateur Radio Society - Birmingham's Eighth Radio & Computer Rally at Stockland Green Leisure Centre, Slade Road, Erdington, Birmingham. Doors open 10am to 4pm. Admission £1. Large free car park, free Christmas draw, trade stands, local clubs and special interest exhibits. Further information from **Peter G6DRN** on **0121-443 1189**. Trader details from **Norman G8BHE** on **0121-422 9787**.

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

The US Government's Asia-Pacific Network (originally named Radio Free Asia) was supposed to broadcast via Voice of America relay facilities in Thailand and the Philippines. But an unforeseen problem developed when the host countries decided they didn't want to chance offending the non-democratic regimes in the area, which are the primary targets of the Asia Pacific Network broadcasts.

Washington has discussed hiring time on some of the religious short wave stations on Guam and Saipan, but the outcome of those negotiations is uncertain. Meantime, a new transmitting station for APN broadcasts is being built on the island of Tinian, in the Northern Marianas. It's said that the transmitters will be those from the now closed REF/RL base at Maxoqueira, Portugal.

The Tinian station is expected to be on the air by 1998. Tinian, of course, was the base from which the atomic bomb raids on Japan were conducted. Meantime, it's unknown at this point when the Asia Pacific Network broadcasts will begin, and from where.

Voice of America

The Voice of America relay station in Sao Tome is now on the air. The tropical band frequency of 4950 is in use from 0300 to 0330 in English Sunday to Thursday; 0500-0530 in Hausa from 0530-0630 Monday to Friday; in French, 1900-1930 Saturday in English; 2030-2100 Monday to Friday in Hausa; 2030-2100 Saturday and Sunday in English. Other frequencies in use at various times include 7.180, 7.290, 5.970, 11.880, 11.890 and 11.975MHz.

Speaking of islands, it appears that the Caribbean Beacon will soon be on the air from Anguilla. Everything is said to be ready to go and preliminary tests have already been carried out.

The Caribbean Beacon will broadcast the University Network of Dr. Gene Scott 24 hours a day. Initial frequencies are said to be 6.090 and 11.775. There's only one transmitter (a 100kW unit manufactured by Continental Electronics) so both frequencies won't be in use at the same time. The station will use a log periodic antenna beamed at the US and Canada.

Argentine Antarctica

Antarctica - Last time we mentioned the return of Radio Nacional Arcangel San Gabriel in Argentine Antarctica, operating on 15.476. The station is now active but it does not operate as late as it did before. It runs only to around 1950 instead of 2330 as it used to do, and seems to be a lot more difficult to hear than it formerly was. The channel is blocked by Africa Number One until 1900.

Some interesting Latin American clandestine stations have either returned to the air or been confirmed as continuing to be active. La Voz Popular, operated by the guerrillas in Guatemala, broadcasts only on Tuesdays and Fridays on or around 7.000 from 2315 sign on. The broadcasts are not long, something like 30 to 45 minutes. The station claims to be broadcasting from the Tajumulco volcano in San Marcos Department in the western part of the country.

In Colombia, Radio Patria Libre, which was silent for sometime, has reappeared and now has two daily half hour broadcasts, at 1800 and 2200 on 6.250, though that frequency shouldn't be taken too seriously - in the past the station has jumped around a lot. The same holds true for the word 'daily.' Patria Libre has tended to be quite spotty in its operation so it may not be in evidence every day. Estacion Fariana, operated by the FARC guerrillas, is reported to have surfaced after years with no news or reports of it. The operations are apparently very sporadic. Try 6.330 around 2100.

Station News

Venezuela - Stations from this country recently logged include Radio Amazonas on 4.939.5, Ecos del Torbes on 4.980 and 9.640, Radio Occidente, 9750.

Guyana - s.w.l.s have welcomed the return of the Voice of Guyana, which is being heard quite well in North America on 3.290 around 0100.

Honduras - La Voz de Mosquitia, Puerto Lempira on 4.910, has been off the air for a time and probably still is, due to transmitter problems. This little station relies on a couple of old, converted Viking brand amateur radio transmitters, both of which are now in need of repair. They have been shipped back to the US to be fixed and it is not known how long it will be before repairs can be completed and the transmitters returned.

Radio Copan International has returned to the air, and returned to its original frequency of 15.675, after conducting experimental transmissions in the 41m band. It's been heard with fairly good signals around 1600. Broadcasts run until 0000 or later. The programming is a mix of block music segments and programmes produced by outside groups.

La Voz Evangelica - HRVC on 4.820 is believed to have a new transmitter and is reportedly now operating 24 hours a day. It's also said to be identifying as 'The Voice of Honduras.'

Ecuador - Radio El Buen Pastor is now operating on 4.815, a move from their former 4830 where they suffered a lot of interference from Radio Tachira in Venezuela, as well as Costa Rica's Radio Reloj on 4.832. The station signs off shortly after 0100. Incidentally, Radio Reloj's 6.006 frequency has been reactivated.

Also reactivated is Radio Progresso, 5060v, sometimes using the slogan 'Progresso Internacional.'

Argentina - Radio Rividavia is being noted again, in lower sideband on 8.100 around 0000 to as late as 0530, although this appears not to be a daily occurrence. This is an s.s.b. 'utility' feeder which may be being used to provide local radio to Argentines in Antarctica.

When in use the channel may not carry Rividavia exclusively. Other Argentine medium wave stations have been relayed in this fashion in the past, though Rividavia seems to be the one most often carried.

Mexico - Radio Mexico International continues to provide very good reception on 9.705. Not surprisingly, they feature a lot of Mexican ranchera music. This frequency is scheduled for operation from 2000 to 0500 (0400 on Saturdays and Sundays). Other hours: 1200-1600 and 1800-2300 on 5.985.

The station is reported to be having problems with the transmitters, neither of which is operating at its maximum 10kW. Most of the other Mexican stations you see in various listings have either been inactive for quite some time or are off the air permanently. Those still active and recently

Gerry L. Dexter
c/o *SWM* Editorial Offices
Broadstone
Poole
Dorset
BH18 8PW

reported include Radio Educacion on 6.185, Radio Mil on 6.010

Uruguay - Radio Monte Carlo, from Montevideo, is being heard around 0200 on 9.595. 11.735 is also listed for this station but may not be active. SODRE, also from Montevideo, is using 6.125. The new Emisora Ciudad de Montevideo is now active on 9.650 at around 2100, although its regular, full schedule may not yet have been implemented. Later, it plans to also use 15.230, with 1kW. Radio Libertad Sport, Montevideo, is operating on 6.045 Monday to Friday from 1100 to 2100 using 300W.

Brazil - Recent loggings from this country include:

2.460 Radio Alvoarada, Rio Branco
3.255 Radio 6 de Agosto, Xapuri
4.775 Radio Liberal, Belem (move from 3325)
4.794 Radio Mundial/Super Tupi. Sao Paulo
4.815 Radiodifusora Londrina, Londrina
4.915 Radio Anhanguera, Araguaina
4.955 Radio Clube, Rondonopolis
4.985 Radio Brazil Central, Goiania
5.055 Radio Journal A Critica, Manaus
6.160 Radio Rio Mar, Manaus
6.000 Radio Guiaba, Porto Alegre
6.160 Radio Rio Mar, Manaus
9.515 Radio Novas de Paz, Curitiba
9.630 Radio Aparecida, Aparecida
11.725 Radio Novas da Paz, Curitiba
11.915 Radio Gaucha, Porto Alegre

The Brazilian government's Radiobras had some problems earlier in the year when it was off the air for several days. In addition, some of the frequencies, historically very stable, have begun to drift a bit. Nominal 15.265 has moved up to 15.268 at times and 17.750 has varied between 17.746 and 17.753. Radio Nacional, 11780, is also reported to have been having some technical problems.

Nicaragua - Radio Miskut, 5.770, continues to be one of the few active stations here. The station's normal 0000 sign off was put aside during hurricane Caesar when broadcasts were noted continuing to past 0500.

That covers all the news from the Americas for this time. Good listening!

Grassroots

Club Secretaries:
Send all details of your club's up-and-coming events to:
Lorna Mower, *Short Wave Magazine*, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW.

AVON

Bristol International RC: Tuesdays, 8pm. The Black Horse Public House, West Street, Old Market, Bristol. All visitors are welcome. The club has been formed so that all radio enthusiasts, whether they be Licensed Amateurs, s.w.l.s or CBers can get together and have a good natter and do things that you do in radio clubs. PO Box 28, Bristol BS99 1GL.

RSGB City of Bristol Group: last Tuesdays, 7pm. New Friends Hall, Purdown, Bell Hill, Stapleton, Bristol BS16 1BG. October 29 - AGM, November 26 - Construction contest. Dave Bailey G4NKT. 0117-967 2124.

South Bristol ARC: Wednesdays, 7.30pm. Whitchurch Folkhouse Assoc., Bridge Farm House, East Dundry Rd, Whitchurch. October 30 - Club forum - members suggestions, November 6 - Top band activity evening/committee meeting, 13th - Christmas raffle commences, 20th - AGM, 27th - QSL cards, please bring your own. For more information ring (01275) 834282 on a Wednesday evening.

BEDFORDSHIRE

Dunstable Downs RC: Fridays 8pm. Chews House, High Street South, Dunstable, Bedfordshire. October 25 - Constructors contest, November 1 - Informal meeting, 8th - Talk by Dick Gilbert from the RIS, 15th - Informal meeting, 20th - Ten pin bowling, 22nd - Curry night. New members and visitors welcome, just drop in or call Paul G7TSJ on (01582) 861936.

BUCKINGHAMSHIRE

Aylesbury Vale RS: Wednesday evenings, 8pm. Hardwick Village Hall, (Hardwick is situated off the A413 between Aylesbury and Buckingham). November 6 - Quiz night. Gerry Somers G7VFV on (01296) 432234.

DEVON

Appledore & DARC: 3rd Mondays, 7.30pm. Appledore Football Clubroom. November 18 - Radio quiz by Mike G3PGA. Dave Brierley G3YGJ. (01237) 476124.

Plymouth RC: 1st & 3rd Tuesdays, 7.30pm. The Royal Fleet Club, Devonport, Plymouth. November 12 - Constructors Cup. John Doherty G7HIK on (01752) 896501.

Torbay ARS: Fridays, 7.30pm. ECC Social Club, Highweek, Newton Abbot. November 22 - How does a PC work? Peter G4UTO. (01803) 864528.

EDINBURGH

Lothians RS: 2nd & 4th Wednesdays, 7.30pm. Orwell Lodge Hotel, Polworth Terrace, Edinburgh. As this is the 50th year of the Society, they plan a number of commemorative events and wish to hear from former members from the early years of the club. November 13 - Scanners by GM4GEQ, 27th - Junk sale. Tommy Main GM4DCL, QTHR on 0131-663 8501 day and evening.

GREATER LONDON

Southgate ARC: 2nd & 3rd Thursdays, 7.30pm. The Pavilion, Winchmore Hill Cricket Club, Firs Lane, Winchmore Hill, London N21 3ER. November 14 - G6QM trophy home-brew equipment, 28th - Radio on the air G6QM let's see if it works. M. E. Viney G0ANN. (01707) 850146.

HAMPSHIRE

Horndean & DARC: 1st & 4th Tuesdays, 7.30pm. Lovedean Village Hall, Lovedean Lane, Lovedean, Hants. November 5 - Notter night, 26th - The RNLY by Bob Miller. S. Swain (01705) 472846.

HEREFORD & WORCESTER

Bromsgrove ARS: 2nd & 4th Tuesdays. Lickey End Social Club, Alcester Road, Burcot, Bromsgrove. November 12 - Video evening, 26th - Christmas dinner. Barry Taylor. (01527) 542266.

Droitwich Spa ARC: 1st Tuesday, 8pm. Droitwich Community Hall. Many interesting evenings already booked. November 5 - Loop aerials talk and demonstration by Trevor Harper G0KIN, 13th - Visit to BBC WoodNorton - please ring the Secretary or Chairman. John Jackson G4OPV (01299) 826188.

Hereford ARS: 1st & 3rd Fridays, 8pm. Many talks and interesting evenings including, November 1 - Annual junk sale, 15th - Talk by Icom. Tim G0JWJ, QTHR. Tel: (01432) 279435 or Paul G0DJF on (01432) 353765.

Malvern Hills RAC: 2nd Tuesdays. Red Lion, St Annes Rd. Jim Davis G0OWS. (01684) 576538.

KENT

Bromley & DARS: 3rd Tuesdays, 7.30pm. The Victory Social Club, Kechill Gardens, Hayes. November 19 - Slide show by Dave Wellman G0OBL. A. Messenger G0TLK. 0181-777 0420

Medway AR & TS: Fridays, 7.30pm. Tunbury Hall, Catkin Close, Tunbury Avenue, Walderslade, Chatham, Kent. November 1 - QRP by Dick G0BPS, 13th - Interclub quiz with Darenth Valley Radio Society at their QTH, team needed, 15th - Conker championships, 22nd - Fish and chips supper. G3VUN, 40 Linwood Avenue, Strood, Rochester, Kent ME2 3TR. (01634) 710023.

LANCASHIRE

Preston ARS: Thursdays, 8pm. The Lonsdale Sports & Social Club, Fulwood Hall Lane, Fulwood, Preston. October 24 - RSGB video, an evening's viewing, November 7 - General discussion evening, natter night and G3KUE on air, 21st - Own choice kit, construction competition. Eric Eastwood G1WCQ. (01772) 686708.

NORFOLK

Norfolk ARC: Wednesdays, 7.30pm. Formal and informal meetings at The Norman Centre, Bignold Road, Off Drayton Road between 'Asda' and Three Mile Cross Roundabout, Norwich. October 30 - Night on the air/construction QRP/Morse practice, November 6 - Surplus equipment sale, 13th - Night on the air/Construction QRP/Morse practice, 20th - Construction contest, 27th - Night on the air/Construction QRP/Morse practice. Mike G4EOL. (01603) 789792.

NORTH YORKSHIRE

Hambleton ARS: All meetings held at Allertonshire School, Northallerton, 7.30 to 9.30pm. October 31 - Video, November 21 - Talk on electrical safety by Richard G7HHK, 28th - Operating night, vintage and DIY equipment. More details from John G0VXH on (01845) 537547.

SHROPSHIRE

Salop ARS: Thursdays, 8pm. The Telesports Club, Abbery Foregate, Shrewsbury. October 24 - DXTV from satellite by Dave G7WBH, 31st - On air night/Natter night, November 7 - Contesting by Bob G4UJS, how to go about contesting by a member of one of the big contest groups, 14th - Natter night/On air night. Ian Davies G7SBD, QTHR or @ GB7PMB.

SOMERSET

Wincanton ARC: 1st & 3rd Mondays, 7.30pm. The Community Launge, King Arthur's Community School, West Hill, Wincanton. October 28 - RSGB Video, November 4 - Lecture, 18th - RSGB video. Tim Stellar G6RCT on (01963) 31788.

Yeovil ARC: Thursdays, 7.30pm. The Red Cross Centre, 72 Grove Avenue, Yeovil. October 24 - The GSB 900 HF Transceiver Revealed by G7INJ, 31st - Club station on the air and committee meeting, November 7 - Video of the construction of the Oriana by G3GC, 14th - Lambda Diode Experiments by G3MYM, 21st - The development of the amateur radio receivers by G3MYM, 28th - Club station of the air and committee meeting. Cedric White, QTHR. (01258) 473845.

SOUTH YORKSHIRE

Barnsley & DARC: Mondays. October 28 - The Great Northern Hamfest briefing for the Northern's largest Hamfest Sunday 3 November, starts 8.15pm prompt, November 4 - Great Northern Hamfest de briefing, 11th - On the air night, 18th - Talk on constructing printed circuit boards by John G4YZO, starts 8.15pm prompt, 25th - On the air night. Ernie Bailey G4LUE on (01226) 716339 between 6 and 8pm.

TAYSIDE

Dundee ARC: Tuesdays, 7pm. Dundee College, Graham Street, Dundee. October 29 - Mini lecture by club members. Allan Martin GM7ONJ, 11 Langlee Place, Broughty Ferry, Dundee, Tayside DD5 3RP.

WARWICKSHIRE

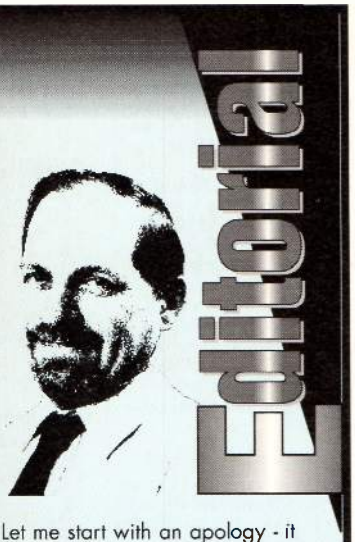
Stratford-upon-Avon & DRS: 2nd & 4th Mondays, 7.30pm. Home Guard Club, Main Street, Tiddington, Stratford-upon-Avon. October 28 - CM Howes latest kits and demanstrations, November 11 - Sounds of yesteryear by John Stroud, gramophones, records, hi-fi, etc., 25th - Night on the air/open evening. The Society are again organising a course of instruction for the Radio Amateur Examination of the City & Guilds of London Institute and further details can be obtained by writing to the Chairman of the Society, Mr J. Harris G8HJS, enclosing a stamped addressed envelope. The address to write to is: 57 Evesham Road, Stratford upon Avon, Warks CV31 2PB.

WEST MIDLANDS

Sandwell ARC: The Broadway, Warley. RAE class on Monday nights, Morse class on Wednesday nights and RAE Novice class on Thursday nights. Three operating shacks, h.f./v.h.f./u.h.f., Phone, c.w., RTTY, AMTOR, Packet, all bands. Talks, outings, contest and demonstrations. Full RAE course commencing September, enrolment Thursday 5th at 7.30pm and course commences Thursday 12th at 7.30pm. Club nights Mondays, Morse classes on Wednesday nights. For further information please ring 0121-552 4619/0121-552 4902.

WILTSHIRE

Trowbridge & DARC: 1st & 3rd Wednesdays, 8pm. The Southwick Village Hall, Southwick, Trowbridge. November 6 - Constructors' Cup, judging of entries. Ian G0GRI on (01225) 864698.



Let me start with an apology - it seems that I wrote far too much last month and the Art Department had to reduce the type size to get it all in. One witty reader wrote to let me know that Sherlock Holmes was actually using his magnifying glass to read my ramblings, so I will try to keep it short and under control this time!

Frequency Exchange

The response to this new feature, introduced last month, has been excellent. In fact, we have had more entries than we can fit into the space allocated. However, please keep them coming - without your input by way of logs, etc., 'Frequency Exchange' will wither and die. Also, please can you try to keep to our format and, if possible, send your logs on disk or by E-mail.

Space

This month is our Space Special and Lawrence Harris has made it very topical with MIR being in the news.

Next month we will be giving you a free 16-page Optoelectronics catalogue - or should that be 'catalog'? This lively American outfit produces some very interesting gear, so you should find their catalogue of interest. I just hope that telling you about it now doesn't produce a 'Murray Walker' result.

Dick Ganderton G8VFH

Letters

The Editor reserves the right to shorten any letters for publication but will try not to alter their sense. Letters must be original and not have been submitted to any other magazines. **The views expressed in letters published in this magazine are not necessarily those of *Short Wave Magazine.***

Hallo Dick

Sorry if I didn't start with 'Dear Sir', but I always find it strange in a radio hobby magazine such as *SWM* to see such formality on the Letters page. Though you do have my permission to change the 'Hallo Dick' to a 'Dear Sir' if you decide to print this letter. Having got that off my chest, I think I should get on with my reason for writing.

I read your Editorial concerning 'Rallies', although as I've lived in Germany for the last 22 years, you might not consider me particularly qualified to comment on this subject. However, I do travel back to the UK two or three times a year and by coincidence these trips always coincide with a rally date. I generally visit the Dunstable Downs Boot Sale and Woburn, plus maybe one local rally each year.

I think it could be argued that there are too many local rallies, but I see them more as a chance to meet old friends than to do a lot of serious shopping and I don't expect such a large selection of stands at a local rally, when compared to the national events. In fact, I'm often amazed that so many companies are prepared to give up their Sunday to set-up stands at these rallies.

Looking back over the last 20+ years I have also seen an increase in the number of computer stands at all rallies, but don't think they have 'taken over', more that they reflect the effect computers have had on most shacks. Yes, I know that they sell lots of games, etc., but I think its unrealistic to think that amateurs only use their computers for 'shack work' and there are, as with the radio segment of any rally, lots of hardware and software bargains to be had if you shop around.

For me, not a lot has changed rally-wise over the 22 years. I arrive early and leave after a couple of hours, when the crowd level becomes intolerable. I certainly haven't noticed (subjectively) that the crush is a lot less these days, or maybe as I'm getting older my tolerance to crowds has diminished! I always come away with my bargains, (junk according to the other half), even though I've walked Dunstable Downs in the pouring rain and stood in a Woburn tent ankle deep in sweat and cow droppings (*I always thought that it was from sheep or deer - **Ed***), I've enjoyed every minute of it and plan to continue 'rallying' for many years to come.

Do we have rallies in Germany other than Friedrichshafen? Well, yes we do but I'll see you next year at Woburn.

Ian D. Spencer DJ0HF/G3ULO
Germany

Dear Sir

I write in response to the letter from M. Tansley, Bradford, on page 9 of the September '96 edition. Mr Tansley has acquired a radio microphone receiver set to the middle frequency of the band covered by DTI specification MPT 1345. These receivers are not normally tuneable, the frequency being set by a crystal.

For interest, the other frequencies are 173.8, 174.1, 174.8 and 175.0MHz. In addition, radio microphone systems often make use of compander circuits, which would need to be disabled before the unit could be used as a radio, even if this were practicable. I believe that Soundlab products are distributed by Altai Ltd. I hope this information is of help.

David Key
Newcastle-under-Lyme
Staffordshire

Dear Sir

Your reviewer of short wave receivers, John Wilson G3PCY, really does a brilliant job on the technical background and other qualities of the AR7030 h.f. receiver in the March 1996 issue of *SWM*. In the review of the AR7030 RX he mentioned that he had worked on the NRD505/515. I had a NRD575 myself but I have never seen a 505, so would John have any photographs of the 505 and R1155 receivers? If so, could he send me some photographs? I would be much obliged.

I have had no luck so far from my request in the May 1994 edition of *SWM* asking for photographs of the R1155 and Redifon R50.

James Reilly
Co. Down
N. Ireland

Dear Sir

With reference to Mike Richards' article 'When I Win The Lottery' in *Short Wave Magazine* September 1996, I, too, aspire to winning the lottery and would also like to splash out on some short wave goodies. However, I am still waiting for those lucky balls, so like Mike, I would like to try out the T2FD aerial.

Unfortunately, he tells of finding it in a book and its excellent features - but what book and how do you construct it? I have looked in various books and when I mention T2FD to anyone, there is a blank expression and silence.

Can you please either send me constructional details or, alternatively, publish details so that others may be equally enlightened? The constructional details should also include details of the 10:1 balun. With any luck, this aerial will take the place of my long wire into a magentic balun.

I. G. Bennett
Whitley Bay
Tyne & Wear

PS: I own a RA17L and find it a very easy receiver to operate, even though it takes up a lot of space and has valves.

Mike explains how to build a T2FD antenna in this month's 'Decode', see page 76 - KN

Dear Sir

I am a retired printer over in the USA who enjoyed the article in *Short Wave Magazine*, September issue, page 26, 'When I Win The Lottery'. I also wanted to tell you that it takes a lot of guts to name your equipment selections out in public.

While I just happen to think that you are right on target, I am aware of that 'hatchet wielding' group of fellow hobbyists out there in s.w.land who take every opportunity given to assault anyone who goes public with any equipment that's different from their own!

I'll bet you'll get your share of 'Hey, you're nuts Richards, you've gotten it all wrong' type of mail from our s.w. friends out there. Well, I'm not one of those, you've done a fine job.

I am new to decoding, having only an old Universal M-1000 decoder and for my PC an M-400 for my 'on top of my NRD-535 receiver' use. These two are okay for just a starter set, but I am like you - the Hoka Code30 is the way to go.

I am going to buy mine from our local USA franchisee, Computer Aided Technologies in my state of Louisiana. The owner, Jim Springer, has sold me a few other CAT computer programs (ScanCat Gold) and when Jim says "Hoka Code 30", I sure believe him. You put the icing on the cake.

As to a receiver, you have also helped me to go for the new AR7030, one third the price of my former choice, the WJ HF-1000. I have a friend who has a HF-1000 and he loves it. But as you aptly said, 'why the larger size?' I think that Watkins Johnson only stays with the case that the military, the main customers, prefers.

Pete, my friend, laughs and says that he can take the top off his WJ and store 12 cans of beer inside! I have read a lot of very positive reviews on the AR7030 and have the AR8000, a very good hand-held d.c. to daylight receiver.

On your antenna, also a wise choice, I wanted to point out that if you don't buy the $4000 WJ HF-1000 you can save enough money to buy the Hoka Code 30 and the RF Systems T2FD. I am a big fan of RF Systems and I have two of their MkIIs (66ft on 12m balun sloper antenna) one DX one. The only active antenna that I even found to work well - yet, as you say, not as good as plain old outdoor wire - but close!

I also have the RF Systems T2FD and the DX I listen to is on order. The RF Systems DX I listen to is a passive two-

position T2FD with an indoors control box that also has a m.w. attenuater and several attenuation settings. The downside of the RF Systems antennas is price. I think that Lowe is a UK dealer, you may want to at least get a copy of the spec sheet for all RF Systems antennas, including the T2FD and DX listeners.

Again, as you accurately spelled out, the T2FD is a very quiet design, basically it is a take off of a 'loop' antenna. For what it's worth, my RF Systems T2FD is a very well constructed and it does not take up a lot of space in the garden.

Well, that is all. Sorry to be so windy, I only really wanted to commend you for a fine articles and to make you aware of the already made RF Systems T2FD, but not to discourage you from home-brew.

Have a good day and keep up the good work.

John T. Wagner
Pickerington
Ohio

PS: *Short Wave Magazine* is a great magazine!

Dear Sir

After reading Mr Semmens letter (October edition) with regards to him not being able to listen to utility stations and etc., allow me to voice my opinion. I am quite new to short wave listening and purchased a Sangean AT803A radio second-hand from Multicomm 2000 (thank you for an excellent service) and a Howes CTU8 a.t.u. running a loft aerial of some 80m.

I spend most of my time listening to utility stations ranging from ATCs to marine with strange ones in between plus the odd station, which would be classed as a DX. Not having to work within a limited field, I would expect to be able to catch anything using his set-up. Irchester, Northants, is not the best place for radios, but its amazing what you can find with a little patience.

By the way, I caught Rocket Radio on Saturday from California (7125, 1200-1330UTC) and they also mentioned Miami Radio, which I listened to the same day, albeit for just 20 minutes SIO44 - but it was enough. It's not just 'you get what you pay for', it's also 'learning to get the most out of what you've got'.

I did enjoy reading about the Numbers Stations and the work that Enigma does. They now have a new subscriber, thanks to your magazine. Now I would like to say a big thank you to *SWM* for sending me the book ordered. It arrived within 48 hours of ordering. I will not hesitate in using your book service again.

Which brings me to a question: Listening on 4.742, UK RAF, Architect at 1610 the wording "TEMPO 2309" was repeated. What does this mean?

Martin Sykala
Irchester
Northants

Dear Mr Ganderton,

I write in response to K.J. Faulkners letter printed in the September 1996 issue of *Short Wave Magazine*, regarding the generation of interference with shortwave radio reception by a FAX machine. I would submit comments in two areas, first a clarification of what the BABT and FCC approvals actually represent and secondly some suggestions of remedial action which could be taken which might improve the situation.

BABT (The British Approvals Board for Telecommunication) has responsibility to ensure the maintenance of the quality of service available over the telephone systems provided by BT and the other Operators in the UK. They do concern themselves with Radio Interference (or EMC to use the more fashionable term), but only in as much as it may affect the telephone service. It has been several years since I was current with the BABT requirements, but at that stage they only laid down limitations of the level of r.f. energy sent by equipment connected to the telephone network back into that network. BABT approval provides no indication of the potential of equipment to interfere with radio receivers.

FCC registration is about radio interference. At least registration against *FCC Part 15* is. There is also *FCC Part 68* which deals with the same issues as BABT but in the USA. Any electronic processing equipment employing frequencies above 50kHz is required to be assessed for potential interference with radio receivers before being sold in the USA. With regard to the short wave frequencies the assessment is made by measuring the r.f. voltages introduces onto cables connected to the equipment on the (reasonable) basis that the cables are the only things long enough to act as effective radiators.

There are two classes of compliance. The less severe is Class 'A'. This requires no r.f. signals of more that about 5mV in any 9kHz bandwidth. Class 'B' has the tighter requirement of about 1mV. The derivation of these limits goes back to 'Protection Distances' - The hypothetical typical minimum likely distance between equipment causing interference and equipment being operated by a person other than the owner of the interfering source. The distance is 30m in the case of industrial and commercial equipment and 10m in the case of domestic equipment. FAX equipment is likely to have been treated as commercial equipment and quite possibly only complies with Class 'A'.

Until quite recently there were no similar generally applied regulations in the UK. This has changed since the implementation of the EEC EMC Directive. From the 1st January 1996 any electronic equipment being newly sold is required to display the CE mark. In most cases this represents (amongst a lot of other things) a manufacturer's declaration that the level of interference produced by the equipment conforms to regulations very similar the FCC ones.

An attempt to reduce the problem of interference should concentrate on the cables connected to the FAX machine. i.e. the power cable, the incoming phone line and the cable to an extension phone if one is present.

Can you run your Icom R71E off a battery? Try this first. If the problem goes away you can conclude that the r.f. energy from the FAX machine is travelling through the a.c. power wiring and you can concentrate on this for a cure. In this case the advice offered further down for treating the FAX machines power cable can be usefully applied to the a.c. power cabling to the radio as well.

Unplug both phone lines. If the interference only occurs when FAX transmission in is progress then it will probably be necessary to pull out the main phone line in the middle of a test transmission set up the required test condition. If the problem does not go away, don't discount the phone lines, but do start suspecting the power line.

Obtain some ferrite loops to wind the power cable and telephone cables around. You should be able to get these from one of the 'High Street' electronic components shops, if you are lucky enough to live near one, otherwise try the mail order electronic suppliers. You may well be able to get the type that have been cut in half allowing you to pass the cable over and around one half then put the other half back to complete the ring. Do make sure the two halves of the ring meet together firmly. These type are made specifically for this job and are a 'lossy' ferrite. If you can only produce the problem by having bath the power line and the phone line plugged in at the same time add ferrites to both at the same time first of all. If the situation improves then remove them one at a time to see if both are actually needed.

If the problem proves to be with the a.c. power line but the ferrites are not sufficient try using a mains EMC filter usually obtainable from electronic suppliers. **NB:** For safety as well as operational reasons these filters must be connected to an earthed power outlet. Fit one as close as possible to the point where the power goes into the FAX machine.

If the phone line is giving the problem try wrapping it in earthed aluminium foil. Unfortunately it is difficult to do much more than this without violating the BABT regulations yourself. In the USA r.f. filters to reduce the pick up of radio transmissions by telephones are available and these would help with the reverse problem that we have here. As far as I am aware there are no similar BABT approved devices.

Philip Williams C. Eng., MIEE, G4KIL

(Formerly EMC Engineer with BNR Europe Ltd., now Electronic Technologist with Ghana Institute of Linguistics, Literacy and Bible Translation).

Is there something you want to get off your chest? Do you have a problem fellow readers can solve? If so then drop a line to the Editor.
IF YOUR LETTER IS PUBLISHED YOU WILL RECEIVE A £5 VOUCHER TO SPEND ON ANY *SWM* SERVICE

SWM SERVICES

SUBSCRIPTIONS

Subscriptions are available at £25 per annum to UK addresses, £30 in Europe and £32 (Airsaver), £37 (Airmail) overseas. Subscription copies are despatched by accelerated Surface Post outside Europe. Airmail rates for overseas subscriptions can be quoted on request. Joint subscriptions to both *Short Wave Magazine* and *Practical Wireless* are available at £42 (UK) £47 (Europe) and £51 (rest of world).

Components for SWM Projects

In general all components used in constructing *SWM* projects are available from a variety of component suppliers. Where special, or difficult to obtain, components are specified, a supplier will be quoted in the article.

The printed circuit boards for *SWM* projects are available from the *SWM* PCB Service, Badger Boards, 80 Clarence Road, Erdington, Birmingham B23 6AR. Tel: (0956) 374918.

Photocopies and Back Issues

We have a selection of back issues, covering the past three years of SWM. If you are looking for an article or review, or whatever that you missed first time around, we can help. If we don't have the whole issue we can always supply a photocopy of the article. Back issues are **£2.60** each, photocopies are also **£2.60** per article, plus **£1.00** for subsequent parts of serial articles.

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

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

Credit card orders (Access, Mastercard, Eurocard or Visa) are also welcome by telephone to Broadstone (01202) 659930. An answering machine will accept your order out of office hours and during busy periods in the office. You can also FAX an order, giving full details to Poole (01202) 659950.

Technical Help

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

LOWE

Lowe Elec

There just simply isn't a

RCON - AVAILABLE NOW!

RCON is our new receiver control program designed to control many short wave receivers and scanners, offering enhanced control options and a wide range of memory management options.

Running under Windows 95 (or 3.1), RCON makes full use of Microsoft's easy to use operating system, making full use of icons, drop-down menus and tool bars and has an extensive on-line help built into the software, making it easy to use. Full facilities available will obviously depend on the receiver you are using but included are:

- Control of all receiver functions from the keyboard / mouse
- Direct tuning using spin wheels, up/down controls and direct entry from the keyboard
- Upload / download receiver memory banks
- Built-in Microsoft Access database engine allowing full SQL searches, allowing you to import, export, edit, create and delete your own databases
- Transmissions in English database included, courtesy World DX Club
- Airband database included, courtesy Photavia Press
- Access Klingenfuss Super Frequency List on CD-ROM
- Receiver can be tuned direct from any database
- On screen S-meter Spectrum display
- Off air record and playback sound files (needs SoundBlaster card)
- PlayList Function - up to 20 station times and frequencies can be pre-programmed for automatic listening

There's obviously a whole lot more which you can find out by asking for our datasheet or by downloading the manual from our Website!

Or you can just buy it! RCON only costs **£49.95 (plus £3.00 p&p)** which is great value for money compared with similar applications! RCON will set new standards in functionality and value for money!

Currently RCON will control the HF250, HF150 NRD535, R72E, R7100, AR3000A, AR8000, AR5000 and drivers for newer (and older!) receivers will be added according to demand.

BRISTOL OPEN DAY

Saturday 14th December, 1996

Come and help us celebrate our Bristol branch's 5th birthday

Once again, Tony and Dave at our Bristol branch are having their annual open day. This time it's our fifth and there will be lots of great special offers on the day, plus free snacks and drinks for the thirsty and hungry!

Also on hand will be representatives from ICOM, YAESU and KENWOOD ready to answer your questions on all their great new products.

You'll also be able to see demonstrations of RCON, our great new Windows based receiver control program, plus all other software including Modemaster and Airmaster.

We'll be able to give you the low-down on our complete range of scanners, receivers, antennas and other accessories, including the world famous JPS digital audio filters.

We've also got our usual free prize draw with some great prizes, plus the DX prize for the person travelling the farthest to the event and you can enter for this by just turning up!

79/81 Gloucester Road
Patchway, Bristol
Telephone 0117 931 5263
for more information

Head Office & Mail Order

Lowe Electronics Ltd

Chesterfield Road, Matlock,
Derbyshire, DE4 5LE
TEL 01629 580800 FAX 01629 580020
email info@lowe.co.uk
URL http://www.lowe.co.uk/

Need more info? We've got some great information packs available to help you choose the most suitable products for your needs. Packs include Short Wave Receivers & Accessories, Scanning Receivers & Accessories, Software Products and GPS Units.
To receive any of our info packs just send us four first class stamps for each one requested plus your name, address and telephone number and we'll do the rest

tronics Ltd

better Ham Radio Dealer

LOWE

AN AMAZINGLY TINY SELECTION OF OUR OTHER GOODIES...

LOWE HF150

HF150

Simply the best value-for-money short wave receiver in the world! Superb performance coupled with a wide range of facilities - don't let its simple appearance fool you - this one has performance that bites! We've a super range of add-ons to enhance operation. including computer control

HF150 - just £419.00

LOWE HF250

HF250

The HF250 goes from strength to strength. Why not join with the top DXers and pick one up now? Superb performance and great ergonomics combine with advanced features make the HF250 a real winner and it's probably the best way of spending £799.00 if you want a top class receiver today!

MVT7100EX

Whether you want to monitor airband, marine or ham radio frequencies the MVT7100EX is the one for you! As well as a complete range of memory control and scanning facilities, it also has excellent receive performance. Our best selling scanner...

Now just £299.00!

DATONG

AD370 active antenna	£79.95
AD270 active antenna	£59.95
FL3 audio filter	£149.95

RF SYSTEMS

MLB	£45.00
MLB ISOLATOR	£45.00
MLBAMK1	£65.00
MLBAMK2	£75.00
SP1 splitter	£65.00
SP2S splitter	£125.00
SP3 splitter	£69.95
MTA	£175.00
GMDSS1	£175.00
DX10 active antenna	£175.00
DX7G	£215.00
DX1PRO	£375.00

JPS COMMUNICATIONS

ANC4	£189.95
NTR1	£199.95
NRF7	£249.00
NIR10	£299.00
NIR12	£399.00

SCANNER BITS

QS200 mount	£10.00
WEP300 earhanger	£10.00
Airband antenna	£10.00
Telescopic antenna	£10.00
WSC1 Universal case	£19.95

SOFTWARE

AIRMASTER 3	£89.95
Upgrade V2 to V3	£29.95
MODEMASTER 2	£139.95
SYNOP	£149.95
Klingenfuss CD-ROM	£24.95

GARMIN

NEW!! Garmin GPS45XL

Now with new firmware giving - Maidenhead locator squares - surely the best GPS in the world for amateur radio use

GPS45XL NOW just £259.00

Check out Garmin's entry level model, the GPS38 at just £199.00

BOOKS

UK Scan Dir 5th ed	£18.50
Understanding ACARS	£9.95
Passport 1996	£14.95
AIRWAVES 96	£8.95
CALLSIGN 96	£8.95
Complete SWL h'dbk	£16.95
Scanning Secrets	£16.95
Weather Radio	£14.95
Pooley's Flight Guide	£7.00

FAST MAIL ORDER

Most items despatched same day for next working day delivery. (Courier delivery charge is just £10.00 on main items)
We also export to any where in the world and you can order by phone, post, fax and e-mail

SO MANY WAYS TO PAY

Cash, cheque, Mastercard, Visa (No surcharges by the way!) and Switch and Delta cards. As a licensed credit broker, we also offer a range of credit schemes, including our BUY NOW PAY LATER SCHEME

QUALITY SERVICE

Service isn't something you can just pull out of a hat when things go wrong. Service means making a long term commitment to customer care and you won't find a more committed team in the country than Lowe Electronics

COMPLETE PRODUCT RANGE

We've got the lot! Cable, Connectors, antennas. SWR/PWR meters, wave meters, mobile antennas and mounts, rotators plus books and maps and a full range of accessories for all main items. Everything from HF to UHF. Voice and data under one roof!

There's a Lowe Branch near you, crammed full of goodies!

Avon - 0117 931 5263 — **79 Gloucester Road, Patchway, Bristol BS12 5QJ**
East Anglia - 01223 311230 — **152 High Street, Chesterton, Cambridge, CB4 1NL**
North East - 0191 214 5424 — **Unit 18B Airport Industrial Estate, Newcastle, NE3 2EF**
Yorkshire - 0113 232 8400 — **12 Station Road, Crossgates, Leed, LS15 7JX**
South East - 01444 400786 — **High Street, Handcross, West Sussex, RH17 6BW**
South West - 01752 257224 — **117 Beaumont Road, St Judes, Plymouth PL4 9EF**

60 Years of BBC Television - Part 1

The world's first regular public high-definition television service began sixty years ago on 2 November 1936 from the BBC Television Studios at Alexandra Palace. In this two part article, Keith Hamer and Garry Smith take a look at the technical achievements of BBC-TV engineers over the past sixty years. They also include some extremely rare examples of BBC-TV test cards and graphics used over the years, which should jog the memories of many SWM readers!

Before we cover the history of BBC Television it is worth discussing the development of BBC Radio, which began seventy-four years ago. In 1922, the BBC was one of the first organisations to start regular public service broadcasting. Ten years later, short-wave broadcasting to listeners throughout the British Empire began.

BBC Radio

At the beginning of World War II, large numbers of trained BBC staff were absorbed by the Armed Forces. The broadcasting service at home was restricted in coverage, by peace-time standards, because of the limitations imposed in the interests of national security. Much of the BBC's efforts were devoted to improving the coverage during enemy air attacks. Sixty low-power transmitting stations were constructed in the largest cities throughout the country; some 150 war-time studios were built and equipped, and to meet the very great expansion of the BBC Overseas and European Services, three major short-wave stations were constructed to supplement the coverage of the pre-war Daventry station which was itself greatly expanded. In 1939, the BBC had twenty-four transmitters in operation with a total power of 1.2MW. At the end of the War, the number had been increased to 121 transmitters with a total power of some 6.24MW.

By August 1961, plans were already in progress to create a considerable number of local sound broadcasting stations, a second television programme and the introduction of colour television. At that time, the BBC were looking forward to inter-continental 'live' television exchanges, perhaps in colour, using radio links made possible by satellites or special cables laid under the Atlantic and Pacific Oceans. In 1961, the BBC requested permission from the government to make a modest start with colour but were refused because "major innovations in television and sound broadcasting should not be permitted until the Pilkington Committee had reported". Despite this, BBC engineers decided to give the public the opportunity to see for themselves what colour television looked like by arranging a demonstration to be included in the BBC exhibit at the 1961 National Radio Show at Earls Court.

Crowded Radio Spectrum

After the War, one of the biggest problems which the BBC had to face was the over-crowding of the long-wave and medium-wave bands caused by the great increase in the number and power of broadcasting stations all over Europe, which had taken place during the preceding five years. A series of international wavelength plans had been produced from time to time to regulate the use of available channels in these bands. None of the plans were entirely successful because there were far too many stations for the wavelength space available.

BBC stations were operated in these wave-bands in accordance with the Copenhagen Plan of 1948, which was put into effect in 1950. This Plan was itself only a compromise, and the number of broadcasting stations in Europe had almost doubled by 1961. As a consequence, in the Sixties there were large areas in the United Kingdom where foreign stations caused serious interference with reception of BBC programmes, particularly during the winter evenings. Careful planning was, therefore, necessary to provide the best possible service in these circumstances. Between 1951 and 1954, twelve additional low-power transmitting stations were constructed for the BBC Home Service. This involved determining the areas in which they were most needed, finding, testing and selecting the actual sites, obtaining all the necessary approvals and installing buildings, plant, masts and antennas.

VHF Radio

Because of the serious interference caused to BBC programmes by foreign stations, and the fact that it was impractical to build any more medium-wave stations (because there were no suitable wavelengths available on which to operate them), consideration was given to the introduction of a new system of broadcasting which used very short wavelengths (that is to say, very high frequencies, or v.h.f.) which were not normally subject to interference from distant stations. Before such a radical step was taken, it was necessary to carry out a very extensive series of experimental transmissions, first with low-power equipment and later on a larger scale using a purpose-built high-power transmitting station located at Wrotham in Kent. A report on the proposed new service was produced by the Television Advisory Committee in 1954. The Committee was set up by the Postmaster-General to advise him on the development of television and sound broadcasting on frequencies above 30Mc/s (or 30MHz in today's terminology).

The BBC was subsequently given permission by the government to proceed with its development. The BBC's faith in this system and the bold step taken to build the high-power station at Wrotham were fully justified. By 1961 there were twenty v.h.f. transmitters in operation and the service was available to some 97% of the population. Further approval from the government was sought in order to install a further twenty-one low-power relay stations for which a special design of equipment had been evolved by BBC engineers for unattended operation.

BBC External Services

In addition to the broadcasting services for listeners in this country, the BBC also operates the External Services for listeners in Europe and in more distant

parts of the world. In the early 'Sixties, there was a battery of short wave transmitters, thirty-seven of which were installed at four sites in the United Kingdom (Daventry, Rampisham, Skelton and Woofferton) and two at Tebrau, near Singapore. The Tebrau installation and the studios in Singapore associated with it were built under the guidance of the BBC engineers in 1951 for the British Far Eastern Broadcasting Service, which was taken over by the BBC in 1948. The BBC has always done a great deal of work on the design of directional short wave transmitting antennas with the object of providing listeners with the strongest signals and the minimum fading. Short wave propagation conditions are constantly changing from day-time to night-time and from season to season as well as over the eleven-year sunspot cycle. In the short wave bands there is overcrowding too and, until recently, the extra problem of deliberate jamming of certain transmissions by the now defunct 'Iron Curtain' countries.

Audio Recording Techniques

Sound recording equipment has always played an important part in the system. By the early Sixties, some 50% of all BBC programmes were recorded. The technical standard of the recordings had to approach, as closely as possible, that of 'live' programmes.

About 80% of recorded programmes were on magnetic tape and, although the recording machines were commercial products, the design of the recording rooms and ancillary items of equipment was done by the BBC.

The disc recording machines were of BBC design and the same applied to the reproducing desks.

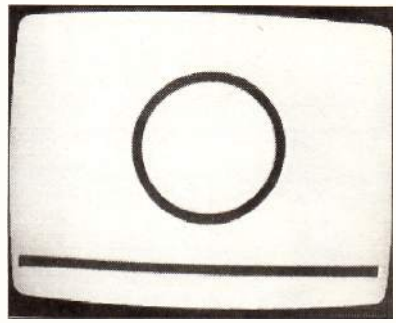
The use of disc recording by the BBC decreased rapidly by about 1961 but there were, of course, many programmes in which commercial gramophone records were played.

Television - The Early Days

Experimental television transmissions by the BBC began in 1929 when facilities were granted to Baird Television Limited to transmit programmes originating in their studios in Long Acre through the London Station transmitter in Oxford Street. These transmissions, which were subsequently referred to as 'low-definition', employed 30 scanning lines, and 12.5 frames were transmitted per second. Vision only was transmitted, but in 1930 the transmissions were continued from the then new London Regional Station at Brookmans Park with the addition of sound. These 30-line transmissions were considered to be of sufficient technical interest for the BBC to equip a studio in Broadcasting House with Baird apparatus, and this was put into use in 1932.

At this time the development of improved standards of definition was proceeding rapidly. Baird Television Limited and A.C. Cossor Limited were experimenting with systems using 120 and 180 lines, the latter firm concentrating on a method known as 'velocity modulation'. Electric and Musical Industries Limited (EMI) and Scophony Limited also had systems which were well advanced.

The question arose as to whether a public service of 'high-definition' television was possible using very high frequencies (v.h.f.) in order to accommodate the large bandwidth necessary for the transmission of such systems. In May 1934, the Postmaster-General appointed a committee under the chairmanship of Lord Selsdon to report on the relative merits of the various systems and on the conditions under which a public service might be provided.



One of the earliest test charts to be radiated by the BBC. This check for correct picture ratio was transmitted in 1934 using Baird's 30-line system - some two years before the start of high-definition television.

The main recommendations of the Committee, whose report was issued in January 1935, were:-

1. That a high-definition public service should be established at an early date and that v.h.f. transmission should be used.
2. That the BBC should be responsible for television as they were already for sound broadcasting.
3. That a standing Advisory Committee approved by the Postmaster-General should be formed.
4. That the first station should be in London and that the makers of the two selected systems, Baird and Marconi-EMI, should each supply their own apparatus for alternative operation.
5. That the cost should be borne by the revenue obtained from the existing ten-shilling licence fee.

A BBC Tuning Signal radiated in 1937. It was transmitted several minutes before the start of programmes to give the valved receivers time to 'warm up'!

This BBC Tuning Signal was introduced on July 24th, 1949 and was the first to incorporate a clock. It was radiated for five minutes before each programme.

The Advisory Committee recommended that the studios and transmitters should be at Alexandra Palace and that Baird Television Limited, and the Marconi-EMI Television Company Limited, should be invited to tender for the supply of apparatus for their respective systems. Transmissions on wavelengths of approximately 6.7m for vision and 7.2m for sound (or 45.0 and 41.5MHz) were to be used, and the standards of picture transmission proposed by the two companies were accepted, namely:

a) Baird System: 240 lines, 25 pictures per second, sequential scanning.
b) Marconi-EMI System: 405 lines, 25 pictures per second with interlaced scanning

18 ▶

HAYDON COMMUNICATIONS

ACCESSORIES

EP-300
Deluxe over the ear earpiece.
£9.95 + FREE POSTAGE

MA-339
Mobile holder for handhelds
£9.99

QS-200.....Air vent holder.....**£9.99**
QS-300.....Desk stand.....**£19.95**
P&P £2 on all mounts

SCANMASTER SP-55
Boost reception of your scanner with this pre-amp. 25-1500MHz, variable gain, band pass filters.
RRP **£69.95** P&P £3.50

ANTENNAS

NEW **AIR-44'N'** NEW

AIR-44'N' Prof. quality airband antenna (Base - Civil & Military Air). Thanks to the huge success of the Air-33 we have now produced a slighter higher gain version with a low-loss N-type fitting (1.7m long). (Gain 6.6/9.65dBi).
£69.95 P&P £8

AIR-33.....1m long (3/6dB).....**£44.95** P&P£4

DB-770H

Telescopic antenna with wideband RX 25 – 1300MHz
RRP **£24.95** P & P £1

TSC-2602

Flexible Wideband Antenna 25 – 1300MHz 14" Long. Superb for scanners. **£22.95** P&P £1

NEW DB-32
A miniature wideband antenna. Receives 30 - 1200MHz. BNC fitting only 1.5" long. It's superb (for its size).
RRP **£29.95** P & P £1

TSA-6671
New ultra small BNC magmount. Amazing. Allows you to use any existing BNC antenna from your scanner to transceiver on your car without having to purchase a car antenna. (Supplied with 3m miniature coax + BNC fitted).
Our price **£22.95** P&P £1

NEW NEW NEW NEW NEW NEW NEW NEW NEW NEW NEW NEW

NISSEI HS-8000
Miniature wideband scanning antenna covers 25MHz-2.8GHz. Includes 5m coax + BNC fitted. (4" long)
RRP **£24.95** P&P£1

NEW NEW NEW NEW NEW NEW NEW NEW NEW NEW NEW NEW

OPTOELECTRONICS

NEW OPTO SCOUT 3.1-Mk2
Latest mini frequency finder from Optoelectronics. It will capture and memorise up to 400 frequencies that can be recalled directly into the AR-8000. Supplied with ant, nicads and fast charger. This month we are giving away a free case worth £16.
RRP **£399**

BUY THE **AR-8000 + OPTO SCOUT** TOGETHER INCLUDING MODIFICATION & CONNECTING CABLE. RRP £848.
SPECIAL OFFER £719

NEW OPTO CUB
The Cub is ideal for communication, surveillance and recreational monitoring applications. From 10MHz-2.8GHz. The Cub has maximised sensitivity for detecting RF in the near field and displaying the frequency detected. The cub features a digital filter that reduces false counts and random noise, digital auto capture that acts like an intelligent hold button allowing any frequency captured to remain displayed as long as needed. RRP **£139**

New Optolinx.....OUR PRICE **£129.95**
Opto-Xplorer.....OUR PRICE **£899.95**

NEW 5th EDITION UK SCAN DIRECTORY
Place your order now!
Over 42,000 spot frequencies in over 540 pages! This directory has become "The UK standard". ***ORDER YOURS NOW.***
£18.50 P&P FREE

SCANNING RECEIVERS

ICOM IC-R8500
The ultimate all mode base receiver. 100kHz-2GHz. Part-ex your old receiver and move into the 21st century. RRP £1695. OUR PRICE **£1549**
Interest free credit available. Send us four post-dated cheques for £389 (incls. P&P UK mainland).

ICOM IC-R7100AC

Professional quality wideband scanning receiver. Covers 25MHz-2GHz.
ONE ONLY **£999.95**

HANDHELD SCANNERS

YUPITERU MVT-7100EX
100kHz-1650MHz. Wideband scanner with SSB. RRP ~~£349.95~~
OUR PRICE **£269.95**

AOR AR-8000

The ultimate h/held scanner covers everything from 500kHz-1900MHz without gaps. All mode AM, NFM, WFM, USB, LSB + CW. RRP £410.
OUR PRICE **£359.00**
+ free DB-32 antenna worth £30

Case for 8000/2700.....**£17.95**
AR-5000.....Comms receiver.....**£1599.00**
BC-220XLT.....*Special offer*.....**£159.95**

POLICE STYLE HOLSTER HHC-2

Matches all handhelds can be worn on the belt or attached to the quick release body holster.
£19.95 P&P £1

★★★★★★★★ **STAR BUY** ★★★★★★★★

REALISTIC PRO-25

Listen to aircraft, ham, marine, public services and much more.
RRP ~~£169.95~~
OUR PRICE **£119.95**

★★★★★★★★★★★★★★★★★★★★★★★★★★★★

LONDON SHOWROOM & MAIL ORDER:- 0181-951 5781/2 FAX:- 0181-951 5782

Address:- 132 High St. Edgware, Middx HA8 7EL
Open Mon-Fri 9.30-5.30pm Sat 9.30-4pm. Close to Edgware underground station (Northern line) close to M1, M25, A406.
WEST MIDLANDS BRANCH:- Tel: 01384 481681
Unit 1, Canal View Industrial Estate, Brettel Lane, Brierley Hill, W Mids DY5 3LO

SIMPLY THE BEST!

PORTABLE SW RECEIVERS

SANGEAN ATS-818

Award winning portable SW receiver. (All mode 0-30MHz).

NEW

RRP ~~£169.95~~

OUR PRICE **£139.95**

SONY SW-100E

Award winning miniature SW receiver. **RRP £219.95**

OUR PRICE **£199.95**

SW-55	RRP £299	OUR PRICE £259.95
ICF-7600G	RRP £199	OUR PRICE £169.95

Sony SW-77

This is the best SW portable receiver on the market.

RRP ~~£399~~.

OUR PRICE **£359.95**

SW-100T.....Now in stock.....OUR PRICE £379.95

POWER SUPPLIES

PORTABLE 12V POWER STATION

Will deliver 50 amps peak. Charges from AC mains or trickle charge from car cigar lighter using lead supplied. Has 12AH sealed cell and dramatically reduces HF car electronics noise. RRP ~~£54.95~~.

OUR PRICE **£46.95**

NEXT DAY DELIVERY £8.00

BE-166

★ 1200MA regulated PSU ★ Variable volts ★ Short circuit protection ★ Automatic thermal & overload cutoff.

RRP **£19.99** P&P £4.50

COMMUNICATION RECEIVERS

AOR AR-7030

Brilliant new all mode short wave receiver with synchronous AM + remote control. RRP ~~£799~~.

OUR PRICE **£729.95**

NEW DX-394

General coverage receiver. Frequency coverage:- LW 150-509.9kHz, MW 510-1739kHz, SW 1.73-29.999MHz.

SPECIAL OFFER **£249.95**

YAESU FRG-100

UK's best selling SW receiver. RRP ~~£599~~

OUR PRICE **£449.00**

DRAKE R-8E

A fine example of a thoroughbred short wave receiver

ONE ONLY **£749.95**

WARNING!!

Not all advertisers in this magazine are authorised stockists for the products they sell. Manufacturers advise customers to purchase from authorised dealers to ensure full company guarantee back-up. Haydon Communications sell only brand new factory sealed stock direct from the manufacturers and are authorised for all its brands.

ACCESSORIES

NEW HOWES CT-U9

500kHz-30MHz ATU with built in balun. Ready built **£69.00** P&P £5

CTU-8 Our price .....**£49.00** P&P £5

AT-2000 ATU with Q selector.....**£99** P&P £5

NEW SP-1 SPYWIRE

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

SP-350V

Be protected this summer! In-line lightning surge protector.

INTRO PRICE **£19.99** P&P £1

COMPACT SW ANTENNAS

VECTRONICS AT-100

This is a superb self contained antenna system for inside the house/flat. (built in preselector).

RRP **£79.95** P&P £4

AN-1 active antenna system .....**£64.95** P&P £6

Sony AN-100 active antenna.....**£49.95** P&P £5

AN-71 pull out S.W. antenna .....**£9.99** P&P £1

DIGITAL AUDIO FILTERS

TIMEWAVE

DSP-9+	RRP ~~£239~~	OUR PRICE **£199.95**
DSP-59+	RRP ~~£299~~	OUR PRICE **£269.95**
DSP-599 +	**NOW IN STOCK**	OUR PRICE **£349.95**
MFJ-784B	RRP ~~£259~~	OUR PRICE **£239.95**

SECONDHAND & EX DEMO BOARD

KENWOOD R-5000

+ VHF converter as new

£799.95

R-2000	With VHF converter	£399.95
R-1000	Communication receiver	£269.95
HF-225	As new	£349.95
HF-150	As new	£299.95
Drake R-8E	As new	£749.95
NRD-525	+ RS-232 card	£699.95
FRG-7700	Comms receiver	£299.95
FRT-7700	SW ATU	£59.95
AT-1000	SW ATU	£69.95
FL-3	Audio filter	£99.95
FRG-100	Ex-demo	£399.95

ICOM IC-R7000

Wideband scanning receiver

£749.95

IC-R7100	As new	£999.95
MVT-8000	As new	£299.95
PRO-2036	Desktop scanner	£199.95
PRO-2032	AS new	£169.95
PRO-2021	Desktop scanner	£149.95
SR-001	Remote control scanner	£199.95
AR-2500	Wideband scanner (all mode)	£349.95
AX-7000	As new	£349.95
FRG-9600	VGC	£329.95
PRO-2006	As new	£199.95
AR-3000A	VGC	£699.95

AOR AR-8000

Excellent condition.

