



# Shortwave magazine

**KITS & PROJECTS SPECIAL**

- ★ Howes DC2000
- ★ Beginner's SSB/CW Receiver Kit
- ★ Ramsey All Band Active Antenna Kit
- ★ Hands Electronics RX1 Simple Superhet Kit

**REVIEWED**

- ★ Yupiteru MVT-9000 Hand-held Scanner
- ★ Marilec MSRS0 Weather Satellite Receiver
- ★ WIN A ROBERTS R501 FINAL Part of our Competition



FEBRUARY 1997 ISSN 0037 - 4261 £2.50

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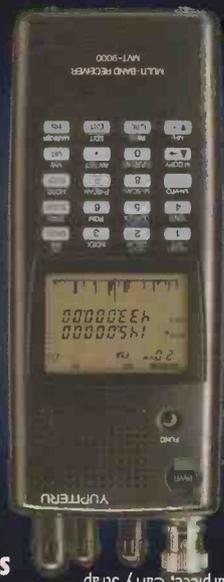
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- Newly designed 'BUSY CATCH SCAN'
- Wide band coverage with all mode receive capability (0.5MHz - 1300MHz)
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## ICOM IC-R10



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- Sell the No.1 seller
- 500kHz-1900MHz
- Computer control
- Data clone
- 1000 Memories
- C/W NiCads & charger

- Supplied c/w NiCads & charger
- AM/FM
- 100 Memories
- 66-952MHz (with gaps)
- use with **TURBO SCAN** receiver.
- Airband handheld that is easy to

## BEARCAT UBC 120XLT



£139.00

## Optional CTCSS board

- receiver attenuator, delay and data options are available direct from the keyboard. Automatic tape recorder ON/OFF and tape output feature!
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- 200 Memories
- AM/FM
- Supplied c/w NiCads & charger

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- Wideband base scanner with **TURBO SCAN** COVERS CIVIL AIRBAND.
- 66-956MHz (with gaps)
- 100 Memories
- AM/FM
- LTV DC
- Mains adaptor supplied.

£139.00

£299.00

- Yupiter's own EMC version of this popular radio.
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- AM/FM/WFM/SSB/CW
- 1000 Memories
- C/W NiCads & charger



- New top of the range handheld from Uniden with **TURBO SCAN**
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- TURBO SCAN
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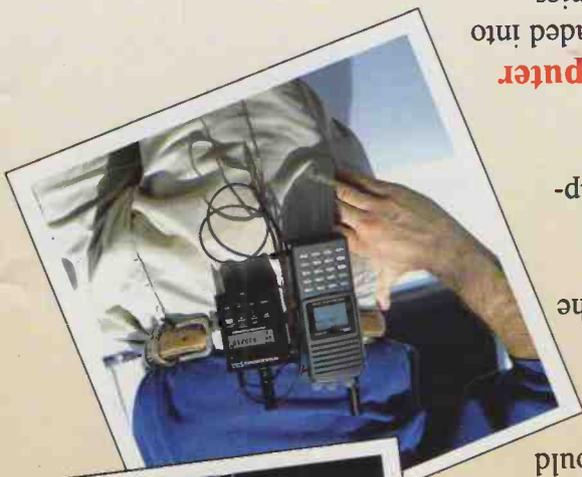
All the Scout memories can be downloaded into your PC using the optional Optoelectronics OptoLink and checked against the Spectrum FCC database. Now you can keep track of all the activity along your scanning journey. **With The Scout Frequency Recorder, Nothing Transmits Unknown.**



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



DB32



CC30 Case

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*Good Listening*

**Win a Roberts R861 Portable World-band Receiver**  
 See page 69 for the final part of this two-part competition.

# Communique

SEND YOUR NEWS TO KEVIN NICE AT THE EDITORIAL OFFICES

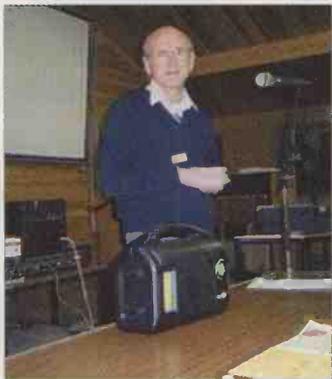
## 1996 WACRAL CONFERENCE

Last October, the Forest Lodge Conference Centre at Cleobury Mortimer, Shropshire, hosted the three day 1996 WACRAL Conference. A record attendance and a highly unusual programme produced many comments of the 'best ever' conference.

Dick Whittington G3UQD/S79DW, the Schedules Engineer for FEBA Radio, presented a special paper entitled 'Frequency management for Missions'. Recently returned from the Seychelles station, Dick's hilarious description of bolting down his transmitter solder tags with a six foot spanner and his pictures of the huge antennas held the hall spellbound.

David Palmer G4PFX, of the Satellite Engineering Centre at the University of Surrey, described the world leading technology and amazing activities of this British team of space scientists.

BMS missionaries Dr and Mrs Adrian and Sylvia Hopkins, home on leave from the



Dick Whittington G3UQD/S79DW, Broadcast Schedules Engineer for FEBA Radio addresses the 1996 WACRAL Conference on frequency management.

Christoffel Blindenmission in the Central African Republic, spoke eloquently on the desperate plight of the African populations in river areas. By putting questions on a routine scenario to the Conference, they demonstrated the apparently insoluble problems faced almost daily by medical missionaries and aid workers in those strife torn areas.

The AGM returned all officers for a further year and resolved to start a new programme of outreach, including a WACRAL site on the Internet.

In lighter vein, Victor Brand G3JNB introduced the pleasures of QRP operation, a 'silly price surplus sale', raised over £200 for club funds and members were instructed in the subtle arts of archery at the sports centre. Fellowship and services of Christian worship were enjoyed by all and the traditional 'scratch' choir of the ladies was a big hit!

A new innovation was the construction competition to make a ONER 1W transmitter kit in an unusual cabinet. The silver trophy was won by G3LRQ for his working rig built into a large Marmite jar!

The WACRAL club call GX3NJB was activated on 80m with many contacts with UK members and overseas QSOs. The most outstanding of which was American YL member Chrissie G7UXJ, working an Israeli amateur working portable from Spain.

Further information on WACRAL can be obtained from the Membership Secretary G3XNX on (01803) 854504.

## BOWLER STRIKES 212!

The winner of the 1996 FEBA Radio Nationwide Ten Pin Bowling Competition was Kim Harle from Leamington, Newcastle Upon Tyne. Her brilliant score of 212 just beat

that of closest rival Paul Andrews from Southampton, who scored 208. Kim, who bowled in a team of 20 players from West Denton Church was 'surprised and overwhelmed' to receive the National Champion's trophy!

More than 200 teams from across the UK registered for the third FEBA Ten Pin Bowling event, which took place on October 5th 1996. An estimated 3000 bowlers participated, each one receiving sponsorship or making a donation to support the building and equipping of FEBA's new Christian Radio Centre in Kenya.

The aim of the event was to raise £30 000 for this exciting project. The new studios and offices will help FEBA's East African team to expand their ministry, getting new language services in Dinka, Nuer and Maasai on air in addition to existing programmes in Swahili.

Back at the start of December, £15 500 has been received from those taking part, with more sponsorship monies still being collected.

## 40 YEARS HONOURED

Recently, Colchester Radio Amateurs decided to make a presentation to their long-serving Honorary Secretary to commemorate two of his many remarkable achievements. Firstly, the organising and teaching of the RAE course in Colchester by Frank Howe G3FIJ over a period of 40 years without a break from 1955-1996.

Frank G3FIJ started classes for the Amateur Radio Certificate and training for the Morse Test in 1955 to enable interested persons to become licensed Radio Amateurs. These have continued every year until now,

with no breaks. For some years, it was said that the only day without Morse Practice Transmissions in Colchester was Christmas Day!

In the years up to 1979, more than 300 people had obtained their Amateur Licence. From 1979 on, the Multiple Choice Exam was introduced and to date there have been over 900 entries with around 750 first time passes and 180 referrals on one paper. Most of these managed a pass at the next attempt.

In one year, there were over 100 candidates taught in three classes per week on three evenings! New courses were devised for the Novice Licence Amateur Radio Exam, with similar success.

Candidates, of both sexes, aged from 9-70 years have travelled from various parts of East Anglia, from as far away as Norfolk, Southend in Essex and Newmarket in Suffolk. Many Morse candidates have listened to Frank and Ted G4LFD (144.160MHz daily at 9.15pm) from Kent to Lincolnshire and have had their efforts corrected and speed improved.

Some candidates are physically handicapped or partially sighted and therefore unable to attend classes. Frank Howe has tutored them personally in their homes so that they have obtained Amateur Radio Licences and thus widened their horizons considerably. For this group particularly, Frank has recorded six long play cassette tapes to enable them to cope with RAE



theory. Copies are loaned whenever needed.

Under Frank's direction and organisation, with his team of helpers from Colchester Radio Amateurs, it is likely that the achievement of training more than 1200 Radio Amateurs will not be surpassed.

Secondly, in 1965 he helped form Colchester Radio Amateurs and became Secretary. He still holds this office and his guidance has been the key to the club's success. It has gone steadily from strength to strength, participating in many Amateur Radio activities and is one of the largest in East Anglia, with a membership of over 70!

Frank, a natural teacher, is in some demand, particularly for his antenna demonstrations which he gives freely to many schools and clubs in North Essex and Suffolk. He is always ready to assist other amateurs from the newly qualified licensee to advanced operators, attempting satellite communication for the first time. All benefit from his support and encouragement.

The value of Frank Howe's efforts should be seen in the context of the Amateur Radio Service being officially recognised for maintaining communications in times of a national disaster, when the essential services communication systems have been unable to cope in an emergency.

The Colchester Radio Amateurs would like to wish Frank well in the continued enjoyment of the Amateur Radio hobby, to which he has given so much.



(L to R) Colin Smith G0LIN (Chairman of Colchester Radio Amateurs), Frank R. Howe G3FIJ (Hon. Sec. of Colchester Radio Amateurs) and Peter Chadwick G3RZP (Ex-President RSGB and Member of Council RSGB).

## 1000 CHANNEL BASE STATION SCANNER

Realistic have just released their new PRO-2042 base station scanner. This 1000 channel scanner has a frequency coverage of 25 - 520 and 760 - 1300MHz and has switchable a.m., w.f.m. and n.f.m. modes over the entire frequency coverage. Tuning is carried out by either keypad entry or the rotary tuning knob.

Scanning rate is 25 memory channels per



second and the search rate is 50 steps per second. The Auto Store feature quickly logs all active frequencies only once so that memories are available for all the new stations monitored, while Frequency Sort arranges them in ascending order.

To reduce interference from i.f. images, the PRO-2042 is a triple conversion superhet. The scanner can be powered from the 240V a.c. mains or from a 12V d.c. supply.

The PRO-2042 is supplied complete with whip antenna to fit the BNC antenna socket, is CE approved and retails at £249.99.

For further details contact **Link Electronics, 216 Lincoln Road, Peterborough PE1 2NE. Tel: (01733) 345731.**

## LOSS OF PART OF THE AMATEUR 10GHz MICROWAVE BAND

The Radiocommunications Agency has announced that the date for the withdrawal of the Amateur service from part of the present 10GHz Amateur band will be 1 April 1997.

The current allocation for Amateur use is 10.00 to 10.50GHz, but to facilitate the introduction of Radio Fixed Access services in the UK, the segment of the band situated between 10.15 and 10.30GHz will be withdrawn.

A Gazette Notice will be published in the *London, Edinburgh and Belfast Gazettes* to vary the Amateur Radio Licence as from 1 April 1997 to take into account this 150MHz reduction in the Amateur frequency allocation.

## DIGITAL TELEVISION PROPOSALS

The proposals on the provision of conditional access services for digital

television provide that licensing of the conditional access

technology needed to support pay television must take place on fair, reasonable and non-discriminatory terms.

In a written answer to a Parliamentary Question from Charles Hendry MP (High Peak) the President of the Board of Trade Ian Lang said:

"Regulations (1996/2185) were brought into effect on 23 August 1996 governing the licensing of proprietary conditional access technology to manufacturers of consumer equipment (eg: set top boxes). These provide that licensing of conditional access technology must take place on fair, reasonable and non-discriminatory terms.

"They also prohibit anyone granted such a licence from discouraging the manufacturer from including, in the same equipment, another conditional access system or a Common Interface."

"The basic approach of these regulations is to ensure that all broadcasters can gain access on fair, reasonable and non-discriminatory terms, to any digital set top boxes which can receive their signal. We have made provision for a range of powers to allow the Director general, OFTEL, to move quickly to firm and effective enforcement action in the event of any anti-competitive behaviour which may significantly distort competition."

National Heritage secretary, Virginia Bottomly said: "These final draft regulations clearly show the Government's commitment to a future in which

viewers can look forward to more choice and the industry to competition based on programming which meets viewers' needs and interests. They give clear notice that any unfair or anti-competitive behaviour by dominant players in the conditional access market will be prevented. We look forward to broadcasters using the new technology to provide attractive new services, and co-operating in launching digital receivers. Regulation can only provide a framework for success. It is the vision and enterprise of broadcasters and manufacturers which will make it happen."

## GLOBAL MOBILE TELEPHONES MOVE A STEP CLOSER

Odyssey, the global, satellite-based cellular telephone system has moved a step nearer with the final approval being granted by the US Federal Communications Commission for TRW Inc. to build and operate the new system. The approval follows the FCC's recent adoption of a frequency band allocation plan that made radio spectrum available for use by satellite feeder links and other radio systems. Odyssey's links between satellites and earth stations will use the newly designated bands.

Odyssey is a personal communications satellite services system that, when operational, will allow subscribers, equipped with just a pocket telephone, to reach any telephone anywhere on earth - from anywhere else on earth. The system is scheduled to start in the year 2002 and will also provide FAX, computer data and short message services.

The FCC order also approved modifications to enhance the Odyssey system design to allow it to operate more efficiently and facilitate the process of co-ordinating internationally with other systems.

## RADIO AND TVDX NEWS

By the end of 1997 the first test transmissions from a future digital terrestrial network across Sweden should be on-air. SVT will offer five subscription channels comprising sports, local news, arts, repeats and a 'gold' (archive material) channel.

Telewizja Wisla TVN with nine local TV channels across Southern Poland is to link with the central Polish Nasza Telewizja to compete with the national network TVP and Polsat.



The Membership Secretary is the main contact person for all subs payments, enquiries about membership and notification of members' change of address.

**Chairman & Contests Manager - John Barber GW4SKA**

29 Brithdir Street, Cathays, Cardiff CF2 4LE, Tel: (01443) 842643 (0900-1700 Mon to Fri).

John is now Chairman in addition to running BARTG's very successful contest.

**Secretary & Publicity Officer - Ian Brothwell G4EAN @ GB7NOT**

56 Arnot Hill Road, Arnold, Nottingham NG5 6LQ, Tel: 0115-926 2360.

Ian handles admin and the publicity side of BARTG.

**GB2ATG News Service Editor - Bob Canning G0ARF @ GB7MAD**

Green Lane Cottage, Eardisland, Leominster, Herefordshire HR6 9BN, Tel: (01544) 388350, bcanning@fclass.kc3ltd.co.uk

GB2ATG transmits regularly every month (each evening in the first full week of the month) on h.f. and is also posted to the packet network.

**DATACOM Editor - Arthur Bard G1XKZ**

9 Linden Close, Oak Park, Cullompton, Devon EX15 1TE, arthur.bard@btinternet.com

DATACOM is the quarterly magazine published by BARTG. It carries all manner of articles related to data comms within amateur radio.

**Awards Manager & Component Sales - Nigel Roberts G4KZZ**

13 Rosemoor Close, Hunmanby, N. Yorkshire YO14 0NB, Tel: (01723) 890786.

BARTG offers several awards, details can be obtained from Nigel. He also sells BARTG's range of components by mail order.

**Publications Sales & Rally Co-Ordinator - Ken Godwin GOPCA**

11 St Lukes Way, Allhallows, Kent ME3 9PR, Tel: (01634) 271548, 101461.3054@compuserve.com

Ken arranges (and staffs most of) BARTG stands at rallies. He also sells BARTG's range of publications by mail order.

**G4ATG Station Operator (And Computer Topics) - Mike Kerry G4BMK**

2 Beacon Close, Seaford, East Sussex BN25 2JZ, Tel: (01323) 893378, 100577.1452@compuserve.com

Mike operates the BARTG station G4ATG. He is also a specialist in computer related data comms.

**President & Mechanical RTTY Topics - Alan Hobbs G8GOJ**

83 St Peters Street, S. Croydon, Surrey CR2 7DG, Tel: 0181-688 2564.

Alan is the longest serving committee member of BARTG. He is also the committee's specialist in mechanical RTTY (still a very popular mode of data comms).

**Treasurer - Dick Whittering G3URA @ GB7TUT**

The Coach House, 28a Flamstead End Road, Cheshunt, Hertfordshire EN8 0HT.

Dick manages the finances of BARTG.

**So, there you have it, a full run down of the 1997 BARTG committee. BARTG is also on the web at: [www.bartg.demon.co.uk](http://www.bartg.demon.co.uk)**

**CLUB CALLS FOR 1997**

Recently landed on the SWM Newsdesk are details of the operators of the ISWL's Club Callsign GX4BJC/P for 1997. As in previous years, a special ISWL club callsign QSL card is available to anyone who hears or works the station.

QSL cards will be sent out upon receipt of an incoming QSL or reception report. The station can be QSL'd either via the bureau or direct to: **David Beale G-10618/G0DBX, ISWL Club Call QSL Manager, 'Kenwood', London Road, Louth, Lincolnshire LN11 8QH, United Kingdom.**

**NATIONAL TRANSMITTER NEWS**

**Corsham:** A new television relay station opened on 19 November 1996 for Corsham in Wiltshire, about 13km north-east of Bath.

Provided jointly by the BBC and NTL on behalf of the Independent Television Commission (ITC), it is located on a mast on the edge of the Corsham School playing fields. It is designed to bring good television, NICAM stereo and teletext reception to approximately 430 people in Corsham, particularly Brakspear Drive, Furzehill, Poynder Road and the eastern end of Brook Drive.

**STATION DETAILS**

Channels	BBC 1 (West)	51
	BBC 2	44
	ITV (HTV)	41
	Channel 4	47

Antenna Group:	B
Polarisation:	Vertical (Brook Drive) Horizontal Poynder

Rd/Brakspear Drive	
ERP:	Vertical 8.0W Horizontal 5.0W

**Southway:** A new television relay station opened on 12 November 1996 for the Southway and Tamerton Foliot areas, about 6km north of Plymouth City Centre.

Provided jointly by NTL on behalf of the ITC and the BBC, it is located on a mast above Whiteleigh Wood and is designed to bring good television, NICAM and teletext reception to approximately 430 people in the village of Southway, particularly the western end of Southway Drive and the southern parts of Bampfylde Way. It is also designed to provide good signals to the Seven Stars Lane and Fore Street areas in Tamerton Foliot.

**STATION DETAILS**

Channels:	BBC 1 (S. West)	55
	BBC 2	62
	ITV (Westcountry)	59
	Channel 4	65

Antenna Group	C/D
Polarisation:	Vertical
ERP:	10W

Further information from either of the below addresses:

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

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

**ISWL Club Callsign Operators 1997**

	Operator	Callsign
January	Bill Trenchard	G4EHU
February	Roy Smyth	G14CBG using GN4BJC/P
March	Nigel Dyche	G0RRW
April	Brian Smith	G0IER
May	David Beale	G0DBX
June	Mike Rutland	G0VIX
July	Paul Westripp	G0SLD
August	Fred Connor	G4FMI
September	Dick Rugg	G2BRR using G4BJC
October	Roger Provins	G0RGJ
November	Bill Griffiths	GW0UJH
December	Philip Conway	G4LAN

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

# Rallies

**February 2:** The 12th South Essex Amateur Radio Society Radio Rally is being held at the Paddocks, Long Road, Canvey Island, Essex. The Paddocks is situated at the end of the A130. Doors open at 10am. Features include amateur radio, computer and electronic component exhibitors. There will also be a Bring & Buy, RSGB Morse testing on demand (two passport photos required). Home made refreshments, free car parking with space outside main doors for disabled visitors. Admission is £1. Further information from **David G4UVJ** on **(01268) 697978**.

**February 2:** The Harwell Amateur Radio Society are holding their indoor Radio & Computing Rally at the Harwell Science & Engineering Centre, 1 mile west of the A34 between Oxford and Newbury. Talk-in on S22. Doors open at 10am. There will be trade stands, a Bring & Buy, craft exhibitors, bar and light refreshments. Admission is £1 and children are free. **Arthur GOKOC** on **(01235) 815399** or <http://www.rmpc.co.uk/eduweb/sites/ntaylor/rally.html>

**February 16:** The Northern Cross Rally is to be held at Thornes Park Athletics Stadium, Wakefield - one large hall - just out of town on the Harbury road. Easy access from M1 junctions 39 & 40 - well signposted and with talk-in on 2m and 70cm. Doors open at 11am (10.30am for disabled visitors and Bring & Buy). Further details from **Peter GOBQB** on **(01924) 379680**, FAX: **(01924) 257445**, E-mail: [rally@waveg.demon.co.uk](mailto:rally@waveg.demon.co.uk) Web page: <http://www.waveg.demon.co.uk/rally/>

**February 22:** The Tyneside Amateur Radio Society will be holding their 11th annual rally at the Temple Park Centre, South Shields. The Temple Park Centre is located on John Reid Road, approached from A194 and with excellent access from all parts. Doors open at 11am with special entry at 10.30am for disabled persons. Admission is £1 on the door. The talk-in station will be provided on S22 from Bam. There is ample parking space for visitors and special arrangements will be made for disabled visitors. There will be a Bring & Buy and all the usual trade stands. More details from **Jack GODZG** on **0191-265 1718**.

**February 22:** The 12th Rainham Radio Rally, sponsored by the Bredhurst Receiving and Transmitting Society. This is the 4th year at the new venue, which is, The Rainham School for Girls, Derwent Way, Rainham, Kent ME8 9PP. Talk in on S22 GB4RRR. Doors open 10am, (9.30am for disabled visitors and items for Bring & Buy). Admission is £1.50, under 14s free. There will be the usual mix of trade stands, Bring & Buy, many special interest groups will also be represented, ie. RNARS, RAYNET, KRG, KEPAC, BARTG, etc. There will be plenty of off road parking, a licensed bar, food and refreshments. More details from **Martin MOAAK** on **(01634) 365980** at any reasonable time.

**February 23:** The Barry Amateur Radio & Computer Rally will be held at the Barry Leisure Centre, off Holton Road, Barry. Doors open at 10.30am, (10am for disabled badge holders). There will be trade stands, a Bring & Buy, refreshments, a swimming pool and free car parking. **Brian GWOPUP**, Tel/FAX: **(01222) 832253**.

# Bandscan

# AMERICA AMERICA AMERICA AMERICA

Various Argentine medium wave broadcasters continue to appear on short wave on a vary sporadic basis, relayed by one of the Argentine utility stations. It's believed the relays may be intended for Argentines working in Antarctica, at least in part.

For several years, Radio Rividavia was heard regularly on short wave via a utility station. Now it is one of several Argentine medium wave (and perhaps f.m. outlets, too) being relayed in this fashion.

The airings don't seem to have any particular schedule and are heard very much on a catch-as-catch-can basis. Weekends and special nationwide sporting events involving Argentine teams seem to offer the best opportunities. The frequencies which may be in use include 8.100, 11.055, 13.361, and 20.276.

Radio Nacional Arcangel San Gabriel, the Argentine station in Antarctica, has gone silent again. Short wave listeners now understand that this station comes and goes in concert with activity at Argentina's Antarctic Base. The station begins operating sometime in March and closes for the season sometime in October or November. The station uses 15.476 with call letters LRA36 and normally signs off around 2300 or earlier.

**Brazil** - Here's a run-down of Brazilian short wave outlets reported recently:

- 4.774 Radio Liberal, Belem
- 4.775 Radio Integracao, Cruzeiro do Sol
- 4.815 Radiodifusora Londrina, Londrina
- 4.825 Radio Cancao Nova, Cachoeira Paulista
- 4.835 Radio Capixaba, Vitoria
- 4.845 Radio Meteorological Paulista, Ibitinga
- 4.865 Radio Alvorada, Londrina
- 4.866 Radio Sentinela da Amazonia, Oriximina
- 4.875 Radiodifusora de Roraima, Boa Vista
- 4.885 Radio Clube do Para, Belem
- 4.895 Radio Bare, Manaus
- 4.915 Radiodifusora de Macapa, Macapa
- 4.965 Radio Alvirada, Parintins
- 4.985 Radio Brazil Central, Goiania
- 5.965 Radio Nova Visao, Santa Maria
- 6.000 Radio Guaiba, Porto Alegre
- 6.020 Radio Gaucha, Porto Alegre
- 6.170 Radio Cultura, Sao Paulo
- 9.615 Radio Cultura do Sao Paulo
- 9.630 Radio Aparecida, Aparecida
- 9.645 Radio Bandeirantes, Sao Paulo
- 9.665 Radio Marumbay, Florianopolis
- 11.705 Radio Nova Visao, Santa Maria
- 11.815 Radio Brazil Central, Goiania
- 11.830 Radio Anhanaguera, Goiania
- 11.916 Radio Gaucha, Porto Alegre
- 15.135 Radio Record, Sao Paulo

In North America, Brazilian short wave stations are best heard early in the morning at their sign on times (such as 0800 and 0900), during the evening hours on the lower bands and during the afternoons and early evenings on the higher frequencies

The Brazilian government recently expanded the frequency

ranges Brazilian short wave stations are allowed to use. The added bands are: 9.775 to 9.900, 11.650 to 11.700, 11.975 to 12.050, 13.600 to 13.800, 15.450 to 15.600, 17.550 to 17.700 and 21.750 to 21.850. You might want to check 9.820 now and then for usage by Radio Nove de Julho, Sao Paulo which is due on in a few months. It was active on short wave some 20 years ago!

A few Brazilian short wave stations are reported to be inactive at the moment, including Radio Record on 6.150, Radio Rio Mar on 9.695, Radio Aparecida on 11.885 and Radio Inconfidencia on 15.190 Canada - CKZN, the CBC short wave outlet in St. John's, Newfoundland, which relays local medium wave CBN on 6.160 wants to hear from more of its listeners. The CBC's Don Lockhart says the short wave station is designed to serve parts of the Canadian coast which can't hear the medium wave outlet well enough, but that the station receives very little mail.

We have to wonder whether, if that situation were to continue long enough, the powers that be might begin to question the value of continuing the short wave relay. Letters can be sent to **Don Lockhart, CBC, Goose Bay, Labrador, Canada**. He can also be reached via E-mail at: [dlockhar@nlet.nf.ca](mailto:dlockhar@nlet.nf.ca).

**Chile** - A rarely heard Chilean broadcaster is Radio Triunfal Evangelica, a religious outlet operating on 5.825 (or a hair below) which operates daily except Thursdays and Sundays from 2100 to 0100. The station is located in the small town of Talagante, about 30 miles southwest of Santiago.

Unfortunately, the frequency is also used by WEWN, one of the powerful US religious broadcasters during that time period so until, or if, this station ever moves any chance for further reception of the Chilean station appear to be pretty bleak.

**Colombia** - Ecos del Orinoco, from Puerto Carreno, has been reactivated on 4905.5, and is heard as late as 0330, although sometimes it

signs off shortly after 0200. Another reactivation is Radio Macarena, Villavicencio on 5.974 variable.

**Costa Rica** - The University of Costa Rica's short wave station is being heard quite frequently and quite well, too, on 6.105, running with cultural programming in Spanish until sign off just after 0600.

**Dominican Republic** - Radio Cristal, Santo Domingo, (5.012 variable) has been active on a somewhat irregular basis since it came on the air last year. (A station of the same name was active on this frequency perhaps 20 years ago). The station usually manages to put in only a poor to fair signal at best. Check between 0000 and 0100, but it may or may not be on the air at present. Their address is **PO Box 9252, Santo Domingo**. This station carries some English programming, including commercials.

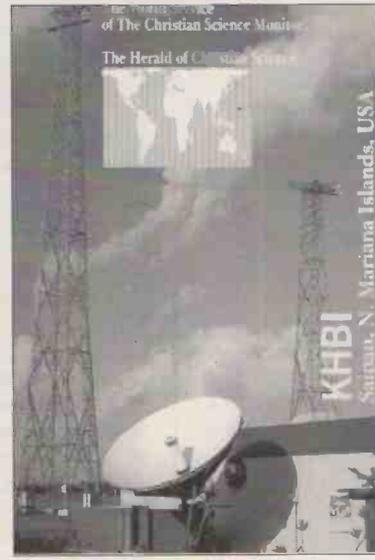
**Ecuador** - A very rare catch from this country is Radio Chinchipe (also 'La Voz de Chinchipe') on 3.570, sometimes heard around 0000.

**Mexico** - Tus Panteras, 6.105, resumed short wave transmissions last October, apparently to provide additional coverage of the hurricane threatening Mexico at the time.

After the hurricane passed, the station was silent for a few days, then returned. Unfortunately, most of the private Mexican short wave stations have a history of long periods of inactivity interspersed with brief periods of operation. The Merida-based broadcaster had not been active on short wave for years and it's anyone's guess how long this latest appearance will last. Indeed, it may well have disappeared already.

Meantime, Radio Educacion, one of the few steadily active Mexican short wavers, plans an increase in both its power and its broadcast hours. The transmitter power will jump from 5 to 20kW and the operating schedule will increase to 16 hours per day. The station will also begin broadcasting some programs in Russian. Radio Educacion operates on 6185.

**United States** - The US government's Radio Free Asia service



**Herald Broadcasting's KHBI on the Pacific island of Saipan is relaying the US government's new Radio Free Asia service.**

**Gerry L. Dexter**  
C/O SWM EDITORIAL OFFICES  
BROADSTONE  
DORSET  
BH18 8PW

is now in operation. Some of the Asian governments who were asked to air RFA programming on their short wave stations said 'no' for fear of offending China, which is not happy about the Radio Free Asia effort. The US government then had to look for other outlets. One which agreed was Herald Broadcasting (the Christian Science Monitor) which is carrying RFA on its KHBI in Saipan. Several transmitters in the former Soviet Union are also relaying RFA, including Kazakhstan, Armenia and Tajikistan. The US government is in the process of building a large short wave station on the island of Tinian in the Northern Marianas. When finished, this station will provide the majority of RFA's coverage, which is intended for Burma, China, Vietnam, North Korea, Cambodia and Laos. The site, not due to become active until late next year, will probably use three 500kW short wave transmitters. Six such units were originally planned but that number was cut back due to budget restraints. Even with the cutbacks the project is expected to cost over \$20 million. Radio Free Asia plans to set up a web site at [www.rfa.org](http://www.rfa.org) so you may be able to find current schedules there. For regular, postal mail their address is 1201 Connecticut Avenue, NW, Suite 400, Washington, DC 20036.

The Voice of America has discontinued use of the remainder of its short wave 'feeders', the last of which provided service to the relay station in Kavala, Greece. Until then, the VoA lacked an agreement with the Greek government, which prevented access to its satellite interconnect system. Now that such an agreement is in hand there's no need for the short wave feeders any longer. Still, it seems there'll always be a chance use may be made of these in emergencies or to test the equipment now and then.

**Uruguay** - Radio Monte Carlo and Radio Oriental share time on the same transmitter which, at this writing, is off the air for repairs. The stations operate on 6.140, 9.595 and 11.735, the latter being the most often heard in North America, although even that is a fairly rare occurrence. Also inactive at the moment is SODRE on 9.620, although it is expected to return once the transmitter is made operative again. The fairly new Emisora Ciudad de Montevideo on 9.650 (slightly variable) has largely escaped the ears of North American DXers, in part perhaps due to its very early sign off time - 2130, which is mid-Afternoon over here.

Until next time, good listening!

## AVON

**Bristol International RC:** Tuesdays, 8pm. The Little Thatch Country Club, 684 Wells Road, Whitchurch, Bristol. All visitors are welcome. The club has been formed so that all radio enthusiasts, whether they be Licensed Amateurs, s.w.l.s or CBers' can get together and have a good natter and do things that you do in radio clubs. PO Box 28, Bristol BS99 1GL.

**RSGB City of Bristol Group:** last Tuesdays, 7pm. New Friends Hall, Purdown, Bell Hill, Stapleton, Bristol BS16 1BG. January 28 - Facts & Fallacies in Amateur Radio by Peter Chadwick MIEE G3RZP, February 25 - The RLO Speaks! - Dave Collins will try to answer all your questions about RSGB matters - if he can't, he will get the answers. Robin Thompson G3TKF on (01225) 420442.

**South Bristol ARC:** Wednesdays, 7.30pm. Whitchurch Folkhouse Assoc., Bridge Farm House, East Dundry Rd, Whitchurch. January 29 - Bring & Buy Car Boot Sale, February 5 - 10m evening and committee meeting, 12th - VHF workshop for newcomers, 19th - Any interest in hand-held rigs by Dave G7PKJ. For more information ring (01275) 834282 on a Wednesday evening.

## BEDFORDSHIRE

**Dunstable Downs RC:** Fridays 8pm. Chews House, High Street South, Dunstable, Bedfordshire. New members and visitors welcome, just drop in or call Paul G7TJS on (01582) 861936.

## BUCKINGHAMSHIRE

**Aylesbury Vale RS:** Wednesday evenings, 8pm. Hardwick Village Hall, (Hardwick is situated off the A413 between Aylesbury and Buckingham). February 5 - Discussion evening. Gerry Somers G7VFFV on (01296) 432234.

## DERBYSHIRE

**Derby & DARS:** Wednesdays, 7.30pm. 119 Green Lane, Derby. Martin Shardlow G3SZJ, 19 Portreath Drive, Allestree, Derby DE22 2BJ on (01332) 556875.

## EDINBURGH

**Lothians RS:** 2nd & 4th Wednesdays, 7.30pm. Orwell Lodge Hotel, Polworth Terrace, Edinburgh. Tommy Main GM4DCL, QTHR on 0131-663 8501 day and evening.

## GREATER LONDON

**Southgate ARC:** 2nd & 4th Thursdays. Winchmore Hill Cricket Club, The Paulin Ground, Firs Lane, Winchmore Hill, London N21 3ER. January 23 - Radio on the air, February 13 - Development of WWII AI Mk8 by D. Hawes G8DIS, 27th - Radio on the air. M. Viney GOANN on (01707) 850146.

**Wimbledon & DARS:** 2nd & last Fridays, 7.30pm. St Andrews Church Hall, Herbert Road SW19. January 31 - General activity evening, February 14 - Racial RA17 by G8MOB. (01737) 356745.

## HAMPSHIRE

**Horndean & DARC:** 1st & 4th Tuesdays, 7.30pm. Lovedean Village Hall, Lovedean Lane, Lovedean, Hants. January 28 - Digital communications by GQJEZ, February 4 - Natter night, 25th - Bring & Buy sale. S. Swain (01705) 472846.

**Southampton ARC:** Mondays, 7pm. This club is now up-and-running after some years of inactivity. New members welcome. Harold McIntyre on (01703) 737715.

## HEREFORD & WORCESTER

**Bromsgrove ARS:** 2nd & 4th Tuesdays. Lickey End Social Club, Alcester Road, Burcot, Bromsgrove. January 28 - Talk, February 11 - Technical topics from RadCom, 25th - Talk. Barry Taylor. (01527) 542266.

**Hereford ARS:** 1st & 3rd Fridays, 8pm. Many talks and interesting evenings including, February 7 - AGM, 21st - Informal evening. Tim G0JWJ, QTHR. Tel: (01432) 279435 or Paul G0DJF on (01432) 353765.

## HERTFORDSHIRE

**Harpenden ARC:** 1st Thursday of the month from September to May, at Aldwickbury School, Harpenden. Morse classes each Monday during term time. Further details from Peter 2E1BDB on (01727) 860631 or John G4JOV on (01582) 765821.

## ISLE OF MAN

**Isle of Man ARS:** 1st Mondays, 8pm Transport House, Fort St, Douglas. Other Mondays, 8.30pm, Royal Naval Assoc., Regent St., Douglas. Every Thursday, The Manx Legion, Peel, 9pm for an informal get together. Chris Wood GD6TWF, 2 Lyndale Avenue, Peel, Isle of Man.

## KENT

**Dover RC:** Wednesdays, 8pm to 10pm during term time. Duke of York's Royal Military School, Dover. Morse classes are held from 7pm to 8pm and Novice training courses are also conducted as required at that time. The club is in the course of registering as a C&G Exam centre and hopes to be operational as such in time for the May exams next year (1997). The club also operates a CB station and encourages practical project work. Brian Hancock G4NPN on (01304) 821007.

## LANCASHIRE

**Preston ARS:** Thursdays, 8pm. The Lonsdale Sports & Social Club, Fulwood Hall Lane, Fulwood, Preston. Eric Eastwood G1WCQ. (01772) 686708.

## NORTH YORKSHIRE

**Hambleton ARS:** All meetings held at Allertonshire School, Northallerton, 7.30 to 9.30pm. January 23 - AGM, February 6 - Video, 20th - Talk. More details from John GOVXH on (01845) 537547.

## NOTTINGHAMSHIRE

**South Notts ARC:** Wednesdays, 7pm. Meetings held (in term time) at Fairham Community College, Farnborough Road, Clifton Estate, Nottingham. Julie Brown GOSOU. (01509) 672734.

## SOMERSET

**Yeovil ARC:** Thursdays, 7.30pm. The Red Cross Centre, 72 Grove Avenue, Yeovil. January 23 - Microwave communications - Part 2 by G3TSK, 30th - Club station on air and committee meeting. Cedric White, QTHR. (01258) 473845.

## WARWICKSHIRE

**Mid Warwickshire ARS:** 2nd & 4th Tuesdays, 8pm. St Johns HQ, Warwick Div., 61 Emscote Road, Warwick. G8HRI on (01926) 424465.

**Stratford-upon-Avon & DRS:** 2nd & 4th Mondays, 7.30pm. Home Guard Club, Main Street, Tiddington, Stratford-upon-Avon. January 27 - Members' evening/demonstration of home-built equipment, February 10 - Kitchen table metal bashing by John Harris G8HJS, 24th - Test equipment, bring your equipment for checking. 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 YORKSHIRE

**Wakefield & DRS:** Tuesdays, 8pm. The Ossett Community Centre, Prospect Road, Ossett. January 25 - Annual dinner, 28th - On the air, February 4 - RAYNET, 11th - Rally preparation, 16th - Northern Cross Rally, 18th - on the air, 25th - Video show. Bob 0113-282 5519 or G3WWF@GB7WRG.

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.

# Grassroots



# Editorial

## Home Construction

In this issue I am once again propounding the joys of building your own equipment. The d.i.y. approach to radio offers a lot to the short wave listener. Not only will you have the thrill of using something that you have put together with your own hands - you will also learn much more about radio and how it works than you can by using the latest computer controlled black box. The 'SWM One-valve Project', described in the December '96 issue of SWM, seems to have stirred up a lot of interest and I am looking forward to receiving many pictures and logs from builders of the replica 'Denco Beginner's Simple Short Wave Receiver' who should be entering our competition.

## The Global Radio Guide

Short Wave Magazine readers and subscribers in the UK will find a free copy of the *Global Radio Guide* inside their magazine. This very useful little booklet provides a comprehensive and up-to-date listing of international broadcast stations. We are able to bring this publication to you as a result of close co-operation between *Short Wave Magazine* and The Association for International Broadcasting Limited.

**Dick Ganderton G8V FH**

# 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.**



### Dear Sir

I wonder if any SWM readers out there can help me. I've recently purchased a communications receiver, Benedix RATO. It is a valved set, there are eight thermionic devices in all. Unfortunately, the audio valve is suspect. Does anyone know where to get one from? I believe it's an ex RAF set. To the left is a large tuning wheel, below it is a b.f.o. switch, and in the centre is the waveband switch, no frequencies, just four red dots along the bottom, on/off volume r.f. gain and, antenna. Does anyone know of such a receiver and if so do they have any information?

**Stewart Leeming  
Rotherham  
S. Yorkshire**



### Dear Sir

I am a disabled short wave listener and when I am bed bound, there are times when I cannot lift my *World Radio TV Handbook* and my *Passport To World Band Radio*. Something had to be done, and I hope the following tip is of some use to other unfortunate s.w.l.s in the same boat.

Take a large transparent envelope, cut a square of white card to fit the envelope, rule the card across and also in columns for band, frequency, SIO and station, etc., both sides. When filling in the card, use every other line, that way you have space for other frequencies that one might obtain.

I have two transparent envelopes filled in with all the gen. I required when I cannot get up. My radio, a Sangean ATS803A, is on the bedside table and when I am propped up with piles of pillows, I can still work in comfort.

I have been trying to write to you and send you the above tip, but it is not very often that I write properly. Thank you and your staff for SWM. The date for next month's magazine can't come quick enough.

**E.S. Walden-Vincent  
Great Yarmouth**

## What is a Scanner?



### Dear Sir

It is becoming more and more obvious that many

people who should know better are commenting incorrectly on a subject of which they know little and I feel that some authority should make available a definitive description of what exactly a scanner is and what it is capable of.

The word 'Scanner' is a somewhat loose term used to describe many dissimilar devices in today's world of technology.

The scanner most lay people are probably familiar with is the supermarket Checkout Scanner which is used to scan the goods purchased. The data scanned is sent to the store computer which responds with the price and totals your bill. At the same time the product scanned is deducted from the store stock record and advises the manager when to order fresh supplies. The data scanned is used for many other useful bits of information which is another subject.

We also have the various 'scanners' used in the medical field for examining conditions inside the body. These use ultrasonic sound waves and their echoes are transformed by computer into pictures for the medical practitioners to interpret.