£299.95

SW-55	Excellent condition	£229.95
SW-77	As new	£299.95
SW-100E	As new	£149.95
SW-7600	VGC	£139.95
PRO-80	As new	£199.95
IC-R1	Miniature scanner	£269.95
AR-1000	As new	£179.95
AR-2000	As new	£199.95
PRO-43	As new	£169.95
MVT-7000	VGC	£199.95
MVT-7100	As new	£249.95

giving 50 fields per second.

A v.h.f. sound transmitter manufactured by Marconi's Wireless Telegraph Company Limited, was provided by the BBC for use with either system.

Experimental public transmissions by both systems were radiated from Alexandra Palace during the Radio Exhibition at Olympia in August 1936, after which the transmissions were discontinued until October when a series of trial programmes was radiated for two hours daily.

The Alexandra Palace Station was formally opened on November 2nd 1936 by the Postmaster General and a public service for two hours daily came into being. The two transmission systems were used during alternate weeks.

The Baird Systems

It is worth mentioning here how Baird's studios operated. In fact, two were provided at Alexandra Palace whereas Marconi-EMI were allocated only one. In Baird's main studio (measuring 70ft long, 30ft wide and 23ft high) separate methods of producing television programmes were available - the 'Intermediate Film Process' and the Baird 'Electron' camera system.

The Intermediate Film Process used a 17.5mm film taken in the studio which was continuously passed, in turn, through a developing tank, a washing tank, a fixing tank, and a second washing tank. The complete process took 65 seconds. The negative film was immediately scanned while still wet by a disc which rotated at 6000r.p.m.

Illumination was obtained from a 30A arc lamp. The light from the scanning disc passed on to a photo-cell which incorporated an electron multiplier. The vision current from this device was passed to a valve amplification chain from which it was sent to the Baird control room. The recorded sound was taken off the film via a pick-up head and was passed to the control room. The Intermediate Film Process equipment was housed in a room adjacent to the main studio and had a glass window through which the camera filmed all the action.

'Electron' Camera

The second system at Baird's disposal was the 'Electron' camera located in a special sub-control room. The system could be used for programmes such as lectures or the broadcasting of cartoon films. The set-up was designed to use the spot-light system in which the studio was kept mainly in darkness except for a scanning beam of light projected on to the artist. The reflected light was detected by photo-cells. In the adjoining projection room, a large disc rotating at 6000r.p.m. and illuminated by a 150A arc, generated the scanning beam which was admitted into the small studio via a window. The studio was equipped with four photo-cells which used multipliers from which the generated signals passed through a chain of amplifiers *en route* to the control room.

The sound was picked up by a single microphone. Engineers in the control room could fade between signals produced by both the Intermediate Film Process and the Electron camera system. Apparently, all the artists hated the prospect of appearing in front of Baird's scanning system and found all sorts of excuses to put off turning up at the studio until the following week when the Marconi-E.M.I. 405-line system was in use!

Single Set Of Standards

On February 5th 1937, the Postmaster General announced that, as a result of the experience gained with the transmissions from Alexandra Palace, the Television Advisory Committee recommended that a single set of standards should be adopted for transmissions from the Alexandra Palace Station. The standards were as follows:

Number of lines per picture: 405 interlaced.
Number of fields per second: 50.
Ratio of peak white picture to synchronising pulse amplitude: 70:30.

Accordingly, from February 6th 1937, the Marconi-EMI system alone was used at Alexandra Palace with positive modulation of the vision signal. Both sound and vision transmissions were amplitude modulated and vertically polarised. It is interesting to note that the basis of this system was suggested as long ago as 1908 by A.A. Campbell-Swinton who put forward in a letter to *Nature* an idea for the use of cathode-ray tubes at both transmitter and receiver. He greatly amplified this idea in a presidential address to the Röntgen Society in 1911, envisaging a special type of c.r.t. at the transmitter, which was the forerunner of the cameras used later.

Credit for the development of this system should also be given to a team of EMI research workers led by Mr. Isaac Shoenberg for translating Campbell-Swinton's theory into a workable television system. That team included such men as A.D. Blumlein and C.O. Browne, who both lost their lives in an accident during the War, and Dr. McGee who later became a professor at the Imperial College of Science and Technology in London.

Alexandra Palace

When the Service started there was a single transmitting station at Alexandra Palace in North London. The transmitter developed a peak white output of approximately 17kW and was of the high-power modulated type. Separate antennas were used for the vision and sound transmitters, each having a gain of 3dB. The power of the sound transmitter was 3kW.

Two studios only were available, situated at Alexandra Palace in the same building as the transmitters. Each studio measured 70ft long by 30ft wide by 23ft high (21 x 9 x 7m) and was equipped with three cameras of the Emitron (Iconoscope) type. About 100kW of lighting was available in each studio, part a.c. and part d.c.

Equipment was provided at Alexandra Palace for televising standard cinema films, such as newsreels, cartoons, and other features, and 'outside shots' for incorporation into studio programmes. The equipment consisted of continuous-motion Mechau film projectors throwing an image directly onto the photo-sensitive mosaic of an Emitron camera.

Outside Broadcasts

It was realised from the outset that outside broadcasts would contribute a great deal to the television programmes. At first, such broadcasts were limited to the precincts of Alexandra Palace because the greatest length of camera cable that could be used was approximately 1000 ft. (305m). However, early in 1937 the Post Office installed a balanced-pair cable vision circuit between Alexandra Palace and central London. It was by this means that the first outside broadcast to be undertaken at a distance

from Alexandra Palace was carried. This was the Coronation Procession of HM King George VI in May 1937.

To enable outside broadcast programmes to be televised from places further afield, the BBC purchased two mobile transmitters (operating in Band I with a vision transmitter output of 1kW), which had a range of some twenty miles and could be used to convey the vision signals to Alexandra Palace for transmission in the normal way. Two mobile control rooms containing equipment for the control of three cameras were also obtained. Regular programmes were transmitted for about two hours each evening and one and a half hours each afternoon up to the outbreak of War in September 1939 when the Television Service was abruptly closed down for reasons of national defence.

Transmission Standards

To say that television is a much more complex business than sound broadcasting is an understatement with which no-one will disagree. One complication unique to television is that both the vision and sound signals must be transmitted in accordance with a pre-determined set of standards. These standards specify, among other things, the number of lines into which the picture is divided, the number of pictures transmitted each second, and the method of transmitting the sound. A television receiver made for one set of standards only will not work on another and unfortunately there are different sets of standards in use in different parts of the world.

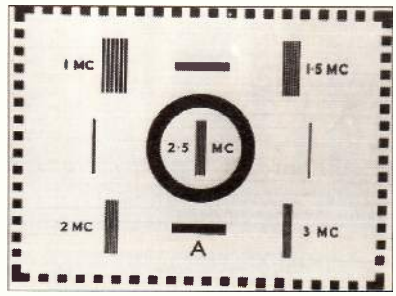
Even with the advent of satellite television, different standards have been adopted such as PAL, B-MAC, D-MAC, D2-MAC and PALplus. With respect to normal terrestrial broadcasts in the Fifties and the early Sixties, the standards were often referred to merely by the number of lines in the picture (405 lines in the UK, 625 lines in most of Europe, 819 lines in France and Monaco, and 525 lines in North America and Japan).

In Britain, the world pioneer of high-definition television, a 405-line standard was adopted in 1936. In September 1943, the government appointed a Committee, under the Chairmanship of Lord Hankey, to prepare plans for the reinstatement of the television service following the War. The Committee recommended that the service should be resumed on the same 405-line standard that was in operation before the War, and that television should be extended as soon as possible to the most populous provincial centres on the same basis. At that time, no alternative system capable of giving appreciably higher definition had been developed in any European country and it was recognised that a long period of research and development would be needed before any such system became available for a public service.

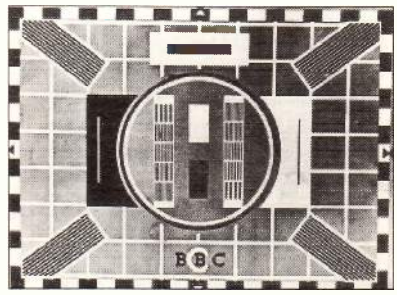
Recommendations

In 1945, the government accepted the recommendations of Lord Hankey's Television Committee that the television service should re-open with the same standards. It should be remembered that at that time the 625-line standard, since widely adopted in Europe, had not been put forward. In 1948 the government announced that the 405-line standard would also be used for further stations.

Once this fundamental question had been decided it was possible to begin the long process of getting the studios and transmitters at Alexandra Palace into working order again. Most of the apparatus had been stored during the War and some had been used for other purposes so that nothing less than a detailed overhaul and the testing of almost every component in the system was required. The task was completed by the appointed time on June 7th 1946, when the BBC Television Service was re-opened. The next day, an outside broadcast of the Victory Parade from The Mall was successfully accomplished and the foundations of the post-war Service were laid.



Test Card 'A' was radiated by the BBC in the late 'Forties. It was the world's first television test card to be transmitted.



The famous BBC Test Card 'C' was introduced in January 1948 and continued to give faithful service until the early 'Seventies. Test Card 'C' was also used by many television services throughout the world.

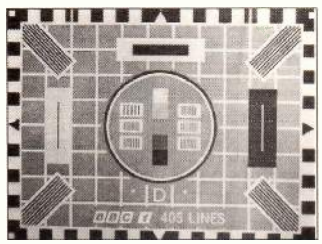
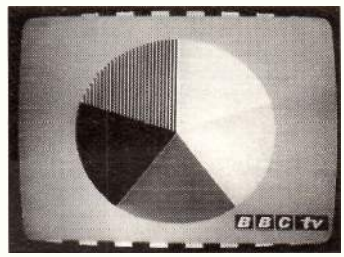


Fig. 7: The BBC-1 Test Card 'D' was introduced on April 20th, 1964 to mark the start of BBC-2 on u.h.f. 625-lines.



The 'Pie Chart' Tuning Signal, used thousands of times during the early Sixties to introduce every BBC Schools programme. The two-minute sequence was accompanied by some specially composed music played on the flute and cello.

Fig. 8: The familiar BBC-1 on-screen Globe Symbol with special identification to celebrate 60 years of BBC broadcasting, which began in 1922.

In part 2 Keith and Gary will continue the story.

NEVADA SHORTWAVE & SCANNING SPECIALISTS

THIS MONTHS used Equipment SELECTION

RECEIVERS

DRAKE R8A	PERFECT - ALL FILTERS FITTED	£875
DRAKE R8E	GOOD COND - BOXED	£750
ICOM R-70	TOP CLASS RESULTS, G COND	£299
ICOM R-72E	NARROW FILTER, FM	£725
ICOM R-1	POCKET SIZED W COV + EXTRAS	£245
LOWE HF-150M	MARINE VERSION	£345
LOWE HF-225	TOP CLASS PERFORMANCE	£379
ROBERTS R-818	CASSETTE RECORDER BUILT-IN	£159
KENWOOD R-2000	NICE TO OPERATE - FROM	£299
KENWOOD R-5000	2 NICE ONES	£699
SONY SW-1	C/W CASE & ACCS	£129
YAESU-FRG-7	WORKS WELL - CHOICE FROM	£159
YAESU-FRG-7700	ALL MODE COVERAGE	£299
YAESU-FRG-8800	NEAT CONTROLS	£325

LATE ARRIVALS

AOR-AR3030	VERY GOOD CONDITION	£479
AOR-AR3000	WIDE COV RX, ALL MODE BASE	£575

SCANNERS

ALINCO DJ-X1	G COV, GOOD COND - BOXED	£275
AOR 800E	H/HELD	£125
AOR 2002	BASE	£185
BEARCAT 8C350A	BASE	£99
BEARCAT 200XLT	200 MEMS, UP TO 900MHZ	£135
BEARCAT 50XLT	10 CH VHF/UHF - BOXED	£79
BEARCAT 65XLT	10 CH VHF/UHF	£85
BEARCAT 700A	MOBILE/BASE, G COND	£120
BLACK JAGUAR III	16 CH+SWITCHABLE AM/FM	£130
FAIRMATE HP100	H/HELD - BOXED	£165
NETSET PRO-2032	BASE + G COVERAGE, BOXED	£175
REALISTIC PRO-26	H/HELD	£175
REALISTIC PRO-35	NICE H/HELD, GOOD STARTER	£99
REALISTIC PRO-39	H/HELD, G COND, BOXED	£139
REALISTIC PRO-43	H/HELD	£145
REALISTIC PRO-50	20 CH HANDIE, VHF/UHF	£79
REALISTIC PRO-2024	BASE, G COND	£110
REALISTIC PRO-2004	BASE, WORKS WELL	£159
SKYVOICE	AIRBAND RX AM - EX-DEMO	£89
YUPITERU VT-125	AIRBAND, CLEAN EXAMPLE	£99
YUPITERU VT-225	AIRBAND HANDIE	£175
YUPITERU MVT-7000	WIDE COV. HANDIE, BOXED	£179

Other p/x bargains in stock from only £50 - phone now for details 01705 662145

On The Internet?

E Mail Us at:-
info@nevada.co.uk

Visit our Website
http://www.nevada.co.uk

DRAE Products

DRAE Wire Antennas

Drae wire antennas use the very best quality components and "Flex Weave" wire with 168 strands of 36 gauge solid copper woven to give high strength and flexibility. This wire won't kink, unfold or rust. Drae antennas are guaranteed to give years of outstanding performance

G5RV	Full size	(80 - 10 mtrs)	£45.00
G5RV	Half size	(40 - 10 mtrs)	£35.00
GW40	Windom	(40 - 10 mtrs)	£55.00
GW80	Windom	(80 - 10 mtrs)	£65.00
EFW	End Fed Wire	(s/waves)	£59.95
DLB	Long Wire Balun		£39.95
Flex Weave Wire			60p per metre

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

G5RV Plus	Full size	(80 - 10 mtrs)	£75
G5RV Plus	Half size	(40 - 10 mtrs)	£65

EFW - Shortwave Antenna

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

Price £59.95

DLB - Shortwave Balun

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

Price £39.95

35ft Telescopic Mast

- Military Standard

- Seven sections 65mm bottom section - 20mm top section
- Base plate
- 3 guys & ground stays
- Spring loaded locking pins
- Weight 9.9kg

Price ..... £169.95 + p&p £10

PSU 101 Stand/Charger

A combined desk stand and PSU/Charger for handheld scanners, Opto counters, Scout, Cub and 3300.

Price £34.95

Accessories

YAESU Rotators

G250	200kg	Light Duty	£149
G450XL	550kg	Medium Duty	£289
G650XL	700kg	Medium Duty	£399
G5050	Stay bearing		£29
G1000SDX	1100kg	Heavy Duty	£499
G5400	AZ-El	Light Duty	£569
G5600	AZ-El	Medium Duty	£669

VHF Antenna Rotator

AR303	lightweight rotatator	£49.95
AR201	light support bearing	£19.95

Antenna Switches

2 Way

CX201 PL	(0 - 1 GHz) 2.5KW	£18.50
CX201 N	(0 - 1 GHz) 2.5KW	£19.95

4 Way

CX401 PL	(0 - 1 GHz) 2.5KW	£37.50
CX401 N	(0 - 1 GHz) 2.5 KW	£39.95
V4 PL	(0 - 50 MHz) 500 Watts	£11.95

Remote Masthead Switch

CAS-A2 - Only 0.19dB insertion loss @ 1 GHz this switch requires 12V DC and handles 300 Watts. £49.95

JAPANESE Low Loss Coax

Double screened foam polyethylene insulation, good to 3GHz - this is the cable to use to cut those losses! For HF try our 5D - FB or 8D - FB.

5D-FB - 8.1mm dia. 0.062 dB/mtr @ 144 MHz 3KW RF @ HF	£0.85/mtr
10D-FB - 13.1mm dia. 0.031 dB/mtr @ 144 MHz 6KW RF	£2.75/mtr

Magnetic Loop Antennas

Our Drae magnetic loops use high quality semi rigid 13mm Japonese Ultra Low Loss coble for the radiating element, making loft mounting & portable operation possible. Packs easily awoy into the car boot. Fibreglass construction ensures full weatherproofing.

- (3 - 30) MHz Coverage
- Remotely Tuned
- 100W Power
- Flexible for Loft Mounting & Portable Operation
- Low Visual Profile

Model ML80	Model ML170
Freq: 7 - 30 MHz (continuous)	Freq: 3 - 10.3 MHz (continuous)
Diameter: 80cms	Diameter: 1.7 mtrs
Price: £169.95 (P&P £5.75)	Price: £189.95 (P&P £6.75)

ML1 Control Unit - Not Supplied
Optional 2 way control unit allows remote tuning & switches between 2 loops £24.95

SGC SMARTUNER®

Auto ATU for HF bands

- Remote tune any length antenna from 8ft to 80ft
- Ideal for base of verticals, inverted L, etc
- Keep RF away from the house by remote tuning
- Use in the shack as an auto ATU
- 1.6 -30MHz
- 150W RF
- 500 memories
- Fully weatherproof

save £50!

Our Price ~~£399.00~~ **£349.00**

POWERCLEAR™

Add on DSP

With built in audio amp, speaker mounting bracket. Use with ANY Radio, Transceiver, voice or Data Link, even noisy telephone lines. ~~£399.00~~ **£349.00**

- Ideal for vehicle mounting
- Noise reduction
- Notch filter
- Variable band pass filter

save £50!

We stock the very BEST digital filters from TIMEWAVE USA - Simply connect the unit to your speaker socket and hear DX signals easily.

ALL TIMEWAVE ARE NOW CE APPROVED

DSP-9 PLUS

for CW, SSB, RTTY, AMTOR, PACTOR, HF PACKET, G-TOR.

Price £199

DSP-59 PLUS - VER. 3.04

Deluxe digital filter, 555 filters, self test and audio gen.

Price £269

DSP-599zx The NEW & most powerful noise and QRM filter in Amateur Radio.

Many new features with the DSP-599zx advanced hardware platform and LCD alpha-numeric display, call or visit to get the details.

Price £369

ERA Microreader

- Decodes RTTY/AMTOR/CW/SITOR/FEC
- Inc CW tutor mode
- 12V Supply req

Price ..... ~~£199~~ £189

ORDER HOTLINES: TEL: (01705) 662145
FAX: (01705) 690626

SHOWROOMS:- 1A MUNSTER ROAD, PORTSMOUTH PO2 9BS
MAIL ORDER:- 189 LONDON ROAD, PORTSMOUTH PO2 9AE

Over 6,500 sq ft crammed FULL of the LATEST EQUIPMENT

- ☑ LOWEST PRICES
- ☑ FRIENDLY ADVICE
- ☑ FAST DELIVERY
- ☑ SERVICE BACK UP

THIS MONTH'S HOT PRODUCTS!

NEW! ICOM R8500

Our first shipment has now arrived - YES, we've got them IN STOCK! This receiver is everything we hoped it would be, covering 100kHz - 2GHz and lots of features.

PAY BY 3 POST DATED CHEQUES! £516 each

Our Price ~~£1649.00~~ **£1548.00**

The NEW AR 5000

NOW IN STOCK

PROFESSIONAL GRADE ULTRA WIDEBAND SCANNER

Covers 10kHz - 2600MHz. All mode reception and a huge range of facilities. DEMAND IS HIGH for this set and supplies are limited. CALL NOW AND PAY BY 3 POST DATED CHEQUES!... ~~£1749~~ **£1569**

FREE DELIVERY

YAESU FRG 100

SPECIAL!

Probably the best value for money short wave radio on the market this month offered at the very special price of

£449!

SAVE £150 ON THE RRP!

AOR AR7030

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

- Razor sharp selectivity
- Better than 0.3µV sensitivity

Price ..... ~~£799~~ **£729.95**

Scanner Antennas

New SW2 Indoor wire antenna

- Wideband coverage
- 100 kHz - 1 GHz
- Special VHF/UHF section
- For handheld & base scanners

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

Price £19.95

DIAMOND D707
ACTIVE WIDEBAND ANTENNA

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

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

Price £129.95

SCANMASTER DE-LUXE
DELUXE DESKTOP ANTENNA
500kHz - 1500MHz

A beautifully engineered top performance desktop antenna. Should substantially improve your scanners reception when used at home. Supplied c/w 4.4mtrs of good quality cable & fitted BNC plug ready to go. May be mounted on the floor, ceiling, wall or desktop..... £59.95

• • • AND PAY BY 3 POST-DATED CHEQUES

ON ANY ITEM OVER £100 IN VALUE

Simply divide the price into 3 equal payments. Write 3 cheques dated in consecutive months starting with today's date. Write your telephone N°, cheque card N° & expiry date on the back of each cheque. Post them to us, enclosing your name & address & we will (subject to status), send your goods immediately.

SPECIAL PURCHASE!

AR 1500

Handheld Scanner with SSB!

- Continuous coverage: 500kHz-1300MHz
- 1000 user programmable memory channels
- All modes: FM(narrow) FM (wide) AM & SSB
- Selection steps: 5kHz-995kHz
- Priority channel

Complete selection of Accessories supplied **FREE**

- NiCads
- Charger
- Soft case
- Belt hook
- Earphone
- 12V cigar plug & lead
- DA 900 Wide band whip antenna
- 5 mtr wire ant w/BNC for Shortwave

~~£349~~ SPECIAL **£189** +£6 P&P

ONLY LIMITED QUANTITIES AT THIS PRICE - SO HURRY!

ROBERTS R827
Multi-band Digital Pre-set Stereo World Radio

- Receives SSB & CW
- SW, MW, LW, FM
- 45 preset stations
- 5 tuning methods:

Price ..... **£159.95** + £4.75 p&p

OPTO SCOUT v3.1

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

Price £399.95

RADIO SHACK DX394
Communications Receiver

SAVE £100

- Covers 150 KHz - 30 MHz
- Receives AM/CW/SSB

NEW!

Ideal for the newcomer to Short Wave Radio.

INTRODUCTORY OFFER **£249**

USUALLY £349

SONY Radios

We are a SONY SHORTWAVE CENTRE and carry the full range of Receivers IN STOCK! All our stock is guaranteed by SONY (UK) and not low cost European *grey* imports.

SONY SW1000T NEW Worldwide Receiver	£389.00
SONY SW77 Digital World Receiver	£349.95
SONY SW55 Compact World Receiver	£259.00
SONY SW100E Miniature World Receiver	£199.00
SONY SW7600G World Receiver	£179.00
SONY AN 1 Active antenna 150kHz-30MHz	£59.95
SONY AN 3 General purpose antenna	£59.95

VECTRONICS AT 100

A combined, tuneable pre-amp and active antenna. Boost reception of your existing antenna or use as a stand alone indoor active antenna.

300 kHz - 30 MHz £79.90

GLOBAL AT 2000

Shortwave tuner NEW version with Q selector to reduce interference (100 kHz - 30 MHz)

Price £95

Computer Control

SYNOP WEATHER PLOTTING

Receive and decode RTTY Signals on shortwave to produce live on screen weather pictures

NEW LOW PRICE! £99

SKYVIEW WX CHART

Receive on screen weather pics with SYNOP OPTION for FAX III users..... £49.95

SKYVIEW FAX III

Receive the very latest news & weather Faxs from around the globe. PC based package with on screen help & manuals. Decodes RTTY, CW, FEC, NAVTEX & FAX..... £139.95

Books

SCANNER BUSTERS 2	£6.00
SHORTWAVE MARITIME COMMS	£16.50
EAVESDROPPING ON BRITISH MILITARY	£17.50
FLIGHT ROUTINES (1995) SPECIAL	£4.50
SCANNING SECRETS	£16.50

UK Scanning Directory
NEW 5TH Edition

540 PAGES!!

42,000 Frequencies listed!

Price ..... £18.50 free p&p

Europe's Number 1 Supplier

Have AKD hit the TARGET?

A little bit of skullduggery by the Editor enabled John Wilson to take a good look at a new, low-cost, British made, communications receiver selling for just £159 all in.

Ears were set twitching earlier this year when AKD, a British manufacturer of amateur radio v.h.f. transceivers and accessories, announced that they would be introducing an h.f. receiver towards the end of 1996. This was welcome news for me because I was the first person to propose that it was possible for British companies to operate in this market and produced the HF-125 and HF-225 to prove it. Here then was a second British manufacturer about to enter the fray - and with a really low target price hinted at. What a pleasure it was to get my hands on a pre-production sample of the AKD 'Target HF 3' h.f. receiver, and what a surprise it turned out to be.

Unpacking the Target revealed a neat little receiver having similar size to the AKD transceivers - in other words about the size and shape of a car radio. The case and front panel are moulded in a nice grained finish and the colour is a discreet shade of grey. The first thing that struck me was the relative absence of controls, these consisting of an obvious tuning knob, a volume control, a clarifier control and a row of four buttons controlling mode up/down, memory store and memory recall. The rear panel was equally clear of 'things', bearing only the 12V power input jack, an attenuator switch and the antenna connector.

Flywheel

First thing to reach for after connecting a power supply was the tuning knob - good gracious it feels like an Eddystone, and there is no doubt that there is a substantial flywheel built in somewhere behind the panel. Take a quick look behind the panel and sure enough, there sits a lead flywheel with enough inertia to satisfy anyone. One minor snag is that the hole for the grub screw is wide and deep enough to slightly unbalance the free running shaft, so on some frequencies the knob will not stay put. My suggestion to cure this would be to use a grub screw as long as the radius of the flywheel so that the weight of the screw would re-balance the whole assembly - however, the tuning is a delight to feel.

One advantage of the flywheel effect is that spinning the knob to get from the bottom to top of the impressive frequency coverage of 30kHz to 30MHz, in conjunction with the four stage 'speedup' of the tuning rate, gets you to a new frequency in fractions of a second. There is no 'roll-over' at band edges, so when you hit 30MHz or 30kHz the receiver stops dead and you have to go into reverse to tune the other way.

Now - the tuning steps; on the face of it a 1kHz tuning step for an h.f. receiver spells difficulty, but because the i.f. filters are 3.8kHz wide for s.s.b. and 6kHz for a.m., it's actually possible to tune across even an amateur band and hear the signals stepping through quite easily.

Once within the pass band, a quick twiddle on the clarifier control brings them in loud and clear, and because there is proper sideband switching with crystal controlled carrier injection there is absolutely no doubt which sideband you are on. Do not confuse this system with receivers such as Taiwanese portables or the WinRadio, which try to provide sideband selection by using a tuneable b.f.o. They are infinitely more difficult to use because you never quite know where you are, and the positioning of the carrier injection relative to the i.f. pass band is sheer guesswork. On the Target HF 3, when the display says u.s.b., you can be certain that it is receiving upper sideband signals, and equally that l.s.b. means correctly receiving lower sideband.

Clarifier

The clarifier control is designed to neatly tune across the gap between the 1kHz main dial tuning steps, and has a quoted range of ±800Hz. On the review receiver the range was actually ±980Hz, but that's unimportant since the tuning range is clearly more than adequate to cover the desired span with a decent overlap.

Although the handbook contains no technical information either in a block diagram, circuit description or circuit diagram, I had to use my eyes and experience to scan the receiver inside and work out some of the design details. The clarifier works by using a d.c. controlled Varicap diode to tune the second conversion oscillator, which is a crystal running at a nominal 14.84833MHz tripled to 44.545MHz to convert the 45MHz first i.f. down to 455kHz. By pulling the crystal at its fundamental frequency the amount of shift is also tripled, which means that it only has to move ±300Hz to achieve the full clarifier range.

Mode selection is by two buttons, one 'UP' and one 'DOWN', logical and easy to use because there are only three modes to select, u.s.b., l.s.b. and a.m. The other two buttons are memory store and memory recall - there is only one memory, how refreshing and actually how simple to use. Before you switch off, just prod the store button and that is where the receiver will be when you switch it on again.

The main display is a clear black-on-grey liquid crystal unit, reading frequency in kilohertz, with a segmented 'S' meter display along the bottom. It's not illuminated, but that didn't seem to matter in all the conditions I used the receiver, and I don't know many people who would

attempt to use the Target 3 in the pitch darkness - unless your name is Dracula. And that's about it as far as controls go.

Performance

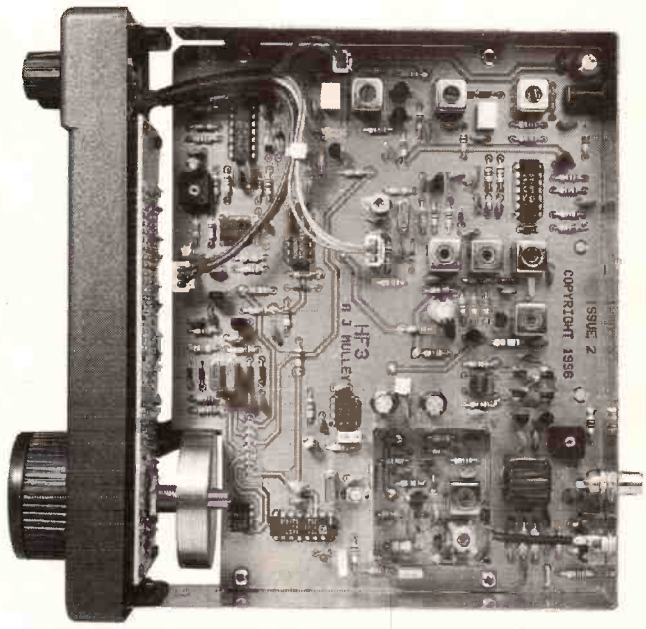
So, how did the Target HF 3 behave in use? Amazingly well, because here is a receiver designed as a receiver with no pretensions to a plethora of unnecessary facilities. Tuning around the spectrum with a decent antenna connected quickly revealed that, despite the simple appearance, the Target 3 behaved extremely well indeed. Recovered audio was excellent; tuning rates were well chosen; the r.f. performance was clearly very good, and this was confirmed by bench measurements as shown in **Table 1**.

The 'S' meter calibration was approximately 3dB per division, starting with S1 at -104dBm (1.41µV)and S9 at -80dBm (22.5µV). The a.g.c. knee was at about -100dBm (2.25µV), with the audio output kept within 10dB from there on.

Technical types will immediately recognise that this is a pretty good performance from a simple receiver; far better than any comparable receiver at the price, and better than many receivers at a higher price. The reciprocal mixing and 3rd order intercept figures bear comparison with the WinRadio to show how a proper receiver should perform. Taking a closer look inside the radio reveals that the front end has been designed by someone who has studied and understood modern thinking. The input transformer to the mixer is a sight to see; in fact I haven't seen one as chunky in any recent radio, and everything about the first mixer says 'r.f. performance'. The conversion architecture is similar to many designs, using a synthesised first oscillator converting to a first i.f. of 45MHz followed by direct conversion down to 455kHz. A 45MHz crystal filter removes first i.f. images, and second i.f. filtering is by ceramic filters giving the nominal bandwidths of 3.8 and 6kHz. The a.m. detector is said to be quasi-synchronous, and again because of the lack of any circuit information I can only assume that this is similar to the JRC NRD series receivers in which an incoming a.m. signal is passed through a high gain limiting amplifier which strips off the modulation and provides the original, now clean carrier, to demodulate the double sideband signal in an s.s.b. product detector. The advantage of this type of detector is that it combats selective fading on a.m. signals without the 'howl' which you get from phase locked detectors. The ultimate performance on deep fades is not quite up to the phase locked systems but it's very good in practice and the average user of the receiver will never know it's there.

Synthesiser 'Wobble'

So, I'm clearly in love with this little receiver; was there anything less than perfect?



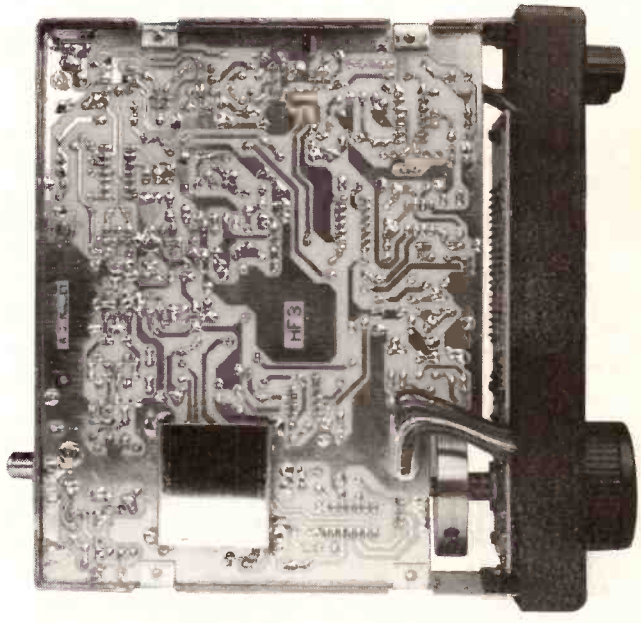
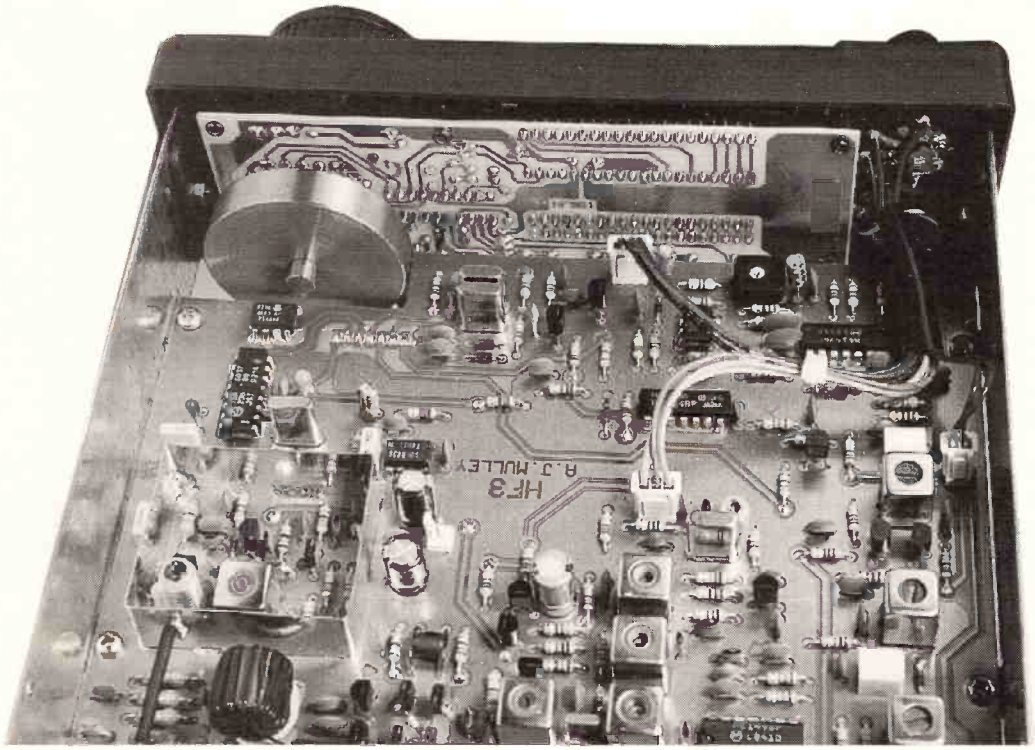


Table 1. Tests conducted at 14.2MHz.

Sensitivity (12dB Sinad):	**Normal**	**Attenuated**
u.s.b.	-110dBm (0.7µV pd)	-100dBm (2.25µV pd)
a.m. 60% mod.	-104dBm (1.4µV)	-94dBm (4.5µV)
Noise floor:	-121dBm (u.s.b. with nominal 3.8kHz i.f. filter)	
3rd order intercept point:	-4dBm (normal gain setting)	
Dynamic range:	78dB	
Reciprocal mixing:		
+5kHz	45dB (inside filter pass band)	
+10kHz	90dB	
+20kHz	101dB	
+50kHz	105dB	
+100kHz	109dB	



The synthesiser has a little 'wobble' on it which is apparent when listening to a steady carrier, but this is undoubtedly due to the trade off which occurs when you want a less 'wobbly' synthesiser which has a slow response time to change, against the need to have a fast enough synthesiser to follow the tuning knob data changes when you need to move frequency quickly. In the case of the Target 3, I personally would have preferred a slower and less wobbly response, but I don't know how that would have affected the tuning rate, so let's leave it to the designer who, let's face it, has done an excellent job.

Another thing which people will notice is that the frequency readout is correct for the centre of the a.m. filter pass band, but since the s.s.b. filter is 3.8 (4)kHz wide, the s.s.b. demodulator crystal oscillators are offset by ±2kHz to place the carrier on each side of the filter. This results in an incorrect frequency readout on u.s.b. and l.s.b., but it's exactly the same in this respect as the much admired Trio R-1000, and you **must** remember that the Target sells for £159 - half what you would pay for a ten year old, second hand R-1000.

The IOTH Brigade

Let me now philosophise about receiver design and how it applies to the Target HF 3.

Every design is a compromise, and never more so than in a short wave receiver. When John Thorpe and I discussed design of receivers, we always began with a target price in mind, for this is a commercial business, and although everyone wants to produce the 'ultimate' receiver, it's highly likely that the 'ultimate' would only satisfy a handful of customers.

No - the first step is finding a place in the market which is set by the end user price and then design a receiver which offers the best combination of features and performance for that all important target price. Having done that and completed the design, along will come the IOTH brigade (If Only They Had). If Only They Had frequency correction so that the display didn't have the ±2kHz offset (but look at the price of £159). If Only They Had used an SO-239 antenna connector instead of a phono socket (but the phono is standard on Collins and Drake gear - and look at the price of £159). If Only They Had fitted high spec. i.f. filters (but look at the price of £159). If Only They Had fitted a headphone socket (actually I agree with that comment, even taking into account the price).

A Bold Move

Let's put the Target 3 into context; this receiver competes directly in the market place with Taiwanese portables, but it knocks spots off them when it comes to r.f. performance. This is a 'real' receiver despite the apparent simplicity, and I admire the straightforward way in which the designer has balanced all the compromises. Had I still been in the receiver manufacturing business, this is the one I would like to have built, and I do congratulate AKD for taking a bold move into the low cost receiver field. Don't let the IOTH brigade destroy your confidence, and I hope that the readers of this review will understand just how good the Target HF 3 really is - and for only £159; it's a bargain.

The Target HF 3 is, I understand, the first in a range of h.f. receivers to be introduced by

AKD, Unit 5,
Parsons Green Estate,
Boulton Road,
Stevenage,
Herts SG1 4QG.
Tel: (01438) 351710. FAX: (01438) 357591.

They also have a Web site at **http//www.kbnet.co.uk/akd**

STOP PRESS

AKD have just told us that, following the comments made in our preview last month and by others, they have relented and are taking the bold step of halting production of the Target HF 3 to allow them to make the necessary modifications to fit a 3.5mm heaphone socket on the rear panel.

Waters & Stanton

01702 206835/204965
Fax 01702 205843

UK's Leading Communications Supplier

Shops: 9 - 5.30pm Mon - Sat Mail Order: 24 or 48 Hour Delivery

New
WS-1000E
World's Smallest Scanner

FM, WFM & AM
500kHz - 1300MHz

Ham Radio Today says:
"This is a superb design - brilliant performance."
SWM Review July issue:
"Tomorrow's technology today - A new dimension in portable scanners."

True pocket size, designed by one of the world's largest communications manufacturers. Up to 24 hour's continuous operation from AA cells, programmable power off, 400 memories, fabulous sensitivity, excellent strong signal handling. Sendy today for full details.

New 1997 Catalogue Out Now!

Europe's Largest Ever Ham Radio Catalogue
144 Pages!!

£2.50 inc postage

To order:
Phone credit card
Send cheque
Send £2.50 in stamps.

144 pages packed with products, illustrations and every product priced. Get the full specification of thousands of items. See the kind of accessories that you don't often see advertised, and the bargains to be had simply by purchasing a copy of this book. You'll also be first with the news on new products, some that have not even been introduced yet. There's also topical items, technical data etc. A BARGAIN!

NEW WEP-400
Improved Earpiece

- Soft Earband
- Adjustable Height
- Adjustable Angle
- Left or Right Adjust
- Washable Pad
- Right-angle Plug
- 3.5mm fitting
- 8 Ohm drive.

US Police Design

WEP-300 Earpiece

We Supply This to the Police!

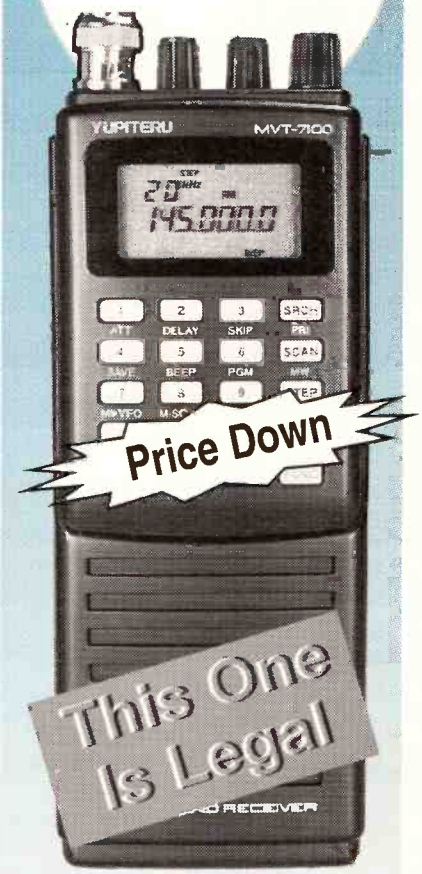
£9.95

Fitted 3.5mm plug. "K" version fitted 2.5mm plug

Xplorer Scanner
25 - 1300MHz

Locks onto any frequency in less than a secod! Gives digital readout, decodes audio and reads tone frequencies

New
MVT-7100EX



Look For The Label

CE MVT - 7100EX MODIFIED TO CONFORM TO EMC REGULATIONS BS EN 55013

£299.95

Tthe MVT-7100EX conforms to the Electro Magnetic Compatibility Regulations that became law as from 1st of January, 1996. We can now supply this latest version from stock.

Full Range of Yaesu Kenwood, Icom and Sony Stocked Phone for Discounts!

The Miller

Ultra Compact Short Wave Aerial
1.8MHz - 30MHz
A Most Amazing Performer

£69.95

Height	2m
Weight	1.3kg.
Socket	SO-239
Impedance	50 Ohms

Inc. mast bracket - 5.5cm max

This antenna is a unique design that uses balun matching and inductive loading to achieve the most compact short wave antenna ever. It requires no power, just connect any length of 50 Ohm cable between the "Miller" and your receiver.

Lowe Receivers

HF-150 30kHz -30MHz	£419.00
AP-150 Speaker plus filter	£219.00
HF-225 30kHz -30MHz	£499.00
HF-250 30kHz - 30MHz	£799.00
WA-250 Active antenna.	£35.00

Long Wire Balun

Post £1.50

£22.95

YAESU FRG-100

FRG-100 12V DC	£499.95
KP-100 keypad	£49.95
FM Unit	£33.95
PA-100 AC adaptor	£44.95

"Scanning Secrets"

A "Best Seller"
Almost 300 Pages

£16.95
Post £1.50

Now in All Maplin Stores

The book that lets you into the secrets of successful monitoring. It is a "Best Seller" and one that should be on everybody's bookshelf.

1996 World Radio & TV Handbook	£17.95
1996 Passport to World Band Radio	£14.95
Packet Radio Beginner	£1.95
Packet Radio Made easy	£2.95
Easy Up Antennas	£2.95

Add £2 postage for books

Mobile Scan Aerial

WATSON WSM-1900

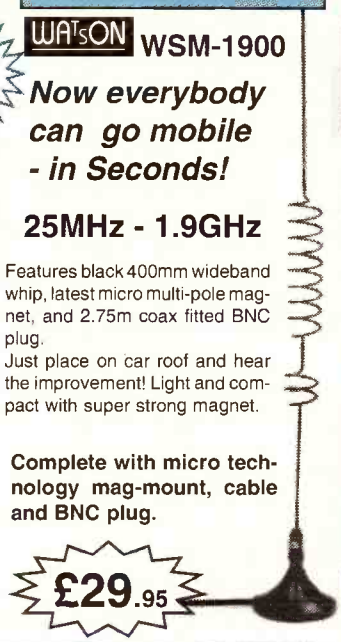
Now everybody can go mobile - in Seconds!

25MHz - 1.9GHz

Features black 400mm wideband whip, latest micro multi-pole magnet, and 2.75m coax fitted BNC plug.

Just place on car roof and hear the improvement! Light and compact with super strong magnet.

Complete with micro technology mag-mount, cable and BNC plug.



£29.95

Why not trade up?

Give us a call for a deal on your old receiver. It may be worth more than you think when traded against a new model. We can arrange collection anywhere in the UK. Give us a call

Price Match

We'll match or beat our competitors' prices!

WATSON

Scanning Aerials
25 - 1900MHz

A new range of scanning aerials designed to give you what others promise.

Hear The Difference

These Antennas Available all MAPLIN STORES

Tele-Gainer:
41cm telescopic with knuckle joint BNC
Maplin Ref BH82D £14.95
Regular-Gainer:
21cm flexible whip BNC
Maplin Ref BH81C £12.95
Super-Gainer
40cm flexible whip BNC
Maplin Ref BH83E £19.95

AT-2000 Receiver ATU.

£99

* 500kHz - 30MHz
* Long wire - coax - balanced
* SO-239 sockets & terminals
* "Q" control for ultimate reception

Connect between short-wave aerial and receiver socket and adjust the controls for best reception. The most popular receiver atu on the market - and no wonder!

WHB-1 Belt Clip

£6.95

Fits all modern handhelds, (ex Kenwood). Has non-slip grip and quick thumb-spring release.

QS-200 Mobile Mount

A great idea. Just clip your handheld via belt clip onto the QS-200 and push it onto the plastic vent grill of your car.

£9.95

WHB-1 Belt Clip

£6.95

Replaces the standard belt clip. Much more comfortable and easy to use.

AR-7030 Short Wave Receiver

£799

MFJ-784B Filter

£259

The best receiver filter in the world - at least that's what users say!

GARMIN GPS-38

£189

Accurate to 15m (subject to GPS random system error). Includes live map display and wide range zoom. Stores 250 waypoints and 20 reversable routes. 4 x AA cells can give 20 Hours.

NEW Icom ICF-8500

Price Match - we'll match or beat our competitor's prices!

Icom's super new receiver that goes from 100kHz to 2GHz. This is a fabulous new design that puts all your receiving requirements into one very compact package. However, this is a complex piece of equipment that only dealers like us with full service facilities can give you 100% service backup. Don't take chances!

MVT-7000UK

100kHz - 1300MHz Scanner Receiver

New Low Price!

WFM-NFM-AM
Maplin Ref CM00

A great scanner if you don't need SSB. This model gives great performance on VHF & UHF. Phone for free brochure and details of all our accessories.

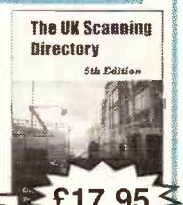
MVT-7200 100kHz to 1300MHz Scanner

Yupiteru's latest model and includes a ferrite aerial for low frequency reception. Also included is a new narrow band SSB filter. AM reception has also been improved by the addition of a new narrower filter and a circuit revision has reduced total battery consumption.

£399
Plus FREE Carriage

VHF - UHF Frequency Guides

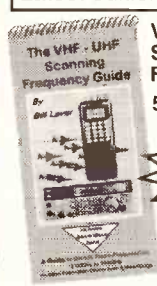
The UK Scanning Directory



New 5th edition with even more frequencies. Covers VHF and UHF in detail.

Latest editions

£17.95



VHF - UHF Scanning Frequency Guide
500kHz - 105GHz!

£12.95

Spiral bound flip style guide - used by professionas!

VISA Tel: (01702) 206835 / 204965 Fax: (01702) 205843 ACCESS
Shop & Mail Order 22, Main Road, Hockley, Essex. SS5 4QS
24 Hour Answerphone and Fax. Open Mon-Sat. 9am - 5.30pm

Intermodulation-

General Considerations for Active Antennas

After his look at three commercial active antennas, last month, Andy Ikin discusses the importance of good intermod preformance.

Many years ago, I purchased a Trio R-1000 receiver for use in the home as my wife was never happy with my home-brew valved sets. At first, the Trio appeared to be a dream come true with its stable local oscillator and direct digital frequency readout. However, as soon as a reasonable antenna was coupled to the receiver, weak signal reception became impossible. Listening to the receiver on the 15m amateur band and the 13m broadcast band was impossible due to the receiver being swamped by phantom broadcasts and Soviet jammers. The only way of curing this problem was to use the antenna attenuator. However, this caused the receiver sensitivity to drop to the point where some stations were lost in the noise. At first I dismissed these phantom broadcasts or interference as simple crossmodulation that normally used to occur with valved radios with too much r.f. gain. The problem was much worse than with the valved radios.

I decided to 'pull the R-1000 apart' and find out where the problem lay. By using a signal generator loosely coupled to antenna socket with the R-1000 tuned to 21.4MHz I could hear these phantom stations if the sum or difference of the signal generator and the Broadcast bands was 21.4MHz. At this time I was not familiar with this problem of intermodulation distortion, because the old valved receivers used several tuned circuits between the antenna and the mixer to reduce image signals. Also these same tuned circuits prevented interaction of the sum and difference frequencies of the powerful broadcast transmitters. The main problem was the sum of the signals in the 6, 9, 12 and 15MHz bands. My difficulties with the R-1000 was eventually pin-pointed to several deficiencies; the single ended f.e.t. in the r.f. stage was mixing the sum and difference signals because the r.f. filters had insufficient selectivity, the diodes used to switch the r.f. filters were also mixing these signals. I was reluctant to modify the R-1000 because the resale price may have been affected. To resolve the intermodulation of the R-1000, I built a very simple tuned loop antenna using 600mm square frame and a balanced f.e.t. amplifier with an impedance match to 50Ω. This solved the intermodulation problems and provided a reduction in local noise.

Old for New

A few years later the R-1000 was 'traded-in' for a Japenese Radio Company NRD-525. The new receiver didn't suffer from any of the intermodulation problems of the Trio R-1000. The NRD-525 is one of the few receivers that uses a front-end band-pass filter that is tuned by the synthesiser.

At the same time I started to experiment with broad-band directional receiving antennas, using 'home-brew' broad-band active loop and dipole antennas. However, I soon encountered the similar intermodulation problems as with the R-1000. The work on the directional antenna was successful, however the performance was compromised by intermodulation.

I had considered in 1988 using the Datong AD370 Active Dipole. However I was put off by the Intermodulation Tests reported in the *1988 WRTH*. However, In 1991 I purchased two AD370 Head Units and built my own power supply interface unit. I was absolutely amazed by the absence of the intermodulation on short wave. The only slight problem was too much gain on long wave causing the receiver to overload.

My eventual goal was to build a broad-band active loop antenna because of the inherent advantages loops have in their lower sensitivity to local interference. The use of tuned loops was out of the question because the phase characteristics are unpredictable. I still continued to work on producing a broad-band active loop antenna, it was nessecary to construct a simple way of measuring the intermodulation performance. My set up used two crystal oscillators, a transformer combiner, a simple pre-selector and the NRD-525 with its 'S meter' calibrated against a professional signal generator. After about two years, I had built several broadband loop antennas using a 1m aluminium tube and a balanced transistor amplifier. The loops provided comparable performance to either a 20m long wire with matching transformer or a 10m vertical dipole and balun over a range of 2-30MHz. The intermodulation performance was +80dBm for the second order products and +40dBm for the third order. Reception down to 150kHz was possible with lower sensitivity. During this period considerable experience was gained using active antennas and the problems of quantifying the required performance. Below are a few suggestions on choosing active antennas.

Currently there are several active antennas available providing similar performance.
These active antennas generally fall into two types:

1) Whip and dipoles, responding mainly to the electro-static field.

2) Loops, responding mainly to the electro-magnetic field.

The whip/dipole antennas are more numerous because they are easier to design for wide band performance.

The loop antennas are either manually tuned or wideband. The manually tuned antennas can provide excellent results because their selectivity reduces intermodulation products. However, having to manually tune the antenna in step with the receiver is a considerable disadvantage. Also the cost and complexity of the tuned loop is high, if antenna has to be remotly tuned so the antenna can be sited away from local interference. Thus the wideband loop antenna can offer considerable operational advantages, this is why they are used mainly by civil and military authorities. However, these tend to be expensive and are virtually unobtainable in the s.w.l. and amatuer radio market. Also there are tuned loop antennas that can cost several hundred pounds and only provide mediocre performance because they have to be used indoors where local interference is high.

Where active antennas are used in the presence of local interference. The balanced dipole and balanced loop designs provide the best interference rejection. Whip antennas that use the feeder as an r.f. return path are prone to mains borne interference.

Generally the loop antenna is less sensitive to local interference especially on the lower frequencies. Also the wideband loop antenna is less affected by the presence of nearby objects, this can be a useful feature with directional antenna arrays.

Formula 1:

$$IP2 = \frac{2(\text{max signal output dBm}) - (\text{required intermodulation level dBm})}{2}$$

$$IP2 = \frac{2(-17\text{dBm}) - (-107\text{dBm})}{2}$$

$$IP2 = \frac{-34\text{dBm} - (-107\text{dBm})}{2}$$

IP2 = +73dBm

Formula 2:

$$IP3 = \frac{3(\text{max signal output dBm}) - (\text{required intermodulation level dBm})}{2}$$

$$IP3 = \frac{3(-17\text{dBm}) - (-107\text{dBm})}{2}$$

$$IP3 = \frac{-51\text{dBm} - (-107\text{dBm})}{2}$$

$$IP3 = \frac{+56\text{dBm}}{2}$$

IP3 = +28dBm

Table 1

Frequency MHz	Mydel Whip	AD370 Dipole	TL Loop	Prototype Loop	Dipole UMB 130	Longwire RF Sys. MLB
0.06	S9+10	S5	S7	unusable	S4	S5
0.075	S5	S1	S1	unusable	unusable	S1
0.077.5	S7	S4	S5	unusable	S2	S3
0.198	S9+10	S9+32.5	S9+30	S9	S9+10	S9+25
0.567	S5+2.5	S7+2.5	S6	S3+2.5	S3	S7
1.44	S9+25	S9+25	S9+20	S9+5	S9+12.5	S9+17.5
2.892	S9+5	S9	S8	S6	S9	S9+5
3.975	S9+27.5	S9+12.5	S9+10	S9+10	S9+12.5	S9+27.5
4.904.5	S9	S7+2.5	S6	S6	S7	S9
6.075	S9+40	S9+32.5	S9+25	S9+27.5	S9+35	S9+37.5
7.31	S9+30	S9+20	S9+10	S9+15	S9+20	S9+20
9.62	S9+42.5	S9+30	S9+22.5	S9+30	S9+40	S9+40
11.99	S9+27.5	S9+12.5	S9+5	S9+12.5	S9+22.5	S9+20
15.4	S9+10	S9	S7	S9+10	S9+15	S9+5
17.715	S9+10	S9	S7	S9+10	S9+5	S9
21.605	S9	S7	S4	S8	S9	S7

0dBm = 1mW into a 50Ω load.

Antenna Positioning

Active antennas, like their passive counterparts, need to be sited away from sources of interference such as TVs, fluorescent lights, computers and electrical wiring. Normally to achieve lower local interference the antenna should be installed outside as far away from buildings as possible. Loop antennas and other vertically polarised antennas should be mounted near to the ground where the incident signal and the ground reflected signal will add in phase. Horizontally polarised antennas should be mounted as high as possible, otherwise their response to lower angle signals will be reduced, espcially on the lower frequencies.

Intermodulation

Intermodulation products generated by some active antennas can degrade reception of weaker signals and swamp the receiver with a mush of noise and spurious signals.

These intermodulation products fall into two categories, 2nd order and 3rd order. The 2nd order is defined as the sum and difference two signals and the even harmonics thereof.

i.e. F1 + F2, F1 - F2, 2x F1, 2x F2

The 3rd order is defined as twice each signal and the sum and difference thereof.

i.e. 2F1 ± F2, 2F2 ± F1

There is a certain amount of misunderstanding as to whether the 2nd or 3rd order intermodulation performance is the most important. Unfortunately, it is some times stated that because the 3rd order performance is usually critical for receivers then the same is true for active antennas. Most receivers have front end filters to reduce 2nd order intermodulation, so then the 3rd order is dominant. However, wideband active antennas do not have any filtering to reduce the 2nd order and as the 2nd order intermodulation usually appears before the 3rd order is noticeable, then the 2nd order intermodulation performance is critical.

Unfortunately, some active antennas have mediocre 2nd order intermodulation performance. In some cases active antennas are advertised without specifying the 2nd order performance.

So what intermodulation performance is required?

This depends mainly on the signal output level of the antenna in respect to the field strength of the strongest signals.

The usual measure of the intermodulation performance is the output intercept point of which the 2nd and 3rd order are referred to IP2 and IP3 respectively. The following example is used to convert the intercept point into meaningful figures.

In Europe the expected maximum output of an active antenna could be 32mV or -17dBm. Then ideally the intermodulation products or spurious signals should not exceed the atmospheric and manmade noise level. However, as this varies for different locations, then a good starting point should be 1μV or -107dBm.

Therefore to calculate the required second order intercept point IP2 **Formula 1** should be used.

To calculate the required third order intercept point IP3 **Formula 2** should be used:

This example illustrates the importance of a high 2nd order intercept requirement and dispels the myth that a high 3rd order intercept point is really necessary.

Note: The 2nd order intermodulation varies by a 2:1 ratio of the signal output i.e. a 10dB decrease in the signal output will reduce the intermodulation by 20dB. Conversely a 10dB increase would increase the intermodulation by 20dB.

The 3rd order intermodulation varies in a similar way except that the ratio 3:1 i.e. a 10dB change in the signal produces a difference of 30dB in the intermodulation.

Treat With Caution

To summarise, if a medium output antenna is be used (<32mV) then chose an antenna with an IP2 >+66dBm and an IP3 of >+30dBm. However, ensure that the antenna does not overload the receiver by using an attenuator if necessary. At this stage it should be pointed out that the IP3 is dependant on the active amplifier components but IP2 is more dependant on the amplifier balance, so generally for a IP2 specified at say +66dBm most antenna samples would have an IP2 of up to +80dBm. The examples of Datong AD370 that I have tested, fall into this category.

For best rejection of local interference, chose a balanced dipole, balanced loop antenna or a whip antenna with a ground plane isolated from the feeder screen (if you can find one)

Finally it should be noted that receivers should also have a similar high second order intermodulation performance. Some manufactures do not even specify a value for IP2.