When considering radios, not a lot of people realise that the 'Scanner' principle is also used in everyday products such as television sets and VCRs. When being tuned to receive the various channels the set scans the relevant waveband until it receives an active signal which, if wanted, you then select and allot to the channel number of your choice.

A slightly more sophisticated scanning device is included in the circuitry of most car radios. Again initial tuning is carried out by scanning and selecting from the various wavebands the stations you want and assign to the pre-select buttons, but, in addition there is usually a special button which allows you to scan and select the strongest signal should you stray from the area for which your radio was originally tuned. The uninitiated usually do not realise that many Radio Stations can be received on different frequencies in different parts of the country and as you leave one area so the signal weakens.

Then we have the device about which a lot of

misinformation appears to be currently circulating - the multiband radio receiver.

Although having a much wider band of frequencies from which to select it is really not much different in the way it works to the other electronic devices already mentioned. Usually miniaturised into a hand-held receiver it is still simply a radio receiver and nothing more. As with other areas of modern technology the fact that it has a lot of automated (Computerised) functions tends to encourage the uninitiated to look upon it with suspicion and with some fear of its ability to intrude into what is often considered to be (quite wrongly) areas of confidentiality.

This latter subject is what I call the 'mobile 'phone phobia!'

Some people seem to believe that their analogue cellular 'phone should give them absolute protection and conveniently forget the crossed lines one gets on the traditional telephone system where anyone and everyone can and often do listen in to other people's conversations. This is particularly relevant to international telephone calls where it has been publicly stated that GCHQ monitor every 'phone call into and out of the country - a fact which seems to have gone unnoticed by most complainants of intrusion!

If such multiband radio receivers were to be (unnecessarily) banned I believe the authorities would be opening a flood gate in a number of respects. First of all the subject of compensation would I am sure amount to many millions (if not billions) of pounds if one considered an average price of £250.00 plus the cost of any supplementary equipment, antennas and speakers, etc., and any sets in shops and stores in addition to those already in private ownership and possibly an integral part of a computer. Next I am confident that manufacturers, already aware of the market potential, would rapidly develop a similar, non-scanning, manually tuned receiver which would retain all the other advantages and probably be more efficient than the 'Scanners' currently on the market! So the banning of scanners could very well prove to

be a very expensive waste of time!

I personally feel that scanner owners are providing a service by making people aware that any form of electromagnetic radiation is not secure from being intercepted. This includes mobile 'phones, cordless 'phones, walkie-talkies, next door's VCR and even baby alarms. I am sure that owners of baby alarms would be horrified if they knew their homes were wide open to anyone caring to listen in yet there is no warning of this when purchased.

When it comes to the criminal fraternity using scanners to combat police activities this is nonsense. A scanner, I imagine, is probably the most inefficient way of listening to police broadcasts - and, more to the point, we can't even ban guns, imitation or otherwise, knives, getaway vehicles, crash helmets, etc. Those materials and devices which are banned simply go underground. I rest my case!

**K. A. Robinson**  
Potters Bar  
Hertfordshire

#### Dear Sir

I was interested to read Dick Ganderton's observations regarding the decline of attendance at Radio Rallies, *SWM* September Editorial. For the past eight years I have had experience of Radio Rallies from both sides of the table, as a Trader and also as a customer.

The first few years were good. There were not a lot of Rallies, trading space was cheap and customers came to spend money. Everyone was happy!

But about three years ago I noticed a general decline and trade began to fall off quite rapidly. The people that used to spend money, i.e. those in employment, became more reluctant to buy anything as they faced the uncertainty of not knowing if they would have a job the following week.

This is turn brought about a feeling of apathy and the customer that used to frequent the Rallies became more of a sightseer. Indeed, many that I spoke to openly admitted that they only came to get away from the TV and meet friends or anyone who would stand and talk radio with them.

Now we have Rallies which are more akin to Company Trade Exhibitions staffed by sharp suited personnel standing behind banks of expensive 'black boxes' that very few people can afford to buy and

the 'little guy' selling bits and pieces of assorted radio gear at bargain prices, has virtually disappeared. There also seems to be an increasing amount of stalls selling a right 'dolly mixture' of items amongst which you will find dried flowers, toy cars, toffees and telephones.

This is quite ridiculous. Why these traders are allowed the facility within a Radio Rally is quite beyond me. What they are selling has absolutely nothing at all to do with Amateur Radio. Is it really necessary?

And to make matters worse, every Rally now suffers from an invasion of computers. Are the Computer Fairs so popular that these Traders can't get a place to do their business there?

As the general costs of living spiral ever upwards contrasting with wage settlements of between one and three percent for the majority, it is little wonder that people have become apathetic and disillusioned as they realise that the money which they have worked so hard for is now only providing an existence. Certainly customers attending Rallies now seem to have less money to spend than five or six years ago.

If there is to be a future for Radio Rallies in this country, then I sincerely believe that the only way is to make it attractive to Amateur Radio enthusiasts by making them a cheap way of selling and buying. To prove this point, go to any Rally and there are now only two types of trade doing any real business.

The Bring & Buy stand where customers will push and shove each other desperately seeking a bargain and at events with outdoor facilities, the 'car booters'. So, let's get rid of Toffee and Telephone Merchants and encourage the small traders back by offering them cheap and economically viable space in preference to the full time professional business trader.

If the 'Big Company' boys find this idea objectionable, then they should think very carefully because their future is far more dependant upon the success of Radio Rallies than the small time 'Ham Radio' trader.

**Paul Beckett**  
Nr. Crewe  
Cheshire

#### Dear Sir

I own a Racal RA17L receiver which being general coverage, responsive, simple to use, has given me hours of enjoyment. While using the receiver, I have wondered what the receiver's

history is.

Is there any way I can trace the receiver's history? The receiver's markings are as follows: Rear of chassis, Serial No N5346, Year SK. Front panel RAC2413, QL Year.

While reading through your excellent magazine, I have noted that there has been frequent mention of the RA17L, yet I can not recollect seeing any user group for Racal radios. Does one exist and if so what is their address?

I can't remember seeing any RA17L modifications, alterations, add-ons, etc., do they exist, do any of your readers have any, do you have any back issues showing these? I have just replaced the rectifier valve GZ34 due to failing emission. Is there a recognised solid state version which can be plugged into the valve holder without damaging or impairing the performance or modifying the set.

**I. G. Bennett**  
Whitley Bay  
Tyne & Wear

#### Dear Sir

Re: the film scale of my R210 receiver featured in *SWM* January 1990 by Tom Harrison GM3NHQ. I have just been able to build a converter for same with the kindly help of Bryan Robertson G4POL, Woodstock, Oxon, whose address you gave me four years ago.

However, I have now noticed that the film scale is damaged beyond repair and wonder if you or a member of your staff would be able to help me in finding a replacement. I seem to remember that this subject has been featured in your magazine a long time ago by one of your subscribers.

I also contacted J. Birkett of Lincoln, and he informed me that one of his clients had a replacement being made up by means of a photographic process, but he is unable to trace this gentleman. I do hope there is a way out of my predicament.

P.S. The size of the film is, 6ft by 70mm wide with a sprocket track running along the edges.

**W. J. Borgardts**  
Malvern  
Worcs.

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### Components for SWM Projects

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

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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.

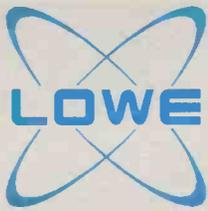
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We regret that due to Editorial time scales, replies to technical queries cannot be given over the telephone. If you require help with problems relating to topics covered by *SWM*, please write to the Editorial Offices, we will do our best to help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



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# nics Ltd



With the launch of our HF 150 short wave receiver, we set amazing new standards for performance against price. Despite a couple of price increases over the years, the HF150 still offers this superb value for money. No one

has come even close to meeting these standards, which shows why even after five years in the market, it is still the number one selling communications receiver and an ideal choice for those about to buy a new receiver but having to watch the pennies.

Frequency coverage of 30kHz to 30MHz includes all short-wave broadcast, marine aviation and amateur bands, and AM, USB and LSB modes mean that nearly all voice modes are covered. For those who like to listen to radio broadcasts rather than looking for exotic DX stations, the HF150 offers unrivalled audio quality via the selectable sideband synchronous detector and a special hi-fi filter setting. We know a number of customers using the '150 as a tuner in their hi-fi systems and that leads me to another of its qualities - the look. Honestly it will not be out of place in your living room, allowing the whole family to benefit from global transmissions with a rich content of music, culture and current affairs from around the world.

The SSB filter is selective enough to allow reception of utility stations like long-distance marine or Trans-Atlantic aviation and the ssb performance is also ideally suited to data modes like FAX, RTTY, and NAVTEX. Indeed a growing number of boat owners are specifying the HF-150 marine version together with our Modemaster software as an on-board weatherfax monitoring station.

The HF150 on its own will provide years of entertainment with enough performance to satisfy a huge number of listeners - there are nearly nine thousand of you out there already. We do however have a complete range of accessories to add operational convenience, like the KPAD1 keypad which allows direct frequency entry or selection of one of 60 memory channels. You can also add a backlight to the LCD, or carry case for portable operation and the IF150 interface can add computer control. By the way, it comes complete with a 12V mains power supply and has provision for battery operation too. These can be dry cells or built-in charging circuit can charge Ni-Cads if you wish.

If you want to improve performance at a later date then consider the matching PR150 pre-selector or AP150 audio processor and amplifier for improved selectivity and audio performance. There's even a neat-looking rack system to store all these items together!

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# Yupiteru MVT-9000

Alan Gardener recently fought his way through the crowd and got his hands on the very latest offering from Yupiteru. Here he reveals his findings.

**D**uring the last decade I have watched with interest the rapid development of hand-held scanners. From the first generation of not quite pocket sized receivers offering limited frequency coverage, slow search and scan speeds, poor sensitivity, heavy battery consumption and minimal operating features to the latest designs with features which would not have seemed possible, even just a couple of years ago.

The past few years have produced a distinct rivalry between two of the main manufacturers of scanning receivers, AOR and Yupiteru, as each takes it in turn to try and produce a more attractive product than its competitor. This has

generated a great deal of discussion between enthusiasts as they extol the virtues of each new model. AOR stole the show for some time with the AR8000, but now Yupiteru have launched the MVT-9000 which many people are expecting to be **the** hand-held scanner of 1997. I was lucky enough to be able to try one of the first to enter the UK and put it through its paces.

## External Appearance

I think the first thing that struck me was the styling of the MVT-9000 which reminded me of a hand-held cellular telephone. This is due to the slightly indented keyboard which curves in towards the centre in order to present a fairly constant key depression range across the face of the front panel. This makes the keyboard pleasant to operate and naturally guides the operators fingers towards the main keys. Above the keyboard is a custom l.c.d. display which consists of a dot matrix area which is used to display graphical and alpha-numeric data and above it a pre-defined text area which is used to display the main operational information. This gives much greater visibility of the display than would be possible with just a dot matrix type l.c.d. panel.

The upper part of the front panel is occupied by the loudspeaker grill, main power switch and

2nd function button. The left hand edge of the receiver has three small buttons to select the display and keyboard illumination, operate the monitor function and lock the keyboard and controls to prevent accidental operation. The right hand side of the case has sockets for an earphone and external 12V d.c. power supply whilst the top edge of the receiver has a BNC socket to connect an external antenna, volume, squelch and rotary tuning dial. The tuning dial is situated towards the extreme right-hand front edge of the panel and as such is fairly easy to operate, but I did find my finger catching the volume control on one or two occasions. The overall size of the unit is 66(w) x 175(h) x 40mm(d) including knobs. This makes it a comfortable fit in the palm of your hand.

My own preference would have been for it to be slightly smaller, but that would almost certainly have been at the expense of build quality.

## Well Built

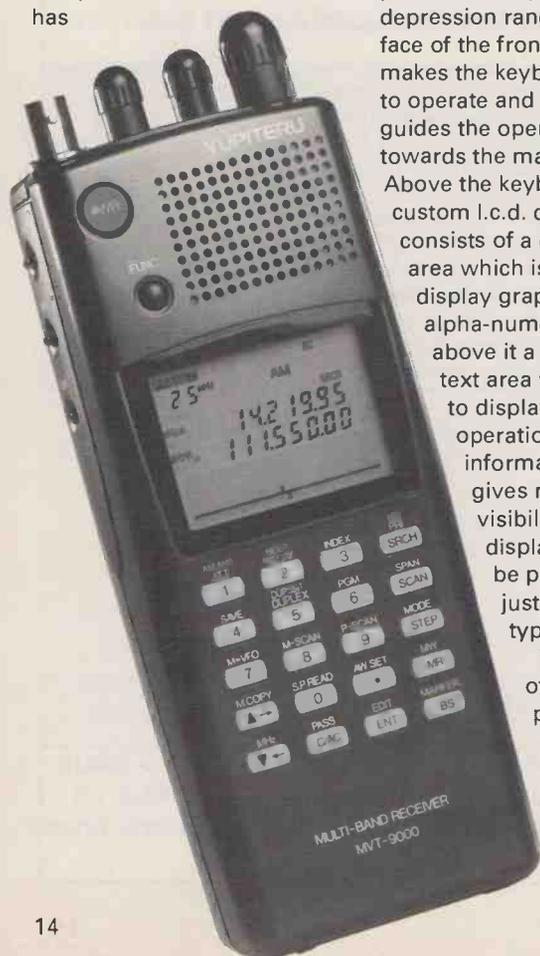
Internally the receiver is very well constructed with all the main receiver boards enclosed within a pressed metal enclosure. The control board is also screened and is linked to the receiver by means of a short flexible printed circuit board cable. Judging by the amount of internal electrical screening, Yupiteru have taken no chances with the design in order to ensure that it would pass the EEC EMC regulations, which are now mandatory before items can be CE marked and sold within the European community. This legislation is good news as it should ultimately reduce the number of spurious

emissions and electrical noise produced by electronic products which could otherwise ruin radio listening in urban environments.

## Main Features

The receiver is capable of tuning from 530kHz to 2039MHz in step sizes of 50, 100, 200, 500Hz 1, 5, 6.25, 8, 9, 10, 12.5, 15, 20, 25, 30, 50, 100 and 125kHz. It can receive n.b.f.m, w.b.f.m., a.m., narrow a.m., l.s.b., u.s.b. and c.w. The narrow a.m. mode being particularly useful for the reception of short wave stations in crowded broadcast bands. The unit has twin v.f.o.s, 1000 memory channels in 20 banks of 50, 20 search banks which are labelled A-J and a-j, all of which can be given up to a nine character long alpha-numeric name. The memory and configuration settings are stored in EEPROM memory so no worries about losing data when the batteries go flat. Like the AOR AR8000 the receiver has a bandscope - but more of that later.

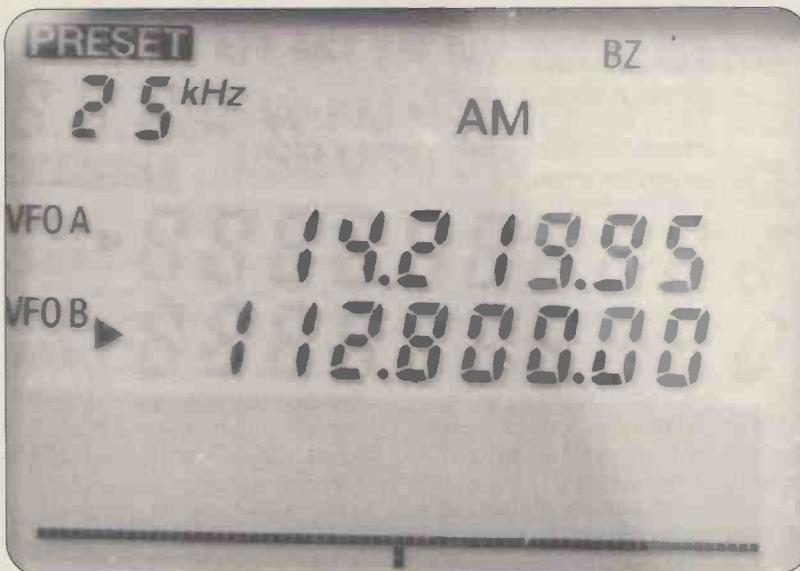
Yupiteru have also included a Duplex facility, which allows you to programme in a standard frequency offset. So if you are listening to duplex transmissions such as amateur radio repeater stations you can quickly check for the presence of local signals on the input frequency. The other method commonly used by scanner owners to perform this function is to programme base transmit and receive frequencies into adjacent memory locations. If a limited memory scan is then selected the receiver will tune to the base receive frequency once the base transmission has ceased or if the scan resumes. Unfortunately, the





## ►15 Receive Performance

Leaving the Bells and Whistles aside and concentrating purely on the reception of signals, I was pleasantly surprised by its performance on the short wave bands. Reception of a.m. broadcast stations and s.s.b. amateur and commercial signals with the supplied flexible antenna was very good, although replacing it with a 2-3m length of wire made a significant improvement. Connecting an external short wave long wire antenna was not quite so successful, as the large number of extremely strong broadcast signals present resulted in a cacophony of intermodulation distortion. Switching the internal attenuator on made a dramatic improvement and although a few spurious signals could still be heard I'm sure a bit more attenuation or the use of an external pre-selector would have solved this problem. I tried comparing the MVT-9000 with my dedicated short wave receiver by providing both with a feed from an active antenna. For the most part this produced



identical results, it was only under extremely crowded band conditions or in the presence of strong broadcast signals on adjacent frequencies that the dedicated short wave receiver showed its true worth. Performance on the medium wave broadcast band was very good for a receiver of this type, and the ability to switch off the internal ferrite rod antenna must make it attractive to listeners who would prefer to use a directional loop antenna on this band.

The v.h.f. and u.h.f. performance was also good with a measured receive

sensitivity of -117dBm (~0.3µV p.d.) @ 150MHz for 12dB SINAD n.b.f.m. and -108dBm (~0.9µV p.d.) @ 150MHz for 10dB S/N wide a.m., -110dBm (~0.6µV p.d.) @ 150MHz for 10dB S/N narrow a.m. The values didn't seem to vary across the main operating frequency ranges and would appear to be in line with previous Yupiteru models.

Although the figures are not sparkling, the actual performance seemed to be better than that indicated by the measured results. I can only assume that this is due to the characteristics of the recovered audio which had a

small amount of residual background noise present, even on very strong signals.

The intermodulation performance was adequate and varied slightly depending on the choice of frequencies. On average a measured 3rd order intercept point of -25dBm for a 100kHz frequency spacing was obtained, which is fairly typical for a modern design of this type. With an

external log-periodic antenna connected I did notice some spurious signals from local paging transmitters in the v.h.f. aircraft band but these were also observed on my base station scanner, so I shouldn't be too critical of the performance. Using the supplied antenna or a loft mounted broadband antenna I didn't notice any unwanted signals, so most users would probably not experience any problems unless they live in a major urban area or close to an amateur radio, p.m.r. or paging base station.

# SUMMARY

The MVT-9000 is a very attractive, wide frequency coverage scanning receiver offering good performance, particularly on the short wave bands. It is relatively easy to operate and provides a large number of features which most owners will find a use for. The Bandscope function is extremely interesting to watch, particularly when monitoring h.f. broadcast stations and propagation conditions change, although its usefulness as an aid to monitoring is somewhat limited.

I suggest that the lack of a computer or RS-232 port will be seen as a major limitation by

potential owners, many of whom would consider it to be an essential requirement on a top of the range model. This facility is especially useful when trying to maintain the contents of 1000 alpha-numerically tagged memories. In addition it would be nice if it was possible for more experienced users to be able to modify the internal bandplan and configuration details, as the values programmed into the review model were not ideally suited to the UK and any current allocations are liable to change as a result of new frequencies and modes being made available for commercial use.

I would definitely say that the MVT-9000 was worthy of being called Yupiteru's flagship handheld receiver, although its price and the competition from other manufacturers may influence many people's decision to buy one - only time will tell if this model is destined to become a Classic.

My thanks to **Waters and Stanton Electronics, 22 Main Road, Hockley, Essex SS5 4QS. Tel: (01702) 206835, Fax: (01702) 205843**, for the loan of the review model. The MVT-9000 has an RRP of £489.

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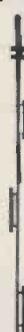
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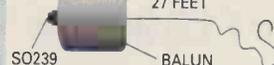
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# RADIO SECRET

David White G3ZPA explains how the source of enemy radio transmissions were detected during the war.

In 1943, near the RAF's famous eavesdropping radio station at Chicksands in Bedfordshire, was a small hut standing alone in a field next to the road to Clophill. In this hut sat a young girl waiting for a telephone to ring. It was a lonely existence, often with long periods of inactivity and she could be there at any time of the day or night, depending on what shift duty she was doing.

Due to the worry of putting young girls on their own in the middle of nowhere, the military authorities issued each girl with a loaded Webley revolver and told them to use it on the approach of anyone who could not identify themselves when challenged. The small team of girls who did a lone watch for each duty were members of the Womens Royal Naval Service (WRNS) and were there for a special purpose, this was to try and determine the direction from which enemy radio transmissions were emanating.

deeply in the ground and only surfaced inside the hut. These were fed into two stationary coils of wire located at right angles to each other.