Also some receivers and preselectors that use low cost signal diodes (1N4148) for switching their front-end filters are also prone to producing 2nd order intermodulation products with signal inputs >30mV.

Active antenna specifications that refer only the IP3 should be treated with some caution. Where IP2 is not specified, then the prospective user should always enquire. A few months ago I enquired about the IP2 figures for a German active antenna to their UK agent, I have yet to receive a reply. If the IP2 performance is less than +60dBm, then the maximum signal level must not exceed 10mV or -32dBm. However such an antenna may have low sensitivity. Also where an IP3 of >+50dBm is specified then the IP2 should be >+100dBm to ensure a similar low intermodulation performance, otherwise the IP3 is being used more as a selling point than a real measure of overall intermodulation performance.

Last month we inadvertantly left out **Table 1**, which contained the comparitive results for the antennas that Andy reviewed. So here it is this month.

MULTICOMM 2

THE UK's LARGEST SPECIALIST SHOWROOM & FULL M

AOR

AOR AR8000
£365.00

AOR AR7030
£720.00

AOR AR5000
£1569.00

AOR AR3000+
£875.00

AOR AR3000A
£815.00

AOR AR7030
£720.00

NEW

ICOM

IC-R7100
£1249.00

IC-R8500
£1499.00

JRC

NRD-535
£1525.00

RECEIVERS

KENWOOD

R-5000
£859.00

TIMEWAVE

DSP599ZX **£325.00**
DSP59 **£245.00**

DSP9 +
V3E **£175.00**

SONY

SW-77
£359.00

SW-55
£269.00

SW-100
£189.00

SW-7600
£169.00

YUPITERU

★★★★★★★★

MVT-7100EX
£259.00

★★★★★★★★

MVT-7200
£345.00

MVT-8000
£325.00

MVT-7000
£245.00

MVT-225
£225.00

MFJ

784B
£249.00

752C
£9.00

ICOM

NEW

IC-R8500
£1495.00

THE ULTIMATE SUPER WIDEBAND RECEIVER

WELZ

WS-1000
£299.00

YAESU

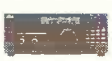
FRG-100
£459.00

USED EQUIPMENT PURCHASED FOR CASH.
TOP PRICES PAID.

WE NEED YOUR USED EQUIPMENT

LET US SELL YOUR USED EQUIPMENT FOR YOU. 0% COMMISSION

MULTICOMM 2000 USED EQUIPMENT



ICOM IC-R7100 25-2GHZ SSB/AM/FM LIKE NEW **£995**

ICOM IC-R71E COMMERCIAL GRADE SW RECEIVER PRISTINE CONDITION **£499**

LOWE HF-150 SW RECEIVER BOXED AS NEW **£275**

JRC NRD-525 NEW CONDITION ONE IN STOCK FROM **£599**

KENWOOD R-5000 LIKE NEW CHOICE OF 2 FROM **£575**

AOR AR-3030 SHORTWAVE RECEIVER BOXED AS NEW **£499**

YAESU FRG7700 + A REAL SW RECEIVER IN EXCELLENT CONDITION **£299**

AOR 3000A RECEIVER 100kHz-2036 BOXED AS NEW FULL MULTIMODE **£625**

LOWE HF-225 SW RECEIVER BOXED AS NEW **£329**

DRAKE R-8E TOP END SHORTWAVE RECEIVER PRISTINE CONDITION **£699**

SIGNAL R-532 WITH PORTABLE PACK **£175**

JRC NRD-535 GEN COV RX IN MINT CONDITION **£910**

ICOM ICR-100 VERY RARE BOXED AS NEW **£485**

YAESU FRG-100 SEVERAL AVAILABLE FROM **£359**

SONY SW-77 PORTABLE SW RX BOXED AS NEW **£280**

AOR 1500EX	£190	JRC NRD 525	£599	Panasonic RFB20	£45	Yaesu FRG7700	£299
AOR 3000A	£625	JRC NRD 535	£910	Roberts RC808	£49	Yaesu FRG50	£75
AOR3030	£499	Kenwood R1000	£245	Roberts RC827	£159	Yaesu FRG101	£145
Bearcat 200XLT	£135	Kenwood R5000	£629	Realistic 9506	£145	Yaesu FRG 101D	£189
Bearcat 3000XLT new	£199	Kenwood RZ1	£169	Realistic PRO 50	£69	Yaesu FRG100	£375
Drake R4C mint	£145	Lake ATU	£45	Signal R532	£145	Yaesu FRG100	£399
Drake R8E	£699	Lowe HF150	£285	Sony SW55	£199	Yaesu FRT 7700	£55
Fairmate HP200	£169	Lowe HF150	£280	Sony SW77	£289	Yaesu FRV 7700	£50
Grundig YB400 new	£95	Lowe PR150	£149	Sony SW7600	£115	Yaesu SP101	£60
Global AT1000 ATU	£56	Lowe HF225	£329	Universal 900	£275	Yupiteru MVT7000	£169
Icom ICR-71E	£499	Momentum MCL1100	£249	Weltz WS1000	£269	Yupiteru MVT7100	£199
Icom ICR-7000	£695	Netset PRO	£75	Yaesu FRG7	£145	Yupiteru MVT8000	£269
Icom ICR-7100E	£995	Opto 2300	£75	Yaesu FRG7	£169		
Icom ICR-100	£485	Opto Interceptor	£149	Yaesu FRG7700	£285		

Collection arranged

12 MONTHS WARRANTY ON OUR USED EQUIPMENT

100s OF DISCOUNTED BOOKS
5th UK SCANNING DIRECTORY
£17.50

VISA DELTA SWITCH

Vent Pipe QRM

Once more J. Edward Brown, brings us Kilocycle Ken who solves an annoying interference problem from the south Pacific. As always, his solutions are just as valid in Northern Europe.

"Give it a Rattle"..

Kilocycle Ken, the senior radio inspector lectured Young Golly the trainee as they stopped outside the complainant's house.

"Believe little of what the complainant says, not that they deliberately mislead you, but they give false clues, false ideas are sprouted - they say it's a man across the street welding, then you find it's a faulty lamp socket in their own house. Happens all the time."

"So, you are going to talk this one out of her complaint," Young Golly said.

"What do you mean by that?"

"You often get complainants to apologise to you for having complained."

"There's an art in that," Kilocycle Ken said. "But of course, you must do your best to find the source, and eliminate it, sometimes easier said than done with vague complaints about QRM that one never hears or sees and we eventually end up closing it as a ceased untraced or trivial category. If we can see it and hear it, we can solve it - or if we get enough clues and it is a genuine complaint."

The house was a standard three-bedroom California-style bungalow, built in the 1920s.

Kilocycle Ken said, "You get to be an expert on architecture, know the various periods and what electrical services were put into them. This one would have had electrical wiring in conduit, might still be in place because it's unusual to see a bell mouth electrical entry still in use. See it there, up on the gable. Most bell mouths have been replaced with a fixed insulator and a fuse.

"Bell mouths are from a time when houses were wired with rubber covered cable in metal conduit, the phase and neutral on two separate wires were fed from overhead street wiring and looped through a bell mouth, which was, and is, a curved pipe, the entry flared like a bell so it didn't rub the wires.

Sometimes with movement the neutral or the phase would be rubbed through and the wires would contact the bell mouth, which was a part of the conduit and would be earthed. If the phase was touching, then there was serious trouble, but if it was only the neutral, you get a static discharge effect which might be her problem."

The radio was an early 1950s 6-valve dual-wave radiogram with an automatic record changer. The only speed was 78r.p.m.

How Long Have You Had A Problem?

Mrs Lee, the complainant said, "It's not on today, but it's a thumping noise and the loudness of the station varies. It's worse in windy weather."

"Ahhh," Kilocycle Ken said. "How long have you been experiencing the problem?"

"A long time," she said vaguely.

"And you've never done anything about it?"

"My husband died recently and since then the wireless has become such a comfort to me."

"These old valved radios are warm to the touch," Kilocycle Ken said.

"I lie in bed at night and the thumping drives me mad."

"We'll see if we can reproduce it," Kilocycle Ken said briskly. "We'll try that bell mouth first, Young Golly. We need a clothes'-prop."

"What's that?" Young Golly asked.

"A pole to prop up the line of washing."

"My mother had a rotary clothes'-line," Young Golly said.

"A long clothes'-line would have been standard for this house, rotaries didn't come into use until after World War II. Have you got a rake or shovel, a broom, Mrs Lee?"

She had a rotary Hill's Hoist replacement for an old laundry drying line and she produce a worn bristle yard broom.

"You listen on the radio, Young Golly," Kilocycle Ken ordered. He prodded the wire drops from the street.

"Nothing," Young Golly said.

Mrs Lee observed, perplexed.

"It isn't the bell mouth so it's probably the vent pipe," Kilocycle Ken said. "Can we have a look at your hot water cylinder?"

Now Mrs Lee was very puzzled.

"It's your vent pipe," Kilocycle Ken said cheerfully.

"I beg your pardon?" she said coldly.

"The vent pipe for your hot water system, almost guarantee it."

The hot water cylinder, somewhat larger than a 44 gallon oil drum, was in the hall cupboard. She removed stacked sheets and towels from the warmth.

Some Way of Venting

Kilocycle Ken said to Young Golly, "The vent pipe is a source of trouble from way back. This pipe comes out of the top of a standard hot water cylinder to let out steam and water if it boils

violently. They go out through the roof, and if the roof is corrugated iron, as this one is, there can be trouble if they are not bonded or earthed. Often the pipe breaks the lead flashing because of wind pressure and causes a click as it taps against the metal roof, the theory of it being that the large mass of metal roof, which is insulated from the ground by rafters, acts as an antenna for the radio signals, but the vent pipe is earthed back through the plumbing system so that when the vent pipe touches the roof if effectively earths the radio's antenna, the same effect as touching the antenna and earth wires together at the back of the set, if it's got them of course, not many radios in ordinary use do."

"We had an antenna, years ago," Mrs Lee said. "It blew down."

Kilocycle Ken said, "A trap is that a near neighbour's vent pipe can cause the same trouble. The newer hot water systems have some way of venting, but there's tens of thousands of these hot water systems still in use."

The house hadn't been modernised. There were electric switches with brass covers, old white glass coolie light shades.

Kilocycle Ken said, "See the pipe coming out the top of the cylinder. I'll rattle it. Sometimes that's enough to see it off."

There was no reaction. "Not enough leverage," Kilocycle Ken said. "Have to get up on the roof. Have you got a ladder Mrs Lee?"

She showed them an old wooden ladder in the garage which housed an ancient Wolseley saloon car.

"Up you go, Young Golly. I'm too old to be climbing on roofs."

"I doesn't look safe," Young Golly said.

"My husband made this ladder," Mrs Lee said.

"How did he die?" Young Golly asked suspiciously.

"In bed," she said sadly.

Young Golly climbed, cautiously.

The vent pipe was very long, six feet and high up close to the ridge. "Give it a rattle," Kilocycle Ken ordered. I'll listen."

A thumping sound.

"That's it!" she said. "The exact noise."

Kilocycle Ken smiled. "Sometimes they make the TV screen flash."

Young Golly reported, "The vent pipe was flashed to the roof with lead, but it's broken away."

"So how do I fix it?" Mrs Lee asked.

"A plumber could repair the flashing, or it could be bonded to the roof with a flexible wire strap so that the vent pipe is earthed, but the easiest and cheapest way is to wedge it with a piece of wood so that it doesn't move."

Mrs Lee said, "I've got plenty of wood. I love my open fire, even though the council has a smoke-free policy."

There was a tomahawk and a wood pile.. "Okay, Young Golly, chop some suitable slivers of wood."

"What am I?" Young Golly grumbled.

"You're a radio inspector, or you will be one day when you've acquired the necessary skills."

"Chopping wood is one of them?"

"A radio inspector is versatile."

"Why did it break?" Mrs Lee asked.

"Maybe something to do with the expansion and contraction of the copper pipe, sometimes occurs if the hot water cylinder thermostat is set too high, then the water will flow up the pipe and fall on the roof, most thermostats are set too high. Or it was just the wind."

Young Golly did the job.

Back in the car, Kilocycle Ken said, "In that case, she gave us the clue. Once has to listen carefully."

Young Golly said, "It's a wonder she had a hot water cylinder."

"It would have been a retro fit, probably 1940s. Originally, probably, had a wet-back on the open fire or the kitchen stove. Did you see she had a solid fuel Shacklog in the kitchen."

"A wet-back?"

"Hot water pipes behind the grate."

..It's a thumping noise.....

Young Golly sighed.

"It took the Radio Inspection Branch a long time to wake up to vent pipe QRM, a long time ago. It probably only occurs in New Zealand, with our corrugated iron house roofs and with every house having an electric water heater, unless in recent times they've got a gas heater, but they aren't common, never caught on."

Traps for Young Players

"There are other sources of static discharges, traps for young players. I went to a house which, under the cladding, turned out to be a big aluminium box. It was a new place and it had been insulated with aluminium foil, which might not have caused any problems, but its electrical wiring was run in copper-covered cable. When the house vibrated with wind, or even the occasional earthquake, the copper cabling vibrated against the aluminium foil. The aluminium was as usual acting as an antenna and the copper cabling was earthed back at the mains, so that the copper earthed the antenna and caused a thumping noise."

"What was the solution?"

"One would have been to rewire the house with insulated cable, another to find the places where the copper was touching, which was probably impossible. It was a nightmare and is probably still occurring, or they've given up listening to the radio.

"Then there was P50, the P&T stock list number of lead-covered one pair telephone cable, used for internal house wiring. It used to cause electrostatic effects if it was loosely laid across ceiling joints and contracted conduit. Never see P50 now, its plastics wire, lead costs a fortune, and electrical wiring is all plastics covered."

"Why was copper sheathed cable used in that house?"

"The owner was a builder. He probably stole it from a commercial job."

"And you call me cynical!" Young Golly said.

AOR (UK) LTD

AOR (UK) LTD
AOR MANUFACTURING LTD
WORLD RADIO CENTRE
e-mail: info@aor.co.uk
http://www.demon.co.uk/aor
Fax: 01773 880780
Tel: 01773 880788

4E EAST MILL, BRIDGEFOOT,
BELPER, DERBYS.DE56 2UA

Which reviewer should you believe?

AOR AR7030 - High dynamic range short wave receiver £799

Short Wave Magazine - John Wilson

"If I thought the synchronous a.m. detector was clever, I was simply amazed when I came to explore the i.f. filtering arrangements in the AR7030."

"...but the surprise came when I realised that this kind of performance (in the RDI classification of 'superb') puts it up there with the Watkins-Johnson HF-1000 and it is significantly better than any of its peer group."

DX ONTARIO / North American NRC - Guy Atkins

"In a comparison with a Japan Radio NRD-525 receiver, the difference is dramatic. The low noise level is a revelation; and when used in a quiet setting with a good antenna you get the impression there is nothing between the signal, the atmospheric noise level, and your ears. The AR7030 seems nearly 'transparent' as it goes about its business."

"In this age of mega-corporations and design by committee, it is refreshing to see what can be done by a single talented engineer with a vision. John Thorpe and AOR's UK facility are producing a remarkably useful receiver for the hobbyist and beyond."

RSGB RadCom - Peter Hart

"The audio quality on both SSB and AM is really excellent, the filters are well matched to the required bandwidths."

"I must admit to being a little apprehensive at first about the ergonomics. However, after a few hours use, and having mastered the logic behind the menu driven operating system, I found it really was friendly to use. The weighted tuning knob was most smooth in operation and the tuning steps were completely inaudible."

Medium Wave News - Steve Whitt

"...my overall verdict is that the 7030 is an excellent receiver. It is easy to use, sounds excellent and is a versatile DX machine. Moreover, John Thorpe's innovation (e.g. auto tuning synchronous detector, IF filter calibration) has truly added new capability at an affordable price level."

"The AR7030 is one of those receivers that causes a major stir when it appears which is not surprising in view of its price/performance ratio and its innovative features."

"...if you've never used a menu-driven machine such as this receiver, don't be put off and give it a try. I'm hooked."

DSWCI - Don Phillips

"When I compare the AR7030 with the Drake R8E, I find similar sensitivity and flexibility, but on the R8E propagation disturbances have a much more destructive effect on the resulting audio. The AR7030 seems to shrug it off and thrust the music at you. Similarly when listening to a few Peruvian and Bolivian stations the other evening, I found the ID's on the AR7030 easier to hear."

A photo copy of these reviews and others are available, just forward a SAE and enclose 4 x 1st class stamps for each review - thanks!

AR7030 options

		price (P&P)
MF500	500 Hz Collins mechanical CW filter	£89.29 (£2)
CFJ455K8	1.0 kHz Murata ceramic data filter	£39.99 (£2)
XTAL2.4	2.4 kHz high quality 8 pole crystal filter (daughter board recommended for fitting)	£129.99 (£2)
FL124	Daughter board for fitting crystal filters	£24.99 (£2)
MF2.5	2.5 kHz Collins mechanical SSB filter	£89.29 (£2)
CFK455J	3.0 kHz Murata ceramic very narrow AM / SSB filter	£29.99 (£2)
MF4	4.0 kHz Collins mechanical AM filter	£89.29 (£2)
CFK455I	4.0 kHz Murata ceramic AM filter	£29.99 (£2)
MF6	6.0 kHz Collins mechanical AM filter	£89.29 (£2)
BP123	(BA7030) Internally mounted battery	£99.99 (£6)
DATA MASTER	PC control software for the AR7030 & AR3030 running under Windows95. Built-in data base, logbook, MUF, maps and more...	£129.00 (£3)
COMP7030	10 page explanation of RS232 control	£3.00 (free)

Planned options to follow:

NB7030	Enhanced multi function audio notch filter plus RF noise blanker. "Features CPU" also supplied as part of the package providing additional memories, alpha-tagged memory, enhanced timer etc... *late 1996*
Features CPU	Enhanced microprocessor, additional features as supplied with the NB7030 or FM7030
TW7030	Optional telescopic whip for the AR7030
SC7030	Soft carry case for the AR7030
FM7030	Stereo internal converter with RDS display - still under consideration and dependent upon demand
SM7030	Service kit. Circuit diagrams, PC controlled alignment / test disk supplied, RS232 lead etc... £35.00 (£3)

DATA MASTER Windows95 control software now available. Please phone / write / e-mail for the latest information or visit our WEB site on the internet: e-mail info@aor.co.uk WEB http://www.demon.co.uk/aor/index.html

AR8000 - Still the KING of hand-held receivers...

The **AR8000 UK** receiver is still the most full featured wide band hand held receiver on the market today. Frequency coverage is from 500 kHz - 1900 MHz without gaps with all mode reception... twin frequency display, alphanumeric text comments. **PC-MANAGER** (versions for DOS and Windows) is an optional utility for memory & search bank management. The software (which works in conjunction with the optional CU8232 interface) permits upload, download, editing, renumbering, saving of data, editing of auto-mode bandplan data (plus a built-in terminal driver for DOS and extra features for Windows including spectrum display and sound recording to disk).

AR8000 UK £410.00

CU8232 interface £99 (£3)

PC-MANAGER £49 (£3)

State DOS or WINDOWS

SC8000 soft case £17.95 (£1.50)

CR8000 tape control interface £44.90 (£2)

Short Wave Column - After The News, a Look at The Weather

Don't worry. We know all about the METEOSAT downlink on VHF. AOR first came to the market with a range of VHF/UHF receivers and soon became the brand leader. One of our sets and suitable aerial and you're away. Too easy. No, the real stuff comes after the satellite image has been received, weather and location information overlaid and the image forwarded in FAX mode on LF, or long-wave if the radio the AOR 7030 replaced had valves in it. We hear Prague, signing as OLT21 on 111.8KHz - that's kilohertz, remember - and the two most audible in the UK, the Mainflingen senders on 117.4 and 134.2KHz. Winter season listening can only improve reception but at this point in sunspot Cycle 23 (debate, please!) will be subject to deep fades.

You need an efficient antenna at these frequencies. The longest long-wire possible with some attempt at matching. AOR owners already have a WIRE input matching the generally high impedances found with wire antennas and the generally low impedances used in JT's relay-switched input circuits. Electrical noise is the enemy down here, so with AOR's policy of 2-Wire mains connection, you can use the best earth you can without looping into the hash from your house supply. Go for an earth spike, banging it into frosty ground is the best post-Christmas aerobics session you could wish for. Loop or ferrite rod antennas are worth a try as they only react to the magnetic part of the radio wave, leaving noise, mostly in the electrical part, behind. Contribute to this debate or send your Xmas Greeting to: bob@aor.co.uk

And the same to you.

AR5000 high performance in a single wide band receiver...

The AR5000 advances the frontiers of performance providing excellent strong signal handling, high sensitivity and wide frequency coverage with microprocessor facilities to match. A great advancement in wide band front end design has been made, partly due to the introduction of **automatic electronic preselection** between 500kHz - 999.999999MHz with low pass, band pass and high pass filters for other bands. The preselection may be "manually tracked" when monitoring spot frequencies to help reduce any potential effects of interference caused by nearby monster transmitters. 'True receive' throughout its range, not an up-converter above 1GHz.

There simply is not enough room here to list all the available microprocessor facilities, in fact the whole story of this feature-rich miracle is not revealed until you are able to study the operating manual... alternatively give us a call and "chat through" all the features!

- 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...!

Descriptive leaflet available, please call

RRP £1749

Exploration of the Xplorer

Alan Gardener sets out on his exploration of the outer limits, with the latest near-field offering from Optoelectronics.

It's a problem most scanning enthusiasts are familiar with - you know that radio communications are being used in your vicinity - you don't know exact frequencies or who is using them - but you would like to be able to monitor them!

Well the answer to problems like this may well be the new Optoelectronics 'Xplorer'.

This is a hand-held device which can very rapidly capture local f.m. transmissions, provide an audio output, indicate the frequency, signal strength, deviation, CTCSS tone, DCS code, DTMF tone, time, date and with a GPS receiver connected, your location.

The concept behind the 'Xplorer' is a logical extension of existing products already manufactured by Optoelectronics. Many enthusiasts will by now be aware of the capabilities of the 'Scout' frequency recorder which I reviewed in *SWM* September '95.

Optoelectronics also produce a wide-band f.m. communications monitor - the R-10 - which can demodulate local transmissions and give an indication of signal strength and deviation - but that's it - it won't tell you the frequency of the signal you are receiving. With the 'Xplorer', Optoelectronics have combined many of the features of these two products and produced an entirely new device.

So What's It All About?

The unit consists of a small black box measuring 75(w) x 40(d) x 145mm(h) including the knob, which makes it slightly larger than an average pocket size. The front panel has a membrane type keypad which occupies the lower half of the facia and has five control pushbuttons and a power switch. The upper half of the panel has a 50 x 15mm dot-matrix l.c.d. display and a small loudspeaker grill.

The top of the unit has a rather oddly shaped rotary 'push / turn' control knob, BNC antenna socket, data, tape recorder, earphone and power sockets and two l.e.d.s to indicate the battery charge and 'lock' status - and that's it!

As you have probably guessed by now - if there are only five buttons and one knob to control the device, you have got to use several permutations of key presses to achieve the desired result. In practice this isn't as bad as it may seem. The buttons are marked 'F1', 'F2', 'Hold', 'Skip' and 'Shift', and for most operations it is relatively easy to control the functions.

When the unit is first switched on it performs various self tests before reverting to its last state of operation. So if you left it displaying the contents of a memory when you switched it off - that's where it will be when it's powered up again.

Once the unit is running you enter the main menu by pressing the 'F1' key. Further presses of the 'F1' key scroll through seven sub-menus, which are described in more detail below. Once a sub menu has been selected with the 'F1' key it is possible to scroll through further options by rotating the control knob. Once an option has been selected in this way it can be modified by simultaneously pressing the 'F2' key and rotating the control knob. A single press of the control knob activates the volume menu and two presses activate the squelch menu, both of which can be altered by turning the control knob. Although this sounds complicated it is actually very easy to remember and I found that I could use the main functions within a few minutes of first powering the unit.

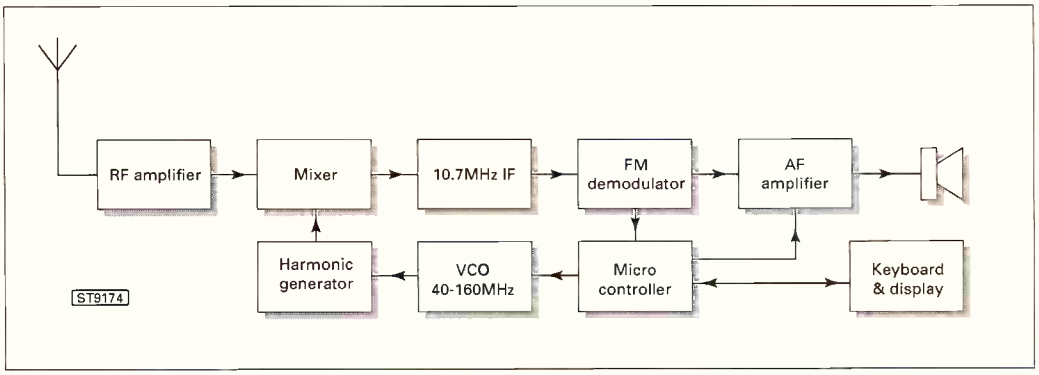
The Main Menus

CONFIG

This is used to set up the main operating parameters of the 'Xplorer' and includes sub-menus to clear memories, set capture and auto store parameters, initiate fast battery charging, enable the backlight, set up the computer interface port, enable the audio, permit DTMF decoding, enable frequency lockouts and set-up the manual and fast tuning rates.

LOCKOUTS

This provides a means of displaying locked out frequencies. These can be scrolled through by turning the control knob.



MEMORY
This provides a means of examining the contents of individual memory locations by rotating the control knob. If the 'F2' key is also pressed the contents of individual memories can be reviewed. These include Frequency, Number of Hits, Time, Date, Audio enabled, DTMF enabled, Latitude and Longitude (With external GPS receiver), Signal Strength, Deviation, CTCSS Tone, DCS Code and DTMF Tones.

TIME/DATE
Displays the current time and date of the internal real time clock.

COORDINATES
Displays the current Latitude and Longitude presented to the unit by an external GPS receiver.

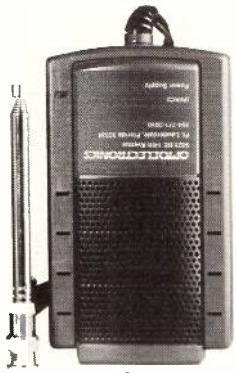
SWEEP
Starts the automatic search and store function. Once a transmission has been detected a press of the front panel 'Skip' button will force the sweep to resume whilst pressing the 'Hold' button will halt the sweep. Pressing the 'Shift' and 'Hold' button manually stores the received signal's parameters into memory and pressing the 'Shift' and 'Skip' button locks the frequency out of any further sweeps and stores the details in the lockout memory.

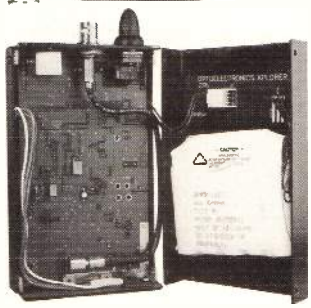
VFO
Provides a means of manually tuning the receiver. Turning the top mounted control knob varies the frequency. The rate can be set up via the 'CONFIG' menu to tune in steps of 5, 10, 12.5, 25, 30, 50 and 100kHz. In addition a fast tuning rate of 1, 5 or 10MHz can be selected. This is enabled in the v.f.o. mode by pressing the 'F2' key whilst rotating the control knob.

In Use

I guess the majority of users will just be interested in the Sweep mode, with the automatic search and store function enabled. Providing the squelch control has been set at a realistic level the unit will sweep across the entire 30MHz to 2GHz frequency range in less than a second, only stopping if an active frequency is detected at a level greater than the squelch threshold. The unit will then store the frequency into one of the memories along with the number of hits, Time, Date, and if an external GPS receiver is connected Latitude and Longitude. One the sweep has stopped on an active channel it is possible to manually load other information such as Signal Strength, Deviation, CTCSS tone, DCS code and DTMF data strings into memory by pressing the 'Shift' and 'Hold' keys.

The captured information can then be reviewed at a later date by scrolling through the 'Memory' menu. Unlike the Optoelectronics 'Scout' there is no provision for an audio 'beep' or silent 'vibrate' mode when a valid signal is detected.





How It Works

Optoelectronics do not provide a block diagram of the unit in the users handbook so I have had to guess at how the unit works. **Fig. 1** shows the signal input on the left, where the antenna is connected to the r.f. stage. This amplifies the signal and feeds it to a mixer stage where it is combined with a harmonic rich local oscillator signal derived from a Voltage Controlled Oscillator and multiplier. The resultant signal is passed on to the 10.7MHz i.f. stage before it is applied to the f.m. Demodulator. Audio output from the demodulator is fed to the audio amplifier and loudspeaker and also to the Microprocessor Controller. The Controller determines the incoming r.f. and Audio frequencies, updates the liquid crystal display, stores information in memory and controls the v.c.o. tuning, audio and squelch level.

The v.c.o. only tunes from 40-160MHz, the reception of signals outside this frequency range is achieved by using harmonics of the v.c.o. signal. No front end bandpass filtering is provided so several different frequencies are actually being received at once. By now the more technically minded amongst you may be asking "How does it know which of the signals produced by the harmonic generator and mixer is the genuine one?" For example if the unit is receiving a signal on 30MHz the v.c.o. will be operating 10.7MHz above this frequency at 40.7MHz. This will also produce an image 10.7MHz higher in frequency than the v.c.o. at 51.4MHz. The harmonic generator will also produce Local Oscillator signals at multiples of the v.c.o. frequency and each of these will have two image frequencies.

Indeed if you manually tune the 'Xplorer' using the v.f.o. mode you can hear signals on the image frequencies as clearly as if they were on the wanted frequency. However when the unit is operating in the 'Sweep' mode it only seems to stop on genuine signals. I can only assume that it achieves this by a clever bit of programming which checks for signals on image frequencies when the 'Sweep' stops and then makes a decision as to which is the most likely to be genuine one. This wouldn't work too well if there were lots of signals present at any one time, but in its intended application where it is only likely to be subjected to a few strong locally generated signals it shouldn't be a problem.

Performance

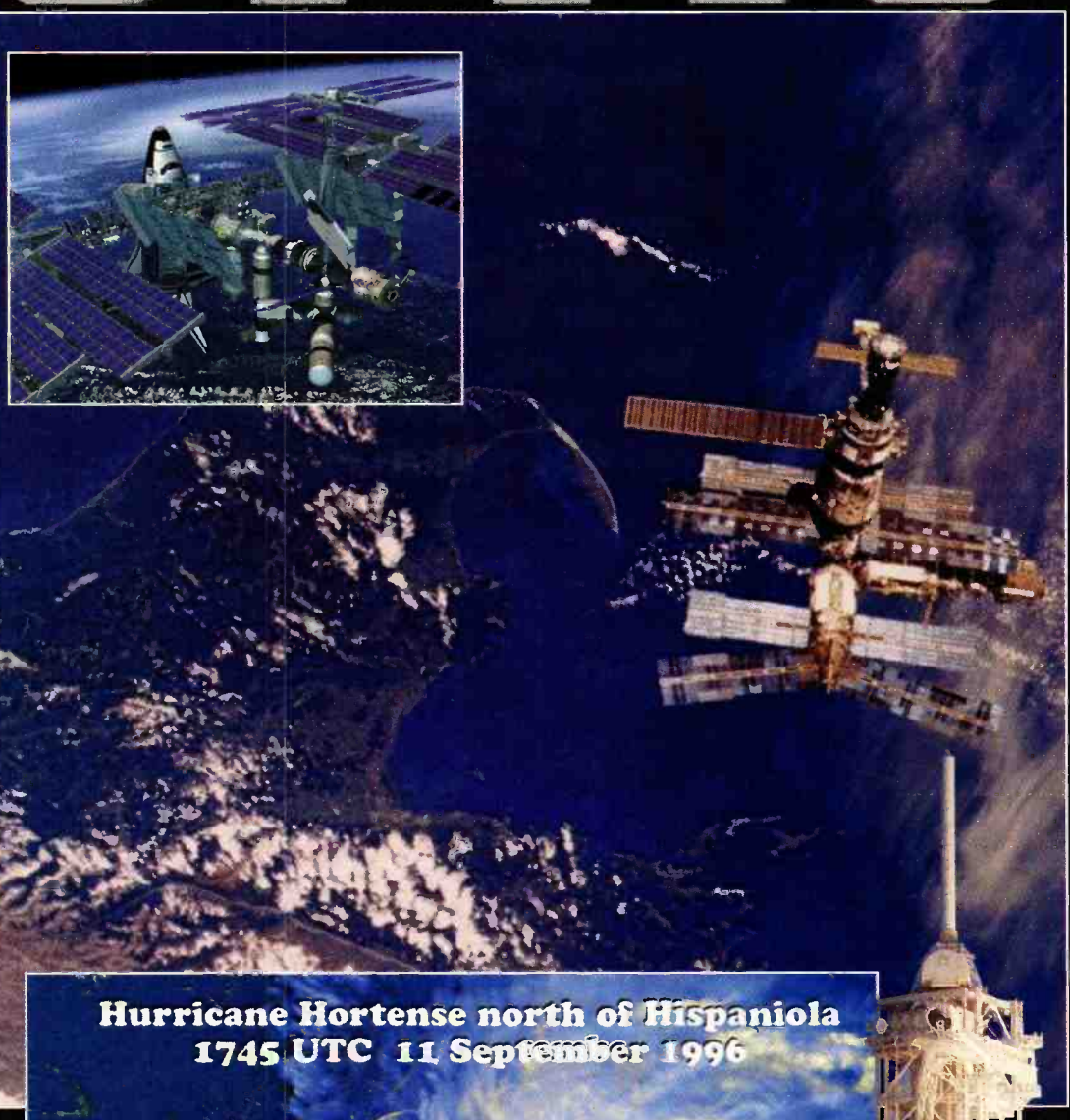
A good example of this is at my home where the signal level from a BBC national f.m. Band II broadcast site is very strong. As I manually tuned the 'Xplorer' I could hear broadcast stations on several different frequencies other than the correct ones. However, when used in the 'Sweep' mode the unit only recorded the genuine frequencies and still managed to capture a few other weak ones. However, fitting a Band II notch filter in line with the antenna improved the performance with other signals dramatically. This highlights the main problem with broadband devices like the 'Scout' or 'Xplorer' you need to exclude as many unwanted signals as possible in order to improve your chances of capturing wanted ones.

The sensitivity was significantly better than that quoted by Optoelectronics (better than 100µV@100MHz)

I found that the 'Sweep and Autostore would function correctly at the following levels:-

continued on page 53 ▶

SPACE SPECIAL



AN 'INFO' SPECIAL

MIR, THE SPACE SHUTTLE AND THE ISS

Whenever MIR becomes visible in the evening skies, space enthusiasts all over the world, both casual and serious, make the effort to identify the satellite and watch it cross the stars. The availability of satellite tracking programs, and the access to current Kepler elements for MIR means that one can know exactly when and where to look. Lawrence Harris explains.

The orbit of MIR is such that it passes over Britain on five or six consecutive orbits every 24 hours, with approximately 92 minutes between passes. Later orbits do not bring it within reception distance. The nature of its orbit is such that each sequence of passes gradually moves earlier during the day, so MIR periodically moves into our early morning (before sunrise) skies, when it can be seen by early risers. A few weeks later, passes move to late, then early evening. This is the most popular time because we can see the satellite illuminated after local sunset. When I go outside during the appropriate evenings to search the skies, neighbours have a habit of suddenly appearing. Curiously, they often spot MIR before I do!

MIR now has its future mapped out for several years, as a result of a new role, despite the financial pressures under which the Russian space programme exists. Between March 1995 and May 1998, MIR is hosting a series of NASA astronauts - delivered by the Shuttle - as crew members. The NASA programme supporting this endeavour is commonly known as the International Space Station, Phase 1 - see later. NASA also provides continuously updated information about its astronauts while they live and work aboard MIR.

MIR has undergone many physical changes since it was first put into low earth orbit. **Fig. 1** shows a recent picture.

MIR is made up of four compartments: working, transfer, intermediate and assembly (only the assembly compartment is not pressurised). The central core module of MIR is shown in **Fig. 2**, with the working and living sections, the solar arrays, and the engines illustrated.

The extensive research on MIR focuses on two main areas: human life in space (Microgravity Sciences, Life Space Sciences, and Space Technology Development) and observational sciences (Earth Observation and Sciences, and Space Sciences). The cosmonauts use themselves (and plants and animals) as guinea pigs while they study the influence of gravity on biological processes. These life space science experiments provide insights into the impact of weightlessness on space operations. Advantage is taken of MIR's microgravity environment in order to conduct scientific investigations into biological and material studies.

International Space Station - Alpha

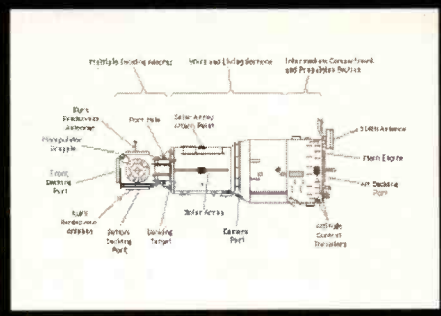
The International Space Station programme began in 1994 and entered the first of its three development stages in 1995. Phase I is the joint MIR/Shuttle rendezvous programme, and its main objective is to provide operations experience. Significant development milestones reached during 1995 included visits to MIR by US Space Shuttles, two satellite link-ups, the transfer of cosmonauts and supplies, and the first participation by a US astronaut, Dr. Norman Thagard, as a member of a Russian station crew.

MIR offers a unique opportunity for long-duration space-data gathering, so ISS designers are using MIR as a test site for hardware, materials, and new construction methods. It forms the 'homebase' for the construction of the ISS. Assembly begins in 1997, and in 1998, US and Russian hardware will be assembled in orbit to create a research facility. Research will be conducted while the Shuttle is docked at the station or through remote operations from the ground when the Shuttle and crew are not present. Construction will continue when pressurised modules and attached payload platforms from Japan and Europe are added. The Space Station is expected to be completed by 2001, and will then support a permanent human presence in space. In the 35-year history of human space flight, no previous programme has required so many transport vehicles, so much interdependent operation between organisations, and so much careful timing.

Enter the Shuttle

The decision to build an International Space Station for peaceful scientific research, gave a new impetus to both MIR and the Shuttle programme. The recent presence of US astronaut Dr. Shannon Lucid on MIR formed the MIR-21 flight. The crew consisted of Commander Yuri Ivanovich Onufrienko, Flight Engineer Yuri Vladimirovich Usachyov and Dr. Shannon Lucid, who lived and worked together on MIR. The daily routine incorporated scientific experiments, the occasional EVA (extra-vehicular activity), the routine enlargement of MIR's power capability, and the observation of Earth.

International Space Station Alpha.



The central core module of MIR.

AN 'INFO' SPECIAL

The combined crews work to answer vital questions about the future of human life in space. While in the safety of a known environment, they experience real-life problems that might otherwise arise with more serious consequences aboard the International Space Station. MIR is a test site for many areas of experience and investigation.

Shuttle Launch

The most active phase of any Shuttle flight is the launch. The Shuttle's main engines and solid rocket boosters employ millions of pounds of thrust to reach low-Earth orbit. Before liftoff, the astronauts carefully monitor cockpit displays, and work with controllers in the Launch Control Complex at Kennedy Space Center in Florida, to ensure all systems are go for launch. Once the Shuttle clears the launch tower, they work with controllers monitoring the Shuttle's systems in the Mission Control Center at Houston, Texas.

The Space Shuttle's launch takes it from a vertical position on the launch pad to an average orbit altitude of 185 statute miles in about eight minutes. To achieve this they use three powerful, reusable main engines, and two reusable solid rocket boosters (SRB), the largest solid-propellant motors ever flown. During the early flight, the solid rockets and the external tank that carries fuel for the main engines are jettisoned. The SRB casings are refurbished and reused; the external tank burns up during re-entry.

Monitoring the Shuttle

There are various ways to monitor Shuttle radio traffic - depending on the circumstances of the flight. Those of us living in the UK can expect to receive direct transmissions from the Shuttle only if its orbit actually comes over Britain - so those flights having an orbital inclination of 51° can be heard directly. A number of 'Info' readers have reported success during these flights. **Colin Knight** of Eastleigh reported the following: "I was lucky enough to hear the direct 'u.h.f.' Shuttle downlink on 259.70MHz on launch day. Launch on the 16th September occurred at 0854UTC and they started coming through on my scanner at 0912UTC, and were in range until 0917UTC - only about five minutes".

As well as watching MIR during favourable opportunities, we can tune general purpose scanners into the various published frequencies used by MIR and its associated support vehicles:

MIR Listening Frequencies

143.625MHz	n.f.m.	voice
145.550MHz	n.f.m.	voice (amateur radio contacts)

Soyuz Monitoring

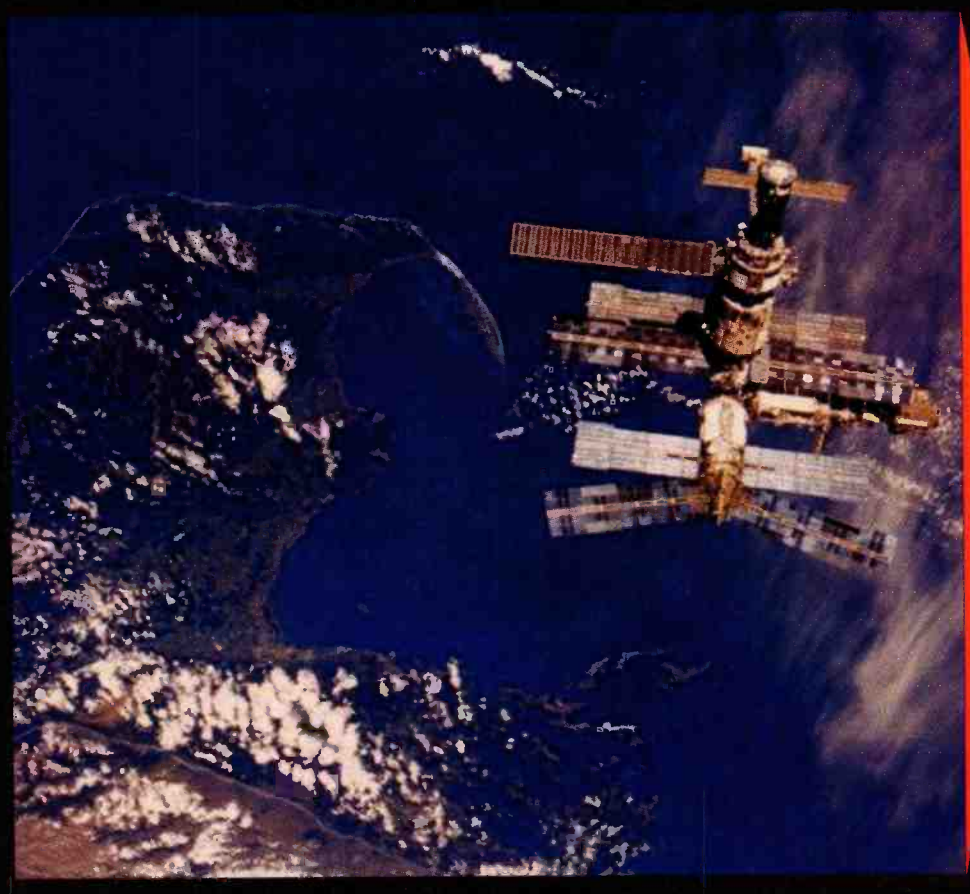
The Soyuz-TM module is used to transport crews and cargo to and from the MIR Space Station. It uses the following frequencies:

166.000MHz	n.f.m.	data telemetry
121.750MHz	n.f.m.	voice

Progress

This is a cargo and resupply vehicle used to send science equipment and data to and from MIR, as well as food supplies and mail for the crew.

165.000MHz	w.f.m.
166.000MHz	w.f.m.
922.750MHz	L-Band



NEW Xplorer

It's a receiver

a counter, a recorder, a decoder....

U.S. Patent No. 5,471,402

•Two-Line LCD display, first line displays frequency. Second line switches between either CTCSS, DCS, DTMF, Signal Strength, or Numerical Deviation.

NMEA-0183 GPS Interface,-Connect your GPS to the Xplorer for Mapping applications.
(GPS and Mapping Software not included)

The New Xplorer Test Receiver. Ideal for any two-way communications testing or monitoring. The Xplorer is a value packed performer integrating the functions of a CTCSS, DCS, and DTMF Decoder, Frequency Recorder, Nearfield Receiver and more into one hand-held unit. No more guessing when programming a frequency for monitoring-the Xplorer captures nearfield frequencies off the air from 30MHz - 2GHz in less than 1 second. The New Xplorer; providing the power of handheld portability with state of the art functionality and performance.

•Built-in Speaker. All frequencies received are demodulated for instant monitoring.

...and the last instrument you will ever NEED.

Features & Specifications

•Easy touch control pad. F1 & F2 keys control all Xplorer functions. Hold, Skip, Store and Lockout all enabled through the keypad.

- •Frequency Lock Out, Manual Skip, and Auto or Manual Hold
- •Internal Speaker, Audio Earphone/Headphone Jack
- •Built-in PC Interface, PC Connection Cable and Download Software included
- •Relative ten segment Signal Strength Bargraph
- •Optimum Maximized Sensitivity for increased nearfield distance reception
- •Tape Control Output with Tape Recorder Pause control relay and DTMF Encoder for audio data recording
- •High speed FM Communications Nearfield Receiver, sweeps 30MHz - 2GHz in less than 1 second
- •Two line LCD displays Frequency and either CTCSS, DCS, DTMF, Deviation or Signal Strength
- •NMEA-0183 GPS Interface provides tagging data with location for mapping applications
- •Frequency Recording Memory Register logs 500 frequencies with Time, Date, Number of Hits and Latitude/Longitude. *(Latitude & Longitude coordinates are only displayed in memory when used with GPS)*
- •Real-Time Clock/Calendar with lithium battery back-up
- •Built-in Rapid Charge NiCad Batteries with 5 hour discharge time and Power Supply included
- •Numerical Deviation Display with 1-10kHz and 10-100kHz ranges
- •Telescoping Whip full range Antenna included

OPTOELECTRONICS®

5821 NE 14th Avenue • Ft Lauderdale, FL • 33334

Haydon Communications
132 High Street • Edgware • Middlesex • HA8 7EL
TEL: 0181•951•5781 **FAX:** 0181•951•5782

Nevada Communications
189 London Street • Portsmouth • Hampshire • PO2 9AE
TEL: (01705) 662145 **FAX:**(01705) 690626

Waters & Stanton Electronics
22 Main Road • Hockley •Essex •SS5 4QS
TEL: (01702) 206835 **FAX:** (01702) 205843

Mapping Software is currently available for United States only

Check Out Our Web Site:
optoelectronics.com
WWW

Table 2: Amateur radio stations re-transmitting Shuttle audio.

Station	Centre	v.h.f.	10m	15m	20m	40m	80m
WA3NAN	GSFC	147.450	28.650	21.395	14.295	7.185	3.860
W6VIO	JPL	224.040		21.280	14.282	7.165	
K6MF	ARC	145.585				7.165	3.840
W5RRR	JSC	146.640	28.495	21.350	14.280	7.227	3.850
AK8Y	LERC	145.670 or 147.195					
W1AW	ARRL	147.555	28.0675	21.0675	14.0475	7.0475	3.5815
KA9SZX		146.880	(Video at 426.250)				
K4GCC		146.940					
WA4VME		145.170					

All frequencies are in MHz. Use f.m. on v.h.f., u.s.b. on 10 to 20m, l.s.b. on 40 to 80m.

Table 1: Space Shuttle downlink frequency list.

Band	Frequency (MHz)	Mode	Use
v.h.f.	145.840	n.f.m.	Amateur Radio
u.h.f.	243.000	a.m.	Emergency Voice Channel
u.h.f.	259.700	a.m.	Primary Voice Channel
u.h.f.	279.000	a.m.	EVA Voice Channel
u.h.f.	296.800	a.m.	Back-up Voice Channel
	(GHz)		
S	2.2175		Data
S	2.2500		Data
S	2.2875		Data
C	5.4000 to 5.9000		Data

The crew of September flight STS-79. Seated, l to r, are astronauts Jay Apt, Mission Specialist; Terry Wilcutt, Pilot; William Readdy, Commander; and Mission Specialists Tom Akers and Carl Walz. Back row, l to r, are Mission Specialists Shannon Lucid and John Blaha.

Colin reports hearing references to 'Houston', which he had previously only heard via the WA3NAN re-broadcasts. My own antenna is currently unsuitable for the higher bands, but I did hear the cosmonauts and Shannon Lucid on 143.625MHz, commenting on the Shuttle launch, during the following MIR pass, shortly after the launch of STS-79.

The Shuttle can usually be received using simple receiving equipment on 145.840 or 145.550MHz. The latter frequency is also used by MIR. **Tables 1 & 2** give details of frequencies and modes.

You should, of course, remember that reception conditions will vary with the time of day, the current state of solar activity, and the effectiveness of your antenna.

MIR Links up with the Shuttle.

MIR crew - Commander Yuri Ivanovich Onufrienko, Flight Engineer Yuri Vladimirovich Usachyov and Dr. Shannon Lucid.

Future Shuttle Missions to MIR

STS-81 Planned launch:
16 January 1997.
STS-84 Planned launch:
15 May 1997.
STS-86 Planned launch:
18 September 1997.

Credits

Pictures are published by courtesy of NASA:Goddard Space Flight Centre and the Russian Press Agency. Frequency information has been obtained from several sources including Keith Stein of Vancouver.

Summary

These ongoing developments in the space field should provide radio and satellite monitoring enthusiasts with an increasing number of opportunities to tune into the action. As information becomes available on frequencies and schedules, 'Info' will carry the details. I produced a 'Shuttle Pack' which includes the complete Shuttle manifest, and is updated from NASA's press releases. It includes information on Shuttle monitoring - see 'Info' for details. Meanwhile, if you would like copies of the images appearing in this feature, please send me a stamped, return addressed envelope with a formatted disk and list of images required. Please enclose a secure 20p coin towards the costs.

READERS' PICS

Lawrence takes this oportunity to show us some more interesting examples of satellite images supplied by SWM readers.

When Editor Dick Ganderton told me that there was an opportunity to have a few colour pictures in the next 'Special', it took me ten seconds to reach for the folder of readers' pictures which I retain 'just in case'! A number of readers of 'Info' have submitted colour pictures, sometimes on disk, and sometimes as hard copy. The pictures usually have to be scanned and reproduced in black-and-white, and on a number of occasions I have wished that the original could be seen in all its glory. Well now you can! Amongst the colour pictures that had not yet been returned to their rightful owners, were prints from Roger Ray and George Newport. Black-and-white prints which have been waiting for publication space also came from Brian Dudman, Peter Schoen and Dr Martin van Duinen, each illustrating features that I planned to include in future editions.

The 'Info'

Roger Ray of Telford upgraded his computer earlier this year, and then upgraded his WXSAT software to the Window's version of PROsatII issued by Timestep. He produced a spectacular METEOSAT-5, colour, whole-disc, visible-light image of the CTOT format, using his Epson stylus colour II inkjet printer. The image is noise-free, and the absence of 'colour blend' - the feature which sometimes happens when artificial colour is added to an original black-and-white image - suggests that a land-outlines mask has been incorporated. Looking at the leaflet on Timestep's software, it is evident that the new program is a generation ahead of the earlier PROsatII.

For readers who have recently discovered WXSAT monitoring and are not sure about METEOSAT and colour, I should explain that most earlier systems have produced images directly from METEOSAT telemetry without incorporating automatic image enhancement techniques. The satellite's image scanners produce a data stream which is transmitted on two channels - 1691.0MHz (called A1) and 1694.5MHz (called A2). Channel A2 also transmits Primary Data (high resolution) images, as well as WEFAX (low resolution) images.

We can receive the 'lower resolution' images transmitted on these two bands, using standard geostationary WXSAT decoding hardware and software. The satellite 'sees' only in black-and-white; there is no colour information in the data stream. After the image data has been decoded (extracted) from the telemetry, it can be displayed on the computer. It can also be 'enhanced' by artificially stretching its contrast, or even changed fundamentally by replacing certain 'grey scales' by the appropriate colour levels. For a 'visible-light' image, the black background can be replaced with dark blue - simulating the colour that the eye expects to see. Similarly, land masses, which usually have intermediate grey shades, can be replaced by shades of green. The lightest greys of an image are normally clouds, so these can be replaced by shades of white/grey (or left untouched). When done with extreme care - often using mask techniques to avoid green clouds and blue land - the result can be as shown in Roger's picture, a result worthy of an exhibition.

George Newport of Canterbury sent me a set of high quality prints which have also been waiting for the possibility of colour reproduction. His NOAA-14 images were obtained on 16 and 19 July. I don't have information on George's receiving equipment, but I know he has access to a good colour printer!

Peter Schoen of Germany operates both a high resolution picture transmission (h.r.p.t.) system built by Timestep, and an a.p.t. system. Being surrounded by houses, Peter's reception starts when the satellites reach about 10° elevation. From a selection of several pictures I have picked the infra-red image received from NOAA-9's channel 4 imager. The picture shows the region of the Baltic Sea, with the islands of Gotland and Oland seen more clearly in this print than in my atlas of the area.

Brian Dudman is another regular contributor to 'Info' and, like several keen monitors of the WXSAT field, he often watches live transmissions during the night. One example of his early morning results is shown in the accompanying pictures.

THE RF SPECTRUM TERMINATOR HAS ARRIVED

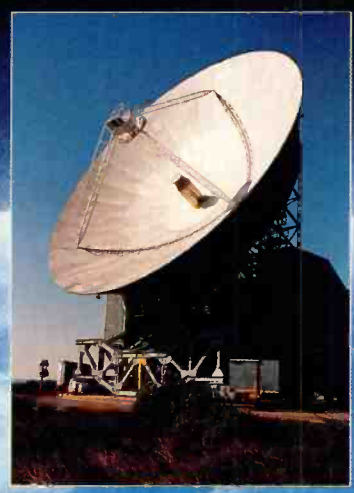
and it's available from

Martin Lynch & Son

RRP: £1695, with FREE 5 year warranty, Icom FL-52A CW/Data Filter *and* AD-55 Mains PSU...worth £250!

Deposit £295, and 24 payments of £70.14.

Total cost of loan £283.36. (APR 19.9%)



COMMUNICATIONS RECEIVER

IC-R8500

MARTIN LYNCH & Son

THE AMATEUR RADIO EXCHANGE CENTRE

To place your order for a new IC-R8500, call the Martin Lynch & Son sales team on 0181 - 566 1120

Martin Lynch & Son is a Licensed credit broker. Full written details are available upon request. E&EO

FORTY & FAT...BUT ST

CHANCE OF A LIFETIME

It's not very often one is given the opportunity of owning the very best receiver in the World. Martin Lynch has secured THREE of the famous Icom ICR-9000 receivers and can offer these at vastly reduced price.

Two pieces are new, one is virtually new, all offered boxed with manuals and all accessories. The retail price of this remarkable receiver is £5695 incl. VAT. The used example is available at only £2495, the two remaining new items at £3495 each.

Once sold this offer will never be repeated. Finance is available on all three units.
Call the sales desk today, 0181 - 566 1120.

DANMIKE DSP-NIR

Manufactured by Danmike of Denmark, the DSP-NIR is a premium grade noise reduction unit directly competing with the DSP 599+

INTRODUCTORY PRICE: £329.95

"HIGHLY RECOMMENDED" BY CHRIS LOREK

JVC GR-DV1

Not only has JVC invented the worlds smallest lightest hand held CamCorder, they've produced it in the new "Mini DV" digital video format.

Offering quality of picture and audio that can only be described as breathtaking, the versatility offered by a unit so small, (it really can fit in your jacket pocket), is yet to be matched by any of the competition.

- Up to 60 mins recording with M-DV60ME tape
- 1/3" CCD (670,000 pixels)
- Lens F1.6, f=4,5-45mm
- Min lux less than 1 in Slow Shutter Mode.
- PCM Digital Audio
- 100x digital zoom
- Colour View finder
- Menu driven features
- Colour View finder
- Light Aluminium case
- Lithium Ion battery
- Comes complete with docking station for ease of use at home
- Remote control for docking station

DISCOUNTED TO £1749
or deposit £349 & 24 payments of £70.14.
Cost of loan: £283.36.

Welz WS-1000

This amazing little unit is a full blown scanning receiver capable of covering everything from 500kHz to 1300MHz with no gaps. Not only is it the smallest scanner you've ever seen, it's the lightest too. Closer in size to a box of matches rather than a pack of cigarettes, the new WS-1000 from Welz-Diamond is technology in its extreme. Take a scanner with you where you wouldn't have bothered before.

specification

- 500kHz-1300MHz
- AM/NBFM/WBFM
- 1/5/6.25/9/10/12.5/15/20/25/30/50/100kHz steps
- 400 memories ▶ Skip search
- Power voltage from only 2.2-3.5V DC
- Dimentions in mm: 58(w) x 97(h) x 24(d)
- 16mA power save 1 sec.
- Weight: 200 grams incl. batteries & antenna

NOW AVAILABLE FROM STOCK

SPECIAL OFFER ONLY £299
incl. VAT & FREE postage

NEW... Icom ICR-8500

Covering 100kHz-2GHz, all mode, IF Shift, APF and direct RS-232C compatibility. Icom have once again set a "standard" to which all other base station scanners must be judged.

Available with 5 years parts & labour warranty FREE of charge, and if you order during October or November you'll also receive an Icom FL-52A CW/Data Filter *and* an AD-55 Mains PSU...worth £250!

RRP: £1695. Deposit £295, and 24 payments of £70.14. Total cost of loan £283.36. (APR 19.9%)

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.
RRP: £410.
ML PRICE: £379.
Super low finance available from only £27.50 per month!

The New AOR AR-7030

Probably the best engineered receiver in the world. Including a FREE FIVE YEAR WARRANTY, only available from MARTIN LYNCH.

FREE 5 year warranty

RRP: £799.
Deposit: £99.
12 payments of £64.28.
Cost of loan: £71.45

Opto Electronics Scout

The most innovative product for scanners of 1995? Connect this little frequency counter up to your AR-8000 and see it make the scanner jump onto a frequency that its literally just "sniffed" out of the air! Termed "Reaction Tune", it has many uses both for the hobbiest and commercial user.
RRP: £449. ML Price: £369 Super low cost finance available from only £27.50 p/m!

Yaesu FRG-100

USED EXAMPLES AVAILABLE FROM ONLY £399
Call for availability

Retailing at £599, the new receiver from Yaesu takes some beating. At £469, its an even better buy!
RRP: £599.
NEW LOWER ML price CASH/SWITCH £469. Super low cost finance available from only £36.66 p/m!

The New AOR AR-5000

For those who take the entire radio spectrum very seriously. The AR-5000 covers 10kHz through to a staggering 2600MHz! All mode base receiver, setting new standards in all band performance.

RRP: £1749. **Lynch Price: £1569.**

Deposit £269, 12 payments of £119.39.
Cost of loan: £132.70 or
Deposit £269, 24 payments of £65.13.
Cost of loan: £263.12. (APR 19.9%)

Global AT-2000

A superbly built SWL antenna tuner for improved receive performance. Built in Q selector. **£95.**

ILL FERTILE!

Lynch 40th (yes 40th) Birthday Party at the store on 2nd November! Bargains & give-aways galore!

UNIDEN BC 9000XLT

Recently supplied to a government department, the new base scanner from Uniden is a professional tool offering serious performance at an affordable price.

- 500 memories
- 25-1300MHz (550-760MHz TV video band blocked)
- Keypad entry
- VFO tuning knob for frequency control
- "Turbo scan" - 300 steps per second
- 100 channels per second
- Selectable modes: AM/NBFM/WBFM
- Line output - ideal for "off air" recording
- Selectable attenuator
- Alpha numeric display
- CTCSS available as option

ONLY £319.95

Lowe PR-150

Matching the HF-150, a preselector can greatly enhance reception of weaker signals, that would otherwise be lost in the noise caused by stronger signals. They really do work. Suitable for most other receivers. Ask for details.

NEW LOW PRICE: £199.

Noise reduction?

Suffering from power line noise? Got a noisy street lamp or thermostat clicking away? Slip in line the ANC-4 and see it disappear. If not send it back and get a refund! **RRP £195 incl. p&p.**

Look-alikes

Police look-alike Lapel speaker
Suitable for most scanners on the market.
Only £11.50 incl. delivery.

Police look alike Earpiece. MyDEL P-300
As used by many government establishments throughout the world, the new MyDEL P-300 easy to wear "over the ear" earpiece is available now, including FREE P&P.
(State which scanner the P-300 is for when ordering).
ONLY £9.95 p&p FREE!

NEW...Opto Xplorer...NOW AVAILABLE

Scan the entire FM spectrum between 30MHz & 2GHz in less than 1 second and hear it, see it decode it, map it and record it! It's bloomin' amazin'! Call our FaxBak service for more information.

FAXBAK 0181 - 566 0 007

ONLY £799!

Garmin GPS-45XL Includes Active Compass

NEW MODEL

Due to an overwhelming demand, we've decided to stock this important device. Locate your latitude/longitude national grid to within an amazing 49ft accuracy! Lots more besides,

ONLY £259.

MVT-7200

The alternative to the AR-8000. If you liked the old MVT-7100, this new enhanced version should fit the bill.

RRP: £449. ML PRICE: £399 and FREE FINANCE! deposit £99, 12 payments of only £25, ZERO APR.

CASIO QV10A - LCD DIGITAL CAMERA

A neat palm size digital storage camera which can store over 90 full colour digital images. Import the picture into your PC with the supplied interface cable & software for IBM compatible (MAC available). Ideal for reprinting images on the Internet, SSTV via JVFAX and lots more. Outputs include direct video and serial for PC connection. Supplied with all accessories including Software & Cables.

RRP £799 **Lynch Price £399**
Deposit: £49, 12 payments of £32.14.
Cost of loan: £35.73 (APR 19.9%)

NEW MODEL

DIGITAL SIGNAL PROCESSORS

NEW LOW PRICES

DSP 9+ DSP 59 * DSP 599zx * 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. Alternatively, order by mail order and if it doesn't impress you, return it for a full refund of the purchase price. How's that for confidence?

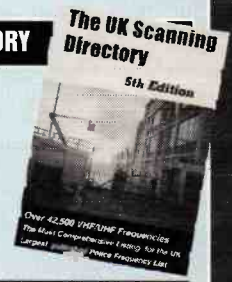
MFJ-784B All mode Tunable DSP £249
DSP 9+ All mode DSP at only £189
DSP 59+ As above but more features £249
DSP 599zx NEW! Hyper speed processor, alpha display and more £349
DANMIKE DSP-NIR "THE BEST" £329.95

AOR AR-3000A

Lots of different versions being offered, but make sure you are buying one sourced through the U.K. distributor. We only sell this model supplied by AOR U.K. Ask before you buy elsewhere!

RRP: £949. **Lynch Price: £849**
Deposit £149, twelve payments of only £64.28. Cost of loan: £71.45 (APR 19.9%)
Also available the "PLUS" version. Please add £46.

5th EDITION UK SCANNING DIRECTORY



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

Optima ACARS Receiver

Designed exclusively for Martin Lynch, this new receiver releases your expensive scanner from monitoring1 frequency for reception of ACARS. All that is required is 12 volts DC input, and an external antenna. The Optima will then give you audio direct into either ACARS decoding software, or our Universal M-400/M-1200 decoder. It's that simple!
RRP: £129.95

Lowe HF-150

We sell as many to commercial users as we do to enthusiasts. The best built, best performing receiver under £500.

RRP: £419. Deposit £59, 12 payments of only £30, ZERO APR.

Why not add a keypad for fast frequency access? only £44.95.

Datong Active Antennas

AD-370/270 The pair of Active Aerials were originally designed for the Royal Navy several years ago and to date, no other manufacturer has been able to offer such performance from a compact design.

If you are stuck for space and need a good high performance SHORTWAVE ANTENNA then order yours today!
Datong AD-270 (internal) **£69.95**
AD-370 (external) **£94.95 p&p £10.**

MARTIN LYNCH & Son
THE AMATEUR RADIO EXCHANGE CENTRE

0181 - 566 1120

TEL: 0181 - 566 1120
FAX: 0181 - 566 1207
CUSTOMER CARE
0181 - 566 0 566

OPENING HOURS MON-SAT 9.30 - 6.00
Late night Thursday by appointment

Please NOTE prices & monthly payments are based on 17.5% VAT & no more price increases! E&OE. £10 p&p on all major items.

MARTIN LYNCH & SON,
140 - 142, NORTHFIELD AVENUE,
EALING, LONDON W13 9SB

MARTIN LYNCH WEB SITE
http://www.martin-lynch.co.uk
E-mail address: sales@martin-lynch.co.uk

METEOSAT-5 visible-light, whole-disc CTOT image from Roger Ray.

NOAA-14 visible-light section image from George Newport.

NOAA-9 h.r.p.t. image of the Baltic Sea from Peter Schoen.

NOAA-12, 6 June '96 0750UTC from Brian Dudman.

METEOR 3-5, 6 June '96 0630UTC from Brian Dudman.

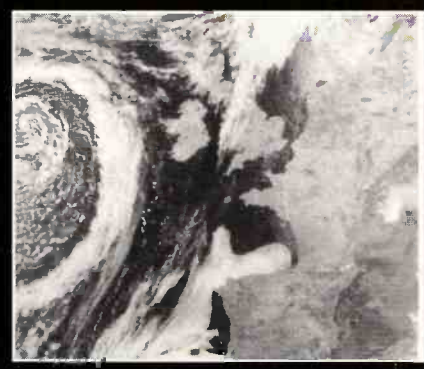
READERS' PICS

The METEOR-3-5 image which Brian received at 0630UTC on 6 June. The picture shows the characteristic format of METEOR pictures - image content, aperture indicating bars, grey scale and 'end of line' bars. A few minutes before 0630UTC, METEOR 3-5 had been travelling north-bound in darkness - not transmitting. At the bottom of the picture, we see that METEOR 3-5 had just switched on (137.85MHz) - the left-side of the image is dark and shows the night side to the west of Britain. The aperture covering the image sensor was fully open - indicated by the vertical black column - which can be interpreted as comprising several vertical bars, each representing a binary counter. Within a few seconds the illumination level improves and the first bar (near the bottom) turns to white. During the following few minutes, more bars change as the binary counter increments. The second portion of this calibration section comprises an easily identifiable grey scale - more vertical bars, ranging from black to white. A final set of white/black bars marks the edge of the image line.

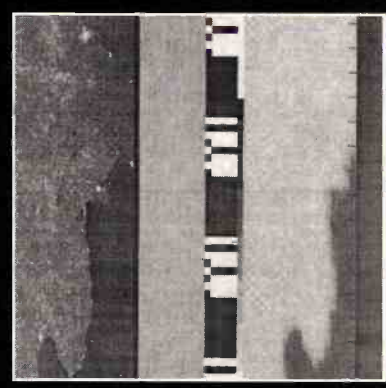
Comparison of this METEOR image and the accompanying NOAA-12 image received 80 minutes later, shows similar weather patterns, but the differences in the imagers' sensitivity to the different spectral regions can be seen. NOAA WXSATs show land features very well, whereas METEOR sensors reveal considerable detail in the snow and clouds - the 'white' levels. Both images show what appears to be fog in the Bay of Biscay. The METEOR image also shows streaks, which may be caused by the aperture not opening smoothly.

Dr. Martin Th. A. van Duinen sent me some pictures, one or two of which have been included in columns earlier this year. The first was transmitted by SICH-1 as it passed over the Baltic Sea, transmitting multi-spectral imagery on 137.40MHz. The left section of the image originates from an onboard microwave sounder; the other part is from the radar. Clouds are transparent to this imager. Various calibration sequences are also seen in this image, including vertical grey scales and a (presumed) telemetry sequence which appears as 'piano-key' telemetry.

My thanks to those many readers who have provided such good quality prints. Those who wish to provide colour images on disk can do so, though please remember that opportunities for colour reproduction may be infrequent!

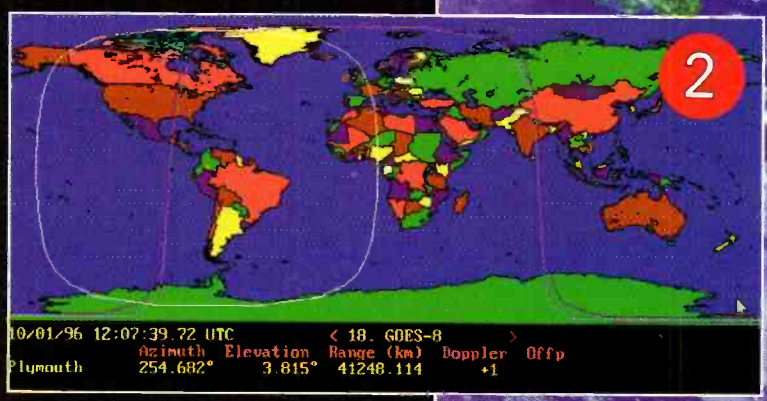


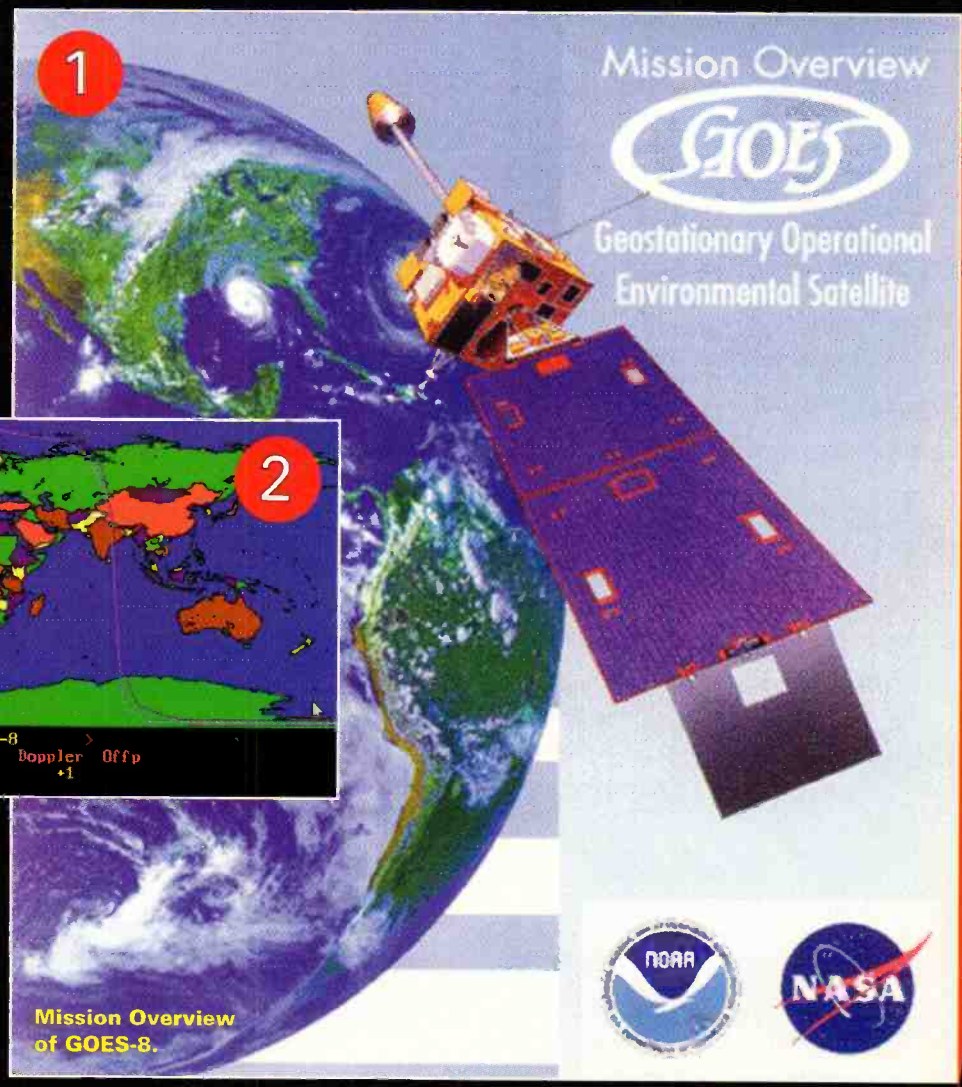
SICH-1 image of Riga from Dr. Martin van Duinen.



GOES-8 - THE ULTIMATE WXSAT!

Our, Info In Orbit, columnist, Lawrence Harris, provides us with some interesting details and pictures about the latest GOES weather satellites.





Mission Overview of GOES-8.

The USA has two primary geostationary WXSATs, (currently GOES-8 and GOES-9) though it should be noted that some of the earlier GOES satellites are still operating to a certain extent, providing valuable data and communication facilities. These primary satellites are located at longitudes 75°W and 135°W (the 'east' and the 'west' positions respectively). From here, they allow the provision of detailed, near continuous coverage of hurricanes and other extreme weather systems on both sides of the USA. The legacy of the *Challenger* accident, together with hardware problems, meant that the launch date for GOES-I, the first of NOAA's next generation of geostationary WXSATs, slipped badly. On 13 April 1994, GOES-I was finally launched. After attaining geostationary orbit on 27 April 1994, then drifted to the 'east' position, the satellite was renamed GOES-8. Subsequently, GOES-9 was launched and positioned at the 'west' location.

Command And Data

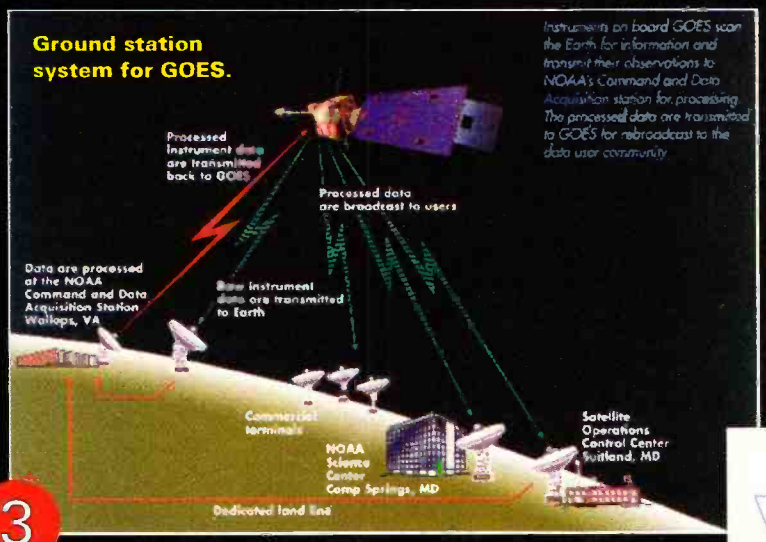
The Command and Data Acquisition (CDA) ground station, located at Wallops, Virginia, supports the interface to both satellites. The NOAA Satellite Operations Control Center (SOCC), in Suitland, Maryland, provides spacecraft scheduling, health and safety monitoring, and engineering analyses. Raw satellite scan data is transmitted to the ground station and then processed. This data is transmitted back to GOES, which then re-broadcasts it to the user community.

Diversity

Those who live within the footprint of GOES-8 (see **Pic. 2**), and that includes the western side of Britain, may be able to receive WEFAX transmissions on 1691MHz direct from this WXSAT. If you are currently monitoring such transmissions from METEOSAT-5, then you already have the required hardware, and your software should cope with the slight differences.

GOES-8 is an amazing WXSAT, providing near continuous images which have been obtained from several sources around the world, including other WXSATs, geostationary and polar, as well as those originating from its own sensors. To illustrate the diversity of these transmissions, I spent many hours collecting live samples of this imagery. Most of the images shown here were obtained using a 1691MHz TH2SAT Yagi antenna, feeding a Timestep Pre-amp and receiver/decoder, processed and displayed on a Pentium computer.

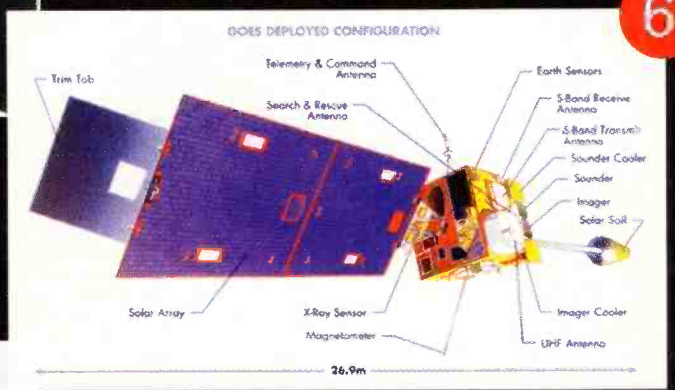
GOES-7 - the previous generation - provided imaging at four wavelengths. GOES-8 has a dedicated, high resolution, 5-channel multi-spectral imager - the Visible and Infra-red Spin Scan Radiometer (VISSR) Atmospheric Sounder (VAS). Among the VAS channels normally included in that multispectral data stream



3

7

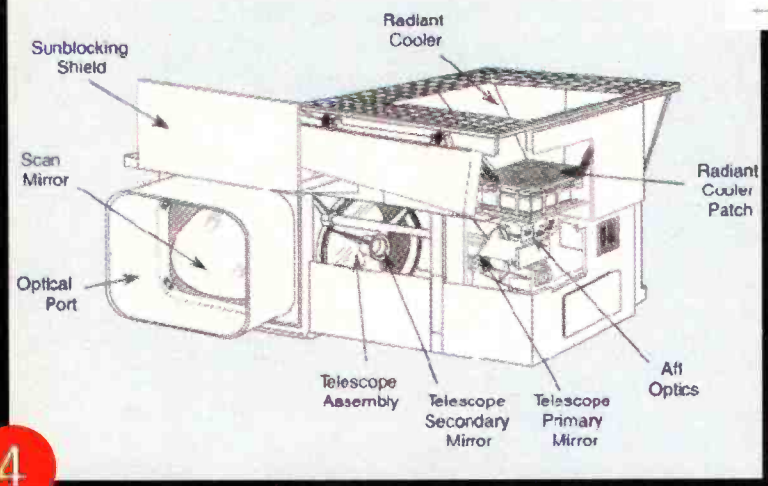
GOMS image (recent) from SMIS.



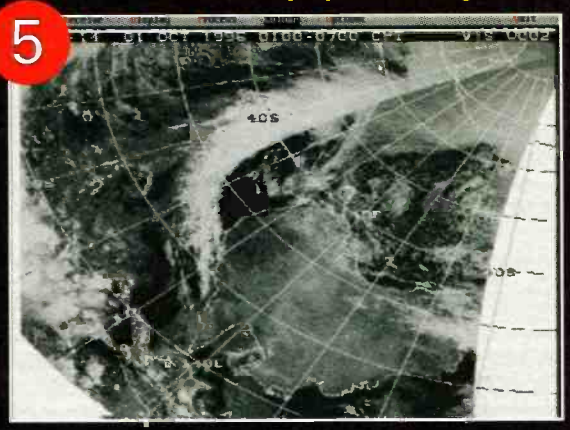
6

Satellite deployment configuration.

Satellite imaging system.



4



5

are those centered on 6.7 and 3.9mm. The change to earth-oriented spacecraft operation results in a more efficient use of the imager and sounder, producing both higher spatial resolution and improved signal-to-noise ratios. The use of an improved sounding capability - a 19-channel sounder - allows operational soundings from geostationary orbit for the first time. In addition, making separate sounding and imaging products eliminates conflicts between the imager and sounder, allowing the maximum utilisation of each sensor.

The satellite's orbital configuration, with the solar panels fully extended is shown in **Pic. 6**, with **Pic. 4** showing the imaging systems.

SARSAT (Search and Rescue)

GOES provides the instantaneous relay functions for the SARSAT system - 'Search and Rescue Satellite Aided Tracking'. A dedicated search and rescue transponder on board GOES is designed to detect emergency distress signals originating from Earth-based sources. These unique identification signals are normally combined with signals received by a low-Earth-orbiting satellite system and relayed to a search and rescue ground terminal. The combined data are used to perform effective search and rescue operations.

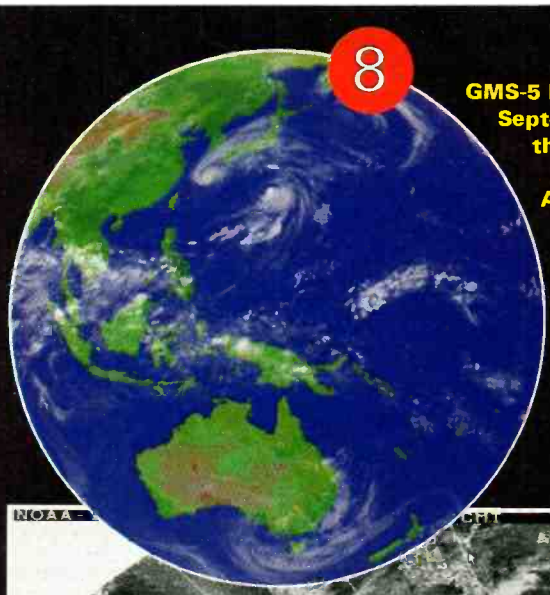
Image improvement

As an illustration of the consistently improved specifications of GOES-8's on-board systems, compared with the previous generation, the visible imaging channel (0.52 - 0.72mm) generates 10-bit images (GOES-7 provided 6-bit). The detectors now comprise stable silicon diodes instead of photo-multipliers.

The overall result of using a significantly improved system, and the acknowledgement of changing user requirements, resulted in the development of a new operating schedule. As with METEOSAT, the schedule can be changed when external circumstances dictate. The schedule issued on 21 May this year includes transmissions originating also from GOES-9, METEOSAT-5, and NOAA-14, with many additional meteorological charts. With so many varied images transmitted from GOES-8, I selected the following samples; please note that the images are not completely noise-free. A satellite barely 3° above the horizon requires precision antenna pointing - my antenna points between the wall of a neighbour's house, and some greenery. Even so, I am very pleased with the results.

Sample images from GOES-8:

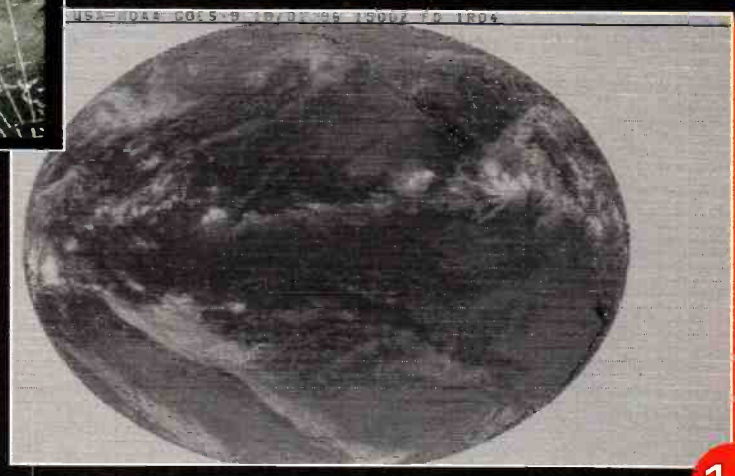
These are the infra-red, whole disc images as seen by GOES-8 and -9 on 1 October at 0845 and 1500UTC respectively, and transmitted in WEFAX format several times each day. Some of



GMS-5 IR image 29 September from the Japanese Weather Association.

Whole-disc IR image from GOES-8.

Whole-disc IR image from GOES-9.



the GOES-9 slots were not being used because the satellite was still in its eclipse season - suffering power reductions while it passed through the earth's shadow - an effect seen during each solstice (while the sun also passes through the celestial equator).

From the vantage point of GOES-8, most of America can be monitored, together with much of the eastern Atlantic Ocean. The difference in the view seen from GOES-9's longitude is obvious from **Pic. 11**, received the same day. Neither GOES image is enhanced. There do not appear to be any whole-disc, visible-light images transmitted as WEFAX from either GOES-8 or 9.

Composite images

Several sets of composite NOAA-14 images are transmitted during each 24 hour period. At 1122UTC, a set of visible-light and i.r. composite polar images are transmitted. The first in the sequence is W001 (**Pic. 10**) covering part of the north polar area around longitude 130° (Japan), as seen during consecutive passes by NOAA-14, between 0100 and 0700UTC.

The W002 format (**Pic. 5**), is a visible-light image of part of the southern hemisphere which includes Australia, and south to the pole. This sequence includes composites of both poles, and other images in this sequence complete the coverage.

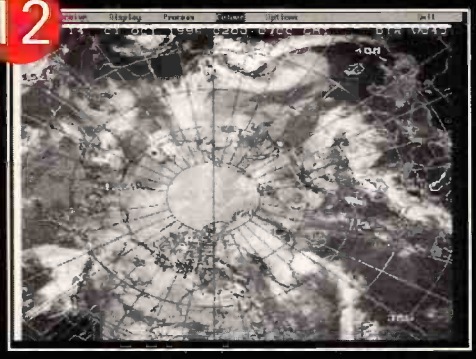
At 0914 and 0926UTC each day, infra-red image composites of the whole of the north and south poles respectively are transmitted - see **Pics. 12 & 13**. These were obtained (by the ground station) from NOAA-14 during the pass times shown on the image header. For clarity, I have enhanced both images using only a contrast stretch. These images could be further enhanced by the addition of artificial colour, and I have found one pleasing effect is obtained using a blue scale (blue being associated with cold). Once such a palette has been set up, it can be saved and re-applied to other 'ice' images. Similarly, hot areas can be enhanced using a red palette.

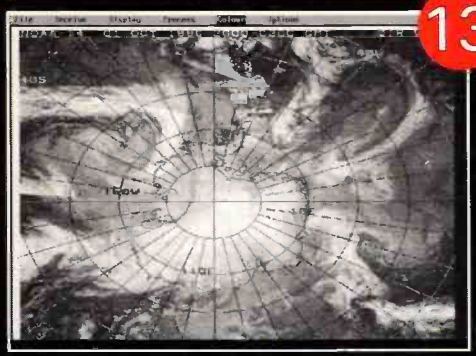
Further sequences of polar composites are transmitted at 0514 and 1706UTC.

Routine images of the four quadrants taken in the three wavebands (visible, infra-red and water vapour) are produced and transmitted by GOES-8 throughout the day. The enhanced visible-light image from 1 October, showing the eastern side of America, and the north-western part of the Atlantic Ocean is shown in **Fig. 13**.

Many METEOSAT-5 images of various formats are regularly transmitted during the day, but there seemed little point in reproducing any of these!

TBUS information (equipment status and future operational plans for each NOAA WXSAT) is transmitted in four slots from 1410UTC. Interestingly, these transmissions, and several WXSAT images are also transmitted at various times, and on various frequencies in the h.f. bands. A sequence of ice charts are transmitted at 0240UTC, but I was reluctant to leave my antenna and pre-





amp on public view in my absence, to receive those images!

And Finally

I have left out a few image sets which GOES provides, but they might be featured in a future 'Info In Orbit' column. To round-off this feature, I have obtained some specially processed images from the original organisations.

Credits

This article was written using extensive access to information provided by the Cooperative Institute for Research in the Atmosphere - CIRA - in Ft. Collins, Colorado. CIRA is sponsored jointly by Colorado State University, and the National Oceanic and Atmospheric Administration - NOAA. I am indebted to them for their help. Images are published by permission of NASA - Goddard Space Flight Centre, the Japanese Weather Association and the Space Monitoring and Information Service of the Commonwealth of Independent States.

Special Offer to 'Info' readers

Mr Roger Phillips, a Computer Specialist of the NOAA/NESDIS/RAAM branch at CIRA, Colorado State University has kindly provided me with a set of three floppy disks (3.5in, 1.4Mb) containing a computer-based introduction to the GOES-8 satellite. If any reader would like a copy of this set, please send either (a) three disks as described, plus one self-addressed, stamped envelope and a secured 20p coin, or (b) £1 and an s.a.e. (I will provide the disks).

▶ continued from page 38

EXPLORING THE XPLORER

Frequency	Sensitivity
100MHz	22µV
400MHz	22µV
1.0GHz	300µV
1.2GHz	900µV
1.5GHz	7mV
2.0GHz	20mV

Note that this was in the absence of other signals, and that in a practical situation other signals would be present which would significantly alter the operating range.

The i.f. bandwidth appeared to be in the region of 50kHz as deviation readings beyond this level of modulation produced an increasing error in readings.

The signal strength reading varied from a minimum of 7µV to a maximum of 15mV@100MHz which gives a dynamic range of approx 67dB.

Checking out the DTMF and CTCSS functions I found that the review model was capable of accurately decoding DTMF tones, but it did not seem to be able to respond to any CTCSS tones below 100Hz. However, I have been told that current versions function correctly.

The Xplorer is capable of being connected to a PC or any other equipment sporting an RS-232 port. Software and a special RS-232 lead were supplied with the unit and these permitted the memory contents to be downloaded as an ASCII text file to a PC. This would have greater potential if the signal strength, CTCSS and DTMF details could be autostored.

My main criticism of the Xplorer is the software driven volume and squelch levels - I found that pressing the rotary knob didn't always activate the control menu, especially if the unit was in the 'SWEEP' mode. In addition I thought that it would have benefited from some form of automatic volume control or a.g.c. function in the audio amplifier. The problem is that unlike most scanning receivers, the f.m. demodulator uses the same i.f. bandwidth and demodulator for the entire range of f.m. deviation. So a broadcast signal with 75kHz deviation sounds considerably louder than a p.m.r. signal using only 2.5kHz deviation. As a consequence of this you have to constantly fiddle with the volume control to prevent your eardrums from suffering permanent damage.

Although the handbook states that the Xplorer is not capable of demodulating a.m. signals it is capable of capturing them. It would have been nice to be able to select a.m. demodulation in some instances in order to identify various non f.m. signal sources.

Summary

The Xplorer is a very specialised item of equipment ideally suited to certain professional applications such as Communications Engineering or Counter Surveillance. It has a unique combination of facilities which it would be difficult to provide by any other means, particularly in such a small package.

It should be noted that Xplorer is not intended to replace a conventional scanning receiver, which is optimised for long range reception at the expense of tuning rate. The Xplorer is designed to locate strong, local, f.m. transmissions in a fraction of a second - but just think how many strong signals are present in an average urban area. As an example I had to lockout about 30 frequencies before I started to get meaningful results using just a short telescopic antenna.

For hobbyist applications other alternatives such as an AOR AR8000 hand-held scanner reaction tuned by an Optoelectronics 'Scout' is capable of providing some of the functionality of the 'Xplorer' and should be considered as an option.

My thanks to **Waters and Stanton Electronics, 22 Main Road, Hockley, Essex SS5 4QS. Tel: (01702) 205835, FAX: (01702) 205843**, for supplying the review model. ■

ASK ELECTRONICS LTD

We also stock a range of books for frequency scanning

248/250 TOTTENHAM COURT ROAD, LONDON, W1P 9AD • Tel: 0171-637 0353/0590 • Fax: 0171-637 2690

SONY RADIOS ARE ON SPECIAL OFFER

YOUR SONY SPECIALIST

All products covered by a total manufacturers guarantee

NEW FROM SONY

ICF-SW1000T *RRP £449* .... ASK price **£360.00**
As reviewed in Short Wave Magazine April issue
ICF-SW77 150-29995kHz, usb/lsb cw, 160 memories & labelling facility, 5 event timer, world timer
RRP £399.95..... ASK price **£329.00**
ICF-SW55 *RRP £299.95*..... ASK price **£235.00**
ICF-SW100E *RRP £219.95* ... ASK price **£159.95**
ICF-SW100S KIT inc active antenna
RRP £299.95..... ASK price **£235.95**
ICF-SW7600G *RRP £189.95*.. ASK price **£129.95**
ICF-SW33 *RRP £149.95*..... ASK price **£135.00**
AN1 Active SW antenna
RRP £74.95..... ASK price **£59.95**
AN-71 Wire antenna..... **£4.99**
AN-100 Active antenna for ICF-SW100 or ICF-SW7600G **£49.95**
AN-102 Compact active antenna..... **£59.95**

ROBERTS

RC-818	£184.95
R-817	£159.95
R-617	£120.95
R-621	£59.95
R-101	£49.95

AS ADVERTISED IN SWM

GARMIN

GPS 38	£170.00
GPS 40 now only	£165.00
GPS 45XL	£230.00

SW Receivers

LOWE HF-150	£385.00
KEY PAD	£39.95
PR-150	£205.00
IF-150 interface	£39.95
HF-225 Europa	£615.00
HF-250	£700.00

GRUNDIG AT ASK

Satelit-700	£320.00
Yachtboy-500	£159.95
Yachtboy-400	£120.00
Yachtboy-207	£32.95
Yachtboy-217	£42.95

MAGELLAN

GPS 2000	£175.00
GPS 3000	£199.00
Trailblazer	£249.00
Trailblazer XL	£299.00

MAIL ORDERS WELCOME ON THE ABOVE PHONE NUMBERS. FAST-EFFICIENT-CONVENIENT TO YOUR DOOR STEP!!

HOW TO INTERPRET FACSIMILE WEATHER MAPS & CHARTS £8.95

WEATHER REPORTS FROM RADIO SOURCES £6.00

We also have in stock a range of Frequency Scanning Guides and Books

UK Scanning Directory 5th Edition	£18.50
Shortwave International Frequency H/Book	£14.95
Ham Tool Kit – CD ROM	£9.95
Shortwave Maritime Communications	£16.50
QRZ Call Sign Data Base (CD ROM)	£9.95
Global Radio Guide	£3.95
Passport To World Band Radio	£14.95

HANDHELD & BASE SCANNERS

YUPITERU

MVT-125II air band	£169.95
MVT-150 FM marine	£169.95
VT-225 civil & military airband	£240.00
MVT-7000 100kHz-1300MHz (no gaps)	£255.00
MVT-7100EX 500kHz-1650MHz	£279.95
MVT-7200	£345.00
MVT-8000 home base 8MHz-1300MHz	£335.00

REALISTIC DX-394 ..... £249.00

AOR

SPECIAL OFFER AR-8000
Full UK spec £360.00

AR-7030	£715.00
AR-5000	£1499.00
AR-2700 500kHz-1300MHz	£260.00
AR-3000A 100kHz-2038MHz home base	£840.00
AR-3030 30kHz-30MHz home base	£615.00
AR-3000	£810.00
OPTO-SCOUT	£369.95
SAC-8000 To link Scout to AR-8000 without modification	£24.95
SDU-5000	£650.00
WA-7000 Active wide band antenna 30kHz-2000MHz	£149.95

WELZ WS-1000 The smallest hand held receiver available.
RRP £349 ..... ASK PRICE **£299.00**

UNIDEN UBC-220XLT £150.00

TAX FREE FOR EXPORT. MAIL ORDER IMMEDIATE DESPATCH. GOVERNMENT & LOCAL AUTHORITY ORDERS WELCOME

YAESU

FRG-100
50Hz-30MHz £509.95
FRG-9600
60MHz-905MHz £525.00

ALINCO

DJ-X1D
200KHz-1300MHz £240.00

ICOM

ICR-1
100KHz-1300MHz £380.00
(The smallest hand held scanner)
ICR-7100 homebase £1279.00

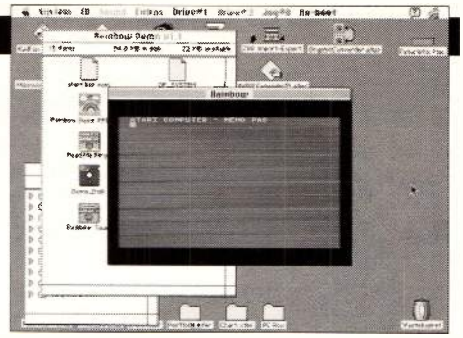
All products are subject to a posting & packaging charge

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

Jerry Glenwright, 23 Downland Avenue, Southwick, West Sussex BN42 4RF

Shackware



Screen dump of the XL-It emulation in action on Jerry's Mac.

Hello and welcome to ShackWare. As I write, the nights are drawing in and the call of my station is growing ever stronger. It's about time to abandon my Land Rover restoration until spring and settle down for some serious knob twiddling! So without further ado, let's press on to your letters.

Reader Mail

Previous correspondent **Matthew Payne** of Broadstairs, Kent, writes once again to tell me about his acquisition of DigiComm 3, a "packet radio program plus accompanying packet modem for the Commodore 64, available from J&P Electronics". Matthew has tied the computer, modem and software to a second-hand Realistic Pro-50 which he asserts, gleefully "works like a dream on 2m and 70cm. I am now running on v.h.f. and u.h.f. packet and I must say it has opened a whole new world of listening to me".

It's rare that I receive mail from listeners with Apple Macs, but I've had two recently. First on the welcome mat was Amersham, Bucks-based **Jack Powell** who has an LC475, a Sangean ATS-803A and yearning to decode weather FAX. Jack notes that I too have a Mac and Sangean and he wonders whether I've had any success – yes, *lots!*

RadFax is a bare-bones fax decode package from Finnish programmer Juri Munkki which I downloaded from a BBS ages ago. While it's definitely seat-of-the-pants stuff compared with JVFAX, the program does indeed offer splendid fax decoding. What's more, unlike PC users who must build or buy add-on hardware to handle signal acquisition, RadFax makes full use of the Mac's internal sound handling and A to D conversion to dispense with the need for extra hardware. Just connect the DIN output of your Sangean to the mic socket on the LC475, fire up the software and start decoding. I find the best settings are a timing drift correction of -550 samples/minute and a resolution factor of 5 half-waves/pixel. As we're both using LC475s that ought to work for you too. Version 0.9 is the latest I've seen, though there may be a more recent release.

Austin Muir, lives at Moreton-in-Marsh, Gloucestershire and was ZS5KH from 1948 until 1964 but "slight deafness discourages me from trying for a licence here". Prompted by a visit from his grandchildren, Mr Muir dug out his old Spectrum+, but damaged the keyboard while using a mini vacuum cleaner to remove dust from it. He now wonders whether a replacement is available. I hesitate to say no, because there is almost certainly a source of spares somewhere in the UK. My advice is to have a flick through one of the magazines devoted to trading in old computers such as *Micro Mart* (about 70p from newsagents). Be aware though, that it might actually be cheaper simply to find a replacement machine at a boot sale! If any reader can help with a spare or source, pass on the good news.

Finally, **D C Tasker** writes from Leicester with details of a recent gift: an Atari 800 complete with disk and tape drives. A listener since the 1930s, Mr Tasker tunes the bands with a Lowe HF-150 and would like to try his hand at decoding the data modes with his new computer. He asks for sources of software and literature, but wonders if he's "...expecting too much from such ancient equipment?". Not at all Mr Tasker, hopefully you've put the literature and disk of software I sent to you to good use already! Other potential Atari users should read on for my quarterly computer cameo...

Masked Ball

Do you ever hanker after an 8-bit computer you once owned and discarded following an upgrade to a 16-bit machine? Or maybe you've come upon some interesting bit of radio-related software which you can't wait to try but no longer own the necessary hardware on which to run it?

Well take heart, because those with PCs, Macs, Amigas and STs can tap into a huge number of emulator packages designed to turn your cutting edge computer into a cut-down version of yesterday's silicon.

And the point of all this for s.w.l.s? Vast treasure troves of bygone radio software available more or less for free suddenly become accessible when you turn your Mac or PC into an old-time 8-bit! It might not be as powerful as some of the commercial packages available today, but it costs all of nothing and it's a lot of fun to experiment with.

Two of my favourites are the Xtender ZX81, and XL-It Atari 8-bit emulators. Both offer high-speed crash-resistant emulation and come with sample software.

Interested s.w.l.s with Internet accounts should check out the Emulator FAQ available at **www.why.net/home/adam/cem** which lists all known emulators and hardware requirements. Those not on the Internet can scour PD libraries which often advertise CDs crammed with emulators, or have individual packages on disk. Failing that, write to me with an SAE, floppy disk and list of requirements and if I've got it (or can find it somewhere!) I'll bung it on a disk and return it to you.

Now, anyone know of a FAX decode package that will work in 1K on a ZX81...?

Potted Pre-history

Anyone familiar with the rise of home computing knows that Atari played a leading part in the action. Way back in 1979, Atari was marketing a 32K 8-bit computer with a 'grown-up' operating system on the inside and a proper keyboard on the outside, and featuring a host of peripherals such as printers, disk drives, modems, light pens and more. While the price was prohibitive in the UK, the Atari 800 (and its cut down sister the 400 – the machines were known during development as Colleen and Candy) showed what was possible from 'real' home computers.

Atari continued to develop its 8-bits yet ensured that each new incarnation was compatible with previous machines. The range expanded via the 600XL and 800XL, to the 130XE, a 128K machine featuring 64K of bank-switched memory and the ability to tap into the huge range of existing software and peripherals. A number of dedicated magazines were published in support, notably the American *Antic* (featuring N6CBT as a contributing editor) and *Analog* mags, and the UK-based *Page6/New Atari User* (still published today!).

The Atari Classic's American heritage translated to a wealth of Ham-oriented software, much of which is still around if you dig deep to find it. As well as the usual stuff such as contact QSL databases, antenna calculators, Morse tutors and so on, there are programs to decode fax and SSTV, RTTY and cw. Antic magazine published simple plans, constructional details and controlling software for interfaces to decode Morse and fax and while neither qualify as rivals to established favourites such as Hamcomm or JVFAX, both will give you a shoestring introduction to decoding the data modes. (Potential owners can write to me for photostats of the articles).

So which model to buy and from where? Any will do, though the exceptionally well shielded 800 was highly respected among the America amateur community. Boot sales are the best source and as for price, my last Atari Classic, an 800XL, cost just 50p, and the last Atari 800 I bought cost £2 from the All Micro Show (see next item). All peripherals are available too at reasonable prices. A 1050 disk drive should be well under £5 at boot sales (I've had one for £1) and everything else costs pennies to a pound or two. LACE is a thriving club for enthusiasts, and offers a BBS and comprehensive PD library. Contact secretary **Roger Lacey, 41 Henryson Rd, Crofton Park, London SE4 1HL**.

Show Time!

While there are probably more prestigious shows in the radio calendar, the All Micro Show is one which will interest all 'ShackWare' readers – that is, short wave listeners who like to use computers in their pursuit of interesting listening. The AMS is oriented towards fans of older computers, has a healthy radio-oriented turnout and features such obscure clubs as the UK Einstein User Group!

AMS '96 takes place on Saturday 9 November between 10am and 4pm at Bingley Hall, Staffordshire Showground, Stafford (signposted from J14 on the M6 or shuttle bus from Stafford BR). Tickets are available on the door priced £2.50 for adults and 50p for children under 14. Contact **Sharward Promotions (01473) 741533**.

Finally...

Yes, the end of another column is nigh but keep those letters coming. Do remember to enclose an s.a.e. for a personal reply and bear in mind that, with one page per quarter, I have an awful lot of mail fighting for a small amount of page space (hint!) so don't be disappointed if your letter doesn't make it.

Until next time, good listening.

SOUTH MIDLANDS COMMUNICATIONS

★ AOR ★ KENWOOD ★ DAIWA ★ COMET ★ YAESU ★ STRUMECH VERSATOWER ★ LAFAYETTE ★ HY-MOUND ★ MANSON ★ ICOM ★ HOKUSHIN ★ TAIWAN SERENE ★ CUSHCRAFT ★ HY-MOUND ★ LAFAYETTE ★ STRUMECH VERSATOWER ★ YAESU ★ COMET ★ DAIWA ★ KENWOOD ★ AOR

THIS MONTH'S SPECIAL OFFERS

AR-303 ROTATOR

ONLY £39

20% OFF

Carr D

TERELEADER TNC-24 MkII

ONLY £149

Carr C

Multimode data terminal

50% OFF

LOWE RECEIVERS

HF-150

AM, AMS, SSB. 30kHz-30MHz 60 memory channels.

Carr D

OUR PRICE £399

HF-250

AM, AMS*, SSB, CW, FM*. 30kHz-30MHz 225 memory channels. RS232 port.

Carr D

OUR PRICE £759

HF-225

AM, CW, SSB, AMS*, FM*. 30kHz-30MHz 30 memory channels.

Carr D

OUR PRICE £475

SRX-50

Portable receiver LW, MW, SW, VHF/FM stereo.

Carr B

OUR PRICE £37

* with options fitted

SCANNING RECEIVERS

AOR AR-8000

500kHz – 1900MHz. AM, FM, FM wide, SSB, CW. 1000 memory channels.

Carr C

OUR PRICE £369

SAVE £41

AOR AR-5000

Carr D

10kHz–2600MHz. All mode, AM, FM, USB, LSB, CW. 100 memory channels.

OUR PRICE £1559 (Scanning RX)

MVT-7100E

530kHz-1650MHz. AM, FM, SSB, WFM 1000 memory channels.

Carr C

NEW LOW PRICE only £299

AOR AR-3000A

Carr D

100kHz – 2036MHz. SSB, CW, AM, FM, FM wide. 400 memory channels.

OUR PRICE £859 SAVE £90

ICOM ICR-7100DC

25MHz – 2GHz. AM, FM, WFM, SSB. 900 memory channels. Carr D

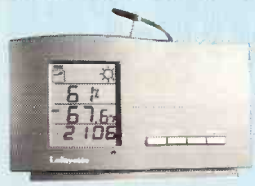
OUR PRICE £1249 SAVE £200

SONY. SHORT WAVE RECEIVERS

ICF-SW100E our price.....£189.00
.....save £30
ICF-SW7600G.....
our price £175.00.....save £25
ICF-SW55.....our price £259.00
.....save £40
ICF-SW77.....our price £349.00.....save £50
ICF-PRO80.....our price £315.00.....save £34

Sony Receivers Carr C

LAFAYETTE ELECTRIC BAROMETER BA213

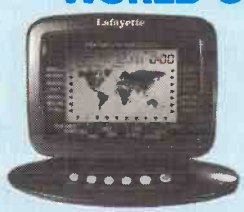


£49.95

- LCD digital display
- 12/24 hour clock format
- Detachable temp probe
- Selectable °F & °C
- Audio/Visual alarm

Carr B

LAFAYETTE EW882 WORLD CLOCK



£21.50

- LCD display
- 16 time zones
- Day, date, month
- 12/24 hour format
- Temp in °C & °F

Carr B

All discounts are based on recommended retail prices.
CARRIAGE: A = £2.75 B = £5.50 C = £9.50 D = £13.50

Showroom/Mail Order 9.30-5pm, 9-1pm Sat **Tel: (01703) 251549** Service Dept **Tel: (01703) 255111** 9-5 Mon-Fri *Email: amateur@smc.comms.com*

SMC Siskin *(SMC HQ) Data Communications Hotline* ***Tel: (01703) 254247*** *9.30am - 5pm for personal callers 9.00 - 9pm for telephone queries.*

SMC Ltd HQ Southampton: *S M House, School Close Chandlers Ford Ind Estate, Eastleigh, Hants SO53 4BY.* ***Tel: (01703) 255111 Fax: (01703) 263507***

ARE Communications: *6 Royal Parade Hanger Lane, Ealing, London W5A 1ET.* ***Tel. 0181-997 4476*** *9.30am - 5.30pm Mon.-Fri. 9.30am - 1.00pm Sat.*

Reg Ward & Co: *1 Western Parade, West Street, Axminster, Devon EX13 5NY.* ***Tel. (01297) 34918*** *9.00am - 5.15pm Tues-Sat*

SMC (Northern): *Nowell Lane Ind. Estate, Nowell Lane Leeds.* ***Tel. (0113) 235 0606*** *9.30am – 5.00pm Mon.-Fri. 9.00am - 1.00pm Sat.*

★ TELEX ★ AEA ★ TOKYO HY-POWER ★ MFJ ★ MIRAGE KLM ★ HENRY ★ MANSON ★ REXON ★ AOR ★ KENWOOD ★ YAESU ★

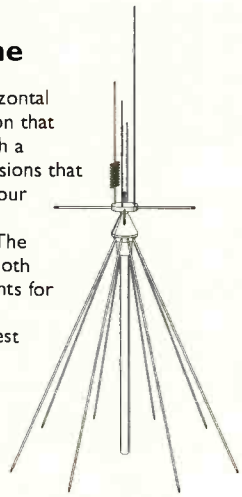
SRP TRADING

MANUFACTURERS & DISTRIBUTORS OF COMMUNICATIONS EQUIPMENT

SRP Radio Centre, 1686 Bristol Road South, Rednall, Birmingham B45 9TZ

Tel: 0121-460 1581/0121-457 7788 Fax: 0121-457 9009

SKY SCAN
DX V1300 Discone



Most discones only have horizontal elements and this is the reason that they are not ideal for use with a scanner. Most of the transmissions that you are likely to receive on your scanner are transmitted from vertically mounted antennas. The Sky Scan V1300 discone has both vertical and horizontal elements for maximum reception. The V1300 is constructed from best quality stainless steel and aluminium and comes complete with mounting pole. Designed and built for use with scanners.

£49.95

+ £3.00 p&p

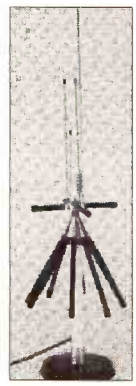
SKY SCAN
Magmount MKII

For improved performance, wide band reception, 25 to 1300MHz. Comes complete with protective rubber base, 4m RG.58 coax cable and BNC connector. Built and designed for use with scanners.

£24.95

+ £3.00 p&p

SKY SCAN
Desk Top Antenna Model Desk 1300



Built and designed for use with scanners. Coverage: 25 to 1300 MHz. Total height - 36ins - 9ins at widest point. Comes complete with 4 metres of RG58 coax cable and BNC connector fitted. Ideal indoor - high performance antenna and can also be used as a car antenna when your car is static. REMEMBER YOUR SCANNER IS ONLY AS GOOD AS YOUR ANTENNA SYSTEM!

£49.00

+ £3.00 p&p

New DX-394

MAJOR FEATURES

- **Frequency Coverage**
  LW 150 - 509.9kHz
  MW 510 - 1729.9kHz
  SW 1.73 - 29.9999MHz
- **Fine Tune**
  Fine tunes the reception signal, especially when you tune to SSB and CW
- **Step ▲, Step ▼**
  Selects the 0.1, 1, 5, or 10 (9) kHz tuning frequency step sequentially
- **Band**
  Selects LW (150-509.9kHz), MW (510-1729.9kHz), or SW (1.73-29.9999MHz) sequentially
- **LCD**
  Large LCD display with LCD signal strength meter

SAVE £100

LIMITED STOCK

WAS £349.99

SALE PRICE ONLY £249.99 + £10 p&p

PRO-2042

NEW

- 1000 memory channels (100 channels x 10 banks)
- 10 limit search banks ● 100 monitor channels.
- *Accessories:* Telescopic antenna and owner's manual
- *Display:* Large l.c.d. with l.e.d. backlighting
- Large rotary or keypad frequency control
- *Dimensions:* Approx 232 (W) x 210 (D) x 90 (H) mm
- *Receiving wave mode:*
  - Wide FM ➤TV sound, ➤FM broadcast
  - Narrow FM ➤Business, ➤Communication, ➤Ham radio
  - AM ➤Aircraft, ➤CB radio
- *Scan and search speed:* Approx 50 channels/sec. and 50 steps/sec.

1000 channel with hyperscan

£359.99 FREE P&P

FREQUENCY RANGE AND MODE

Freq (MHz)	Step	Mode	Freq (MHz)	Step	Mode
25.000-29.995	5.0kHz	a.m.	37.000-224.995	5.0kHz	n.f.m.
30.000-87.495	5.0kHz	n.f.m.	225.000-400.000	12.5kHz	a.m.
87.500-107.995	50.0kHz	w.f.m.	400.005-520.000	12.5kHz	n.f.m.
08.00-136.995	12.5kHz	a.m.	760.000-1300.000	12.5kHz	n.f.m.

SRP Radio Centre

1686 Bristol Road South, Rednall, Birmingham B45 9TZ

Tel: 0121-460 1581/0121-457 7788

Fax: 0121-457 9009

REALISTIC PRO-50
20 channels

~~£109.99~~

£59.99 + £5 P&P

REALISTIC PRO-44
50 channels

~~£149.99~~

£99.99 + £5 P&P

REALISTIC PRO-62
200 channels

~~£229.99~~

£129.99 + £5 P&P

REALISTIC PRO-26
200 channels continuous coverage

~~£299.99~~

£219.99 + £5 P&P

REALISTIC PRO-25
100 channels

~~£219.99~~

£139.99 + £5 P&P

TELESCOPIC SCANNER ANTENNA
Extends portable scanner range. Nine sections, centre loaded. For 1-1300MHz. BNC connector.

£9.99 + £1 P&P

UNIDEN UBC-220XLT
200 channels

~~£189.95~~

£169.95 + £5 P&P

UNIDEN UBC-3000XLT
400 channels

~~£249.95~~

£239.95 + £5 P&P

YUPITERU MVT-7100

SUPER DEAL

£PHONE

CLIP-ON MINI SPEAKER

Ideal for portable scanners. Swivel clip attaches to your collar or lapel for easier listening while you carry your portable on its belt-clip. With 3.5mm plug.

£9.99 + £1 P&P

WELZ WS-1000

£349.00 + £5 P&P

AOR AR-8000

~~£410.00~~

£365.00

UNIDEN UBC-9000XLT
500 channels

~~£325.00~~

£299.95 + £5 P&P

UNIDEN UBC-860XLT
100 channels

~~£139.00~~

£129.95 + £5 P&P

REALISTIC PRO-2039

~~£219.00~~

£149.95 + £5 P&P

OPTO CUB

£139.00 + £5 P&P

OPTO SCOUT

£369.99 + £5 P&P

AOR AR-3000A

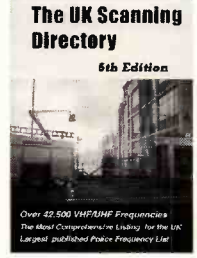
~~£949.00~~

£839.99

Nickel Metal Hydride (NiMH) Batteries. Super Syncro 1100 Rechargeable AA Cell battery 1100 MAH voltage 1.2 £3.00 each incl. P&P.

The new generation of rechargeable 'NiMH' or Nickel Metal Hydride cells, free of toxic or hazardous elements such as cadmium, lead, mercury or lithium, can be used repeatedly and disposed of safely when finally thrown away. A service life of 500 to 1000 charge/discharge cycles can be expected, and the capacity related performance is normally 30 to 50% better than that of the best equivalent NiCad cells.

5th EDITION SCANNING DIRECTORY



FREE P&P

£18.50

John Griffiths, c/o 22 Ffordd Beibio, Holyhead, Gwynedd, North Wales LL65 2EH.

Scanning

This month sees the start of a column, within 'Airband', designed to keep all the military air buffs happy. If you have any info for this, then send your info there, don't send it to me here! I'm going to have to accept being 'grounded' from now on!

This new angle means that I am freed up to return to scanning, a hobby in its own right, which is good, as lately many letters are arriving from people who want to know more, but are confused by the jargon and technicalities about scanning as a hobby. I've given this a great deal of thought and decided that, with Christmas looming up over the horizon, we'll start from the very beginning and cover both seasoned users and newcomers. Where's that I hear you ask? Where else - back to basics!

Book Selection

There is a good selection of books available on the market, and you can buy these from the magazine, designed to appeal to both the beginner and the more experienced user. Books, like most things, tend to go out-of-date very quickly however, and the column should sit in the gaps between this.

I'll review books that are sent to me and give them a good hearing. So, if you have any that you want reviewed, please send them care of the office! This means that while you could start from book lists of frequencies, regular attention to this column will enhance your listening greatly.

There is, however, only *one* book that I'd recommend you have with you at all times if you're into the hobby, new and old alike, and it's the one I use as my 'bible'. Written by the late Peter Rouse, the book *Scanners 3 - Putting Scanners into Practice* is about the only one of its kind on the market dedicated to enthusiasts and written in an easy and informative style. It includes such things as circuits for the home-brew enthusiast as well as giving a very helpful run down on the hobby in general. Definitely one for the Christmas stocking!