A third coil, which was rotatable, was placed inside the other two coils and was connected by a metal shaft to an electric motor. When it was switched on, it would rotate this third coil at a predetermined speed inside the other two coils. The signal that was received in the antennas was fed direct to an American HRO communications receiver, to which a pair of headphones were attached. The signal was also fed into the Y-amplifier of a type OR2 oscilloscope.

On the spinning disc of the electric motor a small magnet was placed and upon every rotation of the motor, a pulse would be fed from this direct into the X-input of the scope. The signal could be observed directly on the screen of the scope and the face of the c.r.t. was graduated in degrees from 0 to 180. This meant that however short the

duration of the signal, the bearing could be read from the screen very precisely indeed. This

**How the bearing was seen on an oscilloscope.**



A group of WRNS at the Navy 'Y' Intercept Station in 1942.

system was known as the Marconi Spinning Goniometer.

## Frequency Intercepting

The procedure of the system's use was as follows: An intercept operator sitting at an HRO receiver in the Navy's wartime 'Y' service monitoring station at Scarborough would hear an enemy radio transmission, which he or she was unable to identify and would immediately advise the supervisor who was sitting at a control panel called the 'Concentrator'.

After checking with the operator, the supervisor would then decide if the transmission warranted location and accordingly would telephone the girl in the direction finding hut and advise her of the frequency on which they were

intercepting and to which she would immediately tune her own receiver.

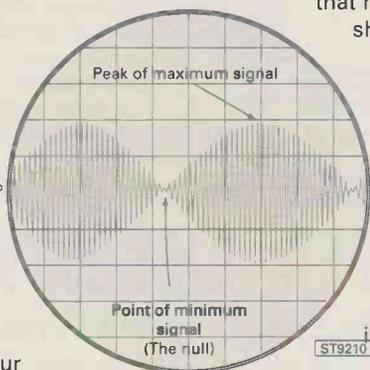
The supervisor would then throw a small switch on this control panel, which had the effect of diverting the signal heard on the operators receiver down a landline direct into the DF hut and into the right hand earpiece of the headphones of the DF operator. The operator would then search on the given frequency until the signal in the left hand earpiece of the headphones matched the one in the right hand earpiece, which was coming down the line.

## Exact Degree Bearing

In the meantime, the Spinning Goniometer had been switched on and the bearing of the required station was read directly on the oscilloscope by means of

## Strange Radio System

The hut was surrounded by a strange radio antenna system, which consisted of four vertical metal poles, which were known as Adcock antennas. The coaxial feeders to these poles were buried



# S OF THE WAR

finding the null or minimum signal, which was clearly displayed. The bearing in exact degrees was then relayed back down the telephone to the supervisor on the 'concentrator'.

Then, immediately, two further places would be advised of this, 1) the Admiralty in London and 2) the section known as 'control' at Bletchley Park. Once it had been determined whether the received signal was a new one that would be transmitting on a regular basis, a continuous watch would be kept and any signals heard were faithfully recorded and sent to the teleprinter room in the Scarborough station. It would then be sent to the Admiralty and into Hut 4 at Bletchley Park where decryption of the messages would take place.

## Friends Reunion

Peggy Sinclair was this particular young girl and she had been sworn to secrecy and never was told who or what she was listening to or what it was that she was attempting to locate. Her six friends were also WRNS and were part of the wartime eavesdropping service that spied on the enemy electronically. They were all based at the large Scarborough station. They too never knew what they were listening to as all the signals were coded five letter groups in German.

In 1995 the friends decided to hold a reunion for the first time since they were demobilised in 1945. It was difficult to arrange as they had all long since retired and lived in very widely separated locations all around the country, but

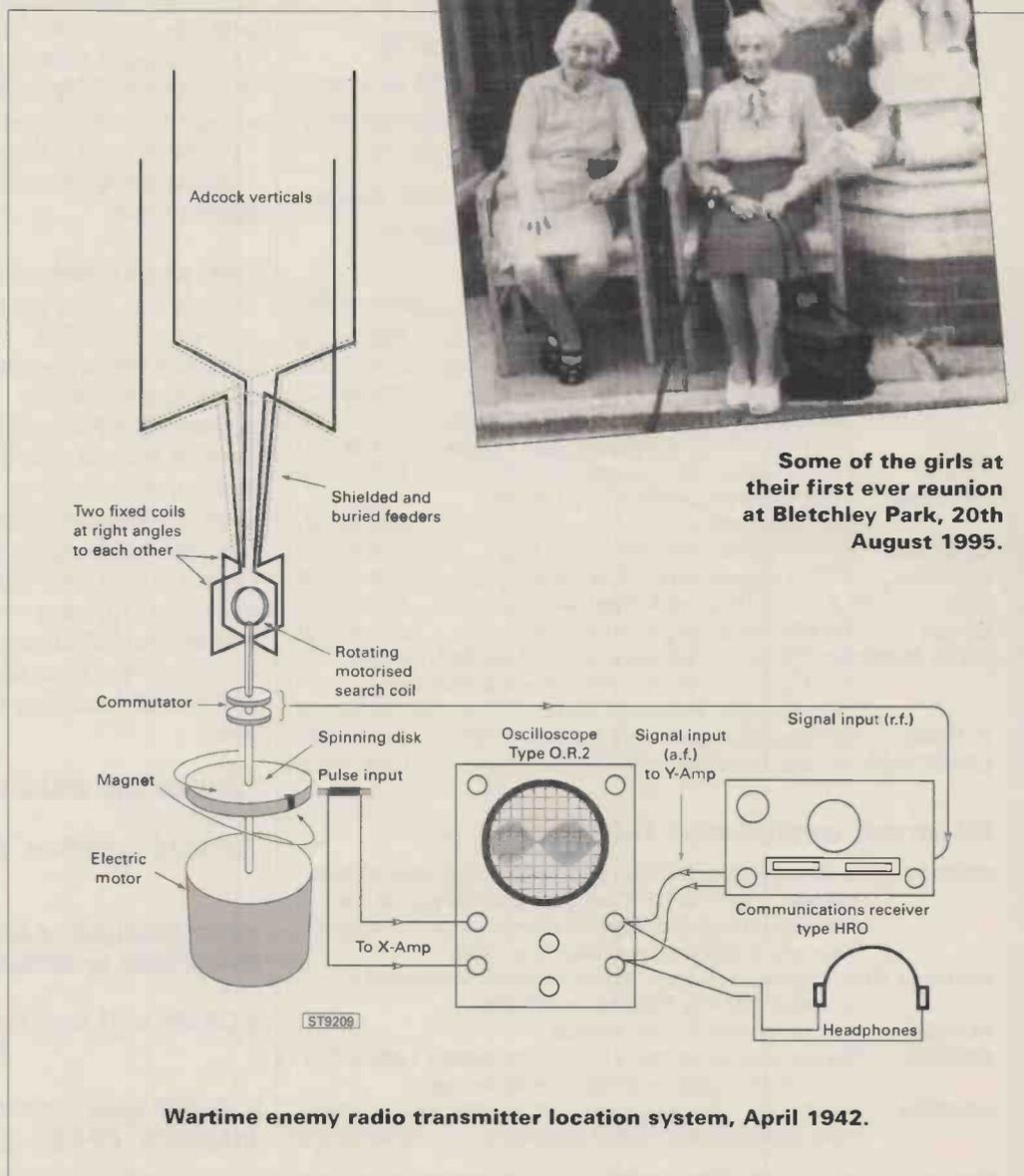
eventually, it was all organised and they decided they would visit the centre of wartime codebreaking operations.

So, on 20th August 1995 they visited Bletchley Park on a special Visitors' Day and were able to see at last just where the secret messages that they had so painstakingly intercepted during the war had been sent to and to find out exactly what was done with them.

They also found out for the first time in 50 years just what a vital contribution to the final Allied victory in 1945 that their hard and often boring work had been.



Some of the girls at their first ever reunion at Bletchley Park, 20th August 1995.



Wartime enemy radio transmitter location system, April 1942.



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built-in RS232 port and more. Innovative features include  
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power supply and illustrated operating manual.

### 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 .....£129.99 (£2)  
(daughter board recommended for fitting)
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### Planned options to follow:

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supplied with the NB7030 or FM7030
- SC7030 Soft carry case for the AR7030
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consideration and dependent upon demand
- SM7030 Service kit. Circuit diagrams, PC controlled alignment  
/ test disk supplied, RS232 lead etc .....£35.00 (£3)

## AR8000 - wide band hand-held receiver, affordable RRP £349

The **AR8000 UK** receiver is an all mode full featured wide band hand held receiver offering computer control and more... Frequency coverage is from 500 kHz - 1900 MHz without gaps with all mode reception... twin frequency display, alphanumeric text comments.

The **CU8232** is a compact interface unit measuring 75mm(W) x 30mm(H) x 123mm(D) and weighs 170g (approx). The interface permits computer control via the RS232 serial port of a computer and *clone of data* between two AR8000 receivers or two AR2700 receivers.

An additional piece of software will usually be required in order to address the computer's serial port with the correct set of parameters. If using an IBM-PC or clone (with 80386 processor or higher) Microsoft **WINDOWS** "TERMINAL" may be used to address the computer's serial port and configuration of "TERMINAL" is covered in the illustrated 50 page CU8232 operating manual (and 16 page AR2700-CU8232 supplement).

**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 £349.00**

**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)**



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

**Cyber Scan®**



RRP £1749  
*Now in stock...*

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 it's 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!

Government departments on both sides of the Atlantic have carried out extensive trials against rival units and we are pleased to find they are placing orders for the AR5000, good sensitivity at frequency extremes, excellent range of facilities, compactness & light weight leading to great flexibility in operation.

## **Bonjour, matelot...**

It was The Trawler Band on the radios of my youth. So were the great romantic radio names like Daventry and Hilversum but as we leave the medium-wave, radio takes a professional stance. British Telecom operate a network of Coastal Radio Stations to provide broadcast information to ships and radiotelephone services. In Europe, try for: Navigation warnings at 0603GMT and 0633GMT with a Weather Bulletin at 0703GMT. 0903GMT for Gale Warnings. Navigation warnings at 1003GMT and 1033GMT. Also at 1803GMT, 1833GMT, 1903GMT, 2103GMT, 2203GMT and 2233GMT on **1883KHz** or try **1856KHz**.

More weather and navigation information can be found at 0733GMT, 0903GMT, 9033GMT, 1333GMT, 1433GMT, 1733GMT, 1833GMT, 1933GMT, 2103GMT, 2133GMT and 2233GMT on **1834KHz**. A general weather forecast for shipping is also carried by Radio Four LW, a station we have never forgiven for scrapping "Sailing By" before the midnight bulletin. So great was the outcry they had to restore it, bless them...

Keep an ear on **2182KHz**: Coast Station Distress, Urgency and Calling. The listening mode is AM compatible USB. To get the best out of whichever mode is in use, use USB. AOR users will note that ships audio comes in a range of colours and sizes. It *is* them, not you. Listen here for weather updates, navigational warnings and the traffic list, a run-down of ships with calls waiting. Once a call has been made to the coast station, the operator will assign a clear frequency. In the golden days of yore, in a time before fishing quotas, the frequency would be announced in kilohertz. Now they use a simple letter code. Space does not allow the table here, but you can always get me at **bob@aor.co.uk**

I must go down to the sea again,  
To the lonely seas and the sky  
They've changed all the numbers for letters,  
Will somebody tell us why?

Ellis after Milligan after Masefield  
©Bob Ellis 1997

- Very wide frequency coverage 10kHz - 2600MHz
- All mode reception: AM, FM, USB, LSB & CW
- Automatic electronic preselection of the front end
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- NCO (Numeric Controlled Oscillator) with tuning steps down to 1Hz
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- SDU ready
- More, more, more...!



# Martelec MSR50 Weather Satellite Receiver

Lawrence Harris shakes down the latest offering in the dedicated WXSAT receiver market - a software controlled receiver for both PC and Amiga.

**W**eather satellite (WXSAT) receivers have a tough job tuning into the 137MHz band as it exists in the mid-nineties. There was a time, during the eighties, when almost any WXSAT receiver could be tuned between 136.00 and 137.99MHz and pull in a signal which, after demodulation, presented a full spectrum of the contents to the decoder, ready for picture production. Then along came pager units! These are activated, country-wide, by powerful transmitters, using officially allocated frequencies alongside the 137MHz band.

Leave a conventional scanner looking anywhere between 136 and 138MHz, and you are likely to hear the most awful shriek as the scanner receives the repeated transmissions. All WXSAT receivers have had to be modified to reject as high a proportion as possible of this unwanted signal. One possible consequence of this requirement for careful designing is that there are not many WXSAT receivers on the UK market.

Those receivers that exist incorporate special filtering and unusual bandwidth characteristics, and are sold to a limited market, a small percentage of the 'ham' market, where conventional scanners are popular. I take a particular interest in testing new receivers, when the manufacturers offer them for review!

The new model, the MSR50 from Martelec is described as a 'virtual' WXSAT receiver, because it is controlled by computer. This has significant advantages, offering the possibility of software upgrading instead of having to return the receiver for a hardware upgrade. The other side of the coin is that it requires a computer to operate.

## Connections

The MSR50 has five connectors, the power supply connector is a 2.1mm dia. d.c. socket and can take between 12 and 16V d.c., consuming 85mA, so battery operation is feasible. I used both mains transformer and battery supplies, without problems. The receiver power input is protected against accidental polarity reversal.

The input connector for the r.f. signal (the antenna), is a BNC socket, labelled antenna, and matched for 50Ω. Advice is given on the use of good quality 50Ω cable, and for maximum cable lengths for carrying the antenna feed down to the receiver. The receiver includes a link in order to supply voltage for a pre-amplifier, should this be required.

The third connection is a phono output to take the demodulated signal from the receiver. This can be connected to a



**Fig 1: External view showing connectors.**

suitable decoder, and, using an internal level control, has a fully adjustable output level that varies between 200mV and 2V p-p (peak-to-peak).

To control the receiver, a connecting lead joins it to either a PC (via the printer port) or to an Amiga. Controlling software for the receiver is included with the package, more on this shortly, together with a special offer at the end!

The remaining connector is an auxiliary input/output, multi-function port, which can be used for connection to the Martelec METEOSAT receiver (if you have

one), and can change channels under software control.

## Software Installation

The program which controls the receiver is supplied in both Amiga and PC formats and installs semi-automatically. I used a PC- 486DX2-66 - for these tests, installing the software in a new directory. The MSR program is mouse compatible; I operated it using mouse and keyboard without any problems.

## Screen Display

The receiver itself, see **Fig. 1** has little more than connectors and a volume control, the latter used to adjust the audio (monitor) level of the output signal. All the 'controls' are presented on screen, hence the description 'virtual'. Parameters are controlled either by the keyboard or by previously editing the configuration file.

The display, **Fig. 2** consists of two sections, the upper shows the virtual receiver with frequency display, channel selections, power switch, operating mode, 'l.e.d.' indicators and satellite mode. The right-hand side of the frequency display provides an indication of the signal strength in the form of a changing number of vertically stacked bars, the number of bars indicates the signal strength.

## Frequency Selection

Being totally software oriented, frequency selection can be programmed to your choice, between the limits of 136.50 and 141.50MHz. This upper limit actually permits the receiver to be used within a METEOSAT system, without the need to change channels via the down-converter!

It works as follows: using a METEOSAT down-converter, the normal connection would be from the antenna pre-amplifier (at 1691/1694.5MHz) to a receiver tuned to 137.50MHz. Switching between the METEOSAT channels would be done at the down-converter, which usually holds two

frequency synthesisers, one per channel.

Operating 1691.00MHz (A1) using a 137.50MHz setting, means that 1694.50MHz (A2) can be found with the setting at 141.0MHz. This permits scheduling of both METEOSAT channels to be performed without adjusting the down-converter.

The default configuration file (MSR50.cfg) includes each of the standard WXSAT frequencies in the 137MHz band, with spare slots occupied by 137.500MHz. There are ten available programmable channels numbered one through ten, and two (channels A1 and A2) for METEOSAT reception. Editing (changing the frequencies for routine use) is easily done, either using the built-in DOS editor 'edit', or by using any word-processor and remembering to save the file in DOS format (ASCII text).

When running, individual frequencies can still be adjusted using either the mouse (click the increment and decrement icons), or the left/right cursor keys. New frequencies are also saved automatically to the configuration file (MSR50.cfg) by pressing 'W' on the keyboard, and this is probably the easiest method.

The 'msr50.cfg' file also allows editing of the parameters RXGEOTYPE and LPTPORTNUMBER; the first used to control METEOSAT reception, the other is unlikely to be changed unless you plan to add a second parallel port to your computer, just to control the receiver.

Below the frequency display is a screen guide to key presses. These avoid the use of a mouse, should you prefer. Key presses include channel selection and cycling, mode change, a.f.t. (automatic fine tuning), power on/off and quit. The automatic fine tuning (a.f.t.) function, monitors the incoming signal and corrects for drift by re-tuning in 2.5kHz steps.



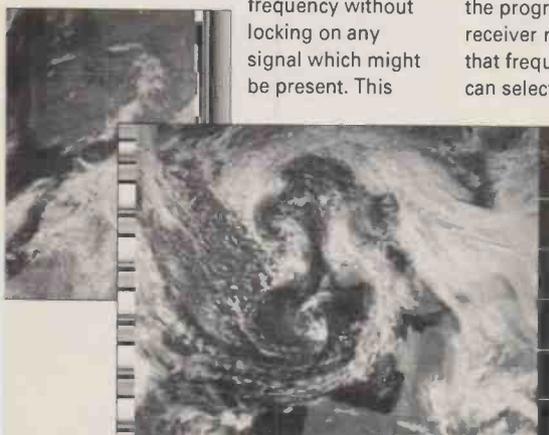
**Fig 2: Screen shot of control software.**

## Operation

For powering the unit I first used a 12V d.c. supply, then a conventional main p.s.u. Using a suitable antenna, a right-circularly phased, crossed dipole is recommended for WXSATs, the receiver can be set in one of three modes: single frequency, SCAN or SEEK mode. Mode change is accomplished by pressing 'M' on the keyboard, or using a mouse and clicking on 'mode'.

SEEK steps through each of the programmed frequencies until a signal is detected, and then locks to that frequency. SCAN simply steps through each

frequency without locking on any signal which might be present. This



Sample images decoded whilst using the MSR50.

proved a problem from my location because the signal indicator showed the presence of noise regardless of frequency.

There is no external or software 'squellch' adjustment to change this level. Ideally, the SEEK option should be held by the detection of the 2.4kHz sub-carrier, which would only respond to WXSAT signals. The latest version, V1.1 of the software provides a 'bell' from the computer's speaker, to alert the operator when a signal is present. This allows the volume control to be left off if required.

I have two WXSAT antenna feeds, one from the crossed-dipole on the roof, and one from a similar antenna positioned on a much shorter mast, just a few metres above ground level. Using the lower one I connected

the receiver to monitor both METEORs and the NOAA birds.

As mentioned, a computer is essential to control the receiver, but once a frequency is selected, the program can be exited and the receiver remains operational on that frequency. By this means one can select the appropriate

frequency for the next pass, exit the MSR program, then load-up a suitable decoding program.

The receiver is fully compatible with the JVFAX software, which provides a DOS shell, consequently the receiver can be re-tuned without leaving the program. JVFAX

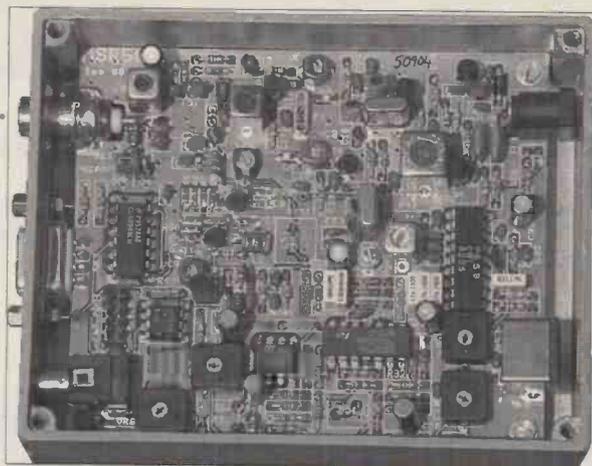
requires the use of a decoder, and on this occasion, Martelex provided me with the latest version of their JVFAX decoder, the JVF2 interface.

To produce images containing a complete range of grey scales, the signal from the receiver to the decoder must be adjusted to a suitable level, and that from the decoder to the computer similarly optimised. The output from the receiver can be adjusted between 0.8V p-p (peak-to-peak) and 4V p-p.

Adjustment is made by removing the back cover from the receiver and turning a potentiometer inside the box. A diagram is provided, making identification easy. A miniature screwdriver is required for this adjustment. Using the screen level monitor provided with my current decoding software, I made the necessary adjustment within a few seconds.

## Results

By monitoring a number of WXSATs during a period of a few days, I quickly established that the receiver worked well, perhaps rather better than my own receiver which dates back to the late eighties. I saved images from



The 'guts' of the receiver.