There are, of course, many more available from the *SWM* Book Store aimed at what might seem a bewildering array of scanning areas. Such titles that exists cover aircraft, ships and much more, often in great detail, but, as a starting off point, Peter Rouse's book is a definite 'must have' for the shack. If you haven't got a copy you really don't know what you're missing.

Antenna Types

One of the commonest questions I'm asked in the mail is about antenna types, such as what is the best, what is the most suitable and what is the one I recommend. This is an area that seems to baffle many new entrants into scanning, and also one that is hyped way above the heads of many people with its talk of baluns, a.t.u.s and the like. This month, I'll take a look at two situations, indoor and outdoor, and how you can choose what's the best for you, as an individual. I'll also keep it as simple as I can!

Firstly, outside antennas. The easiest way to do this is to tell you that 'the higher it is, the better it is'. Simpler than that, even, is the proviso that any outside antenna is better than an inside, or set-top one and the higher you get it and the more it 'sees', the better the results.

Put it this way. You live on a hill overlooking a major port and you have an antenna on the chimney and your mate lives in the town below, surrounded by blocks of flats, a factory and a multi-storey car park. His antenna and yours are exactly the same, and are both mounted on the roof. You both have the same scanner. However, you'll hear more and have better quality signals than he does. It doesn't matter why in technical terms! What it does mean is that any antenna mounted with a good 'view' and in 'the clear' ie. no obstructions to mask signal paths, will outperform the same antenna if that antenna is cluttered - no matter what you do to it!

So, if you live on a hill you're in a better position than being in a town or on an estate. Unless, of course, your house overlooks the port as well....

So, what's the best type of antenna for scanning? Again, there is great argument on this point, but I prefer verticals. Why? Mainly because most frequencies used by v.h.f. and u.h.f. services use vertically polarised antennas, which means you should too. Also, as signals can come from more than one direction, you need to look for something which has an 'all round' capability. A discone type is also useful here.

However, the 'nest of dipoles' you see advertised are multiband antenna and, while they have their fans, I'm not one of them! If you really wanted to get signals in then go for a log periodic type with a rotator, but that's strictly serious stuff and way beyond the purse strings of us mere mortals!

The moral here is to go for what suits you best, providing that you understand the simplest of radio theory. Which is....if they use it (they being the transmitters) then so should you! Airfields, ships, Port Offices, mobiles, all use long, straight types....I rest my case!

However, for all around general scanning reception, a discone is probably your best bet. I've got nothing against them apart from the fact that one of them on your chimney gives a huge signal to the world that you have valuable radio equipment, particularly a scanner, indoors. So does the vertical but it's not as conspicuous!

With regard to indoor antennas, there is only one rule to remember. It's a compromise! There are a few on the market which would be better than the rubber duck / telescopic whip, but if you can mount an outside type, do so. If you can't, you'll probably be best advised to go for one of these. Again, a bewildering array of products available, but if you have to use one then go for the sort which can be hooked up to a pre-amplifier....which is the next quick bit!

Boosting Signals

Pre-amp's are brilliant, boosting signals which were previously weak to better levels. However, they also bring in the rubbish as well, rubbish is all sorts of interference like mains hum, for example, so you'll need a filter! The filter, the booster and the indoor antenna will all cost you as much as an outside vertical or discone, so before you go along that route, think on.

Having said that, a lot of people cannot have outside antenna so it's as broad as it's long. Amplifiers come in two distinct types. Mast head, which you mount 'up the pole' and cable end types. Remember though that connecting an amp may cause more of a problem than it solves unless you also have to happen to have a filter

Filters, again, come in a variety of shapes and sizes. For scanners, it's best to be looking at an adjustable notch filter. This will 'block out' interference from such thing as Band 2 f.m. broadcast breakthrough, taxi cabs and so on. Worth having.

Cables & Connections

Next comes cable. Again, I'll keep it simple. You should not use TV type coaxial cable like UR67 or anything above the 50Ω impedance of the set. It should be the 50Ω type **only**. This comes in two main types, low loss and normal. Again, broad rule of thumb states that if you have around two or three metres between you and the antenna then normal cable is okay to use.

Examples of this type are

RG58 for h.f. and v.h.f. However, for the higher end of the spectrum, such as, for example, military airband and above, you should be looking at low-loss. There is such a wide choice that your dealer will know what is the best or the most economical to use.

Connections! Most, if not all nowadays, of the scanners on the market use a BNC connector on the set or the antenna. These are also what you need to have to make the cable connections. If an antenna is advertised as having, for example, a PL-259 or 'N' connector, then you can get a converter to ensure that it fits.

Cable connectors come in many types, by the way - BNC, PL-259, Motorola, miniature jack-plugs, 'N' to name a few. However, converters are also available so don't panic if you see an unfamiliar plug on the end of the new kit you've just bought!

I'll leave it there on the subject of what you may need. Over the next few months we'll continue with simple explanations as to what's what and then move into other areas involved with scanning in general.

I hope to look at all sorts of stuff like the job that nice little button on your front-end does! I also hope to look at books and at those which are more suited to the scanner owner. In the meantime, it's time for the mail....

Letters

A letter from **Stephen Hill** asks about the frequency **168.875**. Stephen lives in Warwick and any ideas as to the frequency can be addressed to me here and I'll do the rest. He also mentions Gaydon, site of the Heritage Motor Centre. They can be heard on **169.1250** Callsign 'Heritage Control' and the test track used by Rover uses **456.0250** base and **461.5250** mobiles. Gaydon is the home of some of the Minis I admire, so those frequencies are going to be valuable for me, and I suspect, for others who have a passion about cars!

Earlier on I suggested that breakthrough from other services would interfere with your reception and that a filter may be needed. A letter from Mr. **E. Griffiths** of Rhosgadfan asks about how he can reduce this. He says he has a discone connected to 30m of UR43 cable to an AOR AR8000. A change to a less lossier cable, low loss, and the fitting of a suitable filter would help here. Nevada stock the SNF-170 Adjustable RF Notch Filter which assists in 'clearing up' the marine, air and 2m amateur bands, which Mr. Griffiths is suffering in, and is also adjustable, so that you can 'tune out' the unwanted signal. I hope this answers your question, Mr. Griffiths.

Regular readers will have heard me mention **Paul Wey** in these pages before now. Just a note and a word of caution. Paul was picked up by the Police (Intelligence Unit) during the Notting Hill Carnival together with his friend. On him he had scanning items such as an Opto Scout Frequency Counter....in the event both were released with no charges and no equipment seized. His friend writes to say that all scanner users should be wary and careful about what they are doing, the next time they may not be so lucky. Neither could you. It does happen - beware.

Lastly, from an 'anonymous source' comes the following rather unusual frequencies that I have never heard of! In the first two, train spotters around the Severn Valley may like to try **164.000** and **164.9875**. London Bus addicts can try The Big Bus Central London Tours on **180.1625** and **188.1625**! Proves scanning isn't all important people or fast jets!

A request from a reader for the frequencies for Legoland at Windsor. Anyone any ideas?

Keep Writing!

That leaves me now to say 'bye. Don't forget - the unusual aspect of my UFO interests are still on so keep the mail coming in if you heard, saw or may have heard anything unusual over the air/in the air. It doesn't matter whether you think you might be going nuts, just get it in and I'll keep it and examine it for tie-ups. All confidences kept. In fact, anything unusual heard, anything, on the radio do drop me a line.

Remember, from now on all military airband issues to Peter Bond unless you wish to keep it strictly as a private interest between us!

Until next time then, catch you down the log and best wishes. Stay careful!

FREQUENCY EXCHANGE

Don't delay, post your frequencies to the Editorial Offices or E-mail us on: freq@pwpub.demon.co.uk

Here is the second Frequency Exchange. So far the response has been very encouraging indeed. We have had lots of logs from our readers - thank you. You will help us if you can a provide your logs on disk or via E-mail if possible; if not, then you can save lots of editorial time by keeping **exactly** to the format on this page. We look forward to this feature growing - it's all down to you.

If you provide logs on disk, please note that we can read PC and Mac format high density 3.5in disks. Preferred, is MS Word for the Mac. We can, however accept most mainstream wordprocessing formats. If you have an obscure package, then please submit a plain ASCII file.

Key

a.m.	Amplitude Modulation
c.w.	Morse Code
EE	English language
FAX	Facsimile
HRPT	High Resolution Picture Telemetry
l.s.b.	Lower Sideband
n.b.f.m.	Narrow
NATO	North Atlantic Treaty Organisation
OB	Outside Broadcast
p/p	Phone Patch
Picc	Piccolo
stby	Standby
u.s.b.	Upper Sideband
VFT	Voice Frequency Telegraphy
wkg	Working
tfc	Traffic
wx	Weather
dpx	Duplex
xmsn	Transmission
YL	Female Op.

MHz	Mode	Time	Call	Location	Monitor	Notes
4.076	c.w.	1710	REO	-	lg	receiving CIS navy WX, nav bulletins
4.405	u.s.b.	0950	GB	-	lg	RN Coastal Control
4.556	u.s.b.	1650	DLV	-	lg	Dutch mil net
4.838	u.s.b.	1111	OA	-	lg	Brit Army net
4.981	u.s.b.	2244	-	-	lg	Dutch mil net
5.014	RTTY	1626	DCO	-	lg	
5.104	u.s.b.	0921	-	-	lg	Brit Army net
5.140	u.s.b.	1026	-	-	lg	
5.167	c.w.	1932	MOP	-	lg	Fr mil net also FAX channel
5.197	u.s.b.	1454	COSMOS	-	lg	HM Customs also voice encryption
5.197	u.s.b.	1454	ZULU	-	lg	Customs airmobile
5.214	c.w.	1314	OSCAR	-	lg	French mil
5.343	RTTY	1472	RDH77	-	lg	unid
5.343	RTTY	1472	RDH8	-	lg	unid
5.343	RTTY	1472	RVZ73	-	lg	unid
5.384	u.s.b.	2244		-	lg	Dutch mil net
5.393	u.s.b.	1435		-	lg	RN gunnery ranges
5.419	u.s.b.	0948	0	-	lg	Brit Army net
5.5555	u.s.b.	1859	VI	-	lw	Irish fishing boats "doing 3knots", vessels mentioned - *Snail, Voyager K,* and *The Kramer*
5.670	u.s.b.	1715	Speedbird 12	-	lw	B747/400 wkg Madras, *en route* Brisbane to London
5.708	RTTY	1322	NIMES	-	lg	Ecole
5.710	u.s.b.	various		-	lg	used by Taskforce A in most recent attacks on Iraq
5.786	RTTY	1539	RETCJX	-	lg	Spanish army
5.819	RTTY	1355	01MO	-	lg	control station
5.835	RTTY	1549	DSR	-	lg	unid
6.291	c.w.	2215	RFK76	-	lg	receives CIS navy WX, nav bulletins
6.532	u.s.b.	1921	United 82	-	lw	Wkg Manila
6.550	u.s.b.	0835	Coastguard 03	-	lw	Wkg Coastguard Centre - Dutch
6.556	u.s.b.	1021	-	-	lw	Monarch Ops
6.556	u.s.b.	1718	Speedbird 34	-	lw	B747/400 Jaakarta ta London wkg Yangon (Rangoon)
6.584	u.s.b.	0737	200	-	lg	Fr mil net
6.683	u.s.b.	1443		-	lg	NATO last talk stations PINK TIGER, MASTERPIECE, MISTRYSHIP
6.688	u.s.b.	0941	WIE	-	lg	Dutch mil net stns and 'PAJSTO' and 'HAJ'
6.761	u.s.b.	1530	QUID 84	-	ch	Calling REACH V5 also at, 1545z, and 1617z. no joy.
6.761	u.s.b.	1617	REACH V5	-	ch	Wkg QUID 84 air-air. Were slowing down but cld not do anything w/ strong winds. Will be abt 20 mins early. QUID said they would be early also.
6.768	u.s.b.	1325	0	-	lg	Brit Army net
6.770	u.s.b.	1234	OA	-	lg	Brit Army net
6.784	u.s.b.	0809		-	lg	Brit Army net
6.830	RTTY	1549	DSR	-	lg	unid
6.871	c.w.	0801	HEP7	-	lg	Interpol
6.933	RTTY	1644	PKW-IFOR	-	lg	Polish mil?
6.935	c.w.	1510	REO	-	lg	stations receive RLN CIS Navy, wx, nav bulletins
6.943	SITOR	1012	-	-	lg	Spanish BBS
6.958	c.w.	1820	RACDF	-	lg	unid
7.329	u.s.b.	1549	DSR	-	lg	unid
7.564	c.w.	1404	RJF94	-	lg	CIS navy WX, nav bulletins
7.699	c.w.	1125	RJF94	-	lg	CIS navy WX, also 'RCH94' &'RJC38'
7.703	u.s.b.	0853	A20B	-	lg	Brit Army (exercise)
7.804	u.s.b.	0854	AA10	-	lg	Brit Army joint ops
7.857	u.s.b.	1519	-	-	lg	Brit Army net
7.922	u.s.b.	1133	Metaphor	-	lg	AMC Tuzla?
7.988	c.w.	1808	RCH94	-	lg	AMC Tuzla?
7.988	c.w.	1808	RJF94	-	lg	AMC Tuzla?
8.060	RTTY	1549	DSR	-	lg	unid
8.078	SITOR	1032	ANCRE	-	lg	unid
8.120	u.s.b.	1601	-	-	lg	Brit Army net
8.183	c.w.	1324	RJC38	-	lg	
8.183	c.w.	1324	RJC48	-	lg	
8.183	c.w.	1324	RJF8	-	lg	
8.183	c.w.	1324	RJF94	-	lg	
8.400	SITOR	2124	HEP	-	lg	Interpol
9.044	c.w.	1948	AEA2	-	lg	USA Mars
9.975	c.w.	1800	RACDF	-	lg	unid
10.152	RTTY	1406	CWB	-	lg	unid
10.233	u.s.b.	0829	IAEU	-	lg	Italian Navy also 'IARD'
10.243.	u.s.b.	1202	unid	-	rh	asked for radio check, then went into RTTY.
10.548	c.w.	0830	FNB	-	lg	Italian Navy also 'ICA'
11.000	c.w.	1307	RMMW	-	lg	CIS navy wx, nav bulletins
11.054	c.w.	1814	RKZ	-	lg	CIS navy WX also 'RJD56'
11.152	c.w.	1825	RKZ	-	lg	CIS navy WX and 'RJD56'

Continued on page 64 ▶

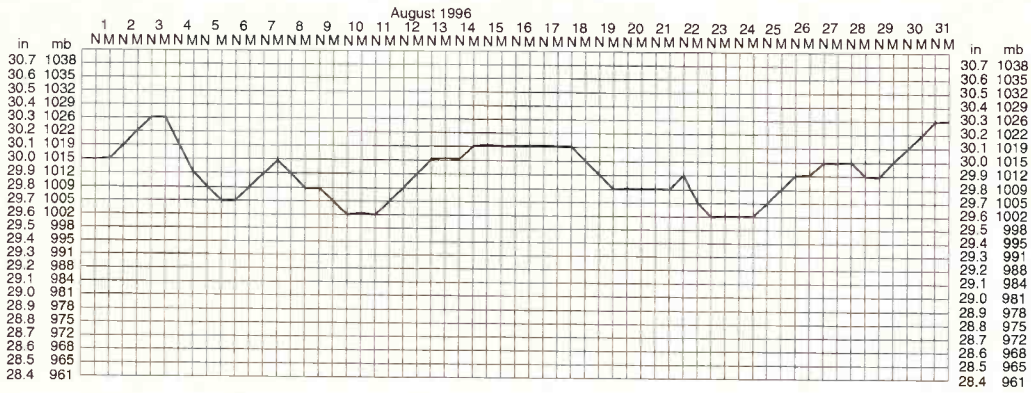
Dick Ganderton, c/o *SWM* Editorial Offices, Broadstone

Propagation Extra

I believe that it is still essential that those readers who have an ongoing interest in propagation still have access to the various pieces of information collated by Ron Ham. I have asked Ron to continue to provide his monthly barometric pressure charts in the same format as before. In the meantime I am trying to arrange for a regular supply of sunspot charts and other similar information. If there are any readers who would be prepared to provide such information **on a regular basis**, please get in touch with me at the Editorial Offices, Broadstone.

Ron has provided two barometric pressure charts for this issue, **Fig. 1** covers the month of August 1996, **Fig. 2** covers September 1996.

Fig. 1: Barometric pressure chart for August 1996 taken by Ron Ham at Storrington, E. Sussex.



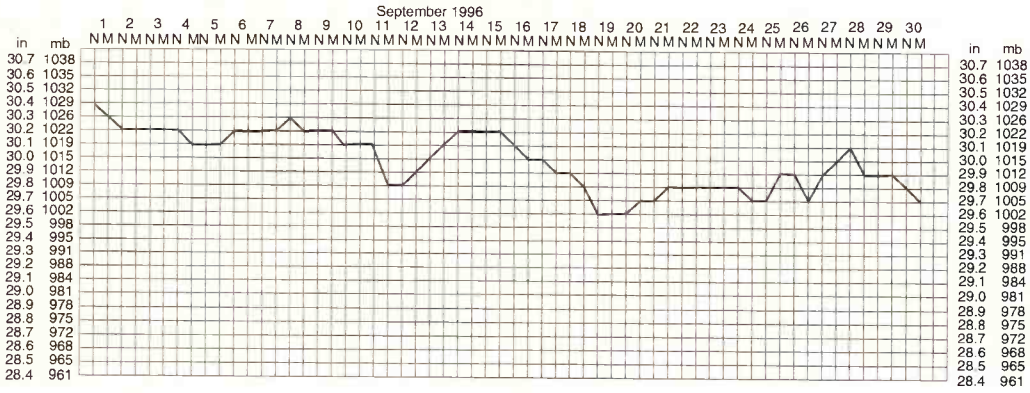


Fig. 2: Barometric pressure chart for September 1996 taken by Ron Ham at Storrington, E. Sussex.

Continued from page 63 ▶

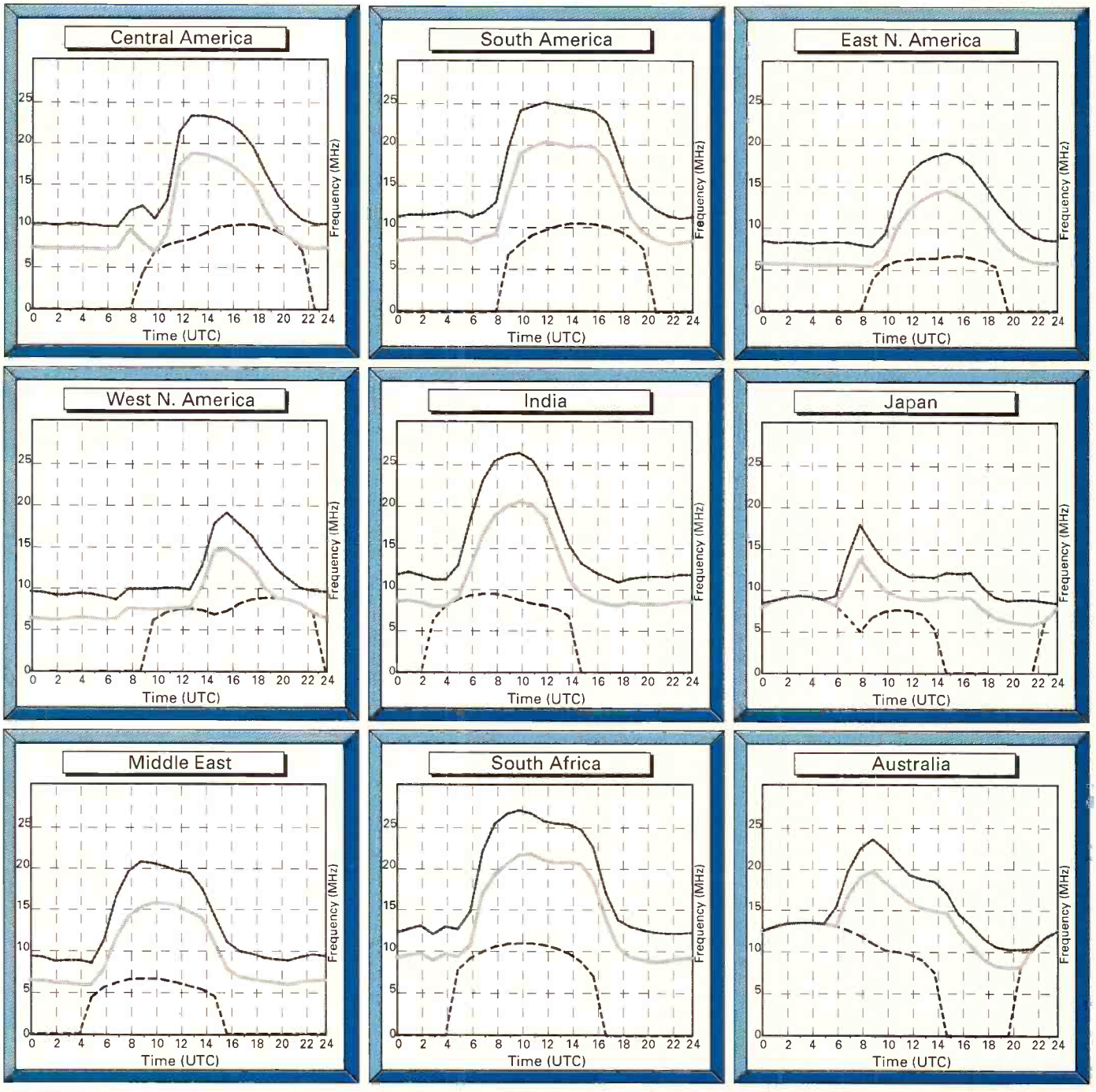
MHz	Mode	Time	Call	Location	Monitor	Notes
11.168	RTTY	1114	KIT	-	lg	unid
11.416	c.w.	1018	RMOL	-	lg	receiving CIS navy WX, nav bulletins
11.429	c.w.	1307	RMMW	-	lg	receiving CIS navy WX, nav bulletins
11.460	u.s.b.	1230	SPAR 67	-	lw	Wkg Andrews
11.606	c.w.	1035	RJE73	-	lg	receiving CIS navy WX, nav bulletins
12.048	RTTY	1114	KIT	-	lg	unid
12.194	RTTY	-	KIT	-	lg	
12.209	RTTY	0830	FOW	-	lg	
13.241	u.s.b.	1000	GORDO 15	-	lw	Wkg Andrews
13.241	u.s.b.	1257	SAM 677	-	w	Wkg Andrews, passed message"we were GORDO 15 we are now SAM 677"
13.866	u.s.b.	1225	unid	-	rh	Cherry Ripe. no jamming yl ee.
13.880	RTTY	0813	JAK	-	lg	
13.937	RTTY	1406	CWB	-	lg	
14.487	u.s.b.	1215	unid	-	rh	Lincolnshire Poacher heavy jamming.yl.ee.
14.888	RTTY	-	CWB	-	lg	
16.040	RTTY	-	CWB	-	lg	
16.048	RTTY	-	CWB	-	lg	
16.131	RTTY	0830	M4W	-	lg	Israel intelligence
16.349	RTTY	1318	CUV	-	lg	unid
19.771	RTTY	1308	-	-	lg	Irish Army Dublin
120.300	n.f.m.	-	-	Tamworth	tt	Baxterlley Field air/ground.
127.900	n.f.m.	-	-	W.Midlands	tt	Air ambulance
132.65	a.m.	24hrs	Delta Ops	RAF Northolt	gt	Ops freq for VIP flights by RAF
140.456	n.f.m.	-	-	Tamworth	tt	British Gas depot
141.000	n.f.m.	24hrs	?	London	gt	Radio 4 talkback
141.0375	n.f.m.	am	?	London	gt	Heart 106.2 FM 'Sky Patrol' air/ ground link
141.162	n.f.m.	-		Birmingham	tt	BRMB studio link
159.012	n.f.m.	-	-	Tamworth	tt	McAlpine contractors
160.575	n.f.m.	-	-	Tamworth	tt	OAP Allarm/paging system
165.712	n.f.m.	-	Acorn	Tamworth	tt	Acorn Taxis
167.350	n.f.m.	-	Bee	Tamworth	tt	A2B taxis
167.830	n.f.m.	-		Polesworth	tt	Polesworth Cars (taxis)
169.460	n.f.m.	-	-	Tamworth	tt	Private roadworks company
312.450	a.m.	-	QUID 84	-	ch	(SAC ops Mildenhall) wkg Banter control. requested update on next receiver. REACH V7. Trying to raise them on 6.761
450.075	n.f.m.	-	-	Tamworth	tt	Encrypted
454.025	n.f.m.	-	-	Birmingham	tt	QE Hospital pagers
455.525	n.f.m.	24hrs	Tower	Heathrow	gt	Heathrow Tower, simulcast of 118.5 (am)
455.550	n.f.m.	24hrs	Ground	Heathrow	gt	Heathrow Ground, simulcast of 121.9 (am)
455.650	n.f.m.	24hrs	-	Heathrow	gt	Heathrow Airport Fire Service
456.825	n.f.m.	-	Tambro	Tamworth	tt	Borough Council
457.4875	n.f.m.	1800	a.m.	W. Midlands	anon	Fire Brigade - Handheld simplex
465.100	n.f.m.	-	-	UK	gt	Falcons Parachute team

And finally Graham Tanner reports 122.95 G-HEMS is the medivac helicopter which operates in and around London during the week. It flies from the London Hospital in Whitechapel, but is kept overnight at Denham Airfield in west London. When it has a casualty on-board, it uses the c/s 'Medivac', otherwise it uses 'G-HEMS'.

Jacques d'Avignon VE3VIA

World Propagation Forecasts November

Circuits to London



How to use the Propagation Charts.

The charts contain three plots. The lower dashed line represents the lowest usable frequency (LUF), or ALF (Absorption Limiting Frequency). The chances of success below this frequency are very slim.

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

Lastly, the upper dashed line, represents the maximum usable frequency (MUF) a 50% probability of success for the path and time.

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

Good luck and happy listening.

Roger Bunney, 33 Cherville Street, Romsey, Hants SO51 8F8

Satellite TV News

Heavenly Sightings.....

Echostar-2 was launched night of September 10th to local spectators at Kourou, French Guinea and to satellite aware folk across Europe and America by satellite TV distribution feeds. Here in Europe the *Space Night* programme on Astra's BR transponder featured the whole launch and commentary - it seems that any important night-time launch is always carried on *Space Night*, it makes a change from the endless repeats of MIR dockings!

There has been a degree of confusion across the Clarke Belt as a result of Intelsat fleet shuffling, allocation changes and slotting in the birds from the more recent launches. **John Locker** (Wirral) checked out the Intelsat web site and sent in a printout of the Clarke Belt according to the latest Intelsat news....

Indian Ocean: Intelsat 703 @ 57°E; 604 @ 60°E; 602 @ 63°E; 704 @ 66°E.

Atlantic Ocean: Intelsat 707 @ 1°W; 705 @ 18°W; VIII @ 21.7°W; K @ 21.5°W; 605 @ 24.5°W; 601 @ 27.5°W; 603 @ 34.5°W; VIII-a + 512 @ 40.5°W; 709 @ 50°W; 706 @ 53°W; VIII + VII @ 56°W.

A warning note from **John Womersley** who advises that the AFRTS TV service that have traditionally distributed their programming to US bases around the world using B-MAC will be going MPEG compressed over the Christmas '96 period. This channel has always attracted interest and in recent months B-MAC decoders have been on sale - be warned as their useful life could well terminate shortly!

Sports enthusiast **Marcus Tate** (Bolton) has been following Major League Soccer ex USA which from August has been carried live on Intelsat K (11.532GHz horizontal, audio 6.60MHz), initially in 525-lines NTSC but later in European PAL 625-lines. The transponder usually fires up around 0145 BST and is the main programme output for the ESPN-2 network. This transponder is a favourite for sporting activity as the American US Open was also carried Eastbound into Germany.

EVF circuit between Paris and Morocco, Eutelsat II F4 @ 7°E.

Election fever hits the USA this year, seen via Orion Atlantic @ 37.5°W.

Julian Redwood (Christchurch) is an active C-Band (4GHz) sat-zapper and has recently upgraded his 1.8 metre dish with a locally made dual feed support system allowing both 4 and 11GHz reception. At 40°E he's seen a new Russian programme M49 @ 3.992GHz (Gorizont 31) and TVM - TV Madagascar was seen via Express 2 - 3.818GHz @ 14°W.

I noticed an outside broadcast feed August 18th via an SNG (satellite news gathering) truck signing 'CZE 001' with ice hockey via Eutelsat II F2 @ 10°E (11.140GHz vertical using SIS), rinkside advertisment placards such as 'Pragobanka' suggested a Czech Republic source using perhaps their only SNG truck. Marcus Tate on the 29th also logged and confirmed Czech Republic ice hockey this time versus Sweden using a Swedish 'TV3 SWE' SNG vehicle. Intelsat K again with audio at 6.60MHz clean effects and commentary 7.20MHz.

A Norwegian reader advises that six Norwegian Telecom SNG units are in current use, TOS-1 a flyaway package; TOS-2, 3, 4 are container packaged and offloaded at the action site for installation locally; and TOS-5, 6 are conventional mobile truck units which live at the Nittedal Earth Station. NRK until recently used their own SNG unit but this has now been absorbed into the Norwegian Telecom fleet. The TOS-6 identification is Eutelsats international registratin code for the TOS-6 truck and normally access Intelsat 707 @ 1°W.

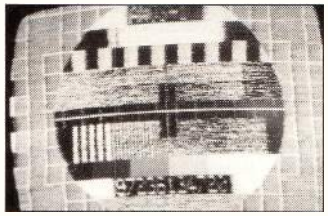
Viewing satellite downlink programmes helped **Edmund Spicer** (Littlehampton) gain excellent A level results in two languages - he was in charge of his college satellite tracking system which covered between Hispasat 30°W and DFS Kopernikus-3 @ 23.5°E. Further help came from his parents who installed a fixed system at home for Telecom 2B @ 5°W to maintain their French language skills both from TV and radio programming. The 2B output carries TF1; France 2; ARTE, La Cinquieme and M6 TV programmes normally unscrambled. RTL-9 also appears and encrypts in Smartcrypt other than clear-time 1800-2000. TMC - Monte Carlo usually stays in Nagravision/Syster though has been known to appear in the clear mornings/afternoons. LC1 - La Chaine Info - remains fully scrambled over the 24 hours. Incidently John Locker from the Wirral reports that Telecom 2D has been testing alongside Telecom 2B at 8°W mid September between 11.400-11.750GHz.

More election fever this time via II F4 @ 7°E.

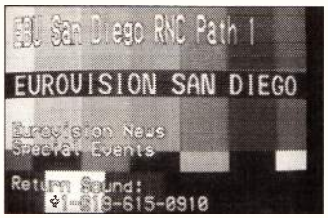
Along the South Coast into Sandown and **Roy Carman** operates his 1.2m Channel Master offset dish in the daytime having recently retired to the Isle of Wight. Mid August on Eutelsat II F2 @ 10°E and Associated Press TV (APTV) appeared, a rare sighting these days as APTV went digital and disappeared from 13°E. One lunchtime at 11.062GHz vertical APTV fired up on this bird with a series of "strong advertisments mostly unseen in the UK, some containing strong language." I wonder if any readers can comment on the APTV output? Roy also noted more Czech outside broadcast circuits, this time from the Czech Grand Prix with motor cycle racing, again 10°E was used which seems a favourite bird for distribution circuits on Czech OBs.

With the Muslim TV (MTA) now transmitting down from Intelsat 603 @ 34.5°W (11.004GHz vert) the occassional programme appears that differs from their mainstream output. Recently Ken Suddes (Welwyn) watched a lesson on satellite dish installation, this included a discussion on C-Band (4GHz) LNBs and feed assemblies, the Ku-Band talk covered the erection of a 600mm Amstrad 'WOK' dish - the sticker logo had however been removed!

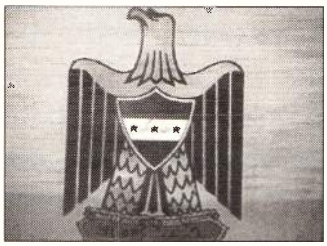
Turksat-1C newly arrived at 31°E is now transmitting test transmissions, GALS-1 & 2 seem to have settled around 36°E and offer several weak programme feeds in DBS which are visible on a 1m dish in the UK. One other new bird is ArabSat-2A slotted at 26°E which will carry 12 analogue transponders all in Ku-Telecom band downlinking programming ex the Arabian Gulf TV networks. **Dave Small**



Intelsat 707 testing @ 1°W with a Nittadel Earth Station test pattern.



Israeli satellite AMOS-1 on test card @ 3.9°W, a scratchy signal with threshold extension on a 1.5m dish.



After the Americans bombed Iraq, Sadam spoke via Iraqi TV to the nation. The eagle logo preceeded the broadcast, which was distributed across Europe via II F4 @ 7°E.

(*Skywaves DX* club magazine) reports already 12.521; 12.536 amd 12.661GHz have been logged on carrier/test card mid September.

Orbital News

An interesting development with satellite rocket launchers has been announced by Hughes Space and Communications with the signing of a contract to build a seaborne satellite launch platform. The submersible platform will be used in the Pacific and offer a more cost effective launch facility, exactly on the Equator. Hughes have ten launches planned from mid 1998 including the new HS-702 series that carry up to 90 transponders with 15kW of onboard power.

The Japanese JSkyB News Corporation project for a +100 channel digital TV service plans a December '97 opening via the JC-SAT-3 satellite (132°E) and increasing payload to 150 channels within 1998. Japanese language programmes will be made by JSkyB and bought in from other local programme makers. Elsewhere in Asia the Indian 'Plus 21' 'adult'/soft porn channel is now airing four hours nightly via a Russian satellite on a DTH basis. With programming transmitted outside of the Indian borders there is no control over the very strict guidlines of India's terrestrial broacasters. Hong Kong's Star TV is planning an Indian digital TV service by early '97 offering Sky News, Sky Sport and two Indian language channels, downlinking via PAS-4 capacity in Ku band.

Keith Hamer & Garry Smith, 17 Collingham Gardens, Derby DE22 4FS.

DX Television

August was an impressive month for long-distance TV reception via Sporadic-E propagation, thanks mainly to the unusual and exotic signals which were received. Unfortunately, the last week in the month saw a rapid decline in Sporadic-E activity, indicating that the main season was drawing to a close. Tropospheric reception occurred towards the end of the month, the most notable reception taking place in the south-east on the 19th when u.h.f. signals were received from as far away as Sweden.

Arabic Reception

The new Syrian second network transmitter on channel E2 was received again in Derby on the 5th. Strong signals were already established by 0900UTC and reception lasted until 0950UTC; the Arabic sound channel was heard at times. On the 11th at 0827UTC, an Arabic signal was present on channel E2, floating with the NRK PM5534 test card from Melhus in central Norway.

South-East Mystery

A mystery signal on channel E2 from the south-east was received on the 6th between 1600 and 1640UTC. Although the pictures were weak to medium strength, no obvious logo or on-screen identification could be seen. A similar signal was monitored the following day between 1600 and 1700UTC with occasional sound being present. This was similar to an Eastern-European or Russian language, thus ruling out countries in the same direction such as Germany and Switzerland. Slovenia (SLO-1 on channel E3) and Croatia (HRT on channel E4) were received during the opening. For some years, several low-power Slovenian and Albanian repeaters have been listed on this channel but so far there have been no claims of reception.

Portuguese RTP-2 Relay

An opening to Spain and Portugal on the 10th between 1000 and 1100CET produced Spanish signals throughout Band I. At around 1050UTC on channel E2, an FuBK test card was noticed faintly superimposed in the background of the TVE-1 programme on channel E2. Careful adjustment of the aerials separated the two signals and revealed that the FuBK was indeed from RTP's second network complete with the 'RTP LISB 2' identification! The RTP-2 35W relay is located in the north of Portugal at Valenca do Duro with RTP-1 broadcasts on channel E4.

Reception Reports

Some of the CIS logos are still causing confusion and as soon as we identify them they seem to change! **Ian Milton** (Ryton, Tyne and Wear) spotted a 'GT' logo inside a box in the bottom right-hand corner of the screen on the 10th on channel R2 at 1700UTC. This sounds very much like 'bT' as used by Belarus TV which originates in Minsk.

Peter Barber (Coventry) noted an excellent Sporadic-E opening on August 5th with the Italian private station 'Video' logged on 47.862MHz at 0808UTC. On the 7th, a full-screen ornamental plaque with Arabic script was seen on channel E4 at 1233UTC; Serbia on channel E3 and RAI UNO on IA were also present at the time. TVA, another Italian private station, was resolved just above channel IA at 1313UTC.

An intense all-day opening occurred on the 10th with signals received between 0630 and 2020 by Peter. During the morning, strong signals from TVE-1 (Spain) and RTP-1 (Portugal) were identified, along with NRK-1 (Norway) radiating the PM5534 test card from Bagn on channel E3. SVT-1 (Sweden) were also noted on channel E3 transmitting the PM5534 test card. From midday onwards, ARD-1 (Germany) was identified on channel E2 with a programme for young people. Also noted were TV NOVA (Czech Republic) on channel R1 with a Yogi Bear cartoon, ETV (Estonia) on R2 and PTJ (Russia) on R2. Evening signals included RAI UNO (Italy) on channel IA at 1829UTC with the 'TG' news and Spanish signals on E2 and E4 including a news item on the severe flooding.

Shaun Taylor (Howden, East Yorkshire) noticed a definite fall-off in Sporadic-E activity during August. Spain, Italy, Portugal and Slovenia were the main countries identified during the month.

Riccardo Mariotti (Italy) comments that the Sporadic-E season has been fairly routine with reception from services such as Russia (OPT) , Rumania (TVR-1 and TVR-2), Estonia (EESTI TV), Ukraine (YT-1 and YT-2), Slovakia (STV-1), Eire (RTE-1), Spain (TVE-1) and Norway (NRK). The more exotic reception has come from Tunisia (RTT) on channel E4 and also from an unidentified country in the Middle East on channel E3. Despite the infrequent showing of test cards this year, Riccardo managed to video record the Portuguese 'RTP-1' FuBK.

Pertti Salonen (Finland) has written to say that reception from the Iberian Peninsula and the Middle East has been absent this year. Many of the signals have originated in Central Europe with broadcasts being noted from YT-1 and YT-2 (Ukraine) on channels R1 and R2, ARD-1 (Germany) on E2 and ORT (Russia) on channel R1. TVR programmes from Moldova have also been identified on channel R1.

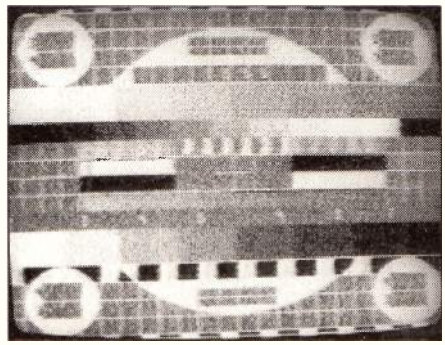


Fig. 1: The G-204 test card radiated via a Russian transmitter and received by Stephen Michie (Bristol). The identification reads '1996'.

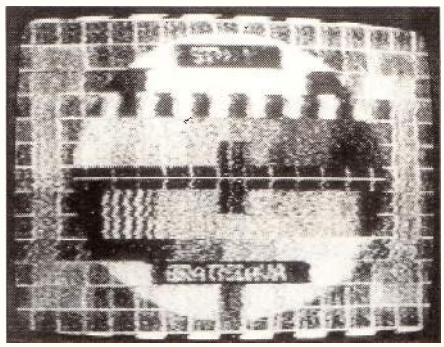


Fig. 2: The Slovakian TV PM5544 test card received from the Bratislava transmitter on channel R2 by Stephen Michie (Bristol).

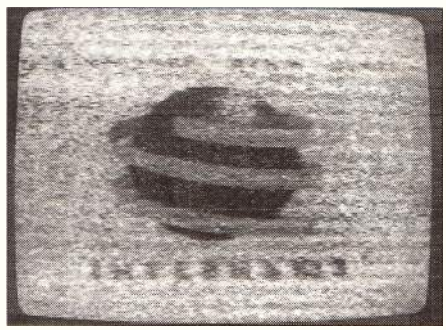


Fig. 3: Ukraine TV (second network) symbol on channel R2 received by Stephen Michie (Bristol).

Tropospheric Reception

A spectacular opening at u.h.f. occurred on the 19th. This was witnessed by **David Harding** in Deal. Between 0515 and 0830UTC, 'Omrop Fryslan' was monitored in snow-free colour on channel E46. This was evidently a regional Dutch station in the north of the Netherlands airing news pages called 'Etherkrant Friesland' (Friesland Newspaper of the Air) plus adverts and programme promotions. Teletext pages were headed 'Fryslantext'. Incidentally, a former regional station 'ZHTV' on channel E49 is to remain off the air.

Danish TV-2 signals were also present on various channels and at one point the local BBC-2 picture on channel E56 was almost obliterated by the PM5534 test card from the Bornholm transmitter. Noise-free signals from Svenborg on channel E32 was eventually swamped by the Dutch FuBK test card when the Goes transmitter came on-air at 0830. Signals from the Nibe transmitter on channel E35 were also identified.

The best was yet to come. At

0610, Swedish TV-4 signals from GSteborg on channel E46 suddenly emerged with perfect colour on channel E46 with a weather forecast. The signal lasted a full twenty minutes before deteriorating.

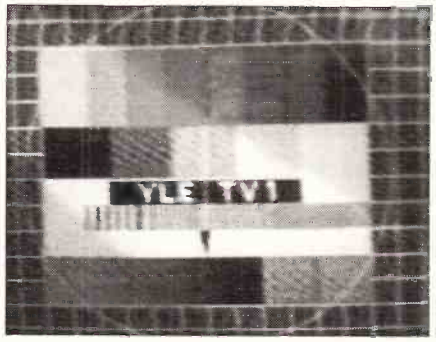


Fig. 5: The Finnish FuBK test card on channel E3 from the Tervola transmitter, received by Bob Brooks (South Wirral).

FM Report

Mike Gaskin (Cornwall) witnessed an incredible f.m. Band opening on the 16th with a number of low-power Spanish 'Canal Sur Radio' outlets being received. Mike also noted AFRTS broadcasts on 102.50MHz from the US Naval base at Rota. Later, several Greek-speaking f.m. stations were logged but none would provide any comprehensible RDS information for identifying their sources.

At 2000UTC on 101.90MHz an Arabic announcement was heard which was very similar to the Saudi Arabian World-Service identification which ends in 'Arabiyah-al-Saudiyah' but in this case ending in 'Riyadh', which is a main studio. There followed a news programme which then gave a local weather forecast. Mike cannot find the station listed and wonders whether it was direct reception (which must be a record in terms of distance for f.m. signals), or whether it was accidentally broadcast by a relay closer to Europe with the initial part of its journey via tropospheric ducting. During the same opening Mike heard a relay of the 'BBC World Service' on 107.60MHz and 'BBC Radio 2' on 106.90MHz with a pronounced echo!

Fig. 4: Russian TV advert for a well-known brand of chocolate, photographed by Bob Brooks (South Wirral).

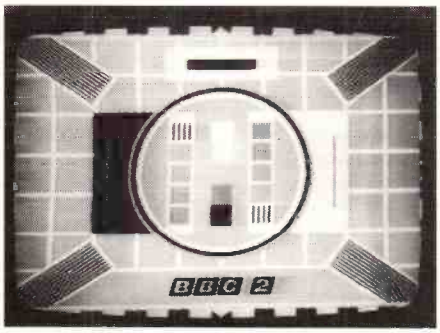


Fig. 6: One from the archives! Test Card 'C', originally introduced in 1948, seen here with BBC-2 identification.

HTV-1 Mystery Solved

In the August column we mentioned a mystery HTV-1 sound channel received on a scanner by **Tim Bucknall** of Congleton in Cheshire.

Apparently there is a self-help relay at Llandegla using this channel (66/67). The hill-top location (approximately 310m a.s.l.) lies to the west of Wrexham and both antennas radiate at 45° and 75° in the general direction of Congleton with an e.r.p. of 1W. Tim can receive the sound from this station on a daily basis although the vision carrier is inaudible. Tim advises that the Wrexham 200W TV relay broadcasts only two channels: BBC-1 Wales on channel E39 and S4C on channel 67.

Keep On Writing!

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

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

Airband

Piper J3 Club.
Photograph: Christine Mlynek.

How can an aircraft's route be related to the frequency on which it is being controlled? Not simple! There are two problems: more than one frequency might be allocated to the same route and the frequencies keep changing.

It's impossible to list all frequencies for even the UK alone in a small column like this one. If you want to see what I mean, try the *Aerad En Route Supplement Europe and Middle East*. Towards the end of the COM section in this book is a list of frequencies, classified by each airway in turn.

How do you get this book? It's available to the public by post. First, though, send a stamped, self-addressed envelope (to hold one A4 sheet) to the Broadstone Editorial Office (NOT to me!), requesting the *Airband Factsheet*. On this, you'll find useful addresses of information suppliers. That will enable you to apply direct, asking for the latest prices.

Practical Hints About Airways

Of all the hints I can give you for following the progress of a flight from one frequency to the next, the simplest is the procedure adopted by the pilots themselves. When changing frequency, they might know from experience and published information what's coming next.

In larger aircraft, the radios allow the next frequency to be pre-set in an auxiliary display and then selected at the flick of a switch. Nonetheless, what really matters is that the controller tells the pilot the next frequency and the pilot reads this back to avoid error. That's the only way to be certain as to what frequency will be worked next.

M. Dendle (Leicester) correctly points out that some frequencies are designated 'As directed' and would be worked if the controller so instructs, eg. if the more usual frequency is busy or unserviceable. Often, though, the published frequencies tell you all you need to know.

You will need an airways chart so as to know where to look in the first place. Aerad will again supply these and I recommend EUR 1/2 (plus EUR 3/4 for the north of Scotland) and H201/202 for UK coverage. If you see an aircraft, or know its route, find it on the chart. Guess which airway it's on by its location and, possibly, heading. Slight errors don't usually matter as adjacent airways are worked by the same sector controller.

Here are two examples that I verified from the published sources. A flight routes Lambourne to Compton via UB29. Aerad lists the UB29 sector from Compton to abeam Brookman's Park as 127.425MHz and this ties in nicely with the actual traffic.

Here's another example: a flight routing from Boulogne via UA2 to Brookman's Park via the UIR boundary. Now, airspace is divided into Flight Information Regions (FIRs). In the UK, we have two: London and Scottish. At high altitude (above FL245) the FIR is called an Upper Information Region (UIR) and so this flight is leaving French airspace and enters London airspace at the UIR boundary. Again, Aerad lists a UA2 sector as abeam Brookman's Park to the UIR boundary on 132.45MHz and that's where you'll find this sort of flight.

Abeam means that the navigation point is currently lying perpendicular to the aircraft's line of travel (track), ie. in line with the pilot's shoulders. Remember that Aerad lists lower and upper airspace (eg. R1 and UR1) separately but in convenient alphabetical order.

But Airways Frequencies Keep Changing!

Which makes it hard to keep up when writing a column with a six week lead time. That's why it's so important for pilots to change frequency as instructed and for the readback to be taken notice of! M. Dendle found an example: 118.775MHz is a new one for London Airways, not listed in Aerad 6/96. In fact it first appears officially in an *AIP Amendment* of 18/7/96. I'm grateful to **Martin Sutton** (CAA) for supplying the *AIP Amendments* quoted in this column.

Whereas the frequency now officially exists, we still don't know what it's used for! M. Dendle suspects it covers part of UB1 and UB39.

Tipsy Belfair. *Photograph: Christine Mlynek.*

Are You Insured?

As I said in September, many readers probably visit aerodromes by car, unaware that they might not be insured, with potentially serious consequences! **Ted Crease** (Bradford) reminds me that, previously, insurance might not apply at all unless on the public highway but my own insurer confirms that this is a thing of the past. Worth checking, though.

Ted has a more recent story that warns us all to be careful. When two cars collided after skidding on ice, the insurers refused to pay up. Why? Although this took place on a roadway, someone had parked a light aircraft adjacent to the accident site so as to make the aircraft more prominent as it was for sale. The insurers said that, as aircraft had access to the accident site, the insurance was void. Note: no aircraft was involved in the accident! See what I mean? Damaged cars are one thing. Injuring someone (likely at LOW speed due to the nature of soft tissue damage) could prove exceedingly expensive.

Ted says to watch out for the companies that offer cheap insurance quotes by 'phone. Don't accept the quote until you've read the ACTUAL policy document and decided that it really meets your needs. **Clive Ellis G4NVX** (Hereford) didn't realise that his AA insurance didn't cover him when visiting the St. Mawgan Air Day.

Not quite as restrictive is the Saga policy (insured by Axa) held by **Arthur Budd** (Southport). I suspect this is only available to older drivers, could you confirm, Arthur? 'Airside' is excluded but there is a definition in the small print. **John Barker** (Sheffield) checked with Prudential who reckon that he would be covered (unless on, say, the runway). So, shop around and, above all else, CHECK the small print!

Follow-Ups

Concorde was studied in September by **Bill Hillier** (Gwent). **Len Woolley** (Bude) notes that Air France AF002 flies Paris-New York departing 1000Z Sunday and Monday, AF004 same route/time Friday or Saturday. Len lists flights on a computer disc: is it available to readers, and if so, what arrangements would you like, Len? More on Air France from **George Nichols** (Bristol) who worked on the Olympus engine design: AF001 operates New York to Paris.

Also, says Len, BA189/188 are (or were) Heathrow-Washington (departs 1745 local Monday, Thursday and Saturday) and Washington-Heathrow (departs 0945 Tuesday, Friday and Sunday) services respectively. The flight numbers are possibly re-allocated to a B.757 operation Birmingham-New York JFK-Toronto according to **Frank Walshe** (Ontario). Frank also notes that BA and AF Concordes often fly the same route in quick succession, working Nat-C on 8.879 or 13.306MHz (eg. 0711 local Canadian time). **Anne Reed G-20126/RS-87871** (Cheltenham) suggests that the Washington service is now operated by a B.747 as BA222 outbound, BA216 returning to Heathrow.

About photos: Chris and I have the same trouble as you do, Anne. We can't get near enough to large aircraft for security reasons. We need a frame-filling subject before it will print successfully in this magazine. So, if anyone can provide airside access (on foot - my car isn't insured, remember!) for snapping transport aircraft, please offer now!

Frequency and Operational News

Relying on *AIP* information from Martin. Now, this information is too extensive to fit in here so I'll concentrate on frequency changes and refer to navigational details. If you need further information then write in to me.

Aerodromes: Birmingham Zone now 118.05 (was 131.325MHz). Glasgow a.t.i.s. now 132.175 (was 115.4MHz). London City Tower now 118.075 or 127.95 (118.4MHz withdrawn). London Gatwick a.t.i.s. now 121.025 (was 128.475MHz). Old Sarum finally settles at 123.2 (was 125.95MHz), clearing up months of confusion!

Airways: New London FIR frequencies: 133.075MHz (no further information available); 128.475MHz south of Abeam

Birmingham to London Terminal Area (covers parts of A1, A34, A47, B71, B321, R41). UN601 now controlled on 129.225 or 125.675MHz between Talla and NEVIS. Possible new frequency 124.925MHz but, soon after introduction, replaced by 130.925MHz below FL195 on A1, A2, A34, A47, B4, B71, B317, B321, R41.

New airways: H52, H53, H54, UH52, UH53, UH54, UM16, UN585, UW501, UW502, UW532, UW534, UW536, UW538. UW550. Altered routings: A34, H51, N863, UA20, UL613, UM14, UN502, UN590, UN614, UN863, UP6.

Beacons: Berry Head n.d.b. BHD (318kHz) withdrawn. Birmingham n.d.b. BIR now 406 (was 433kHz). Clacton n.d.b. CLN (429kHz) withdrawn. Machrihanish TACAN MAZ withdrawn, so no d.m.e. now paired with MAC v.o.r. 116.0MHz. Oldham n.d.b. OLD (344kHz) withdrawn. Ottringham n.d.b. OTR (398.5kHz) withdrawn. Perth i.l.s. IPRF (111.3MHz) and n.d.b. PTH (388kHz) withdrawn. Strumble n.d.b. STU (400kHz) withdrawn. Turnberry n.d.b. TRN (355kHz) withdrawn. The loss of all those n.d.b.s will, I know, hinder readers who used them to study medium frequency propagation.

Danger Areas: Withdrawn: EG D811, EG D901, EG D902, Leuchars/Perth Area of Intense Aerial Activity.

Offshore oil and gas rigs: Barque, Shell Barque PL, Clipper, Galleon now 133.575 (were 122.25) and Markham ST-1 now 125.175 (was 123.225MHz). There's a listing of these in the RAF *En Route Supplement British Isles and North Atlantic* and once again the *Airband Factsheet* tells you how to order this. North Sea Lower Airspace (Southern) 264.575MHz withdrawn (was operated by Anglia Radar). Full details: again, see the RAF Supplement.

Reporting Points: New ones: ANKER, AVANT, BEGDA, BEGTO, BEVAV, BEWLI, CUMRI, ELGAR, FERIT, GILDA, GULDA, HALIF, HANKY, LESTA, LUCCO, MADLI, MYNDA, NEVIS, NOKIN, OLGUD, OMIMI (supersonic route), PHILI, PIKOD, POMPI, RATKA (supersonic route), SUPAP, TARAN, TOVRI, TUTON, UNROK, WESUL. Withdrawn: BAKAT, NOTRO, ROBIN.

Runways. Kirkwall now 06/24 (was 07/25).

Now, if you've waded through the above - spare a thought for me, I typed it all in! The original text ran to many pages - the above is a summary. If anything sounds familiar and you want specific information (eg. the latitude/longitude of a reporting point) then please write in with your request.

Some helicopter callsigns in *AIC* 83/1996 from the CAA: Pipeline or Powerline (followed by a number) indicate inspection flights (the callsign is self-explanatory!) with two electricity operators retaining the callsigns Grid and Electricity respectively. Squawk code will be 0036. If you write in with the number in the callsign, I'll tell you which of the numerous operators it belongs to.

The next three deadlines (for topical information) are November 15, December 13 and January 17. Replies always appear in this column and it is regretted that no direct correspondence is possible. Genuinely urgent information/enquiries: 0181-958 5113 (before 21:30 local please).

Abbreviations

AIC	Aeronautical Information Circular
AIP	Aeronautical Information Publication
a.t.i.s.	automatic terminal information service
B.	Boeing
CAA	Civil Aviation Authority
d.m.e.	distance measuring equipment
FL	flight level
i.l.s.	instrument landing system
kHz	kilohertz
MHz	megahertz
n.d.b.	non-directional beacon
TACAN	TACtical Air Navigation
v.o.r.	very high frequency omni-directional radio range
z	Zone time (same as Universal Time, Co-ordinated)

Peter Bond c/o SWM Editorial Offices

MIL AIR

Regular readers of the Scanning and Airband sections of *SWM*, will be aware that the Military airband information has been appearing, almost exclusively, under the scanning column. It has now been agreed to collate this information into a new Military Airband column, and I have been given the pleasant task of compiling this section. I hope to include details of all aspects of military airband listening, whatever you hear, especially the unusual, may well be of interest to others. I look forward to hearing from *SWM* correspondents on a wide variety of military airband related subjects.

Subject to changes to the situation in Northern Iraq, there should have been several units deploying to and from the Gulf via the UK during September and October. Any reports of discrete frequencies or callsigns in use by the visiting units would be most welcome. Also any information on recent exercises such as "Brilliant Invader, would be appreciated. All letters to me please via the Editorial Offices - all information will be included anonymously, unless you request otherwise.

Spirit In The Sky

September 2nd, saw the first 'brief' visit to the UK of the B-2A Spirit, the stealth bomber operated by the 509th Bomb Wing of the United States Air Force. The inbound flight was running approximately 30 minutes late due to a wide berth given to Hurricane Edward in the Atlantic. The Spirit entered UK airspace across Ireland and then through Wales using the London Control Brecon sector frequency **133.6**. It then descended towards Farnborough using the callsign SPIRIT71, (abbreviated to SPIRT71 for ATC computer purposes). Having performed two flypasts at the SBAC show at Farnborough, the B-2A then continued on the 21.5 hour mission back to its home at Whiteman Air Force Base - A very long day at the office.

Air refuelling was provided by two KC-135 tankers from RAF Mildenhall, using the callsigns QUID 81 inbound and QUID 83 outbound - these are standard Mildenhall mission callsigns. The Mildenhall ACC operations frequency **312.45** was used regularly during the mission, plus I have two reports of both **148.3** and **337.1** being used for Air/Air, (or Air Refuelling?). They were noted by **Tim** in Cardigan and a correspondent who lives near to Brize Norton. Did anyone else hear these, or any other discrete transmissions? The B-2A departed Farnborough to Clacton and then made a short TACAN tour of East Anglia at FL190/FL260, before tracking back across the country to enter the ocean via Dublin. Unfortunately, overcast skies prevented anyone from seeing this quick tour of the eastern counties!

Frequency Focus

News has reached me that RAF Lakenheath may have changed or swapped some of their discrete frequencies. For example, an old Air to Air frequency **299.5** is now apparently in use as 494 FS / 'Panther Ops', (ex **343.675**). This information, coupled with a letter from **Andy C.** in Kent, who asked if we had any up-to-date information on the Auxiliary or Operations frequencies for this airfield - has lead me to ask our readers if they can help with any current information. If we can compile an up to date list of Aux., Operations and Air to Air, etc. I will include it in a future column.

Bits & Pieces

Two new Automatic Terminal Information Service (ATIS) frequencies have been introduced in recent months - Barkston Heath on frequency **351.825** and Shawbury a digital version (DATIS), on **340.7**.

Whilst not strictly Military Airband, RAF Wyton, which closed in 1995, has been reopened for use by microlight traffic using the common frequency,129.825.

Two correspondents, located at Cambridge and Lincoln, have independently reported a new London Military frequency in use during July. **375.25** was heard on several occasions but has not been heard recently, can anyone help with any further information?

Queries

Mike from Yeovil, heard two weak frequencies in use recently on his AOR AR3000. **249.5** and **245.25** both were thought to be RAF voices, but were too faint to get a positive identification, (possibly Squadron Air to Air?). Both of these frequencies seem to be previously unrecorded - can anyone identify them?

Lastly, some information concerning London Control, with a new frequency being noted in use on the Pole Hill Sector. The frequency **118.775** was in use for about ten days at the end of August in place of 131.05. This was apparently an evaluation, and 131.05 is now back in service. The new frequency is currently scheduled to be brought into service on Pole Hill towards the end of the year - See you next month.

THE AVIATION HOBBY CENTRE

VISITOR CENTRE

MAIN TERMINAL

BIRMINGHAM INTERNATIONAL AIRPORT

B26 3QJ

TEL: 0121-782 2112

FAX: 0121-782 6423

Why not send for our free Mail Order Catalogue full of Aviation Books, Videos, Scanners, Antennas, Maps & Charts. Always available are the **UK POCKET VHF/UHF FREQUENCY GUIDE** at £3.95 + 50p P&P. **THE AIRBAND JARGON BOOK** – Explains what exactly is being said and the instructions being given over your airband radio between ATC and the aircraft – Price: £6.95 post free. **AVIATION VIDEOS – PLANE FOOTBALL CRAZY** – see the aircraft such as Martinair B747 + MD-11, Corsair B747, Czech IL-62 and TU154's plus lots lots more when visiting fans arrived at BHX in June for one of the biggest football events held at Villa Park. 90 Minutes Plus Extra Time of aircraft action! Price: £16.99 + £1 P&P. **FIVE DAYS IN MAY – BIRMINGHAM INTERNATIONAL AIRPORT** – a video 'diary' including the aircraft that visited BHX for the Western European conference including German AF VFW614 and A310 Airbus, Polish AF YAK40, Slovak & Czech TU154's as well as various Military and private exec jets. Also features BHX's regular 'traffic'. The best of the five days compressed into a 2 hour action video. Price: £14.99 + £1 P&P. **ON THE FLIGHTDECK VOLUME ONE** – Five varied flights including overhead join and landing at Welshpool in a Cessna 152. An approach and landing at Prague in a CSA B737-500. Larnaca-Beirut – Larnaca great aerial footage of Beirut and its airport from a Cherokee Archer II. Price: £14.95 + £1 P&P.

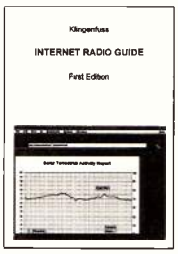
We accept Visa, Access, American Express, Switch, Visa Delta, Cheques, Postal Orders and Cash of course! And we are open 7 days a week 8am – 7pm

LOOK FORWARD TO HEARING FROM YOU.

INTERNET RADIO GUIDE

the first and only manual on this subject worldwide!

356 pages • £ 25 or DM 50 (including airmail)

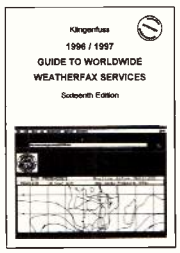


Fed up with boring lists of strange expressions such as *http://www.arrrghhhh/*? Our alternative is concrete information in black and white! The result of hundreds of hours of work, thousands of sheets of paper and an astronomical phone bill, our new INTERNET RADIO GUIDE shows you the varied features of the Internet for radio amateurs and worldwide listeners. Now you can see what the so-called cyberspace *really* has in store for you!

If you do not feel like copying - error-free, of course! - such stupid terms like *http://www.arrrghhhh/*, have a look at our homepage. Thousands of fascinating Internet sites are only a mouse-click away from your forefinger, since *we* provide hyperlinks to all essential locations: Equipment manufacturers from Alden to Wavecom. Organizations and publishers from the CIA over the ITU to the WMO. (No less than two sites for the NSA!) Radio clubs from Australia to the United States. Latest schedules of radio stations from Alaska to Vatican. The hottest utility station frequencies anyway!

And, of course, the book for it :-)

1996/1997 WORLDWIDE WEATHERFAX GUIDE



includes latest schedules and Internet addresses!

436 pages • £ 29 or DM 60 (including airmail)

The international reference book on radiofax stations and telefax services from all over the world. Technique and equipment for direct reception of weatherfax stations and meteo satellites. Includes hundreds of new weather charts and great satellite images!

RADIO DATA CODE MANUAL

comprehensive + unique: the 15th edition already!

604 pages • £ 34 or DM 70 (including airmail)

Latest codes and message formats for aviation and meteorology. Internet addresses for solar data and radio propagation. All ICAO airport and WMO station designators worldwide. All modern data transmission protocols and teleprinter systems used on shortwave!

Plus: 1996 Super Frequency List on CD-ROM for Windows (broadcast *and* utility) = £ 29. 1996 Guide to Utility Radio Stations (604 pages!) = £ 38. Double CD Recording of Modulation Types = £ 48 (cassette £ 29). Payment can be made by cheque or credit card - we accept American Express, Eurocard, Mastercard and Visa. Dealer discount rates on request. We have published our international radio books for 27 years. Please ask for our free catalogue with recommendations from all over the world! ☺

Klingenfuss Publications • Hagenloher Str. 14 • D-72070 Tuebingen • Germany

Fax 0049 7071 600849 • Phone 0049 7071 62830 • E-Mail 101550.514@compuserve.com

Internet http://ourworld.compuserve.com/homepages/Klingenfuss/

GAREX ELECTRONICS

WIDEBAND SCANNERS

All major brands available, with the all-important service back-up from a company who pioneered the UK scanner market; we are completely independent so contact us for impartial advice.

WIDEBAND SCANNER AERIALS

"REVCONE" premium quality British VHF/UHF Discone 16 element for all-round coverage, **SO239** connector **£38.95** or **N-Type** connector for improved UHF performance **£39.95**. **"REVCONE PLUS"** with improved low frequency coverage **£48.95**. **"REVCONE EXTRA"** ready to go package; discone, 10m co-ax fitted PL259, mast clamps, BNC plug **£49.95**.

"RADAC" NEST OF DIPOLES

Imitated but not equalled. Receive 25-1300MHz, outperforms discones: **£74.95**. Special VHF/UHF Airband RADAC: 108-136MHz and 220-400MHz **£74.95**.

"NOMAD" PORTABLE SCANNER AERIAL

Lightweight design using ribbon cable elements: rolls into a small bundle for ease of transport, hang from any convenient point, ideal for travelling, with 4m co-ax and BNC plug. **£16.95**.

NEW ACTIVE "NOMAD"

With built-in wideband preamp complete with supply/splitter box (internal battery or external 9-15v supply) **£29.95.**

SCANNER AERIAL FILTER

Is your scanner useless due to breakthrough? Then this product could solve your problem: a specially designed tunable filter to be fitted in-line with the aerial feeder, reduces breakthrough from strong VHF signals, (e.g. Band II, pagers, police) also includes HPF to reduce SW & MW interference, BNC connectors **£27.95**.

VHF PREAMPLIFIERS

Miniature (only 34x9x15mm), any frequency in the range 40-300MHz, up to 25dB gain. Assembled, but unboxed pcb. Stock versions: 6m, 4m, 2m, 137MHz (W-Sat) **£12.95**. Airband (118-136MHz) (reduced gain due to frequency spread) **£12.95**. Other frequencies in the range 40-300MHz to order: **£14.95**.

VHF AIRBAND PREAMP 118-137MHz

16dB gain, boxed ready for use, powered by internal battery or external 9-15 volts DC, BNC connectors and patch lead **£29.95**.

VHF MARINE BAND PREAMP 156-162MHz

20dB gain (other details as Airband model) **£29.95**.

WIDEBAND PREAMPLIFIER

Model GA4-B. Covers 25–1300MHz, typical gain 12dB (at 500MHz); (other details as Airband model) **£35.95.**

MAINS ADAPTOR

Suits our preamps, Active "NOMAD", etc. 3/4.5/6/7.5/9/12V regulated at 300mA **£8.95.**

FLEXIBLE ¼ WAVE AERIALS

Discover a whole new world of signals: full-length ¼ waves are several dB better than "rubber ducks". BNC plug. Available for VHF Airband, UHF Airband, 2m, 70cms also other VHF & UHF bands to order. VHF models: **£11.95**, UHF: **£9.95**.

Write, phone or fax for lists. ***Callers by appointment only, please.***

ALL PRICES INCLUDE UK CARRIAGE AND VAT AT 17.5%

GAREX ELECTRONICS

Unit 8, Sandpiper Court, Harrington Lane, Exeter EX4 8NS

Phone: (01392) 466899 Fax: (01392) 466887

VISA

JAVIATION

THE AIRBAND SPECIALISTS

CARLTON WORKS, CARLTON STREET, BRADFORD BD7 1DA

01274 732146

Frequency & Callsign List – Together

The latest edition of our most successful publication ever is due to be published during December 1996 - in time for Christmas and the New Year. Fully updated with this years frequency changes together with a comprehensive update on the Military Callsign section. Same format as all previous editions and from customer feedback still the best airband guide there is.

£12.50 including postage

AR8000 Owners

Want to improve performance on the AM Broadcast bands?

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.

Robust leather carry cases also available for the AR8000 - £15.00 inc P&P.

If you have internet WWW access then surf along to our Web Site at:- **http://www.demon.co.uk/javiation**

Lawrence Harris, 5 Burnham Park Road, Peverell, Plymouth, Devon PL3 5QB E-mail: lawrenceh@enterprise.net

Info In Orbit

For several days during September, the characteristic croak of the METEOR WXSATs on 137.85MHz was absent, leaving us the NOAAs and SICH-1. Looking at the orbits as displayed on a satellite tracking program, the reason was clear - the orbital planes of both METEOR 2-21 and 3-5 were near the sunrise/sunset terminators. Unlike the sun-synchronous NOAA WXSATs, orbits of the CIS WXSATs precess - their orbital planes gradually rotate around the earth, causing solar illumination - which powers the satellites - to vary. During the 'off' period, both METEORs were near the terminators.

Future Launches

NOAA-K, the next in the series of advanced NOAA WXSATs, has been rescheduled for launch in April 1997. GOES-K launch date is now 10 April 1997.

STS-80, Shuttle *Columbia* is scheduled for launch on 31 October.
STS-81 *Atlantic* is scheduled for 16 January 1997 into an 51.6 °orbit (over UK), and involves another MIR-linkup.

Shuttle Monitoring

Shuttle flights are sometimes re-scheduled a few days before launch but postponements are rarely reported in the popular press. Consequently, prior to delayed launches I often receive a number of requests for Keplers, even though the flight will not happen. Rather than waste postage, I keep the requests and post the first active Keplers when the flight occurs. 'Dummy' Keplers are issued about 10 days before the flight so if you want a set of these - do ask! I always send Kepler elements without delay, and request only that a 20p coin be included towards costs.

Andrew Higginbottom of Bodmin was one of several people asking about Shuttle monitoring frequencies. Launches forming part of the MIR-Shuttle programme have orbital inclinations of about 56° to link-up with the MIR complex. They pass over Britain for about five consecutive orbits, followed by several hours absence. Before the STS-79 link-up I heard Shannon Lucid talking in English on MIR's 143.625MHz, but I believe that she was actually using a different frequency to talk to the ground, while the MIR voice frequency remained open. During the STS-79 linkup, both Russian and American voices were heard on 143.625MHz.

The official Shuttle voice frequencies in the u.h.f. band are 259.7MHz and 296.8MHz. The windows for such direct monitoring are very short, so for more continuous monitoring, try using a general coverage receiver to tune to WA3NAN on one of the many frequencies used for re-transmission of the Shuttle voice transmissions. The following may be available:

3.8602 - l.s.b., 7.1845 - l.s.b., 14.294 - u.s.b., 21.390 - u.s.b. and 28.645MHz - u.s.b.

A comprehensive listing of every planned Shuttle flight and payload, together with comprehensive information on reception is available from me as the 'Shuttle Pack'. Please include a secured £1 and stamped s.a.e. for the A4 booklet. This pack is continuously updated using information provided by NASA.

Letters

J. Pretorius wrote from Brakpan, South Africa to send a picture that he had received from METEOSAT-4. I was puzzled until I noticed the date stamp on the image was 8 November 1992! Although printed by an HP deskjet using JVFAX v7.1, unfortunately the image was too dark to reproduce properly. He also monitors the v.h.f. transmissions from polar orbiting WXSATs, and a number of h.f. stations, of which he tells me that Pretoria Met ZRO on 7.509 and 12.748MHz and Boston stations are heard at high signal strength locally.

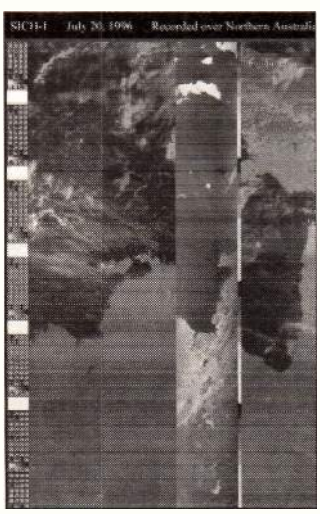


Fig. 4: Australia - SICH-1 on 20 July from Les Hamilton.

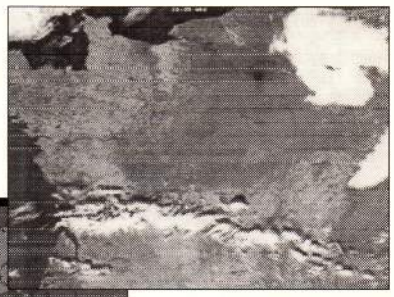


Fig. 1: NOAA-14 h.r.p.t. image from Dr. Martin van Duinen.

Fig. 2: Screen shot of satellite tracking map.

Dr. Martin van Duinen wrote from Holland to send several images from his Hansen h.r.p.t. system. One image, from NOAA-14 h.r.p.t. on 12 October, shows France. The resolution is so good with this imagery that city areas can easily be identified as can the shadows from clouds. With the sun in the south, 1335UTC, the shadows of the cloud bank which crosses west to east can be clearly seen.

PC-GOES/WEFAX V4

Jim and Hilda Richardson of Strathkinness sent several images, and news about the new update - PCGOES/WEFAX version 4 - released by John Hoot of the American company Software Systems Consulting. Earlier versions of this WXSAT/utility decoding software were previously available from a UK company, which no longer retails WXSAT products.

I was able to obtain a copy of the program for a quick review. Version 4 is a considerable upgrade from the last version. From the main menu, the choices are 'File', 'Receive', 'Tune', 'Display', 'Edit', 'Options', 'Setup', 'Orbits' and 'Help'. 'File' has the usual options, including 'Export' and 'Transmit'. 'Receive' offers various methods for reception including the change to the utility section of the program, and unattended operation. 'Tune' displays the tuning oscilloscope simulator. 'Display' provides image processing options, a zoom, 3D and other facilities. 'Edit' offers more sophisticated image processing options, including NOAA infra-red analysis and the map overlay. 'Setup' is used to configure video cards, printers and hardware parameters. File compression is also included. Orbits includes a satellite tracking facility - see **Fig. 2** - as well as computing predictions. The 'Help' menu is comprehensive - and provides information about map overlays.

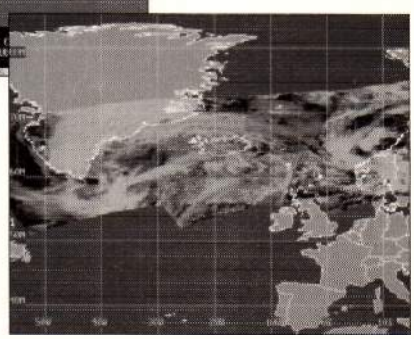


Fig. 3: METEOR 3-5 composite on Mercator map.

An image processing suite is provided and contains the first example that I have seen of software which can overlay the image obtained from a polar orbiting satellite on to a Mercator projection. **Fig. 3** was compiled by Jim and Hilda using passes from METEOR 3-5 received on 24 July. The use of overlays was previously limited to images transmitted by geostationary WXSATs, because their images (nearly) always cover identical areas. Look at METEOSAT's D2 images of Europe and the country outlines are seen superimposed on the image. Images from polar satellites are invariably covering different (though predictable) areas, so overlays have been a theoretical possibility. This software brings the option to your screen.

PC GOES/WEFAX Utility Decoding

The new software includes applications for utility decoding, for example it can receive and decode Baudot, RTTY, NAVTEX and Morse code. Enquiries about version four should be directed to **Software Systems Consulting, San Clemente, California, USA**. I believe the cost of software and manual is $65. Hilda mentioned that when the package was delivered, the UK Customs and Post Office had opened it and added import duty charges - totaling some £12! This may be a matter of 'chance' because I have received CD-ROMs carrying clearly marked 'satellite images' and 'astronomy' programs, and have not yet had such problems.

Jim and Hilda enclosed various pictures, one of which - a stored image - was received from SICH-1

on 20 July. **Les Hamilton** also received this image from SICH-1 - see **Fig. 4** - and recognised it as the Gulf of Carpentaria, Northern Australia.

EUMETSAT - New Web Site

The Internet forms an important media for the release of public information, and many space organisations (such as NASA, NOAA, GOES, WMO and IKI) have web sites for public access. On 1 August, EUMETSAT officially opened their new web site on the Internet:

http://www.eumetsat.de/

EUMETSAT's opening page offers further links for those wanting to get a general view of the organisation. A French language version is offered, as are links to detailed pages within EUMETSAT. The latest details of EUMETSAT plans for future satellites up to the year 2012 are available, together with information on individual spacecraft.

You can also access their User and Operational Services, and find information about the METEOSAT constellation. Some links were not completed at the time of first testing, but this is common on new sites under development. The official METEOSAT dissemination schedule is now online - as are the short-term plans for operational changes; these advised of the imminent use of METEOSAT-6 for image collection during a forthcoming period of decontamination of METEOSAT-5's infra-red sensors. METEOSAT-5 will be transmitting the images obtained from METEOSAT-6 - a configuration already successfully tested.

The Russian Navigation Satellite Constellation

The Russian 'Musson' navigation satellites transmit in the 150MHz band and, like the WXSATs, they are usually easy to receive, they provide a good test of antenna and receiving equipment. Most general purpose scanners include the 150MHz band, so the frequencies 149.91, 149.94, 149.97, 150.00 and 150.03MHz can be programmed and monitored. The satellites simultaneously transmit on frequencies in the 400MHz band. I occasionally receive reports from people monitoring the 150MHz band, and regularly monitor it myself, though without attempting to decode the telemetry.

There is an interesting history to these satellites. During the sixties, a group of satellite experts lead by Geoff Perry, based at Kettering (UK), specialised in monitoring Russian satellites, research which led to a number of surprising discoveries - not least, the identification - during the period of the 'Cold War' - of a hitherto unknown Russian launch site!

The Military NavSats

This group of COSMOS satellites is subdivided into six orbital planes (numbered one to six), and comprise several per group, with one operational satellite in each. The operational satellites in each plane during August were:

(Plane 1) Cosmos 2327 on 149.97 MHz
(Plane 2) Cosmos 2184 on 149.91 MHz
(Plane 3) Cosmos 2218 on 149.94 MHz
(Plane 4) Cosmos 2173 on 149.97 MHz
(Plane 5) Cosmos 2142 on 150.03 MHz
(Plane 6) Cosmos 2279 on 149.94 MHz

Civilian NavSats

This group transmit on 150.00MHz, and the following are currently operational:

Cosmos 2315, Nadezhda 3, Tsikada and Nadezhda 4, all on 150.00 MHz

Nadezhda means 'hope', and Tsikada means 'chirping cricket'. The operational satellite in each group is occasionally changed. The listing shows that each of the six planes has had an associated transmission frequency, but this established pattern seems to have been broken with the operation of COSMOS 2334.

COSMOS 2142 has been the 'plane 5' satellite transmitting on 150.03MHz. A (presumed) replacement COSMOS 2233 was launched but either failed or was turned off. COSMOS 2334 was launched in August, and while updating my tracking program to reflect the changes, I picked up the satellite transmitting on 150.03MHz. Having more problems with my Internet connection, when I was finally able to send in a reception report, I was not aware of the special interest in COSMOS 2334. The significance of COSMOS 2334 is that it is in a 'plane 1' orbit.

Mr Perry (of the Kettering Group) kindly provided the following note: "In more than 20 years of monitoring the 2m signals of the Russian low orbit navsats, the Kettering Group have never before logged a plane 1 spacecraft transmitting on a frequency other than 149.97MHz. 150.03MHz has hitherto been exclusively used by plane 5 spacecraft."

I am grateful to Geoff Perry of Bude for providing comments, and **John Corby** of the 'hearsat-list' for the satellite listing given above.

Meanwhile, a writer from Colchester told me that he is very interested in the Shuttle and the International Space Station, which I feature occasionally, but although he monitored the 150MHz band he heard nothing during a period of 90 minutes. The list above shows four satellites currently transmitting on this frequency. Without knowing the system in use, I would suspect that the most likely reason for not hearing them could be the use of an unsuitable antenna, or its position. For all satellite monitoring, antennas need to be outside and preferably elevated. Having said that, when I completed construction of my first WXSAT receiver, I pushed a short length of wire into the antenna socket and immediately heard the signal from a NOAA WXSAT!

Chinese Polar-Orbiting Meteorological Satellites

The recent POES meeting in America saw presentations from many countries. An 'Introduction to Chinese Polar-Orbiting Meteorological Satellites' was given by Fang Zongyi Xu Jianmin, of the National Satellite Meteorological Centre, China Meteorological Administration. The following includes edited extracts from a comprehensive presentation.

China began its meteorological satellite work at the end of the 1960s. Equipment was developed to receive data from the (American) ESSA satellites, while a programme to build its own meteorological satellites was started. "After developments of more than two decades, China has successfully launched two experimental polar orbiting meteorological satellites, and has an extensive utilisation of meteorological satellite data on many aspects in the country. Today, the meteorological satellite data has already become an indispensable tool in the country's national economy".

The meteorological satellite programme of China consists of two major parts: polar orbiting and geostationary meteorological satellite series named FY-1 and FY-2 respectively. The main objective of this programme is to establish a comprehensive operational meteorological satellite system before the end of this century. The Ministry of Aerospace takes responsibility for the space segment, while the Meteorological Administration is in charge of the ground segment.

The first Chinese experimental meteorological satellite, FY-1A, was launched on 7 September 1988 but did not last the expected lifetime. The system design and equipment performance were examined. There were two major problems with FY-1A: attitude control, which caused the satellite to go out of control after 39 days, and water vapour contamination on the IR detector, which was responsible for IR signal loss.

After more than one years study and improvements, the second satellite, FY-1B, was launched on 3 September 1990. The AVHRR, which was the major payload on board the satellite, obtained cloud images with very good resolution, and terrestrial surface characteristics with 1km scale were clearly distinguishable. The IR images, which were not successful on FY-1A, were greatly improved for FY-1B. The satellite attitude, which also caused FY-1A to go out of control, was obviously improved, but it did not yet reach the expected precision even for FY-1B and needs to be improved.

Future Plans

Feng-Yun-2B (FY-2) is under construction by the Chinese government, with launch expected some time in the first quarter of 1997. The first model, FY-2A, was lost early in 1994 during a fueling accident that destroyed the rocket and satellite. FY-2 should be placed near 105°E. FY-2 is not expected to encrypt its imagery, and therefore it will be available on the global networks.

China is continuing the FY-1 programme. FY-1C is being designed now. It is expected that FY-1C will be launched in the time frame 1997-1998.

Satellite Tracking Software

STS Plus has been upgraded to version 9637. It was specifically designed for Shuttle tracking and provides a display comparable with that at NASA. Winorb29 is mainly used for amateur radio satellite monitoring, and PC Track is currently in version 311. Programs can often be upgraded by registering and the authors then provide an enhanced version. Commercial programs such as Timestep's TrackII are also available. Except for TrackII, the programs mentioned can be obtained from satellite BBSs (such as Starbase 1 and RIG) or from me by sending a pre-paid envelope and disk with secured 50p.

Kepler elements - MIR and Shuttle

Anyone requesting element data expect to receive a current set -

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.
2I 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 set of files containing 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). Please enclose 50p with your PC-formatted disk and stamped envelope.

Frequencies

NOAA-14 transmits a.p.t. on 137.62MHz
NOAA-12 transmits a.p.t. on 137.50MHz
NOAAs transmit beacon data on 137.77 or 136.77MHz
METEOR 3-5 (or 2-21) use 137.85MHz
OKEAN-4 and SICH-1 use 137.40MHz
METEOSAT-5 (geostationary) uses 1691 and 1694.5MHz for WEFAX
GOES-8 (western horizon) uses 1691MHz for WEFAX
Mir uses 145.55 and 143.625MHz amongst others.

Timestep

PROsat II is used by most leading Weather Satellite enthusiasts. They have come to rely on the vastly superior features of **PROsat II.** Features such as 1,000 frame full screen full colour animate, 3D, direct temperature readout, latitude-longitude overlays and country outlines from NOAA, and Windows export make Timestep products preferred by most serious users. All satellites are catered for including the awkward Japanese GMS and the very infrequent Soviet Okean series. All current SVGA cards are supported. NOAA images contain full resolution visible **and** infrared data in a stunning 2.4Mb file!

If you really are serious about Weather Satellites, phone or write us now for a colour catalogue and find out why the world's experts including Arthur C. Clarke use and recommend our equipment.

Advanced Weather Satellite users will by now have read about our new **TRACK II** prediction software. Full screen colour graphics and 6 simultaneous satellites are just some of the amazing features. For the ultimate in detail we offer **HRPT** digital systems with five 1.1km ground sensors, towns and rivers are clearly visible. For everyday use we also have the **PDUS** digital Meteosat system that takes 2.5km data every 30 minutes. Timestep **PDUS** colour animate is used several times a day by Anglia Television because of its very high resolution combined with spectacular colour. Forecasters will appreciate temperature calibrated 30 minute interval images.

A full range of separate Antennas, Preamplifiers, Cables, Receivers and accessories are held in stock.

Timestep PO Box 2001 Newmarket CB8 8QA England
Tel: 01440 820040 Fax: 01440 820281

C.M.HOWES COMMUNICATIONS

Mail Order to: Eydon, Daventry, Northants. NN11 3PT
☎ 01327 260178

SSB & CW Filter – £29.80!

Clean up your reception!

• Reduce noise and interference! • Sharp SSB/Speech filter with faster roll-off than IF crystal filters! • 300Hz bandwidth CW filter • Printed and punched front panel • All aluminium case • Simply connects between radio and external 'speaker or 'phones • Suits all general coverage receivers & transceivers • **ASL5 Kit plus HA5OR hardware: £29.80**

DC2000 built in HA22R hardware option

HOWES DC2000 Electronics kit: £22.90
(includes either standard 80M, or your choice of band module).
HA22R Hardware (pictured): £18.90
Extra band module kits: £7.90 each.

NEW! 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 the same interchangeable band modules as the DXR20, 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.

Like our other receivers, the DC2000 will interlink with many of our other kits to form a complete station. Fancy a digital frequency display, "S meter", sharp CW filtering, a matching transmitter? There are many reasons why building the DC2000 is a great way to start your station!

Enjoy your radio more with great projects from HOWES!

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. DCS2 "S meter" Kit: £10.90. HA20R hardware pack: £28.90

The famous HOWES Active Antenna Kits

AA2. Covers 150kHz to 30MHz. The neat compact answer for those with limited space.
Kit: £8.90 Assembled PCB module: £14.90

AA4. Covers 25 to 1300MHz. Broad-band performance in a neat, compact package.
Kit: £19.90 Assembled PCB modules: £28.90

AB118. Optimised for long distance reception on 118 to 137MHz air-band.
Kit: £18.80 Assembled PCB modules: £27.90

MB156. 156 to 162MHz marine band active antenna system (the brother of AB118!)
Kit: £18.50 Assembled PCB modules: £27.60

Top Value Receiving ATUs

CTU8. Covers 500kHz to 30MHz. Matches antenna impedance and helps reduce spurious signals and interference with extra front-end filtering for the receiver. SO239 sockets.
Factory Built: £49.90. Kit (including case and all hardware): £29.90.

CTU9. As CTU8 plus balun, bypass switch and terminal posts. The fully featured Rx ATU!
Factory Built: £69.90. CTU9 Kit (including case and all hardware): £39.90.

Please add £4.00 P&P, or £1.50 P&P for electronics kits without hardware.

HOWES KITS contain good quality printed circuit boards with screen printed parts locations, full, clear instructions and all board mounted components. Sales, constructional and technical advice are available by phone during office hours. Please send an SAE for our **free catalogue** and specific product data sheets. Delivery is normally within seven days.

73 from Dave G4KQH, Technical Manager.

Mike Richards G4WNC, PO Box 1863, Ringwood, Hants BH24 3XD. Internet: mike.richards@dial.pipex.com

Decode

All the Data Modes

Web Page

Here at last! Yes I've finally launched my Web page on the Internet. Other than just an ego trip, I will be using the page to help keep you up-to-date on the latest news and software. In its initial format, I've built the site with all the necessary links so you can download the latest version of all the software mentioned in my reader's offers. For those of you interested in such things, I built the html pages using Netscape's Navigator Gold WWW browser. This features an editor as well as probably the best browser available. One of the attractive points about the editor is the way you can design WWW pages without having the first idea about native html code. You can also see the page build-up and get it to look just the way you want.

Another attraction is the ability to steal pics and backgrounds from other sites and put them in your document. Whilst browsing around the Web you just select the graphic or background that takes your fancy and save it to disk. In addition to providing access to my software offers, I will be adding links to any shareware or demos that are mentioned in the column. This is very quick and easy to do, so I should be able to keep the site bang up-to-date. I've also built a section that provides links to lots of other Internet sites that offer software and data to help Decode readers. The final section is a readers letter page where I'll place letters that I need help with. Hopefully, other readers will then offer their solutions which I can publicise via the Web and this column. If you'd like to take a look you can find me at: **http://dialspace.pipex.com/mike.richards/** (don't forget the last slash) If you have any comments or suggestions on the site please drop me a line.

Hamcomm Terminal Unit

Leo Black of Bournemouth has recently visited a local rally and bought himself a second-hand Maplin TU-1000 terminal unit for a fiver (approx £74 new!) and wonders how he can put it into use. Leo would like to use the terminal unit with Hamcomm and JVFAX, but hasn't had any luck so far. If you've been involved with RTTY for a few years you may well have come across terminal units, but for those who haven't, lets run through what they do.

The terminal unit evolved in the days before home computers were a practical proposition, so they have a long history. In the good old days when men really were men, sending messages using RTTY required the use of an electromechanical teleprinter. This was rather like a mechanised typewriter that converted a key press into a series of precisely spaced and timed electrical pulses known as Marks and Spaces. The land-line version of this communication system was known as Telex and used ±80V to signal over long distances. When it came to radio transmission, the electrical pulses were used to switch a transmitter between two closely spaced carrier frequencies in the same way as a modern RTTY system. Whilst you will no doubt find teleprinters still in use, most have been replaced by modern computerised versions. At the receiving end, the two audio tones that emerge from the receiver need to be converted back into an electrical signal to operate the print magnets of the teleprinter. A terminal unit (e.g. the TU-1000) is simply the device that performs this conversion. In addition to being used to drive a teleprinter, they were also used to feed computer decoding systems. This was necessary because early micro-processors and programming languages were not fast enough to support internal analysis and decoding of raw audio signals.

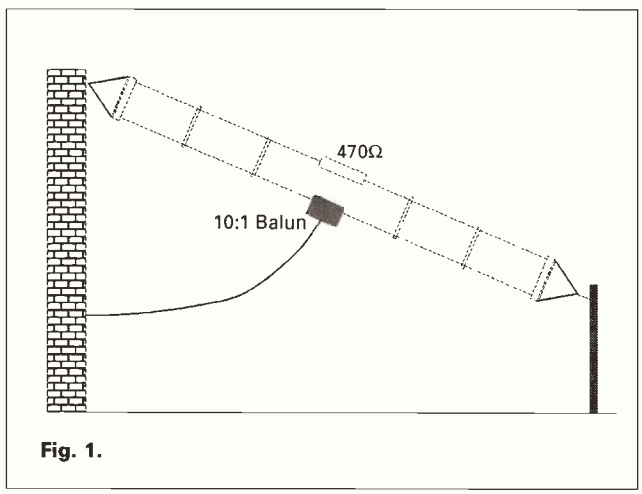


Fig. 1.

Looking back at the range of terminal units produced over the years, there were basically two main decoding techniques that were used. The first involved the use of very narrow audio filters. Here, one of the filters was set to pass only the mark signal, whilst the other is set for the space frequency. The filtered signals were then applied to a form of detector known as a discriminator. This provided a d.c. voltage that swung from one extreme to the other in synchronisation with the received RTTY signal. This signal could then be amplified or used to control a relay to supply the necessary voltages to drive a computer or teleprinter. One of the most famous of these terminal units was the ST5 that was produced commercially in the US and built by most radio amateurs with an interest in RTTY. Although a good filter terminal unit could provide superb performance they had the disadvantage that altering the shift required switching several critical components in each filter.

The second most common form of terminal unit used an electrical circuit known as a phase locked loop. I shan't go into the details of it's operation as that would warrant an article in itself. Suffice it to say that a phase locked loop attempts to track any signal that's applied and generates a d.c. voltage that's directly proportional to the way in which the signal frequency changes. It's this control signal that's used to drive the computer or teleprinter. A more common use of phase-locked loop technology is to control the tuning in most modern receivers. Whilst there were some very good p.l.l. based terminal units, many suffered problems because of the difficulty of making the p.l.l. fast enough to track the RTTY signal but not so fast that it would respond to noise.

Getting back to the TU-1000, this uses modern switched capacitor filters to produce a very flexible filter based terminal unit. The use of switched capacitor filters makes it very easy to alter the shift and the TU-1000 features both pre-set and variable frequency shifts. I've not used one myself, but it has all the makings of a very capable unit. Now that we're hopefully a little clearer on what a terminal unit does - lets look at how we can utilise it with Hamcomm and JVFAX. As far as JVFAX goes the answer is simple - you can't! This is because JVFAX is set- up to handle all the decoding in software and just needs a simple comparator to clean- up and limit the amplitude of the incoming signal. Also, when receiving photographic images such as those from weather satellites, the various shades of

Readers Special Offers

Those of you who've ordered recently may well have suffered rather long delays - I'm sorry for that but unfortunately demand has outstripped my ability to supply. I've therefore been trying to find a better way to handle the offers. As a result I've managed to secure a very special offer with the Public Domain and Shareware Library, PDSL. They have put together a library set of all five disks for just £12.00 all inclusive. Using PDSL also makes ordering simpler as they accept all the usual credit cards, so you can order by phone and you don't even have to write a letter. So in future, please direct all requests for this disk set to **PDSL Winscombe House, Beacon Road, Crowborough, Sussex TN6 1UL. Tel: (01892) 663298** and request library volume:H008739abcde.

grey are transmitted by varying the carrier frequency from one extreme of the shift to the other - terminal units can only switch between two pre-set carrier frequencies. Although you might think this would work for FAX charts the response time of terminal units is generally far too slow to preserve any useful image detail.

The same problems exists for the reception of SSTV signals. The good news is that you can use a terminal unit with Hamcomm to give improved performance especially when dealing with weak or noisy signals. When using Hamcomm in its standard form, with a simple interface the computer has to do a lot of hard work. It first has to monitor and measure the zero crossings of the incoming signal then use this information to work-out the frequency. Then it has to check to see if the frequency should be passed or rejected. All this has to be completed in microseconds and then followed by yet more processing to start to build and print the decoded message. By using an external terminal unit you have better control of the initial signal processing and can therefore use less processing power to resolve the signal. This can be particularly useful if you have a very early PC with one of the slower 8086 processors.

So how do you connect it up? This is actually very simple and can be found described on page 12 of the Hamcomm manual. All you have to do is connect the digital output from the terminal unit to the CTS pin of the serial interface. If you have the standard 25-way D-type connector, the CTS lead is pin 5. Before doing this, you must be sure that your terminal unit uses TTL or RS-232 output levels - the Maplin unit is fine for this. To let Hamcomm know you have an external terminal unit, you have to change one line of the configuration file HC.CFG. First find the entry 'set extconv off' and change it to 'set extconv on'.

The only snag with using an external converter is the loss of the oscilloscope and spectrum analysis functions. However, all is not lost as you can use both interfaces and have the best of both worlds! To do this you need to parallel-up the audio signal from the receiver so that it gets to the comparator interface and the terminal unit. Next you just need to take a lead from the output of the terminal unit and connect to the CTS pin of the simple comparator interface. Of course you also need to make the changes to the configuration file as described earlier. By using this system you get the good analysis tools of Hamcomm with potentially better decoding of weak RTTY and AMTOR signals. If you have any tips and tricks to improve decoding performance please drop me a line with the details.

T2FD - Ultimate Utility Antenna?

Many readers who read my 'if I won the Lottery' article last month have been bombarding me with queries on how to build the T2FD antenna. The response has been so overwhelming that I thought I'd better put some space aside in this column. I first came across the T2FD when I reviewed a copy of the *World Radio and TV Handbook Equipment Buyers Guide* (1993 edition). This is an extremely informative book that's essential reading for anyone contemplating setting-up a short wave station. As well as lots of receiver reviews, this particular edition contained a very comprehensive review of a variety of antenna systems from a fairly basic long wire system through to expensive and sophisticated active antenna systems. Each of the systems under test were subject to careful analysis over a wide range of short wave listening modes and then rated using the SINPO system. The results are very interesting and the T2FD turned-out to be one of the best antennas for utilities over the range 3 to 30MHz. Its main benefit over many other designs was better rejection of man made noise. Incidentally, T2FD is not the callsign of the inventor, it's an acronym for Terminated Tilted Folded Dipole! If you're not mathematically inclined, the T2 means T squared or TT! You could also view it as a sort of squashed rhombic. Anyway it doesn't matter too much what it's called, just how to build it.

As you can see from the diagram, the antenna consists of a pair of wires evenly spaced, joined at the ends with a terminating resistor in the centre of one span and a feed point in the other. The resistor must be a carbon composite type and definitely not wire wound. This is because a wire wound resistor will act as an inductor and make a mess of the antenna's performance. The antenna dimensions are very easy to calculate as you just need to work out the overall length and the spacing between the wires. To find the length in metres you just divide the lowest frequency you want to cover into 100. When choosing the lower frequency you need to remember that the T2FD has a main operating range or bandwidth of 6:1. If you selected 7MHz as the lowest frequency the antenna would be at its best between 7 and 28MHz. The antenna will still operate outside that range, but the performance will gradually deteriorate. It may be better to lower the range to say 4.5 to 18MHz. At this reduced frequency the length becomes 100/4.5 i.e. 22.2m.

The wire spacing is equally easy to work-out and is simply the frequency in megahertz divided into 3. Continuing with my example, this gives a spacing of 3/4.5 i.e. 0.66m. I would strongly recommend using hard drawn copper wire for the antenna as it's very resilient. A good place to get this is at a radio rally, though most amateur radio suppliers keep stocks. The ends of the antenna can be secured using plastics water pipe drilled to accept the antenna and the guy wires. You will also need to include some insulated spacers to keep the spacing of the two wires even and stop them getting tangled in high winds. I have had great success with the oval plastics tubing that's used to bury electrical cable in plaster. These are cheap, light and provide good support. You also need to take great care when mounting the resistor in the antenna. The resistor won't be able to take the stretching forces, so you need to secure the antenna with an insulator and solder a resistor between the two ends. You also need to make sure the resistor is well protected from the elements either with tape or perhaps some epoxy resin.

The next problem is the balun that's used to match the 500Ω balanced impedance of the antenna with a 50Ω coaxial feeder. This requires a 10:1 balun of which there are very few published designs. (*See 'Communiqué' for details of the Wellbrooke Communications unit - Ed*). An alternative is to use a 4:1 balun, change the feeder to 75Ω and replace the 470Ω terminating resistor with a 390Ω unit. This slightly compromises the overall performance of the antenna, but makes construction much simpler. In order to preserve the omni-directional properties of the antenna it's important to keep the slope angle somewhere between 20° and 40°. Now if you're not into all this construction stuff or maybe you've managed a small win on the lottery, you could get yourself a ready built system. The only manufacturer I'm aware of is RF Systems and they produce two variants. The basic T2FD is 15m long, covers 3 to 35MHz and comes complete with all components (including 10:1 balun). A scan through the Web shows Gilfer Shortwave in the US hold stocks and the current price is $239.95 for the basic T2FD and $389.95 for the DX Listener. This latter version includes an indoor control unit that extends the l.f. coverage down to 100kHz. For more info contact Gilfer by 'phone: + 1-201-391-7887, FAX: + 1-201-391-7433 or E-mail **info@gilfer.com**

Printed Literature:

I am still supplying my FactPacks, but am looking at better ways to do this, so watch this space!

Beginners Utility Frequency List (Order Code BL)
Complex Signals Utility Frequency List (Order Code AL)
Decode Utility Frequency List (Order Code DL)
FactPack 1: Solving Computer Interference Problems (Order Code FP1)
FactPack 2: Decoding Accessories (Order Code FP2)
FactPack 3: Starting Utility Decoding (Order Code FP3).
FactPack 4: JVFAX and HAMCOMM Primer (Order Code FP4).
FactPack 5: On the Air with JVFAX and HAMCOMM (Order Code FP5).
FactPack 6: Internet Starter (Order Code FP6).

For the printed literature just send a self-addressed sticky label plus 50p per item (£1.50 for four, £2.50 for 7 and £3.00 for 9).

Organiser Help

Norman Cuell writes from Ruislip asking if there's any decoding software available for the Psion hand-held computers. These computers are ideally suited to those travel and want to be able to take their decoding with them. Whilst you could use a lap-top PC, the Psion range are so much more compact. The down-side is that I'm not aware of any decoding software for these computers. So, if you know of any suitable programs please let me know and I will pass on the details via the column.

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

Amateur Bands Round-up

Listening to the Amateurs

Let's have all your news and comments, sent as usual for the start of the month.

That anonymous contributor again! This month, the question is simple, namely how the blazes can one measure the current drawn from a battery without breaking the leads or otherwise cutting in to the circuitry, a daunting proposition with today's very miniaturised equipment?

As usual, there is a reasonably simple answer. Bear in mind that batteries haven't been reduced in size all that much, so the move is to measure the current at the battery. One convenient way is to get hold of an offcut scrap of double-sided p.c.b. material. You want, for the usual four-cell 6V package, a piece about 10mm square. Now cut two pieces of flexible wire of a length adequate to go to your meter terminals. Allow enough length to suit your bench space and meter. Strip and tin a short length at each end of each piece. Tin a corner of the bit of board on one side, and an adjacent corner on t'other side. Now solder one of your bits of wire to each of the tinned areas on the scrap of p.c.b.

Now, imagine you want to measure the current drawn. Switch off then poke the scrap of board between one cell and it's contact. Connect the two wires to your meter and switch to the **highest** range. Now switch on momentarily. If the meter tries to go backwards switch off and either reverse the leads at the meter or leave the meter end and turn the p.c.b scrap round the other way. Switch on again, and progressively switch down range by range until you get a decent reading. **If** the meter goes past full-scale on the highest range, you've got a short-circuit of course, and you switch off again instantly; but normally you will find a range that will tell you the story. Once you've knocked up a gadget like this you'll wonder how you managed before! If you have a 9V battery you will have to lift one terminal of the battery connector and hold your bit of p.c.b. in place. I made my 'Mark 1' version back in the 'fifties, using a couple of bits of brass stuck either side of a thin bit of insulation.

All my testmeters bought in the past thirty years are still kept in their cardboard boxes, and one of these little gimmicks lives in each box, along with probes and things.

The second question concerns the effect of damp on, say, a dipole. Let's assume the dipole has a feed impedance of 50Ω, and imagine a leakage of 10kΩ across the feedpoint. Ohm's Law says that is insignificant. On the other hand, 10kΩ to earth from one end of our dipole would provoke some odd changes to the measured s.w.r., again by Ohm's Law. **However**, if our feed point had such a leak as we've mentioned, then it's all the gold in Fort Knox to a bent ha-penny that the leak is due to damp and that the damp has got into the feeder to push up the transmission line losses considerably. So - you wouldn't go QRT instantly, but you would certainly be prepared to curse, buy some new coaxial cable and think how to make a better seal as a matter of some urgency.

Letters

Mike Newell last wrote when we sported Lowe ads on the front cover and published from Welwyn, but since then he's acquired G1HGD and been playing packet radio. Recently though, the bug bit again and quite a bit of monitoring has gone on. Now he asks whatever happened to the Heard Prefixes Ladder since he went out of touch. Good Question! The Editor wasn't very keen on it, and he won, hi. For the more recent readers, the basic idea was to collect prefixes; a minimum of 200 different ones to start an entry, and some rules which we reprinted in the column every so often. Scores appeared alongside each piece, and the 'competive thing' was simply to climb to the top. Unlike, say, country-chasing, you could never say "I've got the Lot" cos tomorrow a new prefix can appear from somewhere.

Anyway Mike who now lives in Kenilworth - I was at a do at the Helen Ley Home in Bericote Road a week or so back - has Big Questions. What does Saba, PJ8 count for? Where is it? According to the *RSGB Prefix Guide* Dutch St Maarten, Saba and St Eustatius are lumped together as one DXCC country, and the location around 18°N 63°W. The three islands make a triangle with Saba almost south of St Maarten; a. line running south west from Anguilla and another going north west from St Kitts willl cross in the right general area. Incidentally the French part of St Martin is a separate DXCC country.

Harry Richards writes from Barton-on-Humber to enquire about a group of American amateurs who use computers and refer to the 'Web'. From the context I would think they were talking about the Internet, which has certainly mushroomed in the States and is taking off in a big way over here, and the 'Web' they talked about was the World Wide Web. For example RSGB has its own Web pages.

EMC problems afflict poor **Dennis Miller** in Dawlish. It sounds like a car-engine ticking-over but alas it's there throughout the 24 hours. Seemingly it covers from around 3.5MHz right on up to the highest frequency Dennis has tried which was 14MHz . However, he did manage to winkle out LA3PU, ON6IZ and SM6EOR on Top Band, while for 3.5MHz EK6GC, FM5BH, N1ZZ, RW9AY, SU2MT, VE2AL, VE9MMB, and VP5JM were noted. At 7MHz there were such as CM2SB, CP6RP, CU3GG, CX7OV, HB0/DL1AZZ, HC5NDA, HK4UT, HP3FGA, VE2AU, VE3WII, VK2OEN, and YV1GMP. Finally at 14MHz Dennis logged BV5CM, BV7GA, EY8MM, FM5GU, FR5DX, OA4AWN, OH0MB, V51X, VK3CR, VU2DK, W7FF in Arizona, YV6ELH, ZD7DP and 5Z4RL.

Next we come to **John Mathews** in London SE25, who reports that twice he has been on 14.275MHz (August 26, 21.45UTC and September 1, 2100UTC) and heard a station calling itself the 'Radio Amateur Information Network'. There was a reference to an organisation calling itself 'the American Amateur Radio Association' and giving a telephone number for enquiries. To answer the question of the weak signal, since he was talking about Eastern Standard Time he presumably wasn't beaming east and out to seaward, but somewhere between south through west to north, so he was being heard off the back or side. As to the organisation, I've never heard of it, but guess it is probably a small group of 'antis' dissatisfied with what ARRL do for them, but forgetting that ARRL is the only reason there is **any** amateur radio in USA! Having said that, we have to concede that **no** organisation run by humans can ever be perfect; the sensible thing to do is to stay in the organisation but try to improve it. If you meet one of the moaners and he is a current member, offer to second him for office and you won't see him for dust!

It was 14MHz and s.s.b. all the way for **Colin Dean** of Barnsley; Colin offers A41LD, A41LZ, A71DX, AP2AL, AP2JZB, AP2KSD, BV5DR, BV5GQ, BV7GA, BY1QH, C91CB, D2FIB, EK6GC, K4YT/EL2, ET3BT, EZ8BD, FR5DX, HL0Y/3, HS1NGR, HS8FZ, HS0/IK4MRH, HS/W0YR, HZ1TA, JW9THA, JY5HF, OD5YT, SU1ER, SU1JR, SU1SA, SU1SK, VQ9WM, VR2BH, VR2KM, YB1XUR, YI1RS, ZD7BJ, ZD7CRC, ZD7WRG, Z22JE, 3V8BB, 4L55K, 4S7DR, 4S7EA, 4S7SA, 5A1A, 9G1BL, 9G1YR, 9K2RR, 9N1CU, 9N1KY, 9N1RHM and 9V1YE.

The first letter from **Ted Trowell** in the Isle of Sheppey seems to have been delayed in the post and missed last month's piece, so it refers to things at the end of June and early July. The second refers to the August pickings. In this, Ted mentions c.w. around 0500z on 7MHz with KP4XX, WX7K, CO2PD/7, TI2WR, HJ6PPN, ZL2AGY, ZL1PC, 9H3RJ, 9H3UD, CM3ET, ZL2VS and 9H3WR. At 0600 a shift to 10MHz saw ZL4SEA. Next, 14MHz where at 1500 he booked in 9V1WW, KN0Z, W0IAK, TU2XZ, 9H3WQ before knocking off for a break. At 1800 battle was resumed with 9Q5MRC, 9K2/YO9HP, PY6AN, 9K2MU, and VE1VAS, the Marconi Memorial station in Glace Bay Nova Scotia; a final peep at 2100z found HK5YC. At 1500 on 18MHz Ted noted 9H3PB, TT8SP, OH0/DJ6AU, HZ1AB, RX1OX/FJL, K0EOU, 9H3UF and EA6ZY, with a lone LU/OH0XX at 2000. Looking at 21MHz, at 0900 there was 9H1AL/P, at 1500 9H1GZ and at 1800PP7GAG. 1500z on 24MHz gave SM5BDY and LA8AJA, and on 28MHz at 1800 7Q7RM. Back to the earlier letter (again all-c.w.), where we see 0600z on 7MHz for ZL2AGY, YV5JDP and TI2WR. Nothing noted on 10MHz but on 14MHz 1500z was the time for picking out JA6SRB, PP2FN, JJ2IVT, JA7SSB, VU2BK, JA4AHV, TF3GC, 9K2MU, JI8MCA, VU2AVG, ZP5ALI, 4S7NR, C50A, CR8A, 7Z5OO, OY/SM6RXS, ZP6CW, and J41OG (this chap sent his call as JV1OG at times, but was too good a signal to be from Outer Mongolia!). At 18MHz the log showed 3Z0PEA, 9Q5MRC, T77C, JP6VCH, 5N3/SP5XAR, all around 1500, while at the same hour on 21MHz PY2VRS, G4VXE/VE3, W1AW/3 and TK/F5JMY were noted. On 24MHz again at 1500 Ted noted OY3QN, and RX1OX/FJL. Finally, 1800z on 28MHz produced ZD8DEZ. The W1AW/3 was a bit of a puzzler, as Ted has never heard the ARRL HQ station operating from other than the HQ area in all the years he's been around. On the Sideband front, Ted has been having a play with the six-metre band and so far has Sardinia as best DX.

Comparison of the two letters from Ted Trowell, which quote the operating times mentioned and were all c.w., is instructive and shows how conditions change from month to month.

Not from a letter, but by reading the *Six and Ten Report* from RSGB's Propagation Studies committee, it is interesting to note that even at this bottom of the sunspot cycle the odd East Coast W station appear. There is no doubt that more stations reporting on their hearings on the 28 and 50MHz bands would be a help - there really is so much to learn about these bands, and of course the incoming reports from all over the place are the raw data from which theories can be drawn and then checked. Contact G3USF if you can spare some time to help.

Graham Tanner, 64 Attlee Road, Hayes, Middlesex UB4 9JE. Internet: gmt@delphi.com

SSB Utility Listening

My utility article in September's *SWM* seems to have jolted a few readers into writing with comments, suggestions and logs. **Adrian O'Leary** writes from Eire with some interesting logs, and a list of suggestions. Adrian asks what happened to the Traffic Log? He also asks that I devote some more space to Maritime information.

I originally used the Traffic Log as an experiment to see if it would inspire you to look at different frequencies, or to try to find other active frequencies. It also allowed those who originally sent the logs to get the warm glow of seeing their information used in the magazine. It started off quite well, but soon tailed-off. I started to receive fewer and fewer logs. Those that did arrive seemed to concentrate on the same few frequencies. Undaunted, I continued, adding-in several of my own loggings, to add some variation. I only ever intended to mention those signals which I considered to be out of the ordinary, mentioning other unusual frequencies. Or those transmissions involving stations which would be of interest to a large number of readers (for example, logs of Air Force One, the QE II, or the Space Shuttle re-broadcasts). After a while, I started to receive copies of readers' logs, where they had just sat on one frequency (usually 4.742 or 11.175MHz) for a long period of time, and noted every single transmission. There was very little variation in each entry - aircraft arrival or departure times, or the occasional coded message. At one point, I did consider filling most of the page with a Traffic Log comprising of entries on 11.175MHz, but I decided against it! It was for this reason, I decided that the experiment was not as succesful as I had hoped, and decided to use the space for other things. It may return in the future, depending on the logs that I receive.

The lack of maritime information in this column is completely down to the lack of reader submissions. A few months back, when I mentioned the Arklow net on 2.311MHz, that information was the result of a single letter which arrived out of the blue. It was the first letter for nearly two years which mentioned anything of any significance in the maritime bands. I've had about half a dozen letters in the past two years saying listen to 2.182MHz. I have never received particularly good signals on this frequency, but have spent many hours listening to ships QSYing to standard frequencies, only to pass standard messages about departure times and arrival times. To be fair to Adrian, his logs did include a few maritime logs, which I would have used, had I still been using the Traffic Log.

Adrian did suggest that I gave some information on Portishead, UK/Irish Coast Stations & Royal Navy frequencies, including the busy frequencies and busy periods. However, as I don't have this information available, it is very difficult to produce anything worthwhile. I am limited to one page per issue, and I am sure that the above request would fill more than a page. If somebody would care to send me the information on these subjects, I will gladly use it.

METAPHOR

Clive M. writes from the West Country to ask about a new US Forces frequency that he found recently. The station in question uses the callsign METAPHOR, and was heard on 7.919MHz. Clive found this station when he heard a USAF flight communicating with METAPHOR on one of the normal GHFS frequencies, and METAPHOR said that their primary and secondary frequencies were 7.919 and 4.770MHz respectively. Clive listened to them trying to communicate on both frequencies, and they eventually changed to a third frequency - 14.682MHz. In short, Clive wants to know more about METAPHOR.

As far as I can tell, station METAPHOR is some kind of Command Post situated at Ramstein Air Base in Germany, and it is connected with IFOR operations in the former Yugoslavia. It seems to be coordinating the transport flights of US military aircraft in and out of the country. Several aircraft have been heard using IFO and HERKY callsigns while talking with METAPHOR, and on one occasion a SHADOW callsign was heard. Several contacts in Europe have reported signals involving METAPHOR, including one station who's lat./long. position was in the Balkans. METAPHOR has been heard on the following frequencies: 4.612, 4.770, 5.919, 6.819, 6.870 and 14.682MHz u.s.b.). I would be interested to hear if anyone finds any more frequencies for this station.

Questions

Ian L writes asking for advice on buying a suitable receiver. He has a particular problem, in that he lives near the bottom of a valley. Ian says that he wants something that covers 100kHz to 2GHz and is user friendly. Well, I must admit that those two requirements are probably not going to be answered within one piece of equipment. There are a few receivers on the market with the above coverage, but I would not recommend them to a novice user.

Ian has a particular budget in mind, but I think that I can make some suggestions which will easily keep within that. Reading between the lines in Ian's letter, I get the impression that he thinks your need an expensive all singing, all dancing receiver to pick-up utility signals. I know that this is not the case.

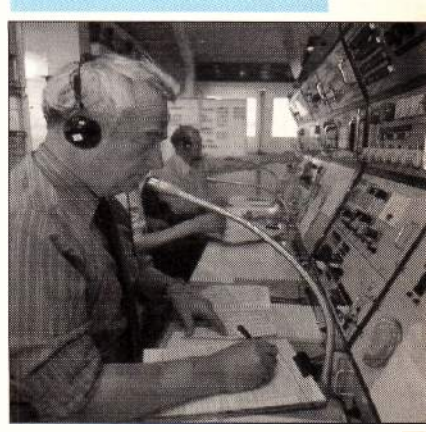
Since Ian lives in such an awkward position, I would not suggest that he spends an enormous amount on a fancy set-up, only to find that he cannot hear any signals, gets rapidly disappointed and gives-up, and then blames me for wasting all his money! I would always suggest that you start with a small-scale set-up, and make sure that it works properly, before deciding if you want to expand into more expensive areas of utility listening. For Ian's situation, I would recommend a low priced Sony, Panasonic, Sangean or similar digital receiver with a keypad and (most important) a b.f.o. control so that you can resolve s.s.b. signals. As for an antenna, Ian has a large garden, so I would suggest a long-wire, strung from the house to the end of the garden, and kept as high as possible. If youre not too keen on trying to build a long-wire, I would suggest a simple G5RV dipole available from just about every amateur radio dealer in the country.

Charles V. writes from north London, with a question about a.t.u.s (antenna tuning units). He wants to know if it is possible to connect two receivers to his a.t.u. (a Global AT-1000), as it has two output connections. Well Charles, it may be physically possible, but it will probably not give you the desired results (*what you need is an antenna splitter combiner unit - for such a solution see the Wellbrook Communications item in 'Communiqué'. This will isolate each receiver from the other - KN*). I presume that you want to use two receivers so that you can listen to two different frequencies at the same time. The main purpose of an a.t.u. is to electrically alter the length of your antenna so that it matches your receiver. Assuming that you want to listen to two different frequencies, the a.t.u. would require two different settings - one for each receiver. But since the a.t.u. has only one circuit, it can only be set for one frequency at a time. You may be lucky with some frequencies, where you can reach a compromise in the settings of your a.t.u., but these will be rare. When the a.t.u. is peaked for one frequency, it will attenuate all other frequencies.

Leicester

Those of you who regularly visit amateur radio rallies through the year will know all about the reputation of the Leicester Amateur Radio Show. This year's event is being held at the usual venue (Granby Halls in Leicester) on Friday 18th and Saturday 19th October 1996.