METEOR and NOAA satellites, and examined them closely after the passes. Interference was usually minimal, resulting in clean pictures, limited more by the decoding software which is now a little old.

## Technical Information

The manual supplied with the receiver is more than adequate, providing a comprehensive description of the circuitry and principal components, for example the Plessey SL6444 front-end integrated circuit is identified. The process by which the received signal is analysed, is described.

Interestingly, the first i.f. (165MHz) is actually higher in frequency than the incoming signal. The local oscillator frequency (137 + 165) is 302MHz,

which places greater demands on the synthesiser, but produces improved responses for the receiver.

## An Invitation From Martelex

Chris Pretty of Martelex is inviting third parties - individuals and companies - to write control software for the MSR50. This offer means that anyone prepared to write software for non-mainstream computers, such as the Archimedes, (or any computer) can obtain all the necessary information from Martelex. This offer also applies to other WXSAT equipment manufacturers who might wish to incorporate the MSR50 into their own systems - even rebranding the receiver! This seems to be a remarkable offer which can be taken up by any enthusiast wishing to develop a custom program.

My thanks to **Chris Pretty of Martelex Communication Systems, The Acorns, Wyck Lane, East Worldham, Alton, Hants GU34 3AW** for supplying the receiver and decoder, and for the opportunity to announce an unusual offer.

## Specifications

The principle receiver specifications are as follows:

Type:	Triple conversion superhet (i.f.s of 165MHz, 10.7MHz and 455kHz)
Frequency Range:	136.5MHz to 141.5MHz approx.
Tuning:	Computer controlled - 2.5kHz (a.f.t. mode) 5kHz in manual mode
Selectivity:	-90dB
Noise Figure:	<3dB
Sensitivity:	-118dBm for 12dB SINAD ( $\pm$ 17kHz modulation) -114dBm for 20dB SINAD (as above)
Input impedance:	50 $\Omega$
IF Bandwidth:	165MHz: $\pm$ 50kHz; 10.7MHz: $\pm$ 30kHz; 455kHz: $\pm$ 25kHz
APT Bandwidth:	900Hz to 4000kHz
Input power:	12 to 16V d.c. and 85mA
Dimensions:	120 x 95 x 50mm.

## Further Options

Apart from the MSR50 receiver, Martelex supply a number of accessories including: MSC30 Low noise downconverter, IMR50 Integrated METEOSAT/GOES receiver MSY50 1.7GHz Loop Yagi antenna for METEOSAT/GOES reception and a range of further hardware for the a.p.t. hobbyist. Details from Martelex on (01420) 827520.

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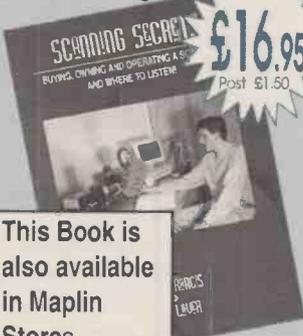


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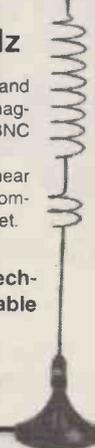
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# When 'Megahertz' Isn't Enough

A quick look at microwave antennas with Joseph J. Carr K4IPV.

The microwave bands were once beyond the capability of everyone except commercial and government users, save only a few eccentric and/or wealthy hobbyist. But with the advent of technologies such as TVRO and DSS satellite TV, and various local wireless communications services, the microwaves are open to a wider variety of users. Even relatively inexpensive scanner receivers used by communication hobbyists operate to 1.3 or 2GHz, and TVRO devices operate to Ku-band (14GHz). The microwaves are different from the lower frequency bands. One major reason is that wavelengths are so short that antenna types that are impossible at lower frequencies become the antennas of choice. In this article we will take a look at several different microwave antennas.

## The Microwave Bands

The microwave bands began to get well used during World War II when Allied forces began using them for radar and other purposes. German aircraft attacking Britain and allied submarines in the Atlantic were quite unprepared for 'centimetric radar' (a reference to the wavelengths of microwave

signals). To keep security, the forces used a letter designation system to label the various microwave bands. The security aspects are no longer a factor, but the practice of labelling the various bands continues. The various literature includes references to the old (US) military, the new (US) military and the IEEE band designations, which are given in **Tables I** through **III**, respectively.

**Table I:**  
**Old US Military Band Designation**

Designator	Frequency Range
P	225-390MHz
L	390-1550MHz
S	1.55-3.9GHz
C	3.9-6.2GHz
X	6.2-10.9GHz
K	10.9-36GHz
Q	36-46GHz
V	46-56GHz
W	56-100GHz

**Table II:**  
**New US Military (post 1970) Band Designation**

Designator	Frequency Range
A	100-250MHz
B	250-500MHz
C	500-1000MHz
D	1-2GHz
E	2-3GHz
F	3-4GHz
G	4-6GHz
H	6-8GHz
I	8-10GHz
J	10-20GHz
K	20-40GHz
L	40-60GHz
M	60-100GHz

**Table III:**  
**IEEE Band Designation**

Designator	Frequency Range
HF	3-30MHz
VHF	30-300MHz
UHF	300-1000MHz
L	1-2GHz
S	2-4GHz
C	4-8GHz
X	8-12GHz
Ku	12-18GHz
K	18-27GHz
Ka	27-40GHz
millimetre	40-300GHz
Sub-mm	Above 300GHz
	0 to infrared

## Horn Antenna Radiators

The horn radiator is basically a tapered termination of a length of waveguide (see **Figs. 1a - 1c**) that provides the impedance transformation between the waveguide impedance and free space impedance. Horn radiators are used both as antennas in their own right and as illuminators for reflector antennas. Horn antennas are not a perfect match to the waveguide, although standing wave ratios of 1.5:1 or less are achievable.

The gain of a horn radiator is proportional to the area (A) of the flared open flange (A = ab in **Fig. 1b**), and inversely proportional to the square of the wavelength:

$$G = \frac{10 A}{\lambda^2}$$

Where:  
A is the flange area and  $\lambda$  is

the wavelength (both in same units)

The -3 dB beamwidth for vertical and horizontal extents can be approximated from:

Vertical:

$$\theta_v = \frac{51\lambda}{b}$$

Horizontal:

$$\theta_h = \frac{70\lambda}{a}$$

Where:

$\theta_v$  is the vertical beamwidth in degrees,  $\theta_h$  is the horizontal beamwidth in degrees, a, b are dimensions of the flared flange and  $\lambda$  is the wavelength.

A form of antenna related to the horn is the cavity antenna of **Fig. 2a**. In this type of antenna a quarter wavelength radiating element extends from the waveguide or transmission line connector into a resonant cavity. The radiator element is placed one-quarter wavelength into a resonant cavity; and is spaced quarter wavelength from the rear wall of the cavity. A tuning disk is used to alter cavity dimensions in order to provide a limited tuning range for the antenna. Gains to about 6dB are possible with this arrangement.

Some years ago, when I was in engineering school,

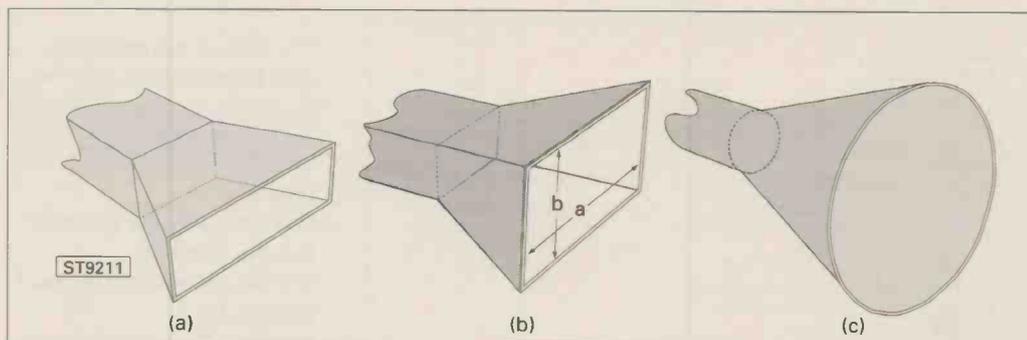


Fig 1.

a popular project amongst some of the more adventurous students was picking-up television signals distributed via microwaves to apartment house and office buildings (for a fee, of course). Some fellows were also interested in picking-up the police speed radar, which operated at 2.455GHz in those days. A common

The antenna pick-up unit can be a small 20-30mm loop soldered between the centre conductor of the BNC connector and the tin. In the students' case, however, a local oscillator signal was passed up the coaxial cable to the antenna, where the diode shown in Fig. 2b downconverted the signal to a u.h.f. television

because of the short wavelengths involved. Reflectors are theoretically possible at lower frequencies, but because of the longer wavelengths the antennas would be so large that they become impractical. Several forms of reflector are used (Figs. 3 and 4). In Fig. 3 we see the **corner reflector**

Figure 4 shows several other forms of reflector surface shape, most of which are used in assorted microwave applications. The version in Fig. 4a is the full paraboloid antenna, which is a near-hemisphere, although of parabolic shape. This is the antenna normally seen as 'dish' antennas for TVRO or DSS. The truncated paraboloid antenna of Fig. 4b is used in many maritime and naval surface search radar antennas. The truncated paraboloid of Fig. 4c is used for radar height finding equipment. Other paraboloids are the orange peel (Fig. 4d) and cylindrical-paraboloid of Fig. 4e.

### Parabolic 'Dish' Antennas

The parabolic reflector antennas is one of the most widespread of all microwave antennas, and is the type that normally comes to mind when thinking of microwave systems. This type of antenna derives its operation from physics similar to optics, and is

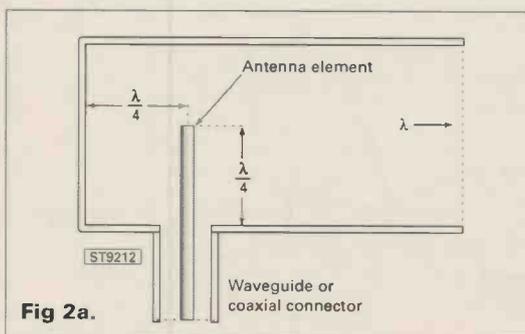


Fig 2a.

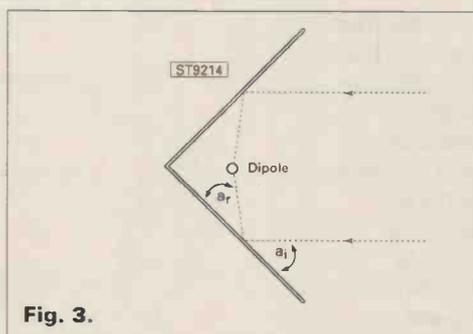


Fig. 3.

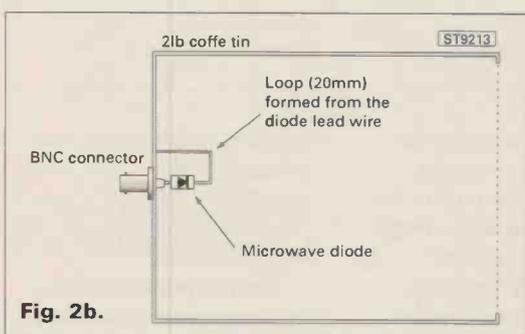


Fig. 2b.

channel. It's a good thing that u.h.f. television receivers in that era used continuous tuners because the local

antenna, which is used primarily in the high-u.h.f. and low-microwave region. A dipole element is placed at the 'focal point' of the corner reflector, so receives in-phase the reflected wavefronts from the surface. Either solid metallic reflector surfaces or wire mesh may be used. When mesh is used, however, the holes in the mesh must be  $\lambda/12$  or smaller.

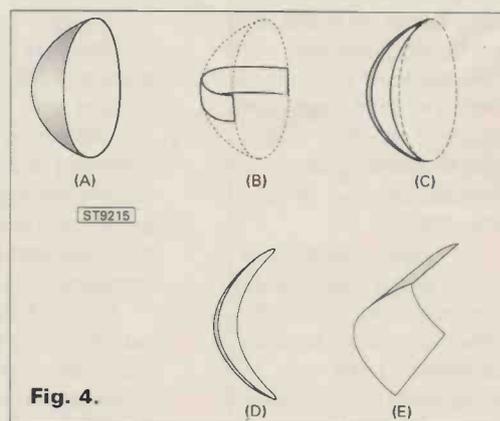


Fig. 4.

possible because microwaves are in a transition region between ordinary radio waves and either infrared or visible light.

The dish antenna has a paraboloid shape as defined

solution was to use the 'coffee tin antenna' of Fig. 2b. This antenna is related to the cavity style, but it uses a discarded metal coffee tin as the cavity. We found that the two pound American size tin gave around 6dB gain for little effort, as nearly as we could measure it.

oscillator frequencies generated by students was not accurate enough to fit into an existing legal TV channel...but it worked.

### Reflector Antennas

At microwave frequencies it becomes possible to use **reflector antennas**

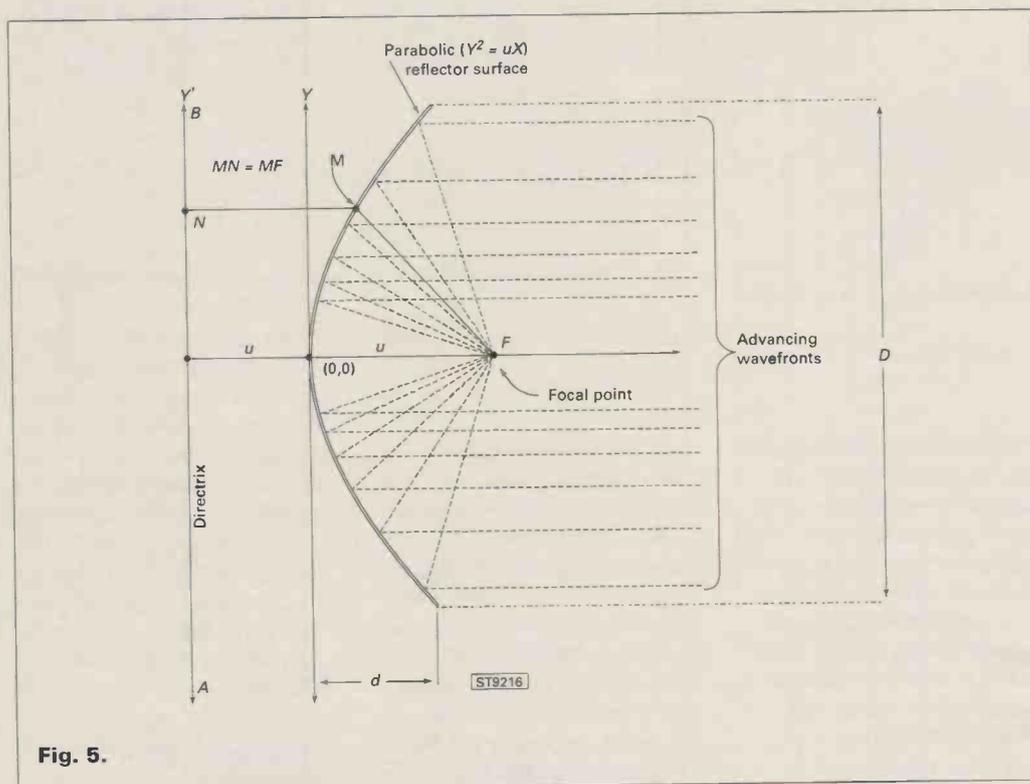


Fig. 5.

by Fig. 5. In this figure the dish surface is positioned such that the center is at the origin (0,0) of an X-Y coordinate system. For purposes of defining the surface we place a second vertical axis called the **directrix** (Y') a distance behind the surface equal to the focal length ( $\mu$ ). The paraboloid surface follows the function  $Y^2 = 4\mu X$ , and has the property that a line from the focal point (F) to any point on the surface is the same length as a line from that same point to the directrix (in other words,  $MN = MF$ ).

If a radiator element is placed at the focal point (F), then it will illuminate the reflector surface, causing wavefronts to be propagated away from the surface in-phase. Similarly, wavefronts intercepted by the reflector surface are reflected to the focal point.

**Gain.** The gain of a parabolic antenna is a function of several factors: dish diameter, feed illumination, and surface

accuracy. The dish diameter (D) should be large compared with its depth. Surface accuracy refers to degree of surface irregularities. For many commercial antennas  $\lambda/8$  surface accuracy is usually sufficient, although on certain high performance antennas the surface accuracy specification must be tighter ( $\lambda/12$ ).

The feed illumination refers to how evenly the feed element radiates to the reflector surface. For circular parabolic dishes a circular waveguide feed produces optimum illumination, while rectangular waveguides are less than optimum. The  $TE_{11}$  mode is desired. For best performance the illumination should drop off

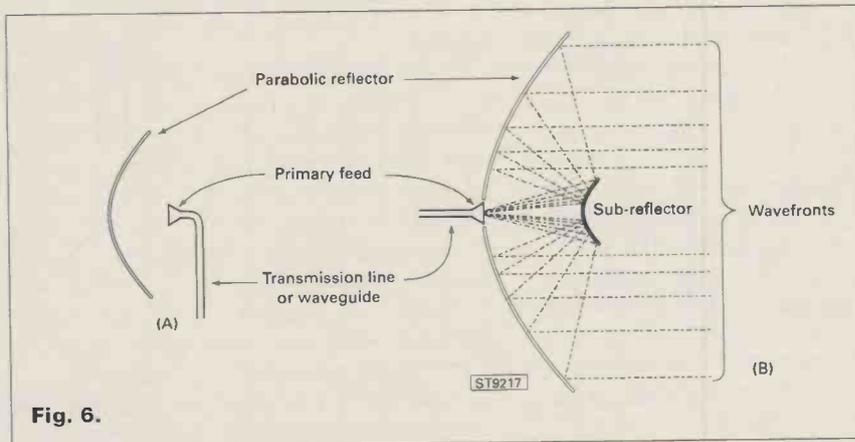


Fig. 6.

evenly from the centre to the edge, with the edge being -10 dB down from the centre. The diameter, length and beamwidth of the radiator element or horn must be optimised for the specific F/d ratio of the dish. The cut-off frequency is approximated from:

$$f_{\text{cutoff}} = \frac{175698}{d_{\text{mm}}}$$

Where:  
 $f_{\text{cutoff}}$  is the cutoff frequency  
 d is the inside diameter of the circular feedhorn in millimeters (mm)

The gain of the parabolic dish antenna is found from:

$$G = \frac{k(\pi D)^2}{\lambda^2}$$

Where:

G is the gain over isotropic  
 D is the diameter  
 $\lambda$  is the wavelength (same units as D)  
 k is the reflection efficiency (0.4 to 0.7, with 0.55 being most common)

The -3 dB beamwidth of the parabolic dish antenna is approximated by:

$$BW = \frac{70 \lambda}{D}$$

and the focal length by:

$$f = \frac{D^2}{16d}$$

For receive applications the effective aperture is the

relevant specification, and is found from:

$$A_e = k\pi \left(\frac{D}{2}\right)^2$$

The pattern radiated by the antenna has sidelobes which tend to be 23 to 28dB below main lobe, or 10 to 15dB below isotropic. It is found that 50% of the energy radiated by the parabolic dish is within the -3dB beamwidth, and 90% is between the first nulls on either side of the main lobe. If a dipole element is used for the feed device, then a **splash plate** is

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placed  $\lambda/4$  behind the dipole in order to improve illumination. The splash plate must be several wavelengths in diameter, and is used to reflect the backlobe back toward the reflector surface. When added to the  $\lambda/2$  phase reversal inherent in the reflection process, the two-way  $\lambda/4$  adds another half wavelength and thereby permits the backwave to move out in-phase with the front lobe wave.

## Parabolic Dish Feed Geometries

The diagram **Fig. 6** shows two methods for feeding parabolic dish antennas, regardless of which form of radiator (horn, dipole, etc.) is used. In **Fig. 6a** we see the method in which the radiator element is placed at the focal point, and either waveguide or transmission line is routed to it. This method is used in low-cost installations such as home satellite TV receive only (TVRO) antennas.

In **Fig. 6b** we see the **Cassegrain feed** system. This system is modelled after the Cassegrain optical telescope. The radiator element is placed at an opening at the centre of the dish. A hyperbolic sub-reflector is placed at the focal point, and is used to reflect the wavefronts to the radiator element. The Cassegrain system results in lower noise operation because of several factors: less transmission line length, lower sidelobes, and the fact that the open horn sees sky instead of earth (which has lower temperature); on the negative side, galactic and solar noise may be slightly higher on a Cassegrain dish.

**Monopulse feed geometry.** In the system a

pair of radiator elements are placed at the focal point, and fed to a power splitter network that outputs **sum** and **difference** signals. When these are combined the resultant beam shape has improved -3dB beamwidth due to the algebraic summation of the two.

## Microwave Antenna Safety Note

Microwave r.f. energy is dangerous to your health. Anything that can roast beef can also cook you! Although not normally dangerous on receive only systems, people connecting transmitters, even low power transmitters, should be very careful. Even 100mW police speed radars have been implicated in health risks to police officers. In one US state, a study showed that male traffic police were many times more likely to acquire testicular cancer because of their unfortunate habit of placing the radar gun in their laps when not immediately needed. Unfortunately, the standard police radar handheld unit of that time was a continuously operating Gunn diode oscillators. More modern units operate only when a trigger button is pressed.

The US Government sets a safety limit for microwave exposure of  $10\text{mW}/\text{cm}^2$  averaged over six minutes; some other countries use a level one-tenth of the US standard or less. The principal problem is tissue heating, and eyes seem especially sensitive to microwave energy. Some authorities believe that cataracts form from prolonged exposure. Some authorities also believe that genetic damage to offspring is possible, as well as other long-term

effects due to cumulative exposure.

One time some years ago I was involved with airborne radar equipment. We had a customer who wanted to mount a strong radar unit on the roof of an aircraft. My task was to contact a friend who was a leading expert on the effects of microwave energy on biological tissue. Our question was "whether this field intensity might cause cataracts in the air crew members?" His reply was: "**No, don't worry about the air crew getting cataracts from long term exposure. At those power densities their eyes will explode a long time before cataracts develop!**"

Because of their relatively high gain, microwave antennas can produce hazardous field strengths in close proximity **even at relatively low r.f. input power levels.** At least one technician in a TV satellite earth station suffered abdominal

adhesions, solid matter in the urine and genital disfunction after servicing a 45m diameter 3.5GHz dish antenna with r.f. power applied.

Be very careful around microwave antennas. Do not service a radiating antenna. When servicing non-radiating antennas be sure to stow them in a position that prevents inadvertent exposure to humans should power accidentally be applied. A **Radiation Hazard** sign should be prominently displayed on the antenna. Good design practice requires an interlock system that prevents radiation in such situations. 'Hot' transmitter service should be performed with a shielded dummy load replacing the antenna. ■

**Again Joe has written a Windows program to assist with the calculations pertaining to this article. If you would like a copy of the software, then send two pound coins taped to a piece of card addressed to Short Wave Magazine, When MHz S/W, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. In return we will send you a PC formatted 3.5in floppy disk containing the installation files. Don't forget to include the return address. Please allow 21 days for delivery.**



# HEARD ALL CON

*In his search for a suitable design for the SWM One-valve Project Editor, Dick Ganderton, looked at the HAC 'K' model before settling on the Denco design.*

The idea for the SWM One-valve Project (December '96) came originally from Ron Pearce. He suggested that he build and describe a replica of the HAC 'K' design, using the 1T4 valve, but replacing the Denco 'Green Range' of coils used in the original design with suitable home wound coils, the Denco coils having long since gone out of production.

In the meantime, however, Ronnie Allwright had started his nostalgia trip and was once again making Denco coils on the original Denco machinery. I arranged to visit both Ronnie at Clacton and Ron at Bungay to see what the chances were of using Denco coils in the project.

Ronnie had already been in contact with Ron Pearce, but he also told me that he had

had some correspondence with the former 'Chief Engineer' of HAC - a certain C.M. Lindars. To cut a long story short, it was decided to use the original Denco design, rather than the HAC 'K' mainly for copyright reasons - Ronnie Allwright was more than happy to give his blessing for the original Denco 'words and music' to be used.

On my return to the office I dug into the magazine's filing system and located the file on C.M. Lindars. He had written two or three constructional articles and they had been published in SWM! But, although we had corresponded and even talked fairly regularly over the telephone, he had never once mentioned his former association with HAC. A visit was obviously called for and was quickly arranged.

## HAC - Heard All Continents

HAC was established in 1935 by a bright young lad called Arthur Baccus, who found that he could sell his designs in kit form. The original HAC 'DX' kit used an AR8 valve, Denco 'Octal' plug-in coils and was supplied complete with everything needed to build the set - all the constructor had to provide was the time and, of course, tools.

Arthur Baccus died in 1974, his widow continuing to run HAC. Encouraged by his wife, C.M. Lindars answered her

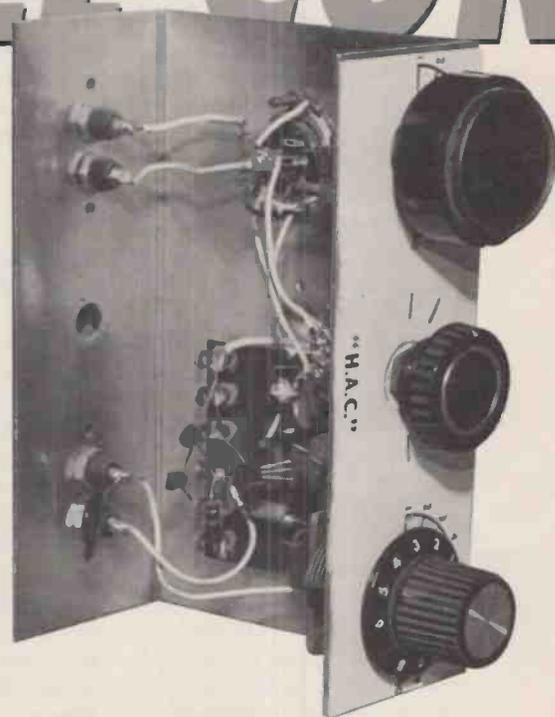
advertisement for an 'engineer and consultant', and got the job, which he carried out in his spare time until the cost of the high quality components used in the kits priced them out of the market and HAC closed for good in 1983.

When a constructor purchased one of HAC's kits he also got the HAC pledge that they would make sure that his set worked. If it failed to work he could return it to HAC and they would sort it out - free of charge!

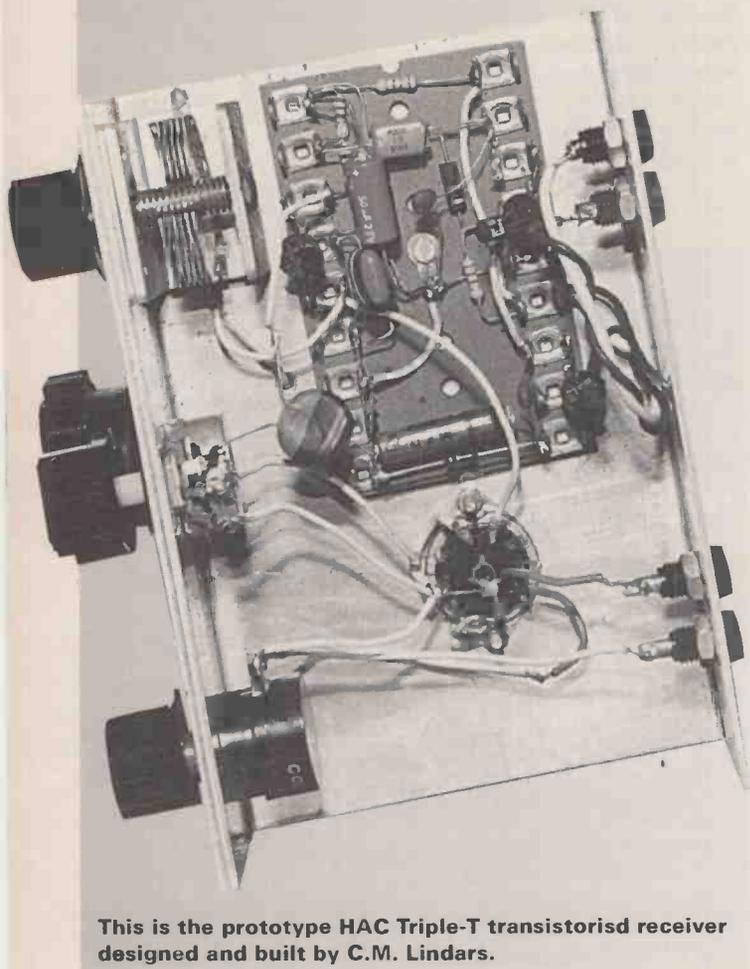
Of course, this meant that C.M. Lindars was going to spend many a long hour in the evenings and weekends answering queries or rectifying the mistakes of many a ham-fisted builder. Often it was quicker and easier to simply strip everything out of the chassis and rebuild it from scratch!

## Into The Transistor Age

With transistors rapidly ousting valves it was decided that HAC needed a



**The prototype HAC T-Twin.**



**This is the prototype HAC Triple-T transistor receiver designed and built by C.M. Lindars.**

# ITINENTS

transistorised model to replace the Model 'K'. C.M. Lindars designed the 'T-Twin' model. This used one field effect transistor (f.e.t.) together with a bipolar transistor and the Denco DP range of coils. To use up HAC's stock of components and so keep the costs down, the 'T-Twin' used as much as possible from the 'K'. All the components, including the transistors, were tested before being packed into kits. The f.e.t.s were tested and sorted into two groups - those that would work with the component values supplied with the kit and those that wouldn't. Later on a special batch of kits, with suitably revised resistor values, were issued to use up the second group!

As well as the 'T-Twin' he also designed the 'Triple-T' - the 'T-Twin' with an extra audio amplification stage. Other kits produced by HAC included an 'Aerial Tuning Unit' and a 'battery

eliminator'. This was a mains driven power supply that replaced the 90V h.t. battery needed for the 'K' one-valver.

## Tesla Coils

C.M. Lindars still enjoys making things. While we were in his workshop he proudly showed me the many receivers that he had made, both to his own designs and those of his friend, Sir Douglas Hall, Bart. - a name that older readers of the erstwhile *Radio Constructor* magazine will remember well.

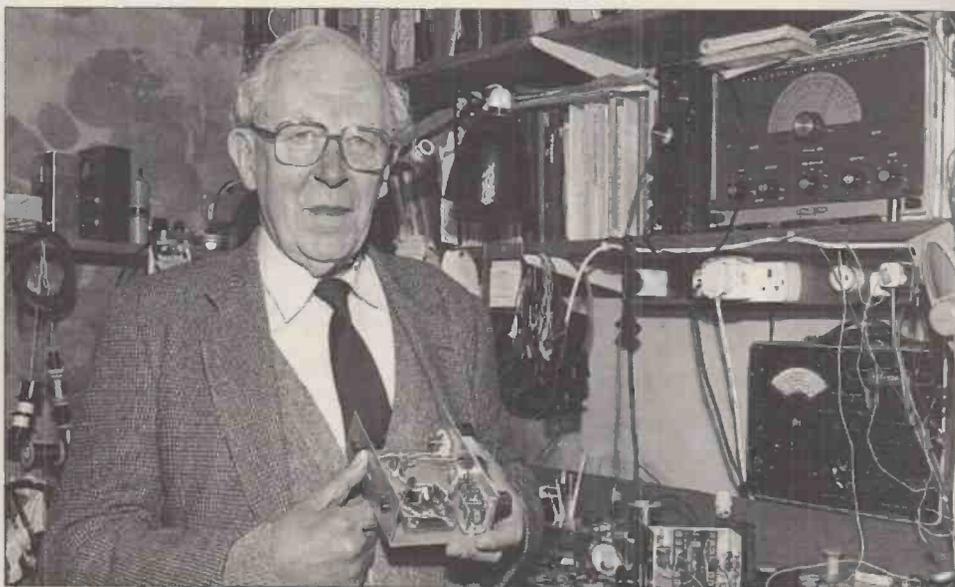
But the highlight of my visit was to see his two home-made Tesla Coils in action. These awesome devices are capable of producing very high voltages. Built from the contents of his 'parts box', the smaller version uses a motor cycle ignition coil to supply the low tension side of the Tesla Coil! The larger model has its low tension provided by a TV fly-back transformer. On both versions, the action

of the low tension circuit on its own is spectacular enough, with a spark jumping an air gap of about 10mm! The discharge from the ball on top of the main column is incredible - as you would expect with a potential of around half a million volts!

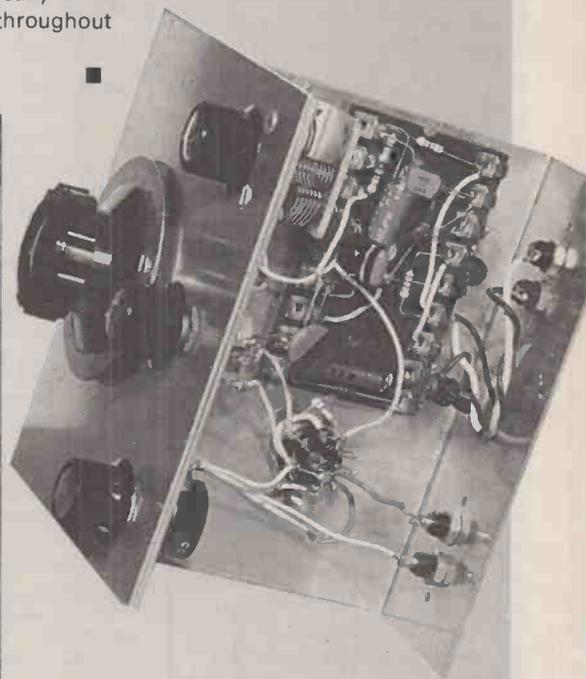
I left knowing that here is a man who has really enjoyed radio throughout his long life.



**This is the larger of C.M. Lindars' two Tesla coils. The copper ball was originally intended to be a vital piece of household plumbing!**



**The 'Chief Engineer' of HAC in his workshop. Like most of us who have been into home construction for a long time, his workshop is full of interesting and nostalgic gear.**



**Another view of the Triple-T.**

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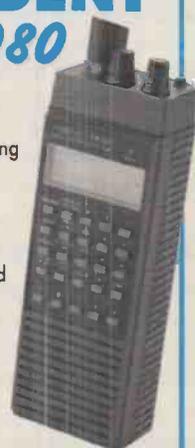
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Europe's Number 1 Supplier



Brian Berry investigates some analysis techniques that can utilise some cheap and cheerful equipment to enhance your listening pleasure.

One of the more fascinating aspects of short wave listening is the analysis of the various signals received, particularly on the h.f. bands. Such an analysis can be done in various ways and the results can be quite revealing.

Unfortunately, with the arrival of the communications satellite, many interesting transmissions disappeared from the h.f. bands, and most of those left are either extremely sophisticated data links that require equally sophisticated equipment to monitor, or are heavily encrypted. Of all the signals that can be heard on the h.f. bands, probably less than 10% can now be decoded (in the RTTY sense) or read by the average short wave listener.

The keen s.w.l. is therefore left with very little to listen to, apart from broadcast stations and a jumble of unintelligible data signals that frustratingly refuse to resolve themselves on his decoder.

### Traffic Analysis

All is not lost however. The s.w.l. who is prepared to spend some time and attack the problem methodically can still gain a considerable amount of information about the station to which he or she is listening. It requires dedication to the task and painstaking recording of every possible detail of the transmission in a log over a period of time. The results of a subsequent analysis of the log, which should contain such details as callsigns, frequency, transmission

times, lengths and type of transmission, country of origin (if known) can then be entered into a computer database.

The database program chosen should allow for as much manipulation of the data as possible, with particular emphasis on the ability to cross correlate the data, both with itself, and also with external events - such as for example a *Coups D'etat* in another country. This is where the dedication comes in; it requires hard work over a considerable period of time - and not just in the short wave bands!

The results can be very gratifying however, as the father of traffic analysis, Gordon Welchman, showed at Bletchley during World War II, when the results of his

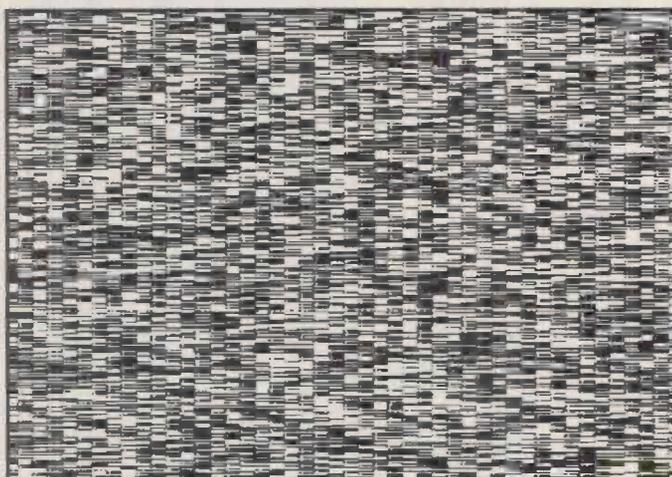
meticulous analysis of German Military radio traffic began to indicate the location and strengths of enemy battalions. Bear in mind that at this time the traffic was heavily encrypted, and his deductions were made purely on an analysis of callsigns, frequencies and the layout of message preambles. His database was a blackboard - what could he have done with a modern computer database! His book *The Hut Six Story* published by Penguin in 1984 should be required reading for all budding traffic analysts.

### Signal Analysis

Together with traffic analysis, a degree of signal analysis should also be brought to bear on the problem. Here

the ground is somewhat more thorny, since the type of equipment necessary is usually extremely sophisticated and expensive - the spectrum analyser springs to mind. However, a lot can be done with the type of equipment that the s.w.l. already possesses. Digital decoder/analysers are beyond the range of most of us, but computer programs such as JVFAX and HAMCOMM can be pressed into service to determine such things as bit rate and type of transmission using just the simple interface. For example, HAMCOMM has a spectrum analyser type display that can instantly identify the number of tones, their frequency and separation. It can also identify the bit rate, although it does seem to have trouble with some of the higher rates. Often with an encrypted transmission it is well nigh impossible to determine the bit rate, and at this point we can turn to JVFAX for some help. The following procedure works well with synchronous signals - not so well with asynchronous signals (plain old RTTY).

Set JVFAX up for FAX reception, LPM120/288, (J) colour off and (G)rey scale to 2. Feed in the digital signal from the receiver via the small interface unit and start fax reception. The screen will soon start to display a series of columns as the picture builds up. Allow it to fill the screen, particularly if you wish to print it out later. Experiment with various settings until you get good results, although those given above will serve in most



**Fig. 1: JVFAX screen display with l.p.m. set to 120/288. With l.p.m. set to 120 the duration of one line is 60s/120 i.e. 500ms. Since there are 46 pulses per line, the length of one pulse is given by the calculation 500ms/46 which gives 10.86ms per bit. The bit rate is determined thus 1000/10.86 which is 92.08b.p.s. Note that in this example, each bit is the same length. This is therefore a synchronous transmission, and although some noise is present is enough information to make the calculation.**

# Traffic Analysis

instances. **Fig. 1** shows a typical result from a 92.08b.p.s. (bits per second) synchronous transmission. Note that the length of each bit is identical, this is the 'fingerprint' of a synchronous transmission. Had it been asynchronous, then the stop bit of each character would have been slightly longer than the code pulses. This is why the use of this method with a normal asynchronous RTTY signal, where one pulse of a series is of a different length, is not quite as satisfactory, and the resulting 'fingerprint' is badly smeared.

## A Bit Of Maths

Now for the mathematics! At a drum speed of 120l.p.m. each full line will occupy

60/120 seconds. That is 500ms. Count the number of columns across the page (each column represents 1 bit) Assuming that there are 24 columns, then the length of each bit is 500/24 milliseconds = 20.83 milliseconds

The bit rate is therefore 1 bit per 20.83ms i.e. 48.0076 bits per second - approximately 48 Baud.

There are available other programs that could prove useful in this sort of analysis such as some of the FFT spectral analysis programs which can be found on several bulletin boards and

graphical form. This can be quite enlightening. **Fig. 2** shows the results from one such program, although the black and white reproduction does not really do it justice.

Armed with

## Ancillary Equipment

Other hardware can also make the job a little easier. A reel-to-reel tape recorder, capable of running at both 7.5i.p.s. and 3.25i.p.s. per second can often pin down a difficult signal by recording it at the high speed and playing it back at the slow speed. It could also be useful to those who monitor c.w. stations and whose Morse is not

perhaps up to the higher rates!

Another useful item would be a panoramic adapter with variable sweep width. For those who have receivers with a fairly low i.f. frequency quite an effective adapter was described by Bill Wilson in the January 1995 issue of *Short Wave Magazine*. Easily constructed from readily available parts, the sweep control enables a single signal to be displayed on an oscilloscope - invaluable in this type of work.