As usual, PW Publishing will have a large stand, with several people from *Practical Wireless* and *Short Wave Magazine* available at various times over the two days. The Editor has decided that I am safe enough to be introduced to the public again! So I will be appearing on the PWP stand on both days. As ever, I enjoy talking to all the visitors, and helping them to purchase some of the offers on the stand; I will also be giving away some interesting frequency listings. If you're visiting LARS this year, please come over and say hello.



The Operations Room at Portishead Radio.

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

LM&S

Long, Medium and Short Waves

From time to time the Editorial Offices in Broadstone has received, via the Internet, messages addressed to me. They had to be printed out and then posted to me by the staff. Where an originator did not include a full postal address and a reply was necessary it had to be sent to the *SWM* Editorial Offices and then via Internet.

The extra work for the *SWM* staff and resulting delays could be avoided if queries and contributions are sent to me by post to the above address.

Long Wave Reports

Note: l.w. & m.w. frequencies in kHz; s.w. in MHz; Time in UTC (=GMT).
Unless otherwise stated, all logs were compiled during August.

A broadcast from Radiotelevisione Italiana (RAI) via Caltanisseta, Italy (10kW) on 189kHz was received at 2002UTC on August 9 by **Tony Stickells** in Thornton Heath. He also detected weak sky waves from the station during two other evenings. In nearby Morden **Sheila Hughes** tried several times to log this low power outlet without success but she intends to keep trying. Down in Storrington **Fred Pallant** found the conditions favourable on August 19 and rated the transmission SINPO 13342 at 2105UTC.

Medium Wave Reports

The m.w. broadcasts from several stations in E.Canada and E.USA reached the UK during some nights in August. Those from CJYQ in St. John's, NF on 930kHz and WNRB in Boston, MA on 1510 were heard every night around 0300UTC during the period 16th to 24th by **David Sayles** in Doncaster. Particulary good conditions were evident on the 23rd and he was able to listen to a programme from CFRB in Toronto, ON on 1010 for a full hour! During that night he also heard WBBR in New York, NY on 1130, rated SIO333 and six other stations which were not positively identified. CJYQ and WNRB were also logged by Tony Stickells - the clearest reception for him was on the 22nd.

Up in Shetland **John Slater** (Scalloway) heard CJYQ every night from the 7th to the 28th. It often peaked SIO333 around 0330. He logged on the 7th: WNRB at 0147; WBBR at 0342. 8th: WEVD New York, NY on 1050 at 0344; WTOP Washington, DC on 1500 at 0345. 9th: WEEI Boston, MA on 850 at 0320; CJCH Halifax, NS on 920 at 0345; WTOP at 0355. 10th: CJCH at 0400; CJFX Antigonish, NS on 580 at 0335; CKVO Clarenville, NF on 710 at 0345; RFO St.Pierre & Miquelon on 1375 at 0350. 13th: WWKB Buffalo, NY on 1520 at 0325; WNRB at 0335. 14th: VOCM St.John's, NF on 590 at 0345; CJCH at 0350; CHNS Halifax, NS on 960 at 0400; WINS New York, NY on 1010 at 0415; WBBR at 0430. 18th: CHNS at 0400. 19th: CKNB Cambellton, NB on 950 at 0503.

The sky waves from stations in the Middle East and N.Africa were also received in the UK after dark - see chart. Over on the Isle of Wight **George Millmore** (Wootton) noticed an improvement in reception from some areas and heard for the first time for several months the BSKSA 100kW outlet at Dammam, Saudi Arabia on 783, which rated SIO222.

Some remarkably distant local radio stations were logged during daylight and after dark - see chart. Listeners should note that London Newstalk on 1152 has been renamed 'LBC 1152'; also Mercury Xtra on 1521 is now called 'Fame 1521'. Although Fortune 1458 was logged by **Ross Lockley** and others, he has informed me that it is to be renamed '1458 Lite AM'. A new ILR station, which will serve listeners in the S.Wales valleys, may soon be operating on 1116kHz. To be known as 'Valley Sound' it will be on the air 24hrs a day and broadcast light, classical & specialist music, news, sports information, and religious programmes. When operational, reports should be sent to **Valley Sound Ltd., PO Box 1116, Ebbw Vale, Gwent NP3 5YJ**.

Short Wave Reports

The **25MHz (11m)** band is unlikely to be used for broadcasting during the sunspot cycle minimum period.

Propagation in the **21MHz (13m)** band is unpredictable. Reception from most areas was often poor during August. Sometimes R.Australia's broadcast to Asia via Darwin on 21.725 (Eng 0630-1100) reached the UK. It was rated 23222 at 0830 by **Thomas Williams** in Truro; 25532 at 0910 by **David Edwardson** in Wallsend; 32213 at 0930 by **Norman Thompson** in Oadby; 34323 at 1000 in Morden.

Also mentioned in the reports were DW via Wertachtal? 21.680 (Eng to Asia, Pacific 0900-0950), rated 25333 at 0940 by **Eric Shaw** in Chester; DW via Julich? 21.600 (Eng to W.Africa 1100-1150) 44333 at 1100 in Scalloway; UAER, Dubai 21.605 (Ar, Eng to Eur 0615-1645) SIO554 at 1148 by **Johan Leidekker** in Deal; RFI via Issoudun 21.620 (Fr to E.Africa 0800-1300) 55454 at 1200 by **Eddie McKeown** in Newry; RCI via Portugal 21.455 (Eng to Eur, M.East, Africa 1330-1400) 35333 at 1340 by **Darren Beasley** in Bridgwater; R.Portugal via Sines 21.515 (Port, Eng to M.East, India 1400-1500 Mon-Fri) 44433 at 1440 by **Stan Evans** in Herstmonceux; BBC via Cyprus 21.470 (Eng to E.Africa 1300-1700) 34333 at 1503 by **Rhoderick Illman** in Oxted; BBC via Ascension Is 21.660 (Eng to W/E/S.Africa 1100-1700) 25322 at 1520 by **Tim Allison** in Middlesbrough; R.Japan via Gabon 21.700 (Jap to Eur, M.East, Africa 1600-1700) 12342 at 1614 in Storrington; REE via Noblejas 21.570 (Sp to S.America 1200-1800) SIO322 at 1654 by **John Eaton** in Woking; R.Portugal Int via Sines 21.655 (Port to Brazil ?-2000 Sat/Sun) 44433 at 1825 by **Robert Connolly** in Kilkeel.

Propagation in the **17MHz (16m)** band varies daily. Sometimes R.Australia's broadcast via Darwin? on 17.715 (Eng to Asia, Pacific 0200-0900) reaches the UK. It rated SIO332 at 0615 in Deal. During the morning R.Pakistan via Karachi 17.900 (Eng to Eur 0800-0845) was 33443 at 0820 in Kilkeel; BBC via Ascension Is 17.830 (Eng to W/C.Africa 0730-2100) SIO332 at 0831 in Woking; R.Austria Int, Moosbrunn 17.870 (Ger, Eng to Australia 0800-1100) 34444 at 0830 by **Ted Harris** in Manchester; R.Denmark via RNI 17.860 (Eng to ? 0838-0853 [1st & 3rd Sun]) 32333 at 0840 in Truro; AIR via Bangalore 17.387 (Eng to Pacific 1000-1100) 33333 at 1000 in Galashiels; R.Pakistan via Karachi 17.900 (Eng to Eur 1100-1120) 54554 at 1115 in Oadby.

After mid-day R.Cairo via Abis 17.595 (Eng, Ben to S.Asia 1215-1430) was 34222 at 1215 in Scalloway; Africa No.1, Gabon 17.630 (Fr to W.Africa 0700-1600) 34343 at 1316 by **Paul Bowery** in Burnham-on-Crouch; RCI via Sackville 17.820 (Eng to Eur, Africa 1330-1400 Mon-Sat) 23231 at 1354 in Middlesbrough; RFI via Gabon 17.560 (Eng to M.East 1400-1500) 34433 at 1430 in Bridgwater; Monitor R.Int via WSHB 17.510 (Eng to Africa 1800-2000) 34322 at 1817 in Oxted; R.Nederlands via Bonaire 17.605 (Eng to S/E/W.Africa 1830-2025) 45434 at 1920 by **Tony Hall** in Freshwater Bay; WYFR via Okeechobee 17.555 (Eng to Eur 1800-2200?) 32223 at 2020 by **Bernard Curtis** in Stalbridge; DW via Antigua 17.810 (Ger to C/N.America 2000-2200) 35444 at 2100 in Chester; RCI via Sackville 17.820 (Eng to Eur, Africa 2000-2130) 25212 at 2117 in Newry; WYFR Okeechobee 17.845 (Eng to Africa 2000-2300?) 34133 at 2121 by **Vera Brindley** in Woodhall Spa; VOFC Taiwan via WYFR 17.750 (Sp, Ger, Eng to Eur, [Eng 2200-2300]) 44533 at 2205 in Herstmonceux.

More stable conditions prevail in the **15MHz (19m)** band. During the morning the BBC via Cyprus 15.575 (Eng to E.Eur, M.East, W.Asia 0400-1500) was 43333 at 0620 in Stalbridge; R.Australia via Darwin? 15.415 (Eng to Asia, Pacific 0030-0800?) SIO333 at 0712 by **Francis Hearne** in N.Bristol; R.Africa 2, Eq.Guinea 15.186 (Eng to Africa 0700?-1100? Mon-Fri) SIO423 at 0730 in Deal; R.Pakistan, Islamabad 15.470 (Eng to Eur 0800-

Long Wave Chart

Freq (kHz)	Station	Country	Power (kW)	Listner
153	Bechar	Algeria	1000	E*,F*,H*
153	Donebach DLF	Germany	500	A,B,C*,D,E,F*,G,H
162	Allouis	France	2000	A,B,C*,D,E,F*,G,H
171	Nador Medi-1	Morocco	2000	A*
171	B'shakovo etc	Russia	1200	B*,C*,D,E*,H
177	Oranienburg	Germany	750	A*,C*,D,F*,H
183	Saarlouis	Germany	2000	A,B,C*,D,E,F*,G,H
189	Caltanissetta	Italy	10	E*,H*
198	BBC R-4 via ?	UK	?	A,B,D,F*,G,H
207	Munich DLF	Germany	500	B*,C*,D,E,F*,H*
207	Azilal	Morocco	800	B*,H*
216	Roumoules RMC	S.France	1400	A,B,C*,D,E,F,G,H
225	Raszyn Resv	Poland	?	A*,B*,C*,D*,E*,F*,H*
234	Beidweiler	Luxembourg	2000	A,B,C*,D,E,F*,G,H
234	Ark'gelsk etc	Russia	500	C*
243	Kalundborg	Denmark	300	A,B*,C*,D,E,F,H
252	Tipaza	Algeria	1500	150*,D*,H*
252	Atlantic I	S.Ireland	500	A,B*,C*,D,E,F*,G,H,I*
261	Burg(R.Ropa)	Germany	200	D,E,F,H
261	Taldom Moscow	Russia	2500	A*
270	Topolna	Czech Rep	1500	B*,C*,D,E*,F,G,H*
279	Minsk	Belarus	500	B*,C*,D*,E*,H*

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

Listeners:-
(A) Ted Harris, Manchester.
(B) Sheila Hughes, Morden.
(C) Eddie McKeown, Newry.
(D) George Millmore, Wootton, IoW.
(E) Fred Pallant, Storrington.
(F) Harry Richards, Barton-on-Humber.
(G) Tom Smyth, Co.Fermanagh.
(H) Tony Stickells, Thornton Heath
(I) Ted Walden-Vincent, Gt.Yarmouth.

Medium Wave Chart

Freq (kHz)	Station	Country	Power (kW)	Listener
520	Hof/Hurzburg (BR)	Germany	0.2	C*,G*,L*
531	Ain Beida	Algeria	600	H*,G*,L*
531	Leipzig	Germany	100	A*,C*,G*,L*,M*
531	RNE5 via ?	Spain	?	A*,C*,G*,H,L*
531	Beromunster	Switzerland	500	H,L*
540	Wavre	Belgium	150/50	A*,C*,E,G*,H,L,M*
540	Solt	Hungary	2000	L*
540	Sidi Bennour	Morocco	600	A*,H*,L*
540	Vitoria(EI)	Spain	10	A*,G*
549	Les Trembles	Algeria	600	A*,D*,H*,L*
549	Thurnau (DLF)	Germany	200	A*,C*,G*,H,L*
558	Espoo	Finland	100	A*,M*
558	Rostock(NDR)	Germany	20	G*
558	RNE5 via ?	Spain	?	A*,G*,H*
567	Berlin	Germany	100	G*
567	Tullamore(RTE1)	Ireland (S)	500	A*,E,C,F,H,K,L*,M*,N*
567	RNE5 via ?	Spain	?	A*,L*
576	Muhlacker(SDR)	Germany	500	A*,C*,G*,H*,L*
576	Riga	Latvia	500	H*
576	Barcelona(RNE5)	Spain	50	A*,H*
585	Paris(FIP)	France	8	E,G*,H,L
585	Madrid(RNE1)	Spain	200	C*,G*,H*,K,L*,N*
585	Dumfries(BBCScot)	UK	2	F,L*
594	Frankfurt(HR)	Germany	1000/400	A*,C*,H*,G*,L*,M*
594	Oujda-1	Morocco	100	A*,L*
594	Muge	Portugal	100	A*,G*,H*,L*
603	Lyon	France	300	G*,M*
603	Sevilla(RNE5)	Spain	50	A*,G*,H*,L*
603	Newcastle(BBC)	UK	2	F,K
612	Athlone(RTE2)	Ireland (S)	100	A*,C,F,H*,K,L*
612	Sebaa Aioun	Morocco	300	H*,L*
612	RNE1 via ?	Spain	10	A*
621	Wavre	Belgium	80	A*,E,G*,H,L
621	RNE1 via ?	Spain	10	A*,L*
621	Barcelona(OCR)	Spain	50	G*,H*
630	Dannenberg(NDR)	Germany	100	C*,L*
630	Vigra	Norway	100	A*,G*,L*
630	Tunis-Djedeida	Tunisia	500	A*,G*,H*
639	Praha(Liblice)	Czech	1500	A*,G*,H*,L*,M*
639	RNE1 via ?	Spain	?	A*,C*,G*,H*,L*
648	RNE1 via ?	Spain	10	A*,G*
648	Orfordness(BBC)	UK	500	C,H,K*,L,M*
657	Neubrandenburg(NDR)	Germany	250	C*,G*,H*,L*
657	Napoli	Italy	120	A*,L
657	Madrid(RNE5)	Spain	20	A*,G*,H*,L*
657	Wrexham(BBCWales)	UK	2	C,G*,L,M*
666	MesskirchRohrd(SWF)	Germany	300/180	A*,C*,G*,L*
666	Sitkunai(R.Vilnius)	Lithuania	500	G*
666	Lisboa	Portugal	135	A*,G*,H*
666	Barcelona(COPE)	Spain	10	L*
675	Marseille	France	600	A*,D*,G*,H*
675	Lopik(R10 Gold)	Holland	120	A*,C,F*,G*,H,L,M*
684	Sevilla(RNE1)	Spain	500	A*,C*,G*,H*,L*,M*
684	Avala(Beograd-1)	Yugoslavia	2000	A*,G*,H*,L*
693	Tortosa(RNE1)	Spain	2	G*,L*
693	Droitwich(BBC5)	UK	150	C,H*,K,L,M*
702	Flensburg(NDR)	Germany	5	A*,G*,L
702	Monte Carlo	Monaco	40	H*
702	Slovensko 1 via ?	Slovak Rep.	?	A*,L*
702	Zamora(RNE1)	Spain	10	A*,G*,H*,L*
711	Rennes 1	France	300	E,G*,H,L
711	Heidelberg	Germany	5	A*,C*,L*
711	Laayoune	Morocco	600	H*
711	Murcia(COPE)	Spain	5	A*,G*,L*
720	Lisnagarvey(BBC4)	Ireland (N)	10	H*
720	Norte	Portugal	100	G*
720	Lots Rd,Ldn(BBC4)	UK	0.5	C,H*,K,L
729	Cork(RTE1)	Ireland (S)	10	A*,G*,H*,K,L*,M*
729	RNE1 via ?	Spain	?	A*,C*,G*,H*,L*
738	Paris	France	4	H
738	Poznan	Poland	300	A*,G*,H*,L
738	Barcelona(RNE1)	Spain	500	A*,C*,G*,H*,L*
747	Flevo(Hilv2)	Holland	400	A*,C,D,G*,H,L,M*
747	Cadiz(RNE5)	Spain	10	G*
756	Braunschweig(DLF)	Germany	800/200	C*,G*,H*,L*,M*
756	Bilbao(EI)	Spain	5	A*,H*,L*
756	Redruth(BBC)	UK	2	F,G*,H,K,L*
765	Sottens	Switzerland	500	A*,G*,H*,L*,M*
774	Enniskillen(BBC)	Ireland (N)	1	K
774	RNE1 via ?	Spain	?	A*,C*,G*,H*,L*
783	Burg	Germany	1000	A*,C*,G*,H*,L*
783	Miramar(R.Porto)	Portugal	100	G*
783	Dammam	Saudi Arabia	100	H*
792	Limoges	France	300	L*
792	Lingen(NOR)	Germany	5	A*,C*,G*,H*,L*
792	Sevilla(SER)	Spain	20	A*,G*,H*,L*
801	Munchen-Ismaning	Germany	300	A*,C*,G*,H*,K*,L*
801	RNE1 via ?	Spain	?	A*,C*,G*,H*,L*
810	Volgograd	Russia	150	H*
810	Madrid(SER)	Spain	20	A*,G*,L*
810	Westerglen(BBCScot)	UK	100	C*,F,H*,K,L*,M*
819	Sud-Radio, Toulouse	France	20	L*
819	Batra	Egypt	450	A*,H*,L*
819	Toulouse	France	50	G*,H
819	Trieste	Italy	25	L*
819	Warsaw	Poland	300	A*,H*,L*
819	S.Sebastian(EI)	Spain	5	A*,G*
828	Hannover(NDR)	Germany	100/5	A*,C*,G*,L*
828	Rotterdam	Holland	5	A*,G*,L
837	Nancy	France	200	H,L
837	COPE via ?	Spain	?	A*,G*,H*,L*
846	Rome	Italy	540	A*,C*,G*,H*,L*,M*
855	Berlin	Germany	100	G*
855	R.Bucharest	Roumania	750	K
855	RNE1 via ?	Spain	?	A*,C*,G*,H*,L*
864	Santah	Egypt	500	G*,H*,L*
864	Paris	France	300	H,L
864	Socuellamos(RNE1)	Spain	2	A*,H*,L*
873	Frankfurt(AFN)	Germany	150	A*,C*,D*,F,G*, H*,J*,L*,N*
873	Zaragoza(SER)	Spain	20	A*,G*,L*
873	Enniskillen(R.UI)	UK	1	8
882	COPE via ?	Spain	?	A*,G*,H*,L*
882	Washford(BBCWales)	UK	100	C,F,H,K,L,M*
891	Algiers	Algeria	600/300	A*,D*,G*,H*,L*,M*
891	Huisberg	Netherlands	20	G*,L*
900	Brno(CRo2)	Czech Rep	25	G*
900	Milan	Italy	600	A*,C*,G*,H*,L*
900	COPE via ?	Spain	?	G*,L*
900	Qurayyat	Saudi Arabia	1000	L*
909	B'mans Pk(BBC5)	UK	140	C,H,K,L
909	M'side Edge(BBC5)	UK	200	L
918	Plesivec(Sloven'nR)	Slovenia	600/100	A*,G*,H*,L*
918	Madrid(R.Int)	Spain	20	A*,G*,L*
927	Wolvertem	Belgium	300	A*,G*,H,L
927	Evora(RRE)	Portugal	1	G*
936	Bremen	Germany	100	A*,C*,G*,H*,K,L*
936	Venezia	Italy	20	H*
936	RNE5 via ?	Spain	?	A*,H*,L*
945	Toulouse	France	300	G*
954	Brno (CRo2)	Czech Rep.	200	A*,H*,L*
954	Madrid(CI)	Spain	20	A*,H*,L*
963	Pori	Finland	600	A*,G*,H*,M*
963	Tir Chonaill	Ireland (S)	10	H*,K
972	Hamburg(NDR)	Germany	300	A*,C*,G*,H*,L*
972	RNE1 via ?	Spain	?	A*,G*,L*
981	Aiger	Algeria	600/300	D*,H*,L*
981	Coimbra	Portugal	10	L*
990	Berlin	Germany	300	A*,C*,G*,H*,K,L*,M*
990	R.Bilbao(SER)	Spain	10	A*,H*,L*
990	Redmoss(BBC)	UK	1	G*
990	Tywyn(BBC)	UK	1	F,L*
999	Schwerin (RIAS)	Germany	20	G*
999	Torino	Italy	20	A*,L*
999	Madrid(COPE)	Spain	50	A*,C*,G*,K,L*
1008	SER via ?	Canaries/Spain	?	A*,G*,L*
1008	Flevo(Hilv-5)	Holland	400	A*,E,G*,H,L,M*,O*
1017	Rheinsender(SWF)	Germany	600	A*,C*,G*,H*,K*,L*,M*
1017	RNE5 via ?	Spain	?	A*,G*,L*
1026	SER via ?	Spain	?	A*,G*
1035	Lisbon(Prog3)	Portugal	120	G*
1044	Dresden(MDR)	Germany	250	A*,C*,G*,H*,L*
1044	Sebaa-Aioun	Morocco	300	H*
1044	SER via ?	Spain	?	A*,H*,L*
1053	Zaragoza(COPE)	Spain	10	A*,G*,L*
1053	Talk R.UK via ?	UK	?	C,H,K,L,M
1062	Kalundborg	Denmark	250	A*,G*,H*,L*,M*
1062	R.Uno via ?	Italy	?	G*,L*
1071	R.France via ?	France	?	A*,E,G*,H,L,M*
1071	Bilbao(EI)	Spain	5	A*,L*
1071	Talk Radio UK via ?	UK	?	C,K,L*
1080	Katowice	Poland	1500	A*,G*,H*,L*,M*
1080	SER via ?	Spain	?	A*,G*,L*
1089	Krasnodar	Russia	300	G*
1089	Talk Radio UK via ?	UK	?	C,H,L
1098	Nitra(Jarok)	Slovakia	1500	A*,G*,H*,L*,M*
1098	RNE5 via ?	Spain	?	A*,L*
1107	AFN via ?	Germany	10	A*,G*,L*
1107	RNE5 via ?	Spain	?	A*,L*
1107	Talk R.UK via ?	UK	?	C,L,H
1116	Bari	Italy	150	A*,L
1116	Pontevedra(SER)	Spain	5	A*,G*,L*
1125	La Louviere	Belgium	20	A*,G*,H*
1125	Deanovec	Croatia	100	L*
1125	RNE5 via ?	Spain	?	A*,H*,L*
1125	Llandrindod Wells	UK	1	F
1134	COPE via ?	Spain	2	A*,G*,H*,L*
1134	Zadar(Croatian R)	Yugoslavia	600/1200	A*,C,G*,H*,L*
1143	AFN via ?	Germany	1	A*,F,G*,H*,L*
1143	COPE via ?	Spain	2	A*,G*,L*
1152	RNE5 via ?	Spain	10	A*
1161	Strasbourg(Flnt)	France	200	A*,G*,H*,L*,M*
1161	S.Sebastian(EI)	Spain	50	A*,L*
1179	SER via ?	Spain	?	A*,G*,L*
1179	Solvesborg	Sweden	600	A*,G*,H*,J*,L*,M*,O*
1188	Kuurne	Belgium	5	A*,E,G*,H*,L*
1188	Reichenbach(MDR)	Germany	5	A*,C*,L*
1188	Szolnok	Hungary	135	G*
1197	Munich(VOA)	Germany	300	G*,M*
1197	Virgin via ?	UK	?	C,H,K,L
1206	Bordeaux	France	100	G*,L*
1206	Wroclaw	Poland	200	L*
1215	COPE via ?	Spain	?	L*
1215	Virgin via ?	UK	?	C,H,K,L
1224	Lelystad	Holland	25	A*,C,E,G*,L
1233	Liege	Belgium	5	A*,G*
1233	Cape Greco(RMC)	Cyprus	600	K*
1233	Virgin via ?	UK	?	L
1242	Marseille	France	150	G*,K,L*,M*
1242	Virgin via ?	UK	?	L*
1251	Marcali	Hungary	500	A*,G*,L*
1251	Huisberg	Netherlands	10	A*,G*,K,L*
1260	SER via ?	Spain	?	A*,G*,L*
1260	Guildford (V)	UK	0.5	E,H*,L
1269	Neumunster(DLF)	Germany	600	A*,C*,G*,H*,K*,L*,M*
1269	COPE via ?	Spain	?	A*,G*,L*
1278	Dublin/Cork(RTE2)	Ireland (S)	10	A*,C,F,H*,K,L*,M*
1287	RFE via ?	Czech Rep.	400	A*,G*,H*,L*
1287	Lerida(SER)	Spain	10	A*,L*
1296	Kardzali	Bulgaria	150	H*
1296	Valencia(COPE)	Spain	10	A*,G*,H*,L*
1296	Orfordness(BBC)	UK	500	E,F,K,L,M*
1305	Rzeszow	Poland	100	A*,G*
1305	RNE5 via ?	Spain	?	A*,G*,H*
1314	R.Due via ?	Italy	?	L*
1314	Kvitsoy	Norway	1200	A*,G*,H*,I,L,M*,O*
1314	RNE5 via ?	Spain	?	A*,L*
1314	Dabiya	UAE	1000	L*
1323	Zyyl(BBC)	Cyprus	200	L*
1323	W'brunn (V.Russia)	Germany	1000/150	A*,G*,L*
1332	Rome	Italy	300	A*,G*,H*,L*,M*
1341	Lakihegy	Hungary	300	G*,L*
1341	Lisnagarvey(BBC)	Ireland (N)	100	D*,F,H*,K,L*,M*
1341	Tarrasa(SER)	Spain	2	A*,H*,L*
1350	Nancy/Nice	France	100	A*,G*,H*,L*,M*
1350	Cesvaine/Kuldiga	Latvia	50	H*
1359	Arganda (RNE-FS)	Spain	600	A*,G*,H*,L*
1368	Foxdale(Manx R)	I.O.M.	20	A*,D*,F*,H*,K,L*
1377	Lille	France	300	A*,E,G*,H,L
1377	Ukraine	Ukraine	50	D*,G*,L*
1386	Bolshakovo	Russia	2500	A*,D*,G*,H* ,L*,M*,O*
1395	Lushnje(Tirana)	Albania	1000	A*,G*,H*,L
1395	Lopic?	Netherlands	?	A*,E,G*,H*,L,M*
1404	Brest	France	20	A*,G*,H*,L*
1413	RNE5 via ?	Spain	?	A*,G*,H*,L*
1422	Heusweiler(DLF)	Germany	1200/600	A*,C*,G*,H*,L*,O*
1422	Valmiera	Latvia	50	G*
1431	Kopani	Ukraine	500	G*
1440	Marnach(RTL)	Luxembourg	1200	A*,G*,H,J,K,L*, M*,N*,O*
1440	Damman	Saudi Arabia	1600	D*,G*,J*,L*
1449	Squinzano	Italy	50	A*,H*
1449	Redmoss(BBC)	UK	2	F,G*,M*
1467	Monte Carlo(TWR)	Monaco	1000/400	A*,G*,H*,L*
1485	AFN via ?	Germany	1	L*
1485	SER via ?	Spain	?	A*,L*
1494	Clermont-Ferrand	France	20	H*,L*
1494	St.Petersburg	Russia	1000	A*,G*,H*,L*,O*
1503	Ardabil	Iran	50	L*
1503	RNE5 via ?	Spain	?	A*,L*
1512	Wolvertem	Belgium	600	A*,D*,G*,H*,L,M*,O*
1512	Jeddah	Saudi Arabia	1000	L*
1521	Kosice(Cizatice)	Slovakia	600	A*,G*
1521	Duba	Saudi Arabia	2000	H*,L*
1530	Vatican R	Italy	150/450	A*,D*,G*,H* ,K*,L*,M*
1539	SER via ?	Spain	?	A*,H*,L*
1557	Nice	France	300	A*,L*
1566	Sfax	Tunisia	1200	A*,G*,L*
1575	Genova	Italy	50	A*,H*,L*
1575	SER via ?	Spain	5	A*,G*,H*,L*
1584	SER via ?	Spain	2	A*,L*
1593	Holzkirchen(VOA)	Germany	150	G*,H*,L*
1602	SER via ?	Spain	?	A*,H*,L*
1602	Vitoria(EI)	Spain	10	A*,H*,L*
1611	Vatican R	Italy	15	L*

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

Listeners:-
(A) Darren Beasley, Bridgwater.
(B) Robert Connolly, Kilkeel.
(C) Ted Harris, Manchester.
(D) Sheila Hughes, Morden.
(E) Rhoderick Illman, Oxted.
(F) Brian Keyte, Bookham.
(G) Eddie McKeown, Newry.
(H) George Millmore, Wootton IoW.
(I) Clare Pinder, while in Appleby.
(J) Harry Richards, Barton-on-Humber.
(K) Tom Smyth, Co.Fermanagh
(L) Tony Stickells, Thornton Heath.
(M) Norman Thompson, Oadby.
(N) Ted Walden-Vincent, Gt.Yarmouth.
(O) Thomas Williams, Truro.

0848) 25443 at 0826 in Middlesbrough; BBC via Oman 15.310 (Eng to S.Asia 0300-0915, 1000-1500) SIO111 at 1100 by **Philip Rambaut** in Macclesfield; R.Finland via Pori 15.400 (Eng to N.America 1130-1200) 55555 at 1139 by **Tom Winzor** in Plymouth.

During the afternoon R.Norway Int 15.305 (Norw [Eng Sun] to Eur 1200-1230) was 44444 at 1200 in Scalloway; RFI via Allouis? 15.530 (Eng to USA 1200-1300) 35543 at 1203 in Wallsend; RCI via Sines 15.325 (Eng to Eur, M.East, Africa 1330-1400) SIO444 at 1330 by **Tom Smyth** in Co.Fermanagh; Voice of Vietnam, Hanoi 15.009 (Fr, Eng to Asia 1300-1357) 43333 at 1350 in Herstmonceux; Israel R, Jerusalem 15.615 (Eng to ? 1400-1430) 44444 at 1400 by **Clare Pinder** in Appleby; WVHA via Scotts Corner 15.745 (Eng to Eur, Africa 1400-1600 Sat) 45444 at 1509 in Woodhall Spa; WWCR Nashville 15.685 (Eng to Eur 1100-0000) 34443 at 1630 in Woking; VOA via Kavala 15.255 (Eng to M.East, N.Africa 1700-1800) 43333 at 1700 in Morden; BBC via Ascension Is 15.400 (Eng to Africa 1430-2330) 55444 at 1736 in Burnham-on-Crouch.

Later, R.Cairo, Egypt 15.255 (Eng to C/S.Africa 1630-1830) was 24232 at 1805 in Newry; Africa No.1, Gabon 15.475 (Fr to W.Africa 1600-1900) 45554 at 1807 in Storrington; R.Kuwait via Kabd 15.505 (Ar to Eur, N.America 1745-2300) 44444 at 1840 in Kilkeel; R.Nederlands via Bonaire 15.315 (Eng to S/E/W.Africa 1830-2025) 44333 at 1850 in Chester; WYFR via Okeechobee 15.695 (Eng to Eur, Africa 1600-1900) 25322 at 1850 in Bridgwater; R.Bras, Brazil 15.265 (Eng, Ger to Eur 1800-2050) 44343 at 1900 in Oadby; HCJB Quito 15.540 (Eng to Eur 1900-2158) 43433 at

Local Radio Chart

Freq (kHz)	Station	ILR BBC	e.m.r.p (kW)	Listener
558	Spectrum, London	I	0.80	F,H,J
585	R.Solway	B	2.00	A
603	Cheltenham R.	I	0.10	A,F,H
603	InvictaSG,Litt'borne	I	0.10	D* E,F,H,J
630	R.Bedfordshire(3CR)	B	0.20	A,D,F,H,J
630	R.Cornwall	B	2.00	A,F,H
657	R.Clwyd	B	2.00	A,F,H,J
657	R.Cornwall	B	0.50	A,F,H
666	Gemini AM, Exeter	I	0.34	A,C,H,J
666	R.York	B	0.80	A,F,G
729	BBC Essex	B	0.20	A,D,F,H,J
738	Hereford/Worcester	B	0.037	A,D,F,H,J
756	R.Cumbria	B	1.00	A,G
756	R.Maldwyn, Powys	I	0.63	A,F
765	BBC Essex	B	0.50	A,D,F,H,J
774	R.Kent	B	0.70	F,H,J
774	R.Leeds	B	0.50	A,B,F,G
774	3 Counties SG, Glos	I	0.14	A,C,H
792	Chiltern SG, Bedford	I	0.27	F,J
792	R.Foyle	B	1.00	A,
801	R.Devon & Dorset	B	2.00	A,C,F,H
828	Chiltern SG, Luton	I	0.20	F,J*
828	Magic 828, Leeds	I	0.12	B
828	2CR CG, Bournemouth	I	0.27	H
837	R.Cumbria/Furness	B	1.50	A,G
837	R.Leicester	B	0.45	A,F,H,J
855	R.Devon & Dorset	B	1.00	F,H
855	R.Lancashire	B	1.50	A,B,G
855	R.Norfolk	B	1.50	F,J
855	Sunshine 855,Ludlow	I	0.15	A,D,F,J
873	R.Norfolk	B	0.30	D,F,H,J
936	Brunel CG, W.Wilts	I	0.18	A,F,J
945	Derby (Gem AM)	I	0.20	A,D*,F,G,H*,J
954	Gemini AM, Torquay	I	0.32	F,H
954	Wyvern, Hereford	I	0.16	F
963	Asian Sd, Manchester	I	?	A,B,G
963	Viva, Southall	I	1.00	D* F,H,J
990	R.Devon & Dorset	B	1.00	A,F,H
990	Gt.Yks G, Doncaster	I	0.25	F
990	WABC, Wolverhampton	I	0.09	F
999	Gem AM, Nottingham	I	0.25	F,J
999	Red Rose G, Preston	I	0.80	A,G*
999	R.Solent	B	1.00	F,H
1017	WABC, Shrewsbury	I	0.70	A,F
1026	R.Cambridgeshire	B	0.50	E,F,G,J
1026	Downtown, Belfast	I	1.70	A,G,I
1026	R.Jersey	B	1.00	F,H
1035	Country 1035, London	I	1.00	F,G*,J
1035	N.Sound, Aberdeen	I	0.78	A,G
1107	Moray Fth, Inverness	I	1.50	G,I
1116	R.Derby	B	1.20	A,F,G*,J
1116	R.Guernsey	B	0.50	E,F,H,J
1152	Amber, Norwich	I	0.83	F,G*
1152	Clyde 2, Glasgow	I	3.06	G*
1152	GNR, Newcastle	I	1.80	G*
1152	LBC 1152	I	23.50	F,H,J
1152	Pic'ly G, Manchester	I	1.50	A,B
1152	Xtra-AM, Birmingham	I	3.00	F
1161	R.Bedfordshire(3CR)	B	0.10	F
1161	Brunel CG, Swindon	I	0.16	A,F,H
1161	Gt.Yks, Hull	I	0.35	G*
1161	Southern Counties R	B	1.00	F,H,J
1161	Tay AM, Dundee	I	1.40	A,G
1170	Amber SGR, Ipswich	I	0.28	G*
1170	GNR, Stockton	I	0.32	G
1170	SCR, Portsmouth	I	0.12	E,F,H
1170	Signal G, Stoke-on-T	I	0.20	G*
1170	Swansea Snd,Swansea	I	0.58	A,G*
1170	1170AM, High Wycombe	I	0.25	D* F,J
1242	InvictaSG, Maidstone	I	0.32	F,J
1242	IoW Radio, Wootton	I	0.50	F,H
1251	Amber SGR, Bury StEd	I	0.76	E,F,G,J
1260	Brunel CG, Bristol	I	1.60	F,G*
1260	Marcher G, Wrexham	I	0.64	G
1260	SabrasSnd, Leicester	I	0.29	F
1260	R.York	B	0.50	A,G
1296	Radio XL, Birmingham	I	5.00	A,B,F,G,H,J
1305	Gt.Yks G, Barnsley	I	0.15	A,G
1305	Premier via ?	I	0.50	F,G,J
1305	Touch AM, Newport	I	0.20	G
1323	S.Coast R, Brighton	I	0.50	A,F,H,J
1323	SomersetSnd,Bristol	B	0.63	A,F
1332	Premier, Battersea	I	1.00	E,F,G*,J
1332	WGMS CG, Peterboro'	I	0.60	A,G
1332	Wiltshire Sound	B	0.30	F
1359	BreezeAM, Chelmsford	I	0.28	E,F,G*,J
1359	R.Solent	B	0.85	F,H
1359	Touch AM, Cardiff	I	0.20	G
1368	R.Lincolnshire	B	2.00	F
1368	Southern Counties R	B	0.50	D,F,H,J
1377	Asian Sd, Manchester	I	?	B,G,J*
1413	Premier via ?	I	0.50	A,E,F,G*,H,J
1431	Breeze AM, Southend	I	0.35	F,G*,J
1431	210 CG, Reading	I	0.14	A,D*,F,G,H,J
1449	R.Peterboro/Cambs	B	0.15	A,F
1458	R.Cumbria	B	0.50	A,G,J
1458	R.Devon & Dorset	B	2.00	A,F,H
1458	Fortune, Manchester	I	5.00	B,G
1458	R.Newcastle	B	2.00	G
1458	Sunrise, London	I	50.00	F,G*,H,I,J
1458	Radio WM	B	5.00	F
1476	CountySnd, Guildford	I	0.50	A,F,G*,H,J
1485	R.Humberside (Hull)	B	1.00	F,G
1485	R.Merseyside	B	1.20	A,G,J*
1485	Southern Counties R	B	1.00	F,H,J
1503	R.Stoke-on-Trent	B	1.00	A,D* F,G,J
1521	R.1521 Craigavon,NI	I	0.50	A,G*,I
1521	Fame 1521, Reigate	I	0.64	F,G*,H,J
1530	R.Essex	B	0.15	D,F,J
1530	Gt.Yks G, Huddersf'd	I	0.74	A,B,G,J
1530	Wyvern, Worcester	I	0.52	F,J
1548	R.Bristol	B	5.00	F,H
1548	Capital G, London	I	97.50	F,H,I,J
1548	City G, Liverpool	I	4.40	A,B,F* G* K*
1548	Max AM, Edinburgh	I	2.20	G
1557	R.Lancashire	B	0.25	A,G
1557	Mellow, Clacton	I	0.125	F,G*,J
1557	Northants SG	I	0.76	F,G*
1557	Sth Coast R, So'ton	I	0.50	F,H
1584	KCBC, Kettering	I	0.04	F
1584	London Turkish R	I	?	F,G*,J
1584	R.Nottingham	B	1.00	D*,F,G
1584	R.Shropshire	B	0.50	A,F
1584	Tay, Perth	I	0.21	D* G
1602	R.Kent	B	0.25	F,G,H,J

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

Listeners:-
(A) Robert Connolly, Kilkeel.
(B) Ted Harris, Manchester.
(C) Francis Hearne, N.Bristol.
(D) Sheila Hughes, Morden.
(E) Rhoderick Illman, Oxted.
(F) Brian Keyte, Bookham
(G) Ross Lockley, Galashiels.
(H) George Millmore, Wootton, IoW.
(I) Tom Smyth, Co.Fermanagh.
(J) Tony Stickells, Thornton Heath.
(K) Thomas Williams, Truro.

1932 in Freshwater Bay; RAE Buenos Aires 15.345 (Eng, Fr, Ger, It, Sp to Eur, N.Africa 1900-2300) SIO232 at 2112 by **Ted Walden-Vincent** in Gt.Yarmouth; VOFC Taiwan via WYFR? 15.600 (Eng to Eur? 2200-2300) 44333 at 2220 in Truro.

In the **13MHz (22m)** band R.Korea via Kimjae 13.670 (Eng to Eur 0800-0900) was 23322 at 0800 in Galashiels; R.Kuwait via Kabd 13.620 (Ar to Eur, N.America 0930-1605) 34433 at 1030 in Woking; Croatian R, Zargreb 13.830 (Cr, Eng to Eur 24hrs) 55454 at 1115 in Oadby; SRI via Sottens? 13.635 (Eng, Fr, Ger, It to Far East, SE.Asia 1100-1300) 55555 at 1122 in Plymouth; ISBS Reykjavik 13.860 (Ic [u.s.b.+ p.c] to Eur 1215-1300) was 35553 at 1238 in Wallsend; SRI via Sottens? 13.635 (Eng, Fr, It, Ger to S/S.E.Asia 1300-1500) 44544 at 1305 in Herstmonceux; R.Austria Int via Moosbrunn 13.730 (Ger, Eng, Fr, Sp to Eur 0400-1800) SIO222 at 1330 in Co.Fermanagh; R.Pyongyang, Korea 13.785 (Eng to Eur, M.East, Africa 1500-1550) SIO322 at 1507 in Macclesfield; AWR via Slovakia 13.590 (Eng to Africa 1600-1700) SIO544 at 1600 in Deal; UAER, Dubai 13.675 (Eng to Eur 1600-1640) 45433 at 1611 in Middlesbrough; R.Denmark via RNI 13.805 (Eng [1st & 3rd Sun] to Eur, Africa? 1630-1655) 32333 at 1635 in Appleby; DW via ? 13.780 (Ger to Eur 0400?-2057?) 45555 at 1645 in Manchester.

Later, R.Vlaanderen Int, Belgium 13.645 (Eng to Africa? 1800?-?) was 35232 at 1804 in Bridgwater; AIR via ? 13.750 (Eng to E/N.Africa 1745-1945) 32442 at 1900 in Kilkeel; WHRI South Bend 13.760 (Eng to E.USA, Eur 1500-2157) 23332 at 1930 in Chester; DW via Sines 13.790 (Eng to Africa, S.Asia 1900-1950) 43333 at 1950 in Stalbridge; RCI via Sackville 13.650 (Eng to Eur 2000-2158) 34434 at 2003 in Freshwater Bay; WEWN Vandiver 13.695 (Eng to Eur 2000-2157) 44444 at 2119 in Woodhall Spa; R.Australia via Darwin? 13.605 (Eng, Chin to Asia 2130-2330?) 33333 at 2132 in Truro; R.Havana Cuba 13.715 (Eng to Eur 2100-2200) 34223 at 2142 in Newry; Monitor R.Int via WSHB 13.770 (Eng to S.America 2200-0000) 33333 at 2205 by **Peter Pollard** in Rugby; AWR Costa Rica 13.750 (Eng to C/N.America 2300-0000) 34333 at 2340 in Morden; WWCR Nashville 13.845 (Eng to USA 1400-0100) 25333 at 2340 by **Harry Richards** in Barton-on-Humber; RCI via Sackville 13.670 (Eng to USA, Caribbean 0100-0300) 34433 at 0104 in Burnham-on-Crouch.

Good reception from many areas has been noted in the **11MHz (25m)** band. The Voice of Greece, Athens 11.645 (Gr, Eng to Eur 0600-0800) was rated 55555 at 0646 in Plymouth; VOA via Kavala? 11.805 (Eng to Eur, M.East, N.Africa 0600-0700) 43433 at 0655 in Herstmonceux; R.Australia via Shepparton 11.880 (Eng to Asia 0400-0730) 35533 at 0720 in Wallsend; HCJB Quito 11.615 (Eng to Eur 0700-0830) 33333 at 0745 in Truro; Slovak R.Int 11.990 (Eng to Australia 0830-0857) 34433 at 0850 in Chester; ORTM Bamako, Mali 11.960 (Fr to W.Africa 0758-1757) SIO111 at 0857 in Macclesfield; R.Korea Int via Sackville 11.715 (Eng to S.America 1030-1100) 32222 at 1030 in Appleby; HCJB Quito 12.005 (Eng to Caribbean 1100-1500) SIO242 at 1113 in Doncaster; R.Finland via Pori 11.755 (Fin, Sw, Russ, Fr, Eng, Ger to Eur 0700-2130?) 55555 at 1130 in Oadby; R.Sweden via Horby? 11.650 (Eng to N.America 1130-1200) 44423 at 1145 in Morden.

During the afternoon Polish R, Warsaw 11.815 (Eng to Eur 1200-1255) was 44333 at 1204 in Newry; WYFR via VOFC Taiwan 11.550 Eng to Asia 1302-1502) 44444 at 1308 in Woodhall Spa; R.Romania Int, Bucharest 11.940 (Eng to Eur 1300-1400) 44333 at 1317 in Manchester; KTWR Agana, Guam 11.580 (Eng to S.Asia 1500-1630?) SIO544 at 1540 in Deal; R.Australia via Darwin? 11.660 (Eng to S.Asia 1430-2057?) 32332 at 1630 in Barton-on-Humber; BBC via Kranji, Singapore 11.750 (Eng to S.E.Asia 0900-1800) 32242 at 1639 in Woking; R.Pakistan, Islamabad 11.570 (Eng to Eur 1700-1755) 55444 at 1715 in Scalloway.

Later, R.Kuwait via Kabd 11.990 (Eng to Eur, N.America 1800-2057) was SIO444 at 1800 in Co.Fermanagh; R.Damascus via Adra 12.085 (Ger to Eur 1805-1905) 33342 at 1824 in Oxted; R.Algiers Int via Bouchaoui 11.715 (Eng to M.East, Eur 1800-1900) 32432 at 1841 in Bridgwater; R.Bulgaria, Sofia 11.720 (Eng to W.Eur 1900-2000) 44444 at 1900 in Freshwater Bay; REE via Noblejas 11.775 (Eng to Eur, Africa 2100-2200) 44544 at 2100 in Galashiels; RCI via Sackville 11.690 (Eng to Eur, Africa 2000-2130) 43444 at 2114 in Rugby; R.Bulgaria 11.720 (Eng to Eur 2100-2200) 42332 at 2119 in Middlesbrough; R.Damascus via Adra 12.085 (Eng to N.America 2105-2205) 44333 at 2152 in Burnham-on-Crouch; R.Havana Cuba 11.970 (Sp to Eur 2100-2300) SIO323 at 2225 in Gt.Yarmouth; WEWN Vandiver 11.820 (Port to America 2200-0000?) 43333 at 2315 in Stalbridge.

In the **9MHz (31m)** band Vatican R, Italy 9.645 (Eng to Eur 0630-0645) was SIO444 at 0638 in N.Bristol; DW via Wertachtal? 9.735 (Ger to Australia, Pacific 0400-0955) SIO222 at 0737 in Gt.Yarmouth; KNLS Anchor Point, Alaska 9.615 (Eng to Far East 0800-0900) 33222 at 0800 in Scalloway; ORTM Bamako, Mali 9.635 (Fr, Ar? to W.Africa 0758-1757) SIO212 at 0858 in Macclesfield; Polish R, Warsaw 9.525 (Eng to Eur 1200-1255) SIO433 at 1205 in Deal; R.Romania Int, Bucharest 9.690 (Eng to Eur 1300-1355) 44444 at 1303 in Woodhall Spa; BBC via Skelton, UK 9.410 (Eng to Eur, N/C.Africa 0300-2300) 35333 at 1615 in Barton-on-Humber; Channel Africa, Meyerton 9.530 (Eng to Africa 1600-1700) SIO333 at 1625 in Doncaster; RCI via Xian, China 9.550 (Eng to Asia 1630-1657) 43444 at 1640 in Burnham-on-Crouch.

Later the Voice of Vietnam, Hanoi 9.840 (Eng to Eur

Tropical Bands Chart

Freq (MHz)	Station	Country	UTC	DXer
2.310	ABC Alice Springs	Australia	2021	F
2.325	ABC Tennant Creek	Australia	2023	F
2.485	ABC Katherine	Australia	2042	F,J
3.200	TWR Manzini	Swaziland	1836	F
3.215	RRI Manado	Indonesia	2300	C
3.220	Channel Africa	S.Africa	0253	E,I
3.223*	AIR Simla	India	1725	F
3.230	R.Sol de Los Andes	Peru	0200	I
3.230	SABC Meyerton	S.Africa	2057	C,F,J,M,O
3.240	TWR Shona	Swaziland	1841	F
3.245	AIR Lucknow	India	1722	F
3.255	BBC via Maseru	Lesotho	2052	D,E,F,J,M,N,O
3.270	SWABC 1, Namibia	S.W.Africa	2052	C,F,I,J,M,N,O
3.290	Namibian BC,Windhoek	S.W.Africa	2135	C,F,I,M,O
3.300	R.Cultural	Guatemala	0204	I
3.306	ZBC Prog 2	Zimbabwe	2040	E,F,I,J,M,O
3.315	AIR Bhopal	India	0020	C,F
3.316	SLBS Goderich	Sierra Leone	2046	C,F,J,N,O
3.320	SABC Meyerton	S.Africa	2207	C,F,I,M,O
3.325	FRCN Lagos	Nigeria	2326	C,M,O
3.330	Christian Voice	Zambia	2055	F,I,J,M,O
3.335	CBS Taipei	Taiwan	2135	F,O
3.340	R.Uganda, Kampala	Uganda	2007	F,J
3.345	AIR Jaipur	India	0045	O
3.345	AIR Jammu	India	1719	C,F
3.345	Channel Africa	S.Africa	1935	F
3.356	R.Botswana	Gabarone	2048	F,J,O
3.365	GBC R-2	Ghana	2047	C,I,J,M,O
3.365	AIR Delhi	India	1731	F
3.375	R.Nacional S.Gabriel	Brazil	2305	C,I,M,O
3.377	R.Nacional, Mulenvos	Angola	2256	C,F,G,I
3.380	NBC Blantyre	Malawi	2024	F,J,M,O
3.390	BBC via Meyerton	S.Africa	2049	F,J
3.915	BBC via Kranji	Singapore	2210	C,F,I,M
3.950	Qinghai PBS, Xining	China	2240	O
3.955	BBC via Skelton	England	0400	D,I
3.955	R.Korea via Skelton	England	1830	K
3.955	R.Budapest	Hungary	0400	C,I
3.965	RFI Paris	France	2058	C,O,H,I
3.975	R.Korea via Skelton	England	2140	P
3.975	R.Budapest	Hungary	2127	A,C,I,K
3.985	Nexus, Milan	Italy	0709	H,I
3.985	China R via SRI	Switzerland	2101	I,P
3.985	SRI Beromunster	Switzerland	1900	C
3.995	DW via Julich	Germany	2102	C,I
4.005	Vatican R.	Italu	1850	C
4.330	Xinjiang BS, Urumqi	China	1638	F
4.500	Xinjiang BS, Urumqi	China	2315	E,F,I,O
4.735	Xinjiang, Urumqi	China	2310	C,E,F,I,O
4.750	Xizang BS, Lhasa	Tibet	2315	O
4.760	Yunnan PBS,Kunming	China	2218	C,M,O
4.760	AIR Port Blair	India	0025	C,F,O
4.760	ELWA Monrovia	Liberia	0255	I
4.760	TWR Manzini	Swaziland	0350	O
4.765	R.Integracao	Brazil	0001	O
4.770	Centinela del Sur	Ecuador	0435	O
4.770	FRCN Kaduna	Nigeria	2053	C,I,J,M,O,P
4.775	AIR Imphal	India	1643	F
4.777	R.Gabon, Libreville	Gabon	2053	C,F,J,M,N,O
4.783	RTM Bamako	Mali	2030	C,D,F,J,M,N,O
4.790	Azad Kashmir R.	Pakistan	1649	F,O
4.800	CPBS 2 Beijing	China	2233	M
4.800	AIR Hyderabad	India	1724	F,O
4.800	LNBS Lesotho	Maseru	2013	F,I,J,N,O
4.805	R.Nac.Amazonas	Brazil	2355	C,E,I,M,O
4.815	R.diff TV Burkina	Ouagadougou	2040	C,D,F,I,J,M,O,P
4.820	R.Botswana, Gaberone	Botswana	1941	F,N
4.820	La Voz Evangelica	Honduras	0400	O
4.820	AIR Calcutta	India	1713	C,F,O
4.825	R.Cancao Nova	Brazil	2245	I,M,O
4.828	ZBC R-4	Zimbabwe	2050	C,D,F,J,O
4.830	R.Botswana, Gaborone	Botswana	0404	I
4.830	R.Tachira	Venezuela	0035	C,E,I,M,O
4.832	R.Reloj	Costa Rica	0405	O
4.835	R.Tezulutlan, Coban	Guatemala	0030	C
4.835	RTM Bamako	Mali	1909	B,C,D,E,F,I,J,M,O
4.840	AIR Bombay	India	0035	C,F,O
4.845	R.Cabocla, Manaus	Brazil	2238	M
4.845	ORTM Nouakchott	Mauritania	2028	C,F,J,O
4.850	R.Yaounde	Cameroon	2003	C,D,I
4.850	AIR Kohima	India	1525	F
4.860	AIR Kingsway(Feeder)	India	1757	B,F,O
4.865	PBS Lanzhou	China	2155	F,M,O
4.870	R.Cotonou	Benin	2057	C,D,J,M,O
4.875	R.Roraima, Boa Vista	Brazil	2350	I,O
4.879	R.Bangladesh	Bangladesh	0035	C,F
4.885	R.Clube do Para	Brazil	2335	C,I,M,O
4.885	KBC East Sce Nairobi	Kenya	1715	F,O
4.890	RFI Paris	via Gabon	0358	I
4.890	ORTS Dakar	Senegal	0440	O
4.895	Voz del Rio Arauca	Colombia	2340	C
4.895	AIR Kurseong	India	1650	F
4.895	Pakistan BC	Pakistan	1730	F,J,O
4.905	R.Nat.N'djamena	Chad	2204	C,D,F,I,J,O
4.910	R.Zambia, Lusaka	Zambia	2045	E,F,O
4.914	R.Cora del Peru,Lima	Peru	0400	O
4.915	R.Anhanguera	Brazil	0005	I,O
4.915	GBC-1, Accra	Ghana	2053	C,D,I,J,M,O
4.915	KBC Cent Sce Nairobi	Kenya	1928	J,O
4.920	R.Quito, Quito	Ecuador	0345	E,M,O
4.920	AIR Madras	India	1735	F,O
4.931	R.Internacional	Honduras	0440	O
4.935	KBC Gen Sce Nairobi	Kenya	2105	C,F,J,O
4.940	AIR Guwahati	India	1645	F,O
4.945	R.Difusora	Brazil	0035	C
4.945	R.Progresso	Brazil	2330	C
4.950	R.Nacional, Mulenvos	Angola	2103	C,F,J,O
4.950	AIR Jammu	India	1725	B,F,O
4.950	R.Madre de Dios	Peru	2312	C,I
4.955	R.Marajoara, Belem	Brazil	2259	I,M
4.955	R.Nac. de Colombia	Colombia	2320	C,O
4.960	Hanoi 2	Vietnam	2057	J,M,O
4.965	R.Alvorada	Brazil	2241	D
4.970	PBS Xinjiang	China	1645	F
4.980	PBS Xinjiang, Urumqi	China	1635	F
4.980	Ecos del Torbes	Venezuela	2312	C,E,I,M,O
4.985	R.Brazil Central	Brazil	2325	O
4.990	Hunan 1, Changsha	China	2325	C
4.990	AIR Ext.Service	India	0040	C,I,O
4.990	FRCN Lagos	Nigeria	1905	O
5.005	R.Nacional, Bata	Eq.Guinea	2200	O
5.005	R.Nepal, Kathmandu	Nepal	1655	F,O
5.006	R.Apintie,Paramaribo	Surinam	2325	C
5.010	R.Garoua	Cameroon	2139	C,F,J
5.010	Guangxi 2, Nanning	China	2330	C
5.010	AIR Thiru'puram	India	0130	O
5.020	PBS-Jiangxi Nanchang	China	2310	F,I,O
5.020	Voz del Upano, Macas	Ecuador	2335	C
5.020	La V du Sahel,Niamey	Niger	2040	C,J,M,O
5.025	R.Parakou	Benin	2040	I,J,O
5.025	R.Rebelde, Habana	Cuba	2330	C,M,O
5.025	R.Uganda, Kampala	Uganda	2040	F,J,O
5.030	AWR Latin America	Costa Rica	0305	C,I,O
5.035	R.Bangui	C.Africa	1914	C,D,F,J,O
5.040	L.V. de Yopal	Colombia	0212	I
5.040	Voz del Upano, Macas	Ecuador	2307	C,M
5.045	R.Cultura do Para	Brazil	2320	C,M,O
5.047	R.Togo, Lome	Togo	2011	C,D,F,I,J,M,O
5.050	R.Tanzania	Tanzania	1850	C,F,O
5.055	Faro del Caribe	Costa Rica	0213	I
5.055	RFO Cayenne(Matoury)	French Guiana	2256	C,M,O
5.060	PBS Xinjiang, Urumqi	China	1645	B,F,O
5.065	R.Candip, Bunia	Zaire	1831	F
5.075	Caracol Bogata	Colombia	0229	C,I,L,M,O
5.097	R.Eco, Iquitos	Peru	2340	C

DXers:-

(A)	Tim Allison, Middlesbrough.	(G)	Bill Griffith, SW London.	(N)	David Sayles, Doncaster.
(B)	Paul Bowery, Burnham-on-Crouch.	(H)	Rhoderick Illman, Oxted.	(O)	John Slater, Scalloway.
(C)	Robert Connolly, Kilkeel.	(I)	Eddie McKeown, Newry.	(P)	Ted Walden-Vincent, Gt.Yarmouth.
(D)	John Eaton, Woking.	(J)	Fred Pallant, Storrington.		
(E)	David Edwardson, Wallsend.	(K)	Clare Pinder, while in Appleby.		
(F)	P.Gordon Smith, Kingston, Moray.	(L)	Peter Pollard, Rugby.		
		(M)	Richard Reynolds, Guildford.		