## Other Alphabets

Many of the signals present on the short wave bands are using Baudot alphabets that are not fully compatible with the ITA2 code (standard RTTY). These signals such as Russian Cyrillic, Arabic and third shift alphabets appear to the uninitiated to be encrypted. This is not so however. They can be decoded via look up tables in

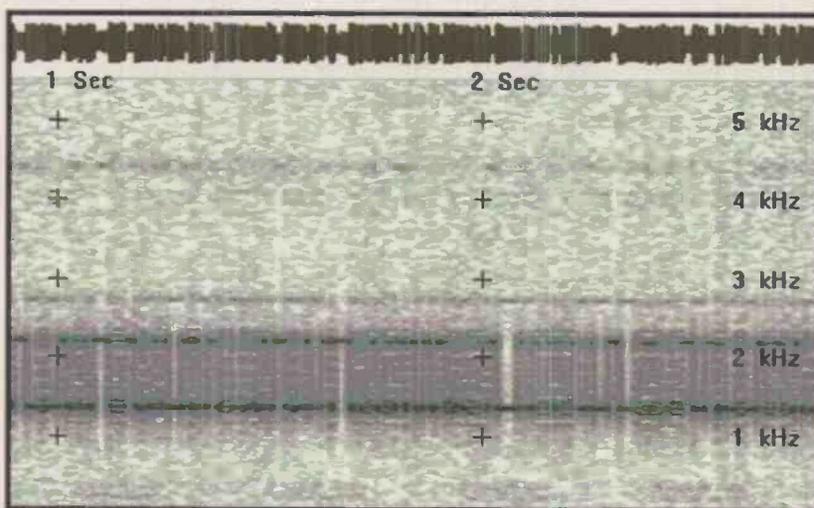
### Bits Versus Bauds

A lot of confusion exists between bit rate and Baud rate. Both are concerned with the measurement of code pulses. Bit rate is the number of pulses that carry information per second. Baud rate is a unit of signalling speed which is equal to the number of bits transmitted per second - regardless of whether or not those bits are carrying information. Baud rate is only equivalent to bit rate when each pulse represents exactly one bit. In asynchronous transmission, the stop bit is 1.5 times the length of the data bits, and therefore the actual bit rate will be slower than that of a synchronous transmission. This is one of the reasons why synchronous transmissions are more efficient.

the bit rate, number of tones, frequencies and their separation, we are now in a position to make a pretty shrewd guess as to the system in use.

For help in this there is no better reference to which to turn than that well known author and monitor, Klingenfuss. His book, *Radioteletype Code Manual* describes in depth virtually every type of telegraph

transmission system in use today, and is required reading for the dedicated short wave monitor. It is of course available from the SWM Book Store.



**Fig. 2: Spectral display of part of the signal in Fig. 1. The display was obtained with an FFT (Fast Fourier Transformation) program sampling at 512 points at a sample rate of 11.025kHz.**

Internet FTP sites. These programs will record a signal sent to them - usually via the sound card on the computer, and then execute a Fourier analysis of the data, presenting the results in a

a computer program. As the name implies, a look up program merely takes the non-standard alphabet character, looks it up in a table, and then substitutes a more recognisable Latin character in its place. Some knowledge of programming is essential in order to be able to do this. However, such signals can usually be recognised by their on screen effect when decoded via a computer that is using normal ITA2 code. Again Klingenfuss fully describes the effects in his manual and suggest methods of transposing them into the standard alphabet.

Many such transmissions are in a foreign language of course, but with the aid of a dictionary of the language or lists of 'key' words that have been gathered from various sources the intelligent s.w.l. can still glean much information. There are many such sources available on the Internet - a few interesting sites are given below.

## Data Encryption

Finally a few words about encryption. You will appreciate the need for circumspection here, suffice it to say that most of the encrypted signals on the short wave bands are **very** resistant to crypto analysis - you don't stand a chance! However, just to whet your appetite, the odd signal here and there will show cracks under statistical analysis. In particular auto correlation tests have proved very useful in investigating polyalphabetic and shift register ciphers, some of which are still in use, as are some very old variants of the German Enigma machine. Many years ago the thought of even being able to make a start on the cracking of an Enigma enciphered message would have been laughable. With the computers available today a competent programmer with a little

## Glossary

Asynchronous Signal:	A transmission in which the time intervals between successive characters may be of unequal length. Transmission is controlled by stop and start pulses at the beginning and end of each character.
Auto Correlation:	To compare a set of data with itself in order to determine if such things as repetitions or other links are buried within the data itself.
Bit Rate/Baud rate:	See box for information.
Cross Correlation:	To compare one set of data with another in order to determine if any relationship exists between the two.
Decoder:	The interface between radio receiver and computer.
Enigma:	A German cipher machine of WWII which performed a polyalphabetic type encryption of military traffic.
JVFAX/HAMCOMM	Computer programs for decoding facsimile, slow scan TV and RTTY using a PC - available through this magazine - see the 'Decode' section.
Panoramic Adapter:	An adapter which, connected to a receiver gives a panorama display of the transmissions occurring either side of the frequency to which the receiver is tuned - see also spectrum analyser below.
Polyalphabetic:	A polyalphabetic cipher is one in which the message is enciphered with many different alphabets - each time a letter is enciphered it is replaced with a different letter. The well known Vigenère is a typical example of this.
Signal Analysis:	The breaking down of a signal into its component parts in order to determine the transmission characteristics.
Spectrum Analyser:	Sweeps a pre-determined range of frequencies and then plots the signals found on an oscilloscope type display.
Synchronous Signal:	Signal in which the data characters and bits are transmitted at a fixed rate with the transmitter and receiver synchronised. This eliminates the stop start pulses needed with asynchronous transmission.

mathematical knowledge and plenty of traffic would make very short work of such a method of encryption! A couple of stations have been noted still using bit inversion as a simple method of encrypting their signals, although most professional data decoders will deal with this as a matter of course. For the amateur short wave listener it is a fairly simple task to carry out bit inversion as an 'add on' piece of hardware or software to the normal

decoding program, XORing the necessary bits. However, the old adage that "If it's worth encrypting it's worth reading" is not necessarily true - these sort of messages usually deal with the most mundane matters - decrypting endless variations of the Sheikh's shopping lists are hardly worth the effort! ■

## Further Information:

For those on CompuServe there is more information to be found in the 'Hamnet Forum' libraries, whilst those on the Internet should check out the site at:

<http://www.ftech.net/~monark/crypto/links/oldlink.htm>

At this site you should also check out the book list from Agean Park Press.

# Roberts

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**R809**



- PLL multi-band digital preset stereo world radio
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- Dual time display
- Clock/alarm
- Complete with soft carrying pouch
- Continuous AM coverage 150kHz - 29.999MHz

**RRP £100.00**

**R827**



- PLL multi-band digital preset stereo world radio
- 5 tuning methods: direct frequency keying, auto-scan, manual scan, memory recall and rotary
- 45 preset stations
- Dual time clock/alarm
- Receive single side-band and CW transmissions
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**RRP £160.00**

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- Receive single side-band and CW transmissions
- Continuous AM coverage 150kHz - 29.999MHz

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**Contact Roberts Radio Ltd. for further details or local stockists**

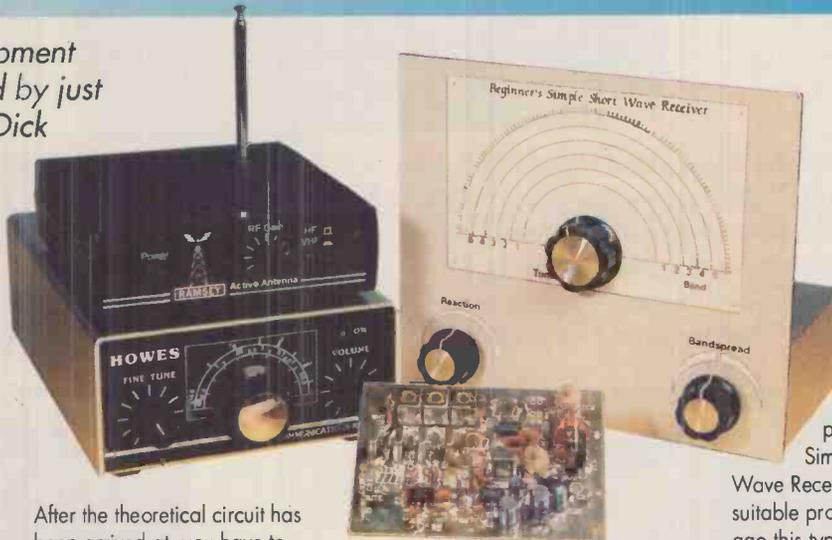
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# REVIEW



*Building your own equipment offers a thrill unmatched by just buying it ready-made. Dick Ganderton has been taking a look at three kits from manufacturers with quite different outlooks.*



I started making simple crystal sets some 50 years ago. I had two main reasons for making rather than buying - I couldn't afford to buy and I soon found out that building and experimenting was more fun anyway. Crystal sets were easy to build, cheap to run - no batteries needed - and offered an operating challenge. The single headphone was easy to conceal under the bedclothes for covert nighttime listening when my mother thought that I was fast asleep!

## A Real Thrill

Nowadays, it is more cost effective to buy a ready made cheap set imported from the 'Pacific Rim' than it is to build one - that is if all you want to do is just listen. But, if you want to experience a real thrill, and learn how radio works, then there is nothing to beat building your own.

There are three basic approaches to building your own equipment. You can buy a kit, build a design published in a magazine or book or design your own from the circuit diagram upwards. Each approach has its advantages, and its drawbacks.

Designing your own set requires a knowledge of circuit design, components and how they can be used in different types of circuits.

After the theoretical circuit has been arrived at, you have to translate this into a practical and working piece of hardware. Getting your own design to actually perform to your original specification must be one of the most satisfying feelings imaginable - but it is only for the few.

Most readers of *SWM* will have to satisfy themselves with one of the other two approaches - build a published design or build a kit. Let's look at building a published design.

Over the years there have been thousands of different designs for receivers published in books and magazines around the world. So, what should you be looking for in selecting a suitable project? I would suggest that you only seriously consider projects published in books or magazines from your own country. Why? Well, not all electronic components specified for projects are readily available in other countries. If you cannot get all the components you do not stand a very good chance of completing the project - unless you have enough technical knowledge to make substitutions.

Next only look for recently published designs. Unfortunately, technology advances at an ever

increasing rate and components can become obsolete and unobtainable overnight. I can remember working on one particular project for our sister magazine *Practical Wireless* and learning on the day the magazine was published that a vital integrated circuit had just been withdrawn by the manufacturer! The replacement i.c. had the same specification and was in the same style package - but the pin-out designations were different, so rendering our p.c.b. design useless!

Even if the design you choose is recent, always make certain that you can get all the components before you start. This can involve you in a lot of searching through different component suppliers' catalogues. However, you will learn a lot about components in the process.

While checking out the availability of components don't forget the metalwork. Does the project use a standard and readily available case, or will you need to make your own? If it uses a standard case will you be able to drill and punch out all the various holes? If you can't, because you don't have the necessary tools and

equipment, do you know someone who can?

Take the recently re-published *Beginner's Simple One-valve Short*

*Wave Receiver* as an example of a suitable project. Thirty-odd years ago this type of project was considered ideal for a beginner to 'cut their teeth on'. All of the components were readily available from a variety of different sources - even the chassis was readily obtainable either as a basic aluminium box or with all the holes prepunched. The idea of drilling and punching holes in a ready folded aluminium box was not as daunting then as it would be now. I remember that I managed to put all of the holes into a GW Smith aluminium chassis using nothing more than a cheap Woolworth hand drill and my mother's large scissors to 'ream' the drilled holes to accept the valve holders! Now, you cannot easily obtain the basic aluminium chassis.

When deciding to re-publish the Denco version of the design in the December '96 issue, I was very much influenced by the recent re-introduction of the appropriate Denco range of coils. The valve and tuning capacitors for this type of set have always been fairly easily obtained and the only major problem was the chassis. This was solved by CM Howes Communications offering to provide the chassis with all the larger holes ready punched for those who were

unable to make their own.

So, if you fancy building a one-valve short wave receiver and entering the competition for the best log, start collecting the necessary parts and get on with it.

## Kits

The third approach is to build one of the many kits available. At the end of this article you will find a list of UK suppliers of kits, some of which are imported, some British.

The kit approach has a lot to commend it. You know that you are going to get all the components to enable you to assemble the project and get it working. The kit supplier should have made certain that the circuit works, can be built by the average person and when finished can be made to work. I am not saying that the raw beginner will be able to take **any** kit on the market and end up with a working project. There are kits designed for the absolute beginner, kits for the competent intermediate level builder and those aimed purely at the advanced and experienced constructor.

You can buy kits for just about any type of project you care to name. Want a weather satellite station - there are several kits. How about a Morse code reader? Yes, you can get a kit for one of them. Computers, test gear, musical instruments, receivers, antennas, accessories - there are kits for all of these. Some of them come complete with the case ready punched and front and back panels pre-printed, others only provide you with the 'electronics' and leave you to provide your own case.

To see just how easy they were to build, I put together kits from three different suppliers. One was a complete kit for a basic receiver from a well-known British manufacturer, another was a complete kit for an active antenna from a respected American manufacturer while the third, again British, was a kit for the more experienced constructor and came with no metalwork at all.

## CM Howes DX2000 Receiver Kit

Dave Howes has been noted for his quality kits for about fifteen years. His first kit was a 'direct conversion' receiver aimed at the beginner and this remained in his ever expanding list until quite recently. The DX2000 'direct conversion' receiver offers an amateur radio receiver in kit form covering all the short wave bands by using plug-in modules. The completed receiver is suitable for s.s.b., c.w. and related modes and is compatible with many other kits in the Howes range.

To build a complete DX2000 receiver requires at least two



Top quality components are supplied in Howes kits. These are some of the parts for the Howes DC2000 receiver.

## Specification

**Frequency coverage:**

1.8 - 30MHz determined by band module in use.

**Modes:**

s.s.b., c.w. (Morse)

**Sensitivity:**

-118dBm (0.3µV) for 10dB S/N  
over audio bandwidth (-6dB) of 2.6kHz.

**Audio output:**

1.2W into 8Ω

**Power:**

10 - 15V d.c. at 200mA. 22mA quiescent.

**Tools needed:**

Small 25W electric soldering iron; Rosin cored solder; Small side cutters, Wire strippers; Long nosed pliers; Trimming tool for oscillator coils.



This picture shows the simplicity of the Howes DX2000 direct conversion receiver.

The completed Howes DX2000 receiver with the aluminium case lid removed.



A neatly finished case makes all the difference to the look and feel of a finished project.

kits from the Howes range. The DX2000 kit itself provides all the electronic components and p.c.b. hardware, and comes with one band module kit, the BM80, for the 3.5MHz (80m) amateur band. To complete the receiver requires the HA22R Hardware Pack, which provides the complete case and other metalwork and comes with the DT1 fine tune kit. The kits I assembled comprised the DX2000 - with the BM80 and the HA22R.

Each Howes kit comes with a full set of instructions. These are clear and easily understood and a beginner should have no difficulty in following them. Each type of component is clearly described as to its physical shape and identifying

markings, if any. Drawings show how the component should be fitted to the p.c.b. and hints are given on how to solder correctly. A faultfinding guide is included as is a description of how the receiver works and full set of circuit diagrams. No p.c.b. track patterns or component placement drawings are included.

The printed circuit board is a glass fibre, single sided type with the component references silk screened on the component side. The copper tracks and pads are big enough that the beginner need not worry too much about overheating them during soldering. All too often designers try to make the p.c.b. as small as possible so that the tracks and pads have to be very small. This makes it all too easy to lift them during soldering. With this kit as long

as you take your time over correctly placing the components according to the instruction sheets and the annotations on the p.c.b. itself, you should have no problems.

There is one component that you have to make yourself. The mixer input transformer is supplied as a two-hole ferrite balun core and two lengths of insulated wire. You have to wind the two windings onto the core to make the transformer. This is not a difficult task - there are only eight turns of the yellow wire and two turns of the red one. Again the instructions explain it all - so just take your time and follow them to the letter.

The plug-in module is assembled in the same way as the main DX2000 board. When completed it should plug onto the main board using the two plugs and sockets. Carefully inspect both p.c.b.s for 'dry joints', bridged tracks, components in the wrong positions or the wrong way round - or even missing. Correct any errors before moving to the next stage.

It is possible to build the DX2000 into any other style of metal case - as long as the case is large enough, of course. However, to finish off the receiver I recommend that you use the HA22R Hardware Pack. This provides the complete metal case, with all the sockets, knobs and main tuning capacitor as well as the necessary nuts and bolts and wire. The front panel is already fitted with a neat screen printed overlay - Dave obviously recognises that this is a difficult operation for the average constructor and a badly aligned panel overlay looks terrible - and you also get the DT1 fine tune kit. This enables the frequency to be adjusted by a small amount to make exact tuning easier.

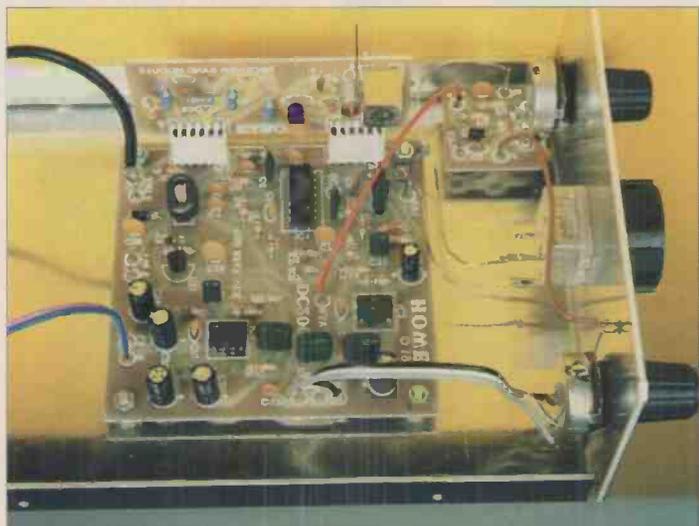
As with the DX2000 kit, the instructions are comprehensive and clear. You have to drill several small diameter holes in the chassis, but the larger ones are pre-punched for you. For this you will need 2, 2.5, 4

and 7mm drill bits. You will also need a medium cut flat file, screwdriver, centre punch and a Junior hacksaw.

The small p.c.b. for the DT1 fine tune unit needs to be built before you can complete the internal wiring of the receiver. This is a simple unit that is soldered directly onto the three tags of the fine tune potentiometer.

The internal wiring is straightforward and it should not take long before you are ready for the magic moment of applying power to your creation. With a length of wire connected to the antenna socket and a pair of 8Ω headphones plugged in you should get some noise when you switch on. If you have set the core of the plug-in module as suggested in the instructions, you should be able to tune in some stations. Full instructions on aligning the receiver are given, but you can buy ready-built and aligned band modules from Howes if you feel that this is easier. I had no difficulties in aligning the module to give full coverage of the 3.5MHz amateur band. If you are unlucky and your DX2000 doesn't seem to be working, a fault finding checklist is provided in the instructions. If you still cannot get it to work, Dave Howes offers telephone advice during office hours - but only after you have exhausted the checks in the instructions.

The DX2000 receiver kit that I built worked well and I had a lot of fun building it. The price of the DX2000 kit is £22.90, the HA22R hardware pack is £18.90. Extra band module kits cost £7.90 each. I would like to thank **CM Howes Communications, Eydon, Daventry, Northants NN11 3PT. Tel: (01327) 260178** for supplying the kits used in this section of the article.

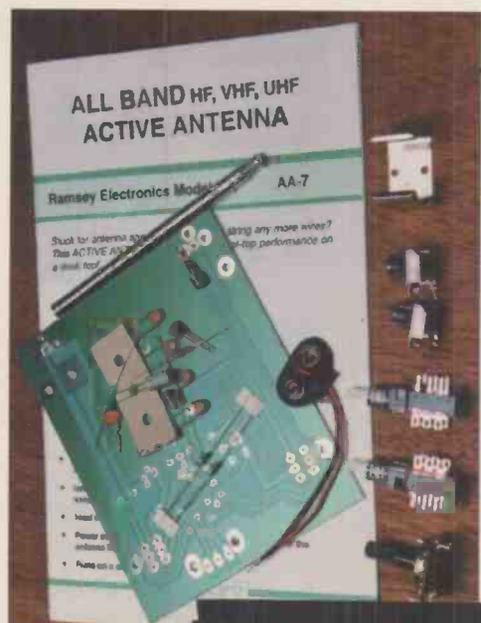


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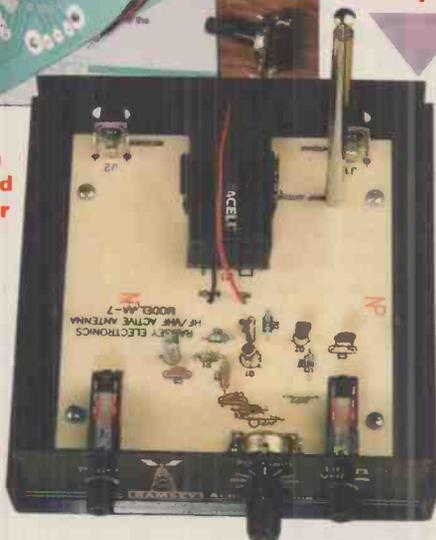
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The contents of the Ramsey AA-7 All Band Active Antenna kit.

The Ramsey AA-7 Active Antenna kit completed.

Ramsey also believe that a nicely finished case makes or breaks a project. The self-adhesive front and back panel labels need a lot of care to ensure that they are correctly placed.



## Specification

### Ramsey AA-7 All Band Active Antenna

<b>Frequency coverage:</b>	Wideband (h.f. to u.h.f.)
<b>Power:</b>	9V d.c. PP3 battery
<b>Tools needed:</b>	Small 25W electric soldering iron; Rosin cored solder; Small side cutters, Needle nosed pliers.

## Ramsey All Band Active Antenna Kit

The Ramsey range of kits originate in the USA. The kit that I built was the AA-7, an active antenna kit covering the h.f., v.h.f. and u.h.f. parts of the radio spectrum, together with the appropriate Custom Case Enclosure Set.