1800-1830) was SIO333 at 1800 in Co.Fermanagh; AIR via Delhi? 9.950 (Eng to W/N.Africa, M.East 1745-1945) 32323 at 1800 in Rugby: Voice of Turkey, Ankara 9.445 (Eng to Eur 1830-1920) 53333 at 1830 in Appleby; Africa No.1, Gabon 9.580 (Fr to C.Africa 0500-2300) 32342 at 1831 in Oxted; R.Pyongyang, N.Korea 9.345 (Eng to Eur 2000-2050) 24332 at 2000 in Galashiels; Vatican R 9.645 (Eng to Africa 2000-2030) 43443 at 2000 in Morden; Voice of Indonesia 9.525 (Eng to Eur 2000-2030) 34543 at 2001 in Wallsend; R.Rumbos, Caracus 9.659 (Sp 24hrs) 44444 at 2100 in Oadby; RCI via Sackville 9.755 (Eng to USA, Caribbean 2200-0000) 44444 at 2305 in Kilkeel; WWCR Nashville 9.475 (Eng 1100-2300?) 43333 at 2310 in Stalbridge; CBC N.Quebec SW Svce 9.625 (Eng,•Fr, Inuk, Cree, Attik 1155-0610) 33333 at 0405 by **Bill Griffith** (W.London) while in Banff, Alberta.

The early morning occupants of the **7MHz (41m)** band include R.Japan via Skelton, UK 7.230 (Eng to E.Eur 0700-0800), logged as SIO322 at 0700 in Co.Fermanagh; Monitor R.Int via WSHB 7.535 (Eng [Various Sat/Sun] to Eur, Africa 0500-0955) SIO232 at 0707 in Gt.Yarmouth; RFPI Costa Rica 7.385 (Eng 24hrs) 22222 at 0708 in Plymouth; WYFR via Okeechobee 7.355 (Eng to Eur, Africa 0600-0800) 44243 at 0720 in Newry; WJCR Upton, USA 7.490 (Eng to E.USA 24hrs) 22231 at 0745 in Chester; R.ABC Denmark via Kaliningrad 7.570 (Eng to Eur 0800-1200 Sun) 55454 at 0800 by **Martin Cowin** in Kirkby Stephen.

Those noted during the evening were R.Australia via ? 7.330 (Eng to S.Asia 1800?-2100), rated 22442 at 1844 in Middlesbrough; AIR via Aligarh? 7.412 (Hi, Eng to Eur 1745-2230) 43543 at 1830 in Bridgwater; R.Thailand via Udon Thani 7.210 (Eng to Eur 1900-2000) 44244 at 1903 in Woodhall Spa; Israel R, 7.465 (Eng to Eur, N.America 1900-1930) SIO433 at 1913 in Doncaster; R.Nederlands via Madagascar 7.120 (Eng to S/E/W.Africa 1730-2025) 33333 at 1930 in Truro; R.Romania Int, Bucharest 7.195 (Eng to Eur 2100-2156) 54433 at 2100 in Galashiels.

Later, VOA via Selebi-Phikwe, Botswana 7.415 (Eng to Africa 1900-2230) 34333 at 2223 in Woking; Monitor R.Int, via WSHB 7.510 (Eng to Eur, Africa 2200-0000?) 43333 at 2310 in Stalbridge; WRNO New Orleans 7.355 (Eng to E.USA 2300-0300) 32332 at 2335 in Kilkeel; R.Bulgaria via Plovdiv 7.480 (Eng to USA? 2300-0000) 45444 at 2350 in Barton-on-Humber.

Some of the **6MHz (49m)** broadcasts to Europe originate from WEWN Vandiver 5.825 (Eng 2100-1000), heard at 0715 in Plymouth; R.Austria Int, via Moosbrunn 6.155 (Ger, Eng, Fr, Sp 0400-2300) rated 34333 at 0749 in Middlesbrough; R.Vlaanderen Int, Belgium 6.035 (Eng, Fr, Du, Ger, Sp 0900-?) 54555 at 1030 in Oadby; Bayerischer Rundfunk, Germany 6.085 (Ger) 33333 at 1240 in Rugby; R.Prague via Litomysl 5.835 (Eng 1700-1727) 44444 at 1700 in Morden; R.Yugoslavia 6.100 (Eng 1830-1900) 54434 at 1830 in Chester; R.Slovakia Int 5.915 (Eng 1830-1900) SIO433 at 1841 in Doncaster; R.Latvia Int, Riga 5.935 (Eng [Sat]) 33333 at 1915 in Newry; R.Austria Int via Moosbrunn 5.945 (Eng, Ger, Fr, Sp 1800-2300) 44333 at 1950 in Oxted; R.Portugal 6.130 (Eng 2000-2030) 32322 at 2024 in Manchester; China R.Int, Beijing 6.950 (Eng 2000-2157) 44333 at 2038 in Woking; RCI via Skelton, UK 5.995 (Eng 2000-2130) 54533 at 2040 in Herstmonceux; R.Ukraine Int 6.010 (Eng 2100-2200) 43333 at 2100 in Appleby; R.Korea via Kimjae 6.480 (Eng 2100-2200) 24222 at 2116 in Woodhall Spa; AWR via Slovakia 6.055 (Eng 2100-2158) 33333 at 2140 in Truro; Croatian R. via Deanovec 5.895 (Cr [News in Eng]) 45544 at 2203 in Bridgwater; Suddeutscher Rundfunk 6.030 (Ger) SIO223 at 2304 in Gt.Yarmouth.

Quite a few to other areas were also mentioned in the reports: R.Australia via Shepparton 6.090 (Eng to Asia 1500?-1900?) was rated 32333 at 1606 in Burnham-on-Crouch; R.Nigeria, Kaduna 6.091 (Ha [Chan 1] 0400-2305) 33343 at 1820 in Storrington; BBC via Antigua 5.975 (Eng to C/S.America 2100-0800) SIO444 at 2300 in Co.Fermanagh and received well at 0025 by Bill Griffith in Vancouver; R.Corp of Singapore 6.155 (Eng [R.One] 2200-1600) 33333 at 2300 in Scalloway and 53444 at 2310 by **Richard Reynolds** in Guildford; RCI via Sackville 5.960 (Eng to USA, Caribbean 2200-0000) 33333 at 2325 in Kilkeel; WHRI Noblesville 5.745 (Eng to E.USA 2200-0400) 45444 at 2340 in Barton-on-Humber; R.Nederlands via Flevo 6.020 (Eng to N.America 2330-0125) SIO444 at 2352 in N.Bristol; BBC via Sackville 6.175 (Eng to N.America 2200-0430) was received well at 0025 in Vancouver.

NEW RATES. £4.00 SUBSCRIBERS, £6.00 NON-SUBSCRIBERS

TRADING POST

Please write **clearly** in **BLOCK CAPITALS** - up to a maximum of 30 words plus 12 words for your address, and send it together with your payment of £6.00 (£4.00 subscribers), to Zoë Crabb, Trading Post, *Short Wave Magazine*, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW.

If an order form is not provided due to space constraints, a form from a previous issue can be used as long as the cornerflash or Subscriber Number is attached as proof of purchase of the magazine.

Adverts appear on a first-come-first-served basis. If there is not enough space to feature a Trading Post ad in the issue you request it is automatically entered into the next one. All queries to Zoë Crabb on (01202) 659910.

We cannot accept advertisements from traders, or for equipment which is illegal to posses, use or which cannot be licensed in the UK.

For Sale

Airmec 319A wattmeter, 325 sweep signal generator, 311 freq. standard, sell best offer or swap s/w rig, no scans, multiband, pictures details, s.a.e. Ross, 'Millway', Oddington Road, Stow on the Wold, Cheltenham GL54 1AL.

AOR AR3000A fitted encoder discriminator, £500. Momentum MCL1100 data decoder, includes Synop, monitor, mint, £225. Racal RA1792 receiver, five Collins filters 1Hz tuning, f.m. detector, 100 memories, £525. Tel: York (01904) 658928.

AOR AR3000A Plus, professional scanner receiver, covers 100kHz to 2036MHz, superb performance, only three months old, circumstances force sale, save £180 on advertised price, first, £700. Gary, W. Midlands. Tel: (0831) 232434 or FAX: 0121-705 7145.

Barlow Wadley XCR-30 Mark 2, as April article *SWM* magazine, v.g.c., excellent working order, open to offers. Tel: Surrey (01932) 850216.

Dressler ARA 500 active antenna, in-door use only, £70 o.n.o. Revco Radac broad band antenna, £30 o.n.o. Wanted mint AOR2001 scanner. Tridgway, 4 Rope Walk Close, Aberystwyth, Wales SY23 1DA.

Eddystone 870A, 15-24MHz, £80. Murphy B62B Navy receiver, 0.15-30.5MHz, £70. Army sets, R209, 1-12MHz, £65. R210, 0.2-16MHz, £80. C12 tank transceiver, 1.6-10MHz, £85. All g.w.o. Tidy R1155 (no valves), £40. Tel: (01482) 869682.

ERA Micoreader MkII, little used, with p.s.u., box and instructions, £90. Tel: Northants (01604) 858702.

ERA Microreader latest version. ERA Synoptic decoder, new. ERA RS232 intelligent display unit. This equipment provides complete decode and display ability, £250 the set! No splitting, no offers, incredible opportunity. Ian, Cheltenham. Tel: (01242) 863497.

ERA Microreader v4.2 decoder, £100. ERA RS232 display, £125. ERA BP34 audio bandpass filter, all boxed, v.g.c., plus postage. Richard, Bromley. Tel: (01689) 602948 answerphone.

FRG-7700 Yaesu com/rec plus FRV-7700 v.h.f. converter, £200, v.g.c. FRDX500 amateur bands rec. 160 to 10m plus 2m board fitted, £75. Free delivery handicapped persons 50 miles. John G6HKQ, Norfolk/Suffolk borders. Tel: (01842) 878703.

HF-225 plus key pad, handbook and manual, six months old, still boxed, £395 o.n.o. Will deliver thirty mile radius. Greg, Stoke on Trent. Tel: (01782) 861940.

HF-225 short wave receiver, f.m. board fitted, instruction manual, frequency lists, excellent sensitive receiver, £245 o.n.o. Mike, Cheptow. Tel: (01291) 620642.

Icom IC-R70 all-mode h.f. receiver, notch p.b.t. pre-amp, boxed, £370 or exchange for mint AR8000 with accessories. Tel: Barnsley (01226) 770634.

Icom IC-R7000HF h.f. v.h.f. u.h.f. comms. receiver, mint condition, original packing, recent service plus AT1000 a.t.u. (h.f.), £700 o.n.o. Tel: Slough (01753) 774348 daytime.

Icom IC-R7100 25MHz-2GHz base, £1500 scanner with speech unit, will exchange for notebook (laptop), must have 1.44Mb HD, CD, colour, complete or sell the IC-R7100 to buy a notebook (laptop). Peter, Suffolk. Tel/FAX: (01473) 785203 anytime.

Kenwood R-5000 receiver (US voltage), transformer for UK use, Barker & Williamson portable whip antenna, mint condition w/manual, all for, £350. Tel: Herts (01920) 830040.

Kenwood R-5000 with v.h.f., all filters, excellent, £600. JRC NRD 525, mint condition, boxed, £550. Panasonic DR29 digital world band receiver, s.s.b., m.w., l.w., f.m., 1-30MHz, £150. Icom IC-7000 v.h.f., like new, boxed, £550. Wanted 75A-3, 75A-1, KWS-1, 30-S-1. Tel: London 0181-813 9193.

Kenwood R-5000, mint, narrow filter, one owner, boxed, manual. Datong AD370, used loft mounted only, FL2 filter, Howes CTU8 a.t.u., boxed, everything, £700 or will split. Frank, Cheshire. Tel: 0161-368 5732.

Lowe HF-150 communications receiver with keypad, instruction and frequency books, eight months old, excellent condition, cash only please, buyer to inspect and collect, £340. Steve, Harrogate. Tel: (01423) 564579.

Lowe HF-150 plus keypad, £270. Signal R535 plus mains p.s.u., £240. Both mint, boxed, manuals, cash only, buyer collect. Tel: Lincs (01476) 572394.

Lowe HF-150 portable kit, backlight kit, key pad, p.s.u., manual, good condition, £280. Tel: Swindon (01793) 726628 evenings.

Lowe HF-225 receiver with f.m./a.m. sync., detector, keypad and internal batteries, £325 o.n.o. John McCormick, Fife. Tel: (01383) 412613.

Lowe HF-225 with f.m. board and whip option, superb condition, boxed with manual, £325. Tel: Kent (01892) 535974 or E-mail: Alan @ A-Thomas. demon.co.uk

NRD-535 h.f. receiver, mint condition, as new, £800 cash. Buyer collects. Tel: Stoke-on-Trent (01782) 533525.

Opto Cub with manual and aerial and charges unit, only, £90. Aerial rotator, complete, boxed, offers, etc., £45. Andy, Suffolk. Tel: (01449) 775395 or (0802) 774997.

Panasonic RF-B45 all band receiver with s.s.b., little used, v.g.c., boxed, £90 o.n.o. Tel: Lincoln (01522) 750236.

PK-232MBX, as new, software for PC, bound manual, £185. Tel: Surrey (01483) 770890.

RCA AR88, superb, £200. RCA AR77, 5-31MHz, £110. Eddystone EC770R 19-165MHz, £135. Eddystone 640 1.7-32MHz, £125. Eddystone 680X, 5-30MHz, £130. Early HRO (glass valves) coils, £145. All g.w.o. with manuals. Tel: (01482) 869682.

Signal R535 airband receiver, mint condition, boxed with manual, carry case, NiCads and charger, d.c. lead rubber flex antenna, £280. Tel: S. Yorkshire (01709) 719781.

Sony AIR7, boxed, excellent condition, £120. SEM v.h.f. converter, £45. Datong v.l.f converter, £22. Action hunter 10 band aerial, £24. Prices include postage. Tel: Bristol 0117-963 7108.

Sony ICF PRO-80 receiver, original kit with attenuator, case and strap, excellent condition, handbook, boxed, £175 o.n.o. Also Sony ICF 2001 with manual, £65 o.n.o. Tel: N. Wales (01492) 875433.

Sony ICF-SW7600G, mint condition, £100, manual. Tel: 0191-414 3745.

Yaesu FRG-9600 scanner, immaculate, boxed, still under guarantee, £420. Canon BJ10SX printer, very little use, £100. Tel: Shropshire (01691) 623751 after 6pm.

Yaesu FRT-7700 ant. tuner, Datong broad band amp c/w a.c. adapter, £50. Tel: E. Yorks (01262) 604823.

Yupiteru VT-125 MkII hand-held airband scanner, memories, NiCads, charger, backlight, delay, search, mains 12V, £100 includes post. Tel: Hilton (01283) 734320.

Exchange

Alinco DJ-X1 scanner, 100kHz to 1299.9MHz, 100 memories, good condition, £200 o.n.o. Opto Cub freq. counter, £100 o.n.o. Realistic 2006, 25-520, 760-1300 scanner, £150 o.n.o. Cash only, buyer collects. Tel: Surrey 0181-647 7784 after 6pm.

Icom IC-R7100 communications receiver, 25MHz to 2GHz, all-mode coverage, new condition, boxed, six months old, £895. Richard, Doncaster. Tel: (01302) 851912.

MFJ1278 multimode decoder, boxed with manuals, requires 12V d.c., handles v.h.f./h.f., packet, RTTY, ASCII, c.w., WEFAX and SSTV. Has RS232 TTL and printer ports, exchange for good quality hand-held/homebase scanner. Tel: Bournemouth (01202) 422273.

Trio 770S 2m multimode, £325. Comodore 128 1571 drive, colmon mouse, £125. *RadComs*, late 50s/current, offers. Wanted p.s.u. and circuit for SB101 TX/RX. Tel: Bucks (01494) 530018.

Wanted

Early wireless sets, crystal sets, horn speaker, valves, etc., particularly by Marconi, Ericsson, Sterling, Tingey, etc., serious collector with private museum, will pay well. Jim Taylor, Bournemouth. Tel: (01202) 510400.

Eddystone sets, still needed EC958, 890, 930, EB35, EB36, 870, 870A, EC10, any Mimco & scrap sets for spares. Telephone anytime, quick decision assured! Peter Lepino, Surrey. Tel: (0374) 128170 or (01372) 454381.

Ferrite rod aerials, must be half inch in diameter, no more or less and must be six inches long or more. Peter Tankard, Sheffield. Tel: 0114-266 5253 anytime.

Ferrite rod aerials, must be half inch in diameter, no more or less, must be six inches long or more. Peter Tankard, Sheffield. Tel: 0114-266 5253 anytime.

Icom IC-R9000, will exchange Icom IC-R7000, Icom R71E plus cash, both boxed with remote controls and in excellent condition, also wanted decoding software for Amiga RTTY c.w. SSTV. Tel: Bury 0161-797 0186 after 6pm.

Multiband transistor radios like Philips AL990, Sony CRF1, 230, 5090, Panasonic RF-9000, 8000, 2900, Hitachi KH3800, Mitsubushi multiband, Toshiba Transoceanic, Silver, all, Sanyo, all, Marco Polo or Perdio and similar and Microradio like Sinclair and old WRTH and Passport WBR. Sabino Fina, via Eesinali, 83042, Atripalda (AV), Italy.

Sony 2001D, must be in absolutely mint boxed condition, etc., emphasise mint, no scratches or graunches, top price paid. Tel: Norwich (01603) 406025.

URR390 or URR391, working or not, would collect southwest area. Symon Kennedy, Cornwall. Tel: (01637) 880479 from 6pm to 8pm.

ORDER FORM

PLEASE WRITE IN BLOCK CAPITALS

I enclose Cheque/P.O. for £.....(£4.00/£6.00)

Made payable to *PW Publishing Ltd.*

Name .....

Address.....

.....

.....

.....

Post Code.....

Credit Card Details ○ ○ VISA ○

Cord Number

PLEASE INSERT THIS ADVERTISEMENT IN THE NEXT AVAILABLE ISSUE OF *SHORT WAVE MAGAZINE*

Signature.....

Expiry date of card .....

Subs No......

£6 will be charged unless Subs number is given.

FOR SALE/WANTED/EXCHANGE maximum 30 words

	(30)		

CONTACT DETAILS maximum 12 words

			(12)

SWM NOVEMBER 96 TP

SUBSCRIPTION RATES

Please enquire for airmail rates

SHORT WAVE MAGAZINE - 6 MONTHS

❑ £13.15 (UK) ❑ £16.00 (Europe)
❑ £17.00 (Rest of World Airsaver) ❑ £19.50 (Rest of World Airmail)

SHORT WAVE MAGAZINE - 1 YEAR

❑ £25.00 (UK) ❑ £30.00 (Europe)
❑ £32.00 (Rest of World Airsaver) ❑ £37.00 (Rest of World Airmail)

SPECIAL JOINT SUBSCRIPTION WITH PRACTICAL WIRELESS (1 YEAR)

❑ £45.00 (UK) ❑ £54.00 (Europe)
❑ £58.00 (Rest of World Airsaver)

Please start my subscription with the

.....issue.

THREE YEAR SUBS OFFER

❑ £65.00 (UK only) £

BINDERS

❑ Please send me .... *SWM* Binder(s) @ £6.50 each. £
Postal charges: £1 for one, £2 for two or more (UK & overseas surface)

BOOKS

❑ Please send me.....copy(ies) of *More Out Of Thin Air* @ £6.95 post FREE (UK only). £

❑ Please send me the following books

.....£

.....£

.....£

.....£

.....£

Postal charges.
UK: £1 for one, £2 for two or more. £
Overseas:
£2.00 per item. £

NEW FASTER NEXT DAY SERVICE (UK)
(For orders received before noon) £4.00 £

GRAND TOTAL £

ORDER FORM

FOR ALL MAIL ORDER PURCHASES IN SHORT WAVE MAGAZINE

HAVE YOU CHECKED OUT THE NEW RANGE OF BOOKS ON PAGE 53?

CREDIT CARD ORDERS TAKEN ON (01202) 659930
between the hours of 9.00am - 5.00pm. Outside these hours your order will be recorded on an answerphone
FAX ORDERS TAKEN ON (01202) 659950
Or please fill in the details ticking the relevant boxes, a photocopy will be acceptable to save you cutting your beloved copy!
To: PW Publishing Ltd., FREEPOST, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW.

PAYMENT DETAILS

Name .....

Address .....

.....

.....Postcode .....

Telephone No. .....

I enclose cheque/PO (Payable to PW Publishing Ltd.) £

Or
Charge to my Access/Visa Card the amount of £

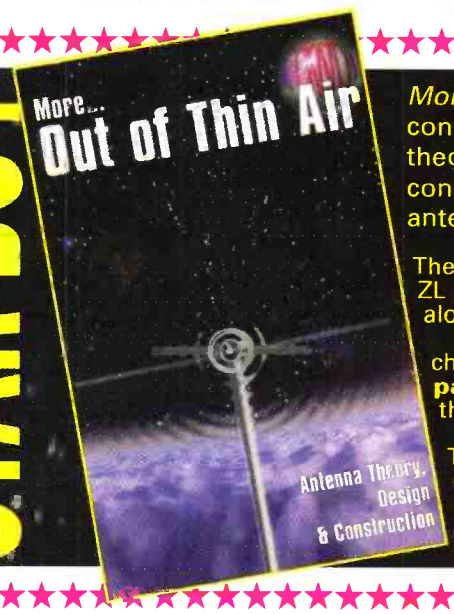
Card No. ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Valid from.....to.....

Signature .....Tel:.....

Orders are normally despatched by return of post but please allow 28 days for delivery. Prices correct at time of going to press. **Please note:** all payments must be made in Sterling.

CREDIT CARD ORDERS TAKEN ON (01202) 659930
FAX ORDERS TAKEN ON (01202) 659950



STAR BUY

More Out of Thin Air covers antenna theory, design and construction. In its 112 pages you will find articles on the theory behind antennas of all types for all frequencies, constructional features to enable you to build your own antennas for h.f., v.h.f. and u.h.f. operations.

The popular designs from the late Fred Judd G2BCX - Slim Jim, ZL Special Beams and the Folded Collinear Array are all in here, alongside designs from several other well-known authors.

This month the *SWM* Book Store is offering UK readers the chance to buy a copy of *More Out of Thin Air* **post and packing free**! For just **£6.95** you can have your own copy of this essential book post free - saving yourself £1.00.

To order your copy of *More Out of Thin Air* either use the Order Form above or telephone the **Credit Card Hotline** on **(01202) 659930** and quote **SWM$B11**.

Offer open until **29 November 1996. (UK only)**

BOOK STORE

TO ORDER YOUR BOOKS:
E-MAIL: bookstore@pwpub.demon.co.uk
TEL: (01202) 659930 (24 HOURS)
FAX: (01202) 659950 (24 HOURS)
OR USE THE ORDER FORM ON PAGE 87
***ANY* queries - ask for Michael!**

The books listed have been selected as being of special interest to our readers. They are supplied direct to your door. Many titles are overseas in origin.

LISTENING GUIDES

AIRBAND

AIR BAND RADIO HANDBOOK 5th Edition. David J. Smith. ....192 pages. £8.99
AIR TO GROUND RADIO FREQUENCIES. Ken Davies....96 pages. £4.99
AIRWAVES 96. ....100 pages. £8.95
AIRWAVES EUROPE. ....124 pages. £9.50.
CALLSIGN 96. ....144 pages. £8.50
FLIGHT ROUTINGS 1996. Compiled by T.T. & S.J. Williams. ....140 pages. £6.60
INTERNATIONAL AIR BAND RADIO HANDBOOK. David J. Smith. ....192 pages. £9.99
THE AIRBAND JARGON BOOK. Ron Swinburne. ....72 pages. £6.95
UNDERSTANDING ACARS
3rd Edition. Aircraft Communications Addressing and Reporting System. Ed Flynn. ....80 pages. £9.95
WORLDWIDE AERONAUTICAL COMMUNICATIONS FREQUENCY DIRECTORY
2nd Edition. Robert E. Evans. 260 pages. £19.95
WORLDWIDE AERONAUTICAL HF RADIO HANDBOOK. Martyn R. Cooke. ....124 pages. £6.95.

BROADCAST

A GUIDE TO THE WORLD'S RADIO STATIONS BP355. Peter Shore. ....266 pages. £5.95
RADIO LISTENERS GUIDE 1996. Clive Woodvear. ....81 pages. £3.95

DATAMODES

FAX & RTTY WEATHER REPORTS. Philip Mitchell....£8.95
GUIDE TO UTILITY STATIONS. 14th Edition. Joerg Klingenfuss. ....604 pages. £35.00
GUIDE TO WORLDWIDE WEATHERFAX SERVICES. 16th Edition. Joerg Klingenfuss ....436 pages. £25.00
WEATHER REPORTS FROM RADIO SOURCES. Philip Mitchell....£6.00
INTERNET RADIO GUIDE. 1st Edition. Joerg Klingenfuss....350 pages. £21.00
POCKET GUIDE TO RTTY AND FAX STATIONS. Bill Laver. ....57 pages. £3.95
RADIO DATA CODE MANUAL. 15th Edition. Joerg Klingenfus....604 pages. £28.00
INTERCEPTING NUMBERS STATIONS. Langley Pierce £9.95

DXTV

DXTV FOR BEGINNERS. Simon Hamer. ....31 pages £3.95
GUIDE TO DX-TV. Keith Hamer & Garry Smith. ....36 pages. £3.95

FREQUENCY GUIDES

1996 SUPER FREQUENCY LIST. Joerg Klingenfuss. £25.00
PASSPORT TO WORLD BAND RADIO 1997. ....£15.50
UK SCANNING DIRECTORY. 5th Edition. ....540 pages. £18.50
VHF-UHF SCANNING FREQUENCY GUIDE. Bill Laver....192 pages. £12.95
WORLD RADIO TV HANDBOOK 1996 (50th Anniversary Issue). ....608 pages. £17.95

GENERAL

EAVESDROPPING ON THE BRITISH MILITARY. Michael Cannon. £17.50
THE COMPLETE SHORT WAVE LISTENER'S HANDBOOK 4th Edition
Hank Bennett, Harry Helms & David Hardy. ....321 pages. £18.95
SHORT WAVE COMMUNICATIONS. Peter Rouse GU1DKD. ....187 pages. £4.50

MARINE

MARINE SSB OPERATION. J. Michael Gale. ....96 pages. £11.95
MARINE VHF OPERATION. J. Michael Gale. ....48 pages. £7.95
SHORTWAVE MARITIME COMMUNICATIONS. B. E. Richardson. ....195 pages. £16.50.
SHIP TO SHORE RADIO FREQUENCIES. Ken Davies. ....95 pages. £5.99
SIMPLE GPS NAVIGATION. Mik Chinery. ....96 pages. £9.95

SATELLITE

AN INTRODUCTION TO AMATEUR COMMUNICATIONS SATELLITES
BP290. A. Pickard. ....102 pages. £3.95
AN INTRODUCTION TO SATELLITE COMMUNICATIONS BP326.
F. A. Wilson. ....230 pages. £5.95
NEWNES GUIDE TO SATELLITE TV. Derek Stephenson. ....371 pages. £18.95
SATELLITE BOOK - A Complete Guide to Satellite TV Theory and Practice
John Breeds. ....280 pages. £32
SATELLITE EXPERIMENTER'S HANDBOOK 2nd Edition.
Martin Davidoff K2UBC. ....313 pages. £14.50
SATELLITE PROJECTS HANDBOOK. L. Harris. ....174 pages. £13.95
SATELLITE TELEVISION. A layman's guide. Peter Pearson. ....73 pages. £1.00
SATELLITE TELEVISION INSTALLATION GUIDE. 5th Edition. John Breeds. ....76 pages. £15.00
SPACE RADIO HANDBOOK (RSGB). John Branegan GM7 4IHJ ....242 pages. £12.50
THE SATELLITE HACKERS HANDBOOK Inc. JVFAX. Colin A. Grellis ...120 pages. £18.75
WEATHER REPORTS FROM RADIO SOURCES. Philip C. Mitchell ....32 pages. £6.00
WEATHER SATELLITE HANDBOOK. 5th Edition. Dr Ralph E. Taggart WB8DQT. ....192 pages. £15.50
WRTH SATELLITE BROADCASTING GUIDE. 1996 Edition. Bart Kuperus. ....366 pages. £17.95

SCANNING

AN INTRODUCTION TO SCANNERS AND SCANNING BP311. I. D. Poole. ....152 pages. £4.95
SCANNER BUSTERS 2. D.C. Poole. ....64 pages. £4.95
SCANNERS 2 INTERNATIONAL. Peter Rouse GU1DKD. ....261 pages. £9.95
SCANNERS 3 PUTTING SCANNERS INTO PRACTICE.
New Edition 4th Revision. Peter Rouse. ....271 pages. £9.95
SCANNING SECRETS. Mark Francis. ....280 pages. £16.95

AMATEUR RADIO

ANTENNAS & TRANSMISSION LINES

25 SIMPLE AMATEUR BAND AERIALS BP125. E. M. Noll. ....63 pages. £1.95
25 SIMPLE INDOOR AND WINDOW AERIALS BP136. E. M. Noll. ....50 pages. £1.75
25 SIMPLE SHORT WAVE BROADCAST BAND AERIALS BP132. E. M. Noll. ....63 pages. £1.95
25 SIMPLE TROPICAL AND MW BAND AERIALS BP145. E. M. Noll. ....54 pages. £1.75
ALL ABOUT VERTCAL ANTENNAS. W. I. Orr W6SAI & S. D. Cowan W2LX. ....192 pages. £8.50
ANTENNA IMPEDANCE MATCHING (ARRL). Wilfred N. Caron. ....195 pages. £14.50
ANTENNAS FOR VHF AND UHF BP301. I. D. Poole. ....104 pages. £4.95
ARRL ANTENNA BOOK 17th Edition. ....732 pages. £21.95
ARRL ANTENNA COMPENDIUM Volume One. ....175 pages. £10.00
ARRL ANTENNA COMPENDIUM Volume Two. ....208 pages. £10.00
ARRL ANTENNA COMPENDIUM Volume Three. Edited by Jerry Hall K1TD. ....236 pages. £12.50
ARRL ANTENNA COMPENDIUM Volume Four. ....204 pages. £15.50
BEAM ANTENNA HANDBOOK. W. I. Orr W6SAI & S. D. Cowan W2LX. ....268 pages. £8.50
BUILD YOUR OWN SHORTWAVE ANTENNAS 2nd Edition. Andrew Yoder. ....208 pages. £15.95
CUBICAL QUAD ANTENNAS 3rd Edition. William Orr W6SAI and Stuart Cowan W2LX. £8.50
EXPERIMENTAL ANTENNA TOPICS BP278. H. C. Wright. ....70 pages. £3.50
G-QRP CLUB ANTENNA HANDBOOK.
Compiled and edited by P. Linsley G3PDL & T. Nicholson KA9WRI/GW0LNQ. ....155 pages. £7.25
HF ANTENNA COLLECTION (RSGB). Edited by Erwin David G4LQI. ....233 pages. £10.99
HF ANTENNAS FOR ALL LOCATIONS (RSGB). Les Moxon G6XN. ....322 pages. £14.65
MORE OUT OF THIN AIR (PWP). ....112 pages. £6.95
PRACTICAL ANTENNAS FOR NOVICES. John Heys G3BDQ. ....52 pages. £6.30
PRACTICAL ANTENNA HANDBOOK 2nd Edition. Joseph J. Carr. ....437 pages. £25.95
PRACTICAL WIRE ANTENNAS RSGB. John Heys G3BDQ. ....100 pages. £8.95
RADIO AMATEUR ANTENNA HANDBOOK. W. I. Orr W6SAI & S. D. Cowan W2LX. ...188 pages. £8.50
RECEIVING ANTENNA HANDBOOK. Joe Carr. 1 ....89 Pages. £17.50
SIMPLE, LOW-COST WIRE ANTENNAS FOR RADIO AMATEURS.
W. I. Orr W6SAI & S. D. Cowan W2LX. ....188 pages. £8.50
W1FB'S ANTENNA NOTEBOOK (ARRL). Doug DeMaw W1FB. ....123 pages. £7.50

BEGINNERS (INC RAE)

AMATEUR RADIO FOR BEGINNERS (RSGB). Victor Brand G3JNB. ....65 Pages. £3.50
AN INTRODUCTION TO AMATEUR RADIO BP257. I. D. Poole....150 pages. £3.50
AN INTRODUCTION TO THE ELECTROMAGNETIC WAVE BP315.
F. A. Wilson. ....122 pages. £4.95.
THE BEGINNER'S HANDBOOK OF AMATEUR RADIO 3rd Edition.
Clay Laster W5ZPV. ....398 pages. £15.95
ETI BOOK OF ELECTRONICS. Dave Bradshaw. ....208 pages. £10.95
HOW TO PASS THE RADIO AMATEURS' EXAMINATION (RSGB)
Clive Smith G4FZH and George Benbow G3HB. ....88 pages. £8.75
THE NOVICE RADIO AMATEURS EXAMINATION HANDBOOK (BP375)
Ian Poole G3YWX. ....150 pages. £4.95
THE RADIO AMATEURS' QUESTION & ANSWER REFERENCE MANUAL.
Fifth Edition. ....Ray Petri G0OAT. £13.95
RAE MANUAL (RSGB). G.L.Benbow G3HB. ....127 pages. £8.75
RAE REVISION NOTES (RSGB). G.L.Benbow G3HB. ....92 pages. £5.25
REVISION QUESTIONS FOR THE NOVICE RAE (RSGB). Esde Tyler G0AEC. ....60 pages. £5.75
THE NOVICE LICENCE STUDENT'S NOTEBOOK. John Case GW4HWR. ....124 pages. £6.50
SHORTWAVE RADIO LISTENING FOR BEGINNERS.
Anita Louise McCormick KA8KGI. ....176 pages. £10.95
TRAINING FOR THE NOVICE LICENCE A MANUAL FOR THE INSTRUCTOR (RSGB)
John Case GW4HWR. ....101 pages. £6.75
W1FB'S HELP FOR NEW HAMS (ARRL). Doug DeMaw W1FB. ....155 pages. £8.95

CALLBOOKS

AMATEUR RADIO CALL BOOK AND INFORMATION DIRECTORY (RSGB)
1997 Edition. ..... 529 pages. £13.69

COMPUTING

ACCESS 95 ONE STEP AT A TIME BP408 ..... 115 pages. £5.99
AN INTRODUCTION TO COMPUTER COMMUNICATIONS BP177.
R. A. Penfold. ..... 2 pages. £2.95
HOW TO EXPAND, MODERNISE AND REPAIR PCs AND COMPATIBLES BP271
R. A. Penfold. ..... 166 pages £ 5.95.
INTERFACING PCs AND COMPATIBLES BP272. R A Penfold ..... 86 pages. £3.95
MS-OFFICE ONE STEP AT A TIME (BP402). ..... pages. £5.95
MS WORD 95 EXPLAINED BP406 ..... 175 pages. £6.99
MS WORKS FOR WINDOWS 95 EXPLAINED BP405 ..... 175 pages. £5.95
NEWNES COMPUTER ENGINEER'S POCKET BOOK Third Edition.
Michael Tooley. ..... 256 pages. £12.95
PCs MADE EASY. Second Edition. James L.Turley. ..... 38 pages. £15.95
THE INTERNET AND WORLD WIDE WEB EXPLAINED. J. Shelley. ..... 130 pages. £5.95
WINDOWS 95 EXPLAINED (BP400). ..... 175 pages. £5.95

EMC

INTERFERENCE HANDBOOK. William R. Nelson WA6FQG. ..... 250 pages. £9.50
THE RADIO AMATEUR'S GUIDE TO EMC (RSGB). Robin Page-Jones G3JWI. ..... 117 pages. £8.95

HISTORICAL

1934 OFFICIAL SHORT WAVE RADIO MANUAL. Edited by Hugo Gernsback. ..... 260 pages. £11.85
EXPERIMENT TELEVISION (1932) £11.75
SECRETS OF HOMEBUILT REGENERATIVE RECEIVERS (Rockey) £7.95
THE BRIGHT SPARKS OF WIRELESS (RSGB). G. R. Jessep G6JP £12.50
WORLD AT THEIR FINGERTIPS (RSGB). ..... 307 pages. £6.30
THOSE GREAT OLD HANDBOOK RECEIVERS (1929 + 1934) £6.95
VISION BY RADIO (1925) (Jenkin) £7.85

MAPS AND LOG BOOKS

AMATEUR RADIO LOGBOOK (RSGB). £3.50
NORTH ATLANTIC ROUTE CHART. ..... 740 x 520mm. £7.50
QTH LOCATOR MAP OF EUROPE. ..... 1080 x 680mm. £5.95
RADIO AMATEURS MAP OF THE WORLD. ..... 980 x 680mm. £5.95
RECEIVING STATION LOG BOOK (RSGB). £3.50

MARINE

SCANNING FOR THE MARINE BANDS. F.F. O'Brian £9.50

MICROWAVES

AN INTRODUCTION TO MICROWAVES (BP312). F. A. Wilson ..... 134 pages. £3.95
ARRL UHF/MICROWAVE EXPERIMENTER'S MANUAL. Various Authors. ..... 446 pages. £14.50

MORSE

MORSE CODE FOR THE RADIO AMATEUR/RSGB £4.25

OPERATING AND HANDBOOKS

AMATEUR RADIO OPERATING MANUAL (RSGB). Ray Eckersley G4FTJ. ..... 249 pages. £12.23
ARRL HANDBOOK FOR RADIO AMATEURS 1996 (ARRL). ..... 1200 pages. £25
THE ATV COMPENDIUM. Mike Wooding G6IQM. ..... 104 pages. £3.50
COMPLETE DX'ER. Bob Locher. ..... 204 pages. £8.95
HINTS AND KINKS FOR THE RADIO AMATEUR.
Edited by Charles L. Hutchinson and David Newkirk. ..... 129 pages. £9.50
RADIO COMMUNICATION HANDBOOK (RSGB).
6th Edition. Dick Biddulph G8PDS. ..... 750 pages. £21.00
SETTING UP AN AMATEUR RADIO STATION BP300. I. D. Poole. ..... 81 pages. £3.95

PACKET

PRACTICAL GUIDE TO PACKET OPERATION IN THE UK.
Mike Mansfield G6AWD NEW EDITION. ..... 220 pages. £10.50
PACKET: SPEED, MORE SPEED AND APPLICATIONS (ARRL). ..... 144 pages. £12.95
YOUR GATEWAY TO PACKET RADIO. Stan Horzepa WA1LOU. ..... 278 pages. £8.95
YOUR PACKET COMPANION. Steve Ford WB8IMY. ..... 170 pages. £5.95

One or two new interesting titles this month to choose from. I would certainly recommend *Electronics Hobbyist Data Book* at £5.95, maybe a stocking filler from the other half? Also, don't miss out on *Passport To World Band Radio 1997* edition at £15.50. Order your copy now!

PROPAGATION

AN INTRODUCTION TO RADIO WAVE PROPAGATION BP293. J.G. Lee. ..... 116 pages. £3.95
LOW PROFILE AMATEUR RADIO - OPERATING A HAM STATION FROM ALMOST ANYWHERE (ARRL). Jim Kearman KR1S. ..... 124 pages. £7.50

QRP

G-QRP CLUB CIRCUIT HANDBOOK. Edited by Rev. G. Dobbs G3RJV. ..... 96 pages. £9.00
QRP CLASSICS (ARRL). Edited by Bob Schetgen. ..... 274 pages. £10.50
W1FB's QRP NOTEBOOK (ARRL). 2nd Edition. Doug De Maw W1FB. ..... 175 pages. £7.95

TEST EQUIPMENT

GETTING THE MOST FROM YOUR MULTIMETER BP239. R. A. Penfold. ..... 102 pages. £2.95
HANDS-ON GUIDE TO OSCILLOSCOPES. Barry Ross. ..... 228 pages. £17.95
HOW TO USE OSCILLOSCOPES & OTHER TEST EQUIPMENT BP267.
R. A. Penfold. ..... 104 pages. £3.50
MORE ADVANCED TEST EQUIPMENT CONSTRUCTION BP249. R. A. Penfold 102 pages. £3.50
MORE ADVANCED USES OF THE MULTIMETER BP265. R. A. Penfold. ..... 96 pages. £2.95
PRACTICAL TRANSMITTERS FOR NOVICES. John Case GW4HWR. ..... 126 pages. £10.00
TEST EQUIPMENT FOR THE RADIO AMATEUR. Clive Smith G4FZH ..... 170 pages. £10.95

VHF

ALL ABOUT VHF AMATEUR RADIO. W. I. Orr W6SAI. ..... 163 pages. £9.50
AN INTRODUCTION TO VHF/UHF FOR RADIO AMATEURS BP281.
I.D. Poole. ..... 102 pages. £3.50

ELECTRONICS

A REFERENCE GUIDE TO BASIC ELECTRONICS TERMS BP286.
F. A. Wilson. ..... 472 pages. £5.95
A REFERENCE GUIDE TO PRACTICAL ELECTRONICS TERMS BP287.
F. A. Wilson. ..... 431 pages. £5.95
BEGINNERS GUIDE TO MODERN ELECTRONIC COMPONENTS BP285.
R. A. Penfold. ..... 166 pages. £3.95
CIRCUIT SOURCE BOOK 1 - BP321. R.A. Penfold. ..... 182 pages. £4.95
CIRCUIT SOURCE BOOK 2 - BP322. R.A. Penfold. ..... 214 pages. £4.95
ELECTRONIC HOBBYIST DATA BOOK. BP396. R. A. Penfold £5.95
GETTING STARTED IN PRACTICAL ELECTRONICS BP345. Owen Bishop. ..... 198 pages £4.95.
NEWNES AUDIO AND HI-FI ENGINEER'S POCKET BOOK Third Edition.
Vivian Capel. ..... 210 pages. £12.95
NEWNES ELECTRONICS ENGINEER'S POCKET BOOK. Keith Brindley. ..... 306 pages. £12.95
POWER SUPPLY PROJECTS BP76. R. A. Penfold. ..... 89 pages. £2.50
PRACTICAL ELECTRONIC FILTERS BP299. Owen Bishop. ..... 89 pages. £4.95
PRACTICAL ELECTRONICS HANDBOOK. Ian Sinclair. ..... 439 pages. £13.95
PRACTICAL OSCILLATOR CIRCUITS BP393. A Flind ..... 136 pages. £4.99
TEST EQUIPMENT CONSTRUCTION BP248. R.A.Penfold. ..... 104 pages. £2.95
W1FB's DESIGN NOTEBOOK (ARRL). Doug DeMAW W1FB. ..... 195 pages. £8.50

DATA

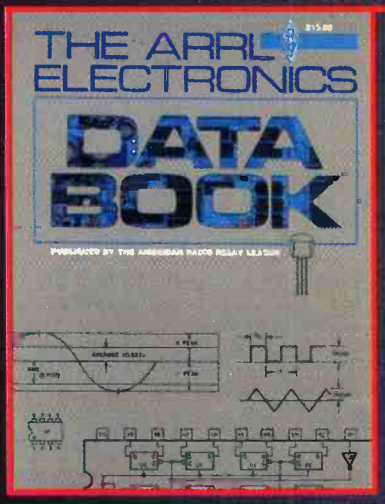
ARRL ELECTRONICS DATA BOOK. Doug DeMaw W1FB. ..... 260 pages. £8.95
ELECTRON TUBE LOCATOR. George H. Fathauer. ..... 350 pages. £19.95
ESSENTIAL CHARACTERISTICS (TUBES & TRANSISTORS)
(Original Publishers General Electric) Re-published by Antique Electronic Supply (Arizona). ..... 475 pages. £9.95.
HANDBOOK OF RADIO, TV, INDUSTRIAL & TRANSMITTING TUBE & VALVE EQUIVALENTS. ..... *60 pages.* £2.95.
PRACTICAL ELECTRONICS CALCULATIONS AND FORMULAE BP53.
F. A. Wilson. ..... 249 pages. £3.95
PRACTICAL ELECTRONIC DESIGN DATA BP316. Owen Bishop. ..... 327 pages. £4.95
RADIO AMATEUR AND LISTENER'S DATA HANDBOOK. Steve Money. 2 ..... 40 pages. £12.95
RADIO DATA REFERENCE BOOK (RSGB) 6th Edition ..... 252 pages. £8.50
RADIO FREQUENCY TRANSISTORS PRINCIPLES AND PRACTICAL APPLICATIONS
Norm Dye & Helge Granberg. ..... 235 pages. £19.95
RADIO VALVE GUIDE BOOKS 1-5 ..... £2.95 each
RCA RECEIVING TUBE MANUAL (Original Publishers Radio Corporation Of America)
Re-published by Antique Electronic Supply (Arizona). ..... 384 pages. £10.50
RCA TRANSMITTING TUBES
(Original Publisher Radio Corporation of America) Re-published by Antique Electronic Supply (Arizona) ..... 318 pages. £9.95.
SOLID STATE DESIGN FOR THE RADIO AMATEUR (ARRL).
Les Hayward W7ZOI & Doug DeMaw W1FB. ..... 256 pages. £10.50
TRANSISTOR DATA TABLES (BP401). ..... 178 pages. £5.95
TRANSMITTER HUNTING - RADIO DIRECTION FINDING SIMPLIFIED. Joseph D. Moell & Thomas N. Curlee ..... 325 pages. £21.95

PROJECTS

COIL DESIGN AND CONSTRUCTION MANUAL BP160. B.B. Babani. ..... 106 pages. £3.95
HOW TO DESIGN AND MAKE YOUR OWN PCBs BP121 . R. A. Penfold. ..... 66 pages. £2.50
MORE ADVANCED POWER SUPPLY PROJECTS BP192. R. A. Penfold. ..... 92 pages. £2.95
PROJECTS FOR RADIO AMATEURS AND SWLS BP304. R. A. Penfold. ..... 92 pages. £3.95.
SHORT WAVE SUPERHET RECEIVER CONSTRUCTION BP276 R.A. Penfold. ..... 80 pages. £2.95
SIMPLE SHORT WAVE RECEIVER CONSTRUCTION BP275 R. A. Penfold. ..... 88 pages. £3.95

ORDER NOW ON (01202) 659930

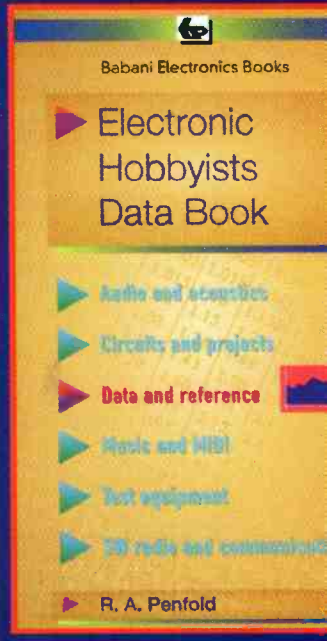
OR PLEASE USE THE ORDER FORM ON PAGE 87.



The ARRL Electronics Data Book

Doug DeMaw W1FB has completely revised and expanded the material in this reference book. Tables, charts and formulae rub shoulders with circuits for oscillators, mixers, amplifiers as well as active devices and their operating parameters. The large 276 x 208mm format has allowed Doug to get a lot of useful information in at a readable size.

The ARRL Electronics Data Book is very reasonably priced at £8.95 and should be alongside your copy of the *ARRL Handbook* - you have got a copy, haven't you?



Each month we will be selecting five or six books that we feel will be of interest to you. They could be new ones just in or old favourites revised.
This month we have a couple of brand new ones, a couple of revised editions and one that falls into both categories - if that's possible. Don't forget last month's selection - they are still available from the *SWM* Book Store.
To order any of these books please use the Order Form on page 87.

profiles

David J. Smith
International
AIR BAND RADIO
HANDBOOK
The guide to world-wide air traffic control

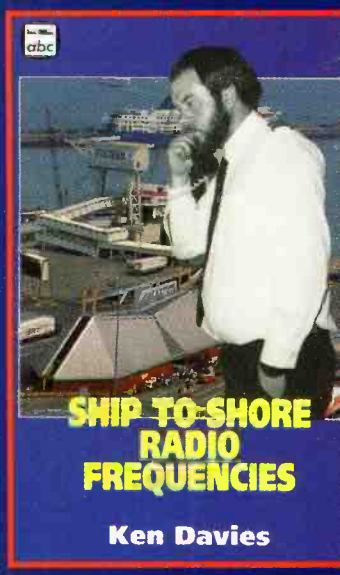
The International Air Band Radio Handbook

David Smith

Written by a professional air traffic controller, this companion volume to the very successful *Air Band Radio Handbook* presents a world overview of the subject.

The book explains how air traffic is regulated internationally and includes brief details of each country's system with frequencies for all major airports. The many related subjects, including navigational aids, phraseology, flight plans, interception and emergency procedures, as well as weather reporting and an ICAO airport code letter listing are all covered.

At £9.99 the *International Air Band Radio Handbook* is well worth adding to your book shelves.

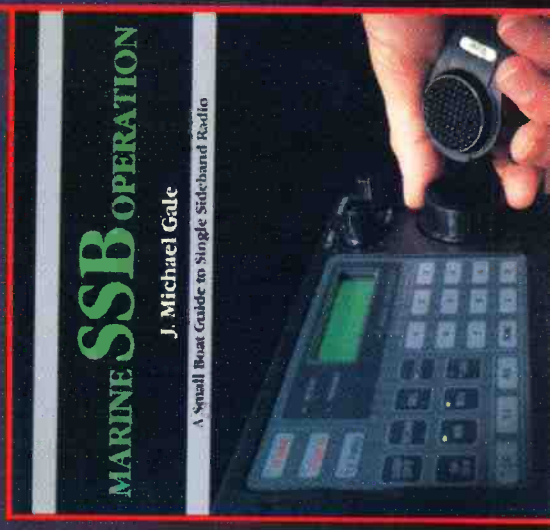


Marine SSB Operation

J. Michael Gale

Based on the author's radio School, where thousands of sailors have qualified for their v.h.f. and s.s.b. certificates, this book covers everything necessary to gain the international 'Restricted' Certificate. It also contains a chapter on amateur radio with the emphasis on the increasingly important Maritime Mobile Nets. The range of Marine SSB set is potentially world-wide and is essential for anyone intending to sail blue water. If you need Marine SSB, you need this book.

Marine SSB Operation costs £11.95.



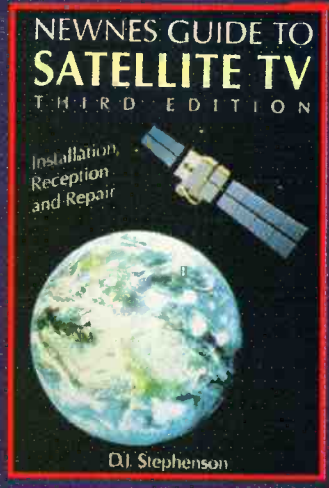
Electronics Hobbyists Data Book

R.A. Penfold

This very useful little book from the Babani Electronics Books stable provides an inexpensive source of a wide range of data. If you need details of a modern five-band resistor colour code, or have an old-style tantalum bead capacitor and want to 'read' its value you will find it in this book.

Useful, even essential, formulae rub shoulders with basic data and leadout information for most types of discrete semiconductor as well as operational amplifiers, CMOS and TTL devices.

Electronics Hobbyists Data Book (BP 396) costs just £5.95.

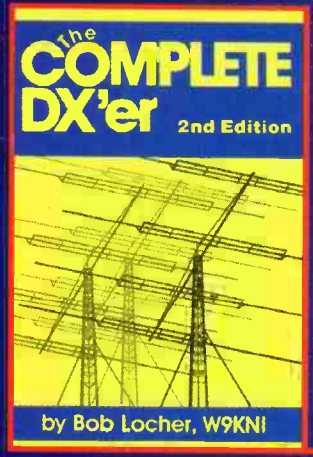


Newnes Guide to Satellite TV

D.J. Stephenson

The third edition of this practical guide to the installation and servicing of satellite TV receiving equipment is aimed at those professionally engaged in this growing field. Completely rewritten and updated it includes topics such as digital television.

Even if you are not a professional this book is a mine of information to enable you to get the most out of your satellite television installation. *Newnes Guide to Satellite TV* is well worth the £18.95 cover price.



The Complete DX'er

Bob Locher W9KNI

This is the 'standard text' for the rising DX hunter. Every significant aspect of DX'ing is covered from learning how to really listen, how to snatch the rare ones out of the pile-ups and how to get that elusive QSL all written in a very readable manner.

At £8.95 *The Complete DX'er* is a very good read.

Ship To Shore Radio Frequencies

Ken Davies

This new addition to the Ian Allan 'abc' series provides all those interested in sailing with a detailed handbook listing all the radio frequencies likely to be encountered whilst sailing round Britain's shores.

Essential for sailors, useful for anyone else interested in marine radio.

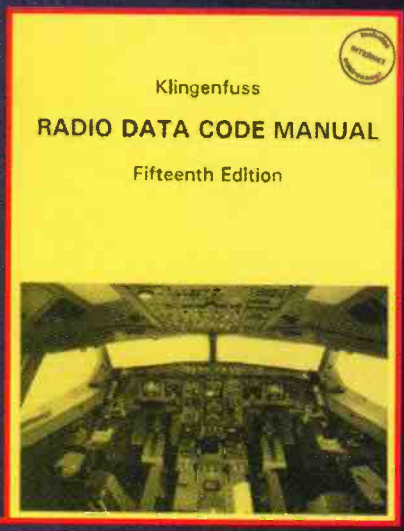
Ship To Shore Radio Frequencies is priced at a reasonable £5.99.

Radio Data Code Manual 15th Edition

Klingenfuss

This new reference book replaces two former Klingenfuss books - *Air and Meteo Code Manual* and *Radioteletype Manual* and can be considered as the updated editions of both of these titles combined into one volume. One major innovation with this book is the introduction of Internet addresses for solar and geophysical data sources and World Wide Web homepages.

At £28.00 the *Radio Data Code Manual 15th Edition* is an essential reference book for anyone interested in monitoring air, meteo and RTTY stations.



COMING NEXT MONTH IN PRACTICAL WIRELESS

FREE! MFJ RADIO PRODUCTS CATALOGUE

THE DECEMBER ISSUE OF THE UK'S BEST SELLING MAGAZINE FOR RADIO AMATEURS WILL HAVE ALL YOUR REGULAR FAVOURITES PLUS A FREE 40-PAGE MFJ RADIO PRODUCTS CATALOGUE PACKED WITH OVER 400 ITEMS OF INTEREST TO ANYONE INVOLVED IN RADIO.

AND THAT'S NOT ALL! THE CATALOGUE CONTAINS MONEY SAVING COUPONS - MAKING YOUR POUNDS GO EVEN FURTHER!

YOU'D BE FOOLISH TO MISS IT - SO MAKE SURE YOU DON'T BY ORDERING YOUR COPY NOW!

***PW* DECEMBER ISSUE - ON SALE 14 NOVEMBER 1996 - PLACE YOUR ORDER TODAY!**

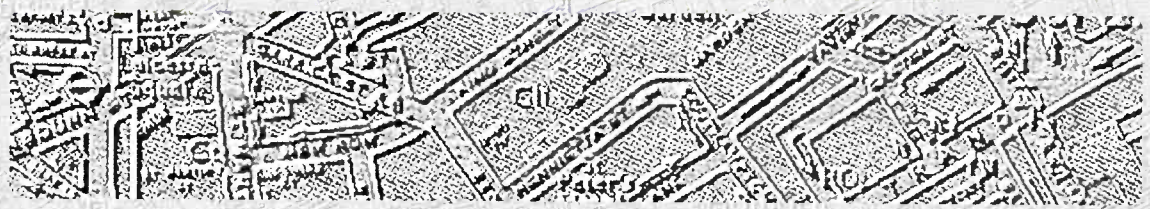
ADVERTISERS INDEX

PUBLISHED on the fourth Thursday of each month by PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. Printed in England by Southernprint (Web Offset), Factory Road, Upton Industrial Estate, Poole, Dorset BH16 5SN. Tel: (01202) 622226. Distributed by Seymour, Windsor House, 1270 London Road, Norbury, London SW16 4DH. Tel: 0181-679 1899, Fax: 0181-679 8907, Telex: 881245. Sole Agents for Australia and New Zealand – Gordon and Gotch (Asia) Ltd.; South Africa – Central News Agency Ltd. Subscriptions INLAND £25, EUROPE £28, OVERSEAS (by ASP) £30, payable to SHORT WAVE MAGAZINE, Subscription Department, PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. SHORT WAVE MAGAZINE is sold subject to the following conditions, namely that it shall not without the written consent of the publishers first having been given, be lent, re-sold, hired out or otherwise disposed of by way of trade at more than the recommended selling price shown on the cover and that it shall not be lent, re-sold, hired out or otherwise disposed of in a mutilated condition or in any unauthorised cover by way of Trade, or affixed to or as part of any publication or advertising, literary or pictorial matter whatsoever.

ICOM

IC-R8500

the super wide-band receiver with street-credibility



If you want to hear everything that's going down on the streets, then the R8500 is for you. Covering 100kHz~2GHz in all modes the R8500 gives you the chance to be a REAL nosey-parker! The R8500 includes IF shift, APF, direct RS-232C computer compatability and will appeal to professionals and serious listeners who demand top performance - but not top prices.

'BIG EARS' IS HERE! LISTEN TO EVERYTHING THAT'S GOING ON

ICOM... manufacturers of top performing base-stations, mobiles, handheld transceivers and receivers.

Icom (UK) Ltd. Sea Street Herne Bay Kent CT6 8LD.
General Operator: 01227 743000. Sales & Service: 01227 741741. Fax: 01227 741742.
INTERNET: http://www.icomuk.co.uk/ E-MAIL: icomsales@icomuk.co.uk.

Count on us!

The Lowe receiver range

Famous the world over

- **HF-150**
  Your first 'real' receiver
- **HF-150M**
  Marine version of the HF150
- **SP-150**
  Matching speaker/filter for the HF150
- **PR-150**
  RF preselector for the HF150
- **RK-150**
  Stack and rack system
- **HF-225**
  Higher specification h.f. receiver
- **HF-225E**
  Super high performance model
- **HF-250E**
  New top line receiver

Distributors and dealers in most countries

Contact Lowe Electronics to find out your nearest dealer

Tel: (01629) 580800
Fax: (01629) 580020

LOWE

Manufactured by:
Lowe Electronics,
Chesterfield Road,
Matlock, Derbyshire, DE4 5LE, UK