The kit comes with everything you need to build the antenna - except the tools, which you have to find. The 16-page instruction manual, printed on re-cycled paper, is comprehensive. It even tells you how many 'solder points' there are to make and gives estimated assembly times for a beginner (2 hr), intermediate (1 hr) and advanced (30 mins). How many readers remember the Heathkit range of electronic kits and their instruction manuals? Well, the Ramsey instruction manuals are similar to the Heathkit ones. You get a box to tick off as you complete each step. And each step is comprehensive. "p 5. Notice that Q2, the 2SC2498 transistor is installed with the flat side facing the rear (antenna and receiver jacks) of the PC-board. Press the transistor gently but firmly into it three holes so that the exposed wire leads are as short as possible. Carefully solder all three leads on Q2." You do this and tick the box. That way you know that you have performed each step. Ideal for beginner and expert alike.

### Two Pre-amplifiers

The AA-7 has two independent, switchable r.f. pre-amplifiers. One for h.f. and the other for v.h.f./u.h.f. The manual details how the unit works and outlines the research work that was used to help with its design. All setting out its credentials as a serious piece of listening kit.

You get a full circuit diagram - drawn in the American style, of course - and a component placement diagram of the p.c.b. I must admit that I always like to have a printed placement diagram, even if the components

are silk screened onto the board. However, I can understand why some kit makers are unwilling to put them in their instructions.

This is a very straightforward kit - in fact it is the ideal beginner's kit with no difficult components to fit and a p.c.b. that has 'acres' of room with large pads and wide tracks.

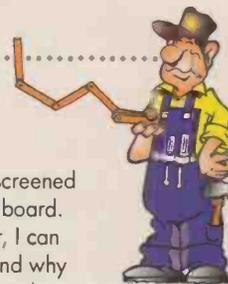
### The Case

The Custom Case provided follows Ramsey's standard design. There are two main halves of the black plastics box with a front and back panels also moulded in black plastics. Printed self-adhesive plastics overlays are provided for the panels. The adhesive is very quick grabbing and strong so that once you have positioned the overlays on the panels you will not be able to remove them. I must admit that I found it difficult to position both overlays accurately and I would have liked to have been able to move them around a bit to get them accurately lined up.

A paper template is provided to help with the accurate drilling of the hole needed in the top tray of the case if you want to fit the whip antenna provided with the kit. I did want to use the whip so I drilled the hole. The p.c.b. needs a bit of juggling to get the various sockets and switches into their respective holes - I fitted the front and rear panels loosely over the protrusions and 'wangled' the panels into the appropriate slots in the bottom tray. The p.c.b. is held in place with four screws provided.

The AA-7 active antenna is powered by a PP3 9V battery which is held in a spring clip attached directly to the p.c.b. An On/Off switch is provided to turn the active antenna off when not in use.

The AA-7 kit was supplied for review by **Waters & Stanton Electronics, 22 Main Road, Hockley, Essex SS5 4QS. Tel: (01702) 206835** and costs £29.95 plus £14.95 for the case kit. My thanks to Waters & Stanton for supplying the AA-7 kit for me to play with.



# Hands Electronics RX1 Simple Superhet Receiver

The third kit I assembled was the RX1 from Hands Electronics. This kit, when assembled, provides the basic features of a superhet receiver on a single, fairly compact printed circuit board. Although it can be used as a complete receiver for one frequency band, its real attraction is that it forms a building block that can be used in a more complex receiver or transceiver.

The instructions are comprehensive and provide full building information with component descriptions and identification aids, such as colour coding explained. A full technical circuit description is provided together with a circuit diagram and component placement drawing. However, this had no copper track information to enable you to determine exactly which holes each component used. But, it proved to be very useful when, as happened in several locations, soldering component leads to the

ground plane obliterated part of a screen printed component reference.

The receiver is constructed on a glass fibre, double sided printed circuit board. The copper ground plane is on the component side of the board with the component positions silk screened on top of it. While most component 'legs' pass through the board and are soldered to the appropriate pads on the other side, some are bent out at right angles and are soldered directly to the ground plane. Because of this, as well as the fairly close packing of the components and the small size of copper tracks and pads, I would not be able to recommend this kit for the raw beginner. It is, however, a satisfying project to build and would be ideal for the constructor who has gained experience on a simpler kit.

On the version I built there are two toroidal transformers and one toroidal coil to be wound. These are described in detail in the instructions, but care needs to be taken to ensure that you have the correct number of turns on each winding. Each time the wire passes through the hole in the toroidal core it makes one turn - it's all too easy to get confused and end up with one turn too many!

For the advanced constructor, extra pads are provided on the

p.c.b. to allow extra capacitors to be added to tailor the width of the F1 filter bandpass. Temperature compensation and bandspread can also be added using the extra pads provided around the v.f.o. circuit.

## Testing And Alignment

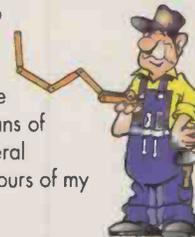
Complete details are provided to enable the constructor to test and align the RX1 receiver board. Initial testing and alignment are carried out before fitting the board into its case. Although the instructions state that no special equipment is required for testing, life is made much easier if a signal generator and frequency counter are available. If you run into problems with one of his kits, Sheldon Hands is always willing to try and help you sort it out.

I haven't yet decided what sort of case I will use for the RX1 board - in fact, Tex Swann, Technical Projects Sub-editor on *Practical Wireless* has been making noises that he wouldn't mind using it in one of his projects.

The Hands Electronics RX1 Simple Superhet Receiver kit costs £45.00 plus £1.50 P&P and is available from **Hands Electronics, Tegryn, Llanfyrnach, Pembrokeshire SA35 0BL. Tel: (01239) 698427.** You can contact them by E-mail at

[hands@rf-kits.demon.co.uk](mailto:hands@rf-kits.demon.co.uk)

My thanks to Sheldon Hands for providing me with the means of passing several interesting hours of my spare time.



## Kit Manufacturers and Suppliers

Badger Boards, 87 Blackberry Lane, Four Oaks, Sutton Coldfield B74 4JF. Tel: (0956) 374918.

Circuit Distribution Ltd., Park Lane, Broxbourne, Herts EN10 7NQ. Tel: (01992) 441306.

CM Howes Communications, Eydon, Daventry, Northants NN11 3PT. Tel: (01327) 260178.

G-QRP Club, c/o G3RJV, 498 Manchester Road, Rochdale, Lancs OL11 3HE. Tel: (01706) 31812.

Hands Electronics, Tegryn, Llanfyrnach, Pembrokeshire SA35 0BL. Tel: (01239) 698427.

Kanga Products, Seaview House, Crete Road East, Folkestone, Kent CT19 4AU. Tel: (01303) 891106.

Lake Electronics, 7 Middleton Close, Nuthall, Nottingham NG16 1BX. Tel: 0115-938 2509.

Maplin Electronics, PO Box 3, Rayleigh, Essex SS6 8LU. Tel: (01702) 554161.

Spectrum Communications, Unit 6b Poundbury West Estate, Dorchester, Dorset DT1 2PG. Tel: (01305) 262250.

Walford Electronics, Upton Bridge Farm, Long Sutton, Langport, Somerset TA10 9NJ. Tel: (01458) 241224.

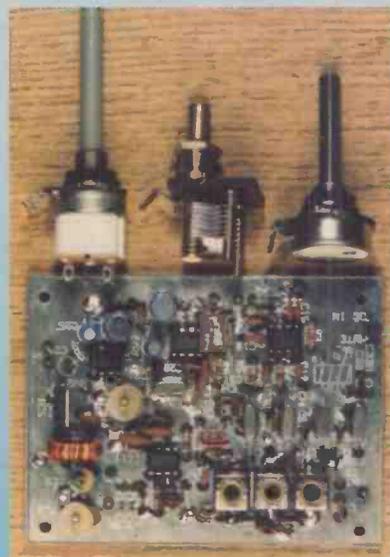
Waters & Stanton Electronics, 22 Main Road, Hockley, Essex SS5 4QS. Tel: (01702) 206835.

Building your own receiver or other pieces of radio gear such as an active antenna or antenna tuning unit can not only give you great pleasure while building it. It can also give you a great thrill when you hear a station through it for the first time. If you haven't already tried your hand at building a kit, give it a go - you are sure to enjoy yourself.

## Specification

Hands Electronics RX1 Simple Superhet Receiver

<b>Frequency coverage:</b>	3.5, 7.0 or 14.0MHz amateur bands (determined by components fitted during construction).
<b>Modes:</b>	s.s.b., c.w. (Morse)
<b>Audio output:</b>	325mW into 8Ω
<b>Power:</b>	12V d.c. 30-40mA quiescent.
<b>Tools needed:</b>	Small 15 - 25W electric soldering iron; Rosin cored solder; Small side cutters, Electrician's pliers; Small half round file; Multimeter.



**The Hands Electronic RX1 superhet receiver. This is the completed printed circuit board awaiting testing and alignment before being fitted into a case. The RX1 p.c.b. is quite densely packed and needs a steady hand on the soldering iron**



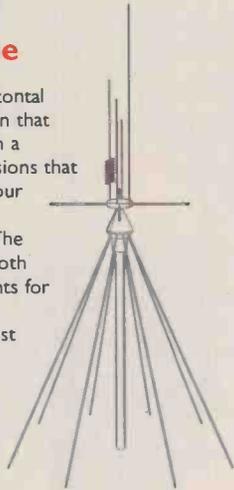


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 SRP Radio Centre, 1686 Bristol Road South, Rednal, Birmingham B45 9TZ  
 Tel: 0121-460 1581/0121-457 7788 Fax: 0121-457 9009

## SKY SCAN DXVI300 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 VI300 discone has both vertical and horizontal elements for maximum reception. The VI300 is constructed from best quality stainless steel and aluminium and comes complete with mounting pole. Designed and built for use with scanners.



**£49.95**

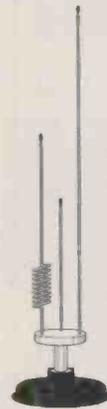
+ £3.00 p&p

## 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**

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## SKY SCAN Desk Top Antenna Model Desk 1300

Built and designed for use with scanners. Coverage: 25 to 1300MHz. 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**

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### 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**

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- Dual conversion if on SW ● FM stereo via earphone socket ● Direct frequency input ● Rotary tuning
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- Soft carrying pouch ● AC adaptor ● Shortwave aerial
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**WEIGHT: 850g (30oz) without batteries.**



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(1000 CHANNEL WITH HYPERSCAN) JUST £359.99\* WITH ANTENNA AND GUIDE  
OR £299.99 ALONE INC P&P\*



- 1000 memory channels (100 channels x 10 banks)
- 10 limit search banks ● 100 monitor channels
- 50 channels/sec & 50 steps/sec scanning speeds ● Large orange backlit LCD display ● Rotary or keypad frequency control.

Size: 232mm W x 210mm D x 90mm H.

Modes: AM, FM and WFM.

Step sizes: 5kHz, 12.5kHz and 50kHz (WFM).

COMES WITH TELESCOPIC ANTENNA AND OWNERS MANUAL.

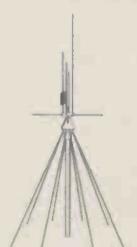
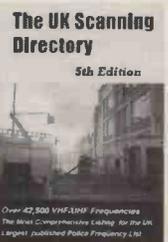
We are offering with each purchase of the **PRO 2042** at a cost of **£359.99 inc P&P\***, both a copy of the 5th Edition UK Scanning Directory (RRP £18.50) and a choice of either

our Skyscan DX V1300 discone antenna (RRP £49.95) or our Skyscan Desk 1300 discone antenna (RRP £49.00).

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Demand is likely to be high, and orders will be fulfilled strictly on a first come first served basis (subject to stock availability). \*Free P&P applies to mainland UK deliveries only.



### Frequency Coverage

Freq (MHz)	Step	Mode			
25.000-29.995	5.0kHz	AM	137.00-224.995	5.0kHz	FM
30.000-87.495	5.0kHz	FM	225.000-400.000	12.5kHz	AM
87.500-107.995	50kHz	WFM	400.005-520.000	12.5kHz	FM
108.00-136.995	12.5kHz	AM	760.000-1300.000	12.5kHz	FM

## QUANTEK FC2000 FREQUENCY COUNTER

This sensitive "nearfield" counter is ideal for on-air frequency checking. Simply hold the counter near to the transmitter to get an accurate frequency reading. Comes complete with nicads, AC charger and aerial. An ideal frequency counter for service engineers or surveillance personnel who need an accurate handheld counter.

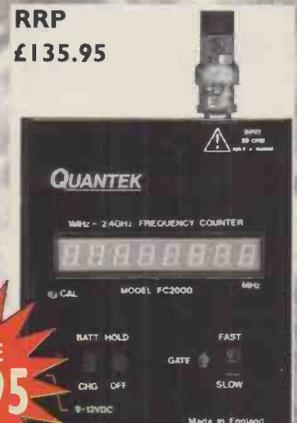
### SPECIFICATIONS

Frequency range:	1MHz to 2.4GHz
Sensitivity (Typical):	800µV @ 10MHz 500µV @ 30MHz 225µV @ 150MHz 640µV @ 450MHz 1mV @ 850MHz <10mV @ 1.3GHz <200mV @ 2.4GHz
Maximum Input Power:	+15dB (50mW), 1.26V RMS
Input impedance:	50Ohm
Timebase stability:	+/- 1ppm 25-35°C
Timebase ageing:	1ppm per year typical

Timebase accuracy:	+/- 1 count in LSD
Gate time:	Fast 0.25 seconds for 1kHz resolution. Slow 2.5 seconds for 100Hz resolution
Power:	Internal nicad batteries 4 x AA, 700mAh or mains adaptor/charger, 240VAC input, 12VDC output, centre positive
Size:	100 x 87 x 28mm

Specifications subject to change without notice

RRP  
£135.95



**SRP PRICE**  
**£89.95**  
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# FREQUENCY EXCHANGE

By Kevin Nice G7T8C

## 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
- Picco Piccolo
- stby Standby
- u.s.b. Upper Sideband
- VFT Voice Frequency Telegraphy
- wkg Working
- trf Traffic
- wx Weather
- dpx Duplex
- xmsn Transmission
- YL Femole Op.

MHz	Mode	Time	Call	Location	Monitor	Notes
2.716	SITOR	1540	-	Gatenberg	abt	Calling MODX England.
2.8933	RTTY	1531	-	Whitehall	abt	Encoded - Naval.
3.494	u.s.b.	1900	EC-FTL	Stockholm	dm	On ground Trondheim, phone patch to ops.
4.204	SITOR A	2233	-	Bergen	abt	Re: arrival of the M/V St. Bruce (callsign) 3ESET, Panama.
4.261	c.w.	2034	-	Turkey	abt	Turkish Navy sending info re firing exercises into the Aegean sea.
4.645	c.w.	17.15	-	Chatham R.	abt	Mitthigon, sending WX forecast.
5.438	u.s.b.	1638	-	?	abt	EE Numbers station - YL
5.517	u.s.b.	2053	Frenchline 754	Magardishu	dm	ANTAX 2053 flight level 310 overheard Mogadishu 2111 Selcall ELAF DC10 FBTD.
5.535	u.s.b.	1313	UNID	?	aib	a/c wkg Shannon with VIP needing to return to mainland - routed to Luton.
5.610	u.s.b.	2137	-	Partishead R.	abt	Phone patch - re: prob with landing gear.
5.634	u.s.b.	2150	Singapore 406	Mauritius	dm	PEDPI-2149 flight level 350 PATKI next.
5.643	u.s.b.	0901	-	New Zealand	dm	Position report.
5.658	u.s.b.	2055	Cathy 289	Urumqi	dm	KCA-2055 flight level 10800m Ramsi 2114.
5.670	u.s.b.	1934	Qantas 9	Madras	dm	BB1-1933 flight level 310 BBM-1949 Selcal AQCE B747-400 VHOJF.
5.680	u.s.b.	1335	RESCUE138	?	aib	wkg Kinloss rescue.
5.685	u.s.b.	2133	-	Cairo	abt	ICAO Very busy.
5.696	u.s.b.	1700	-	Culdrose	abt	Pilot passing messages to his squadron.
5.719	f.s.k.	1403	UNID	US?	kn	Alternating tones approx 500ms period.
5.748	u.s.b.	1710	UNID	?	aib	Numbers station German.
6.151	u.s.b.	2135	-	Asia	abt	Radio Free Asia.
6.556	u.s.b.	1640	Korean 8073	Calcutta	dm	LSO-1639 flight level Chilo 1714 Chittagong next.
6.577	u.s.b.	2142	Salamander693	New York	dm	KRAFT-2142 flight level 310 HOMER 2250 CHAMP next Selcal CJHS.
6.637	u.s.b.	0948	Connie 811	Cedar Rapids	dm	Over Costa Rica. Message far company.
6.637	u.s.b.	1000	Fine Air 29UA	Houston	dm	Off Santo Domingo 0836/47 ETA Miami 1056 Selcal ADCG DC8.63 N29UA.
6.647	u.s.b.	1355	GUZA	?	aib	Fishing surveillance a/c wkg London.
6.739	u.s.b.	1525	KINGS61	?	lg	p/p requesting overfly KMTG (Selfridge).
7.800	l.s.b.	1902	VKS	Australia	tt	Alice Springs Police.
8.685	c.w.	1800	-	Italy	abt	Radio Rome Re Free Radio Medical Service.
8.809	u.s.b.	2200	-	Rome Radio	abt	Phone patch.
8.819	u.s.b.	1900	Swissair119	Rainbow Radio	dm	125 miles SW of Gander. Radio and Selcal check EMBC.
8.861	u.s.b.	1900	Ascot 3221	Recife	dm	En-route Mount Pleasant to Ascension 20°S/21°W-1857 flight level 370 15°S/18°W 1945 10°S/15°W next Selcal LMBJ Tristar.
8.867	u.s.b.	0859	Anset 872	Brisbane	dm	Position report.
8.903	u.s.b.	2154	-	S. Africa	abt	Luanda Control Tower.
8.942	u.s.b.	1640	Northwest 7	Singapore	dm	Position report.
8.942	u.s.b.	1641	Indonesia 972	Singapore	dm	Position report.
8.945	u.s.b.	1601	Thule ACC	Sondrestrom	dm	Passing air traffic on OY-HER position 66°49N/58°10W - 1557 Halsteinborg 1700.
8.970	u.s.b.	1034	HERKY400	?	aib	USAF a/c wkg Ramstein AB.
11.175	u.s.b.	1016	IFO19	?	lg	p/p to US Embassy Sarajevo.
11.406	u.s.b.	2120	Air Indio 1	Delhi	dm	Air India, Relaying message from Director SPG on board the aircraft.
14.284	u.s.b.	2258	-	Romania	abt	Romanian marine mobile talking to LYIEFY QTH Lithuania whilst sailing between Sicily and N. Africa near the island of Patereid.
15.016	u.s.b.	1014	CANFORCE2925	?	lg	p/p via Ascention to Mildenhall meteo for Lynham and Manchester WX.
17.245	u.s.b.	0810	GK?	Partishead R.	abt	Phone patch from Warship Washington.
17.245	u.s.b.	1600	GK?	Partishead R.	abt	Phone patch from RO-BT global challenge.
17.287	u.s.b.	1651	-	Germany	abt	Phone patch Norddeich Radio.
17.410	a.m.	0933	UNID	?	aib	Two messages for EZI, YL EE Numbers stn.
18.268	RTTY	1200	-	Rabat Tangier	abt	Re: conflict between Morocco & Shiaria.
31.7750	n.f.m.	-	-	W.Birmingham	anon	City Hospital paging.
70.750	a.m.	24hrs	NO	Northampton	kr	Fire Control.
85.0635	n.f.m.	-	-	Birmingham	anon	'Ambuline' Private Ambulances.
85.925	n.f.m.	1700	-	Birmingham	tt	Taxi Firm.
152.5750	a.m.	24hrs	NG	Northampton	kr	Ch1 Base (143.0250 Mobile) Police.
154.950	a.m.	24hrs	HB	Berkshire	kr	M25,M40,M4,M5, Police.
163.2000	n.f.m.	-	-	W.Birmingham	anon	City Hospital Medical Engineering.
164.0610	n.f.m.	-	-	Aston Villa	anon	St. John Ambulance Ch.3 Aston Villa/B'ham City
164.125	n.f.m.	-	-	Woltham Abb.	ca	Sego Mega World Staff.
164.650	n.f.m.	1238	Cannock Base	Cannock	tt	Doctors On Call.
165.3625	n.f.m.	-	-	London	ca	Tosca Skips, West London Skips and Streetwise Buses (Community Repeater 170.1625).
165.0875	n.f.m.	-	-	Biggleswade	ca	Jordans Cereals (Duplex 169.8875).
165.150	n.f.m.	-	-	Coventry	ca	Walsgrave Hospital Porters (Repeater 169.950).
165.1625	n.f.m.	-	-	Plymouth	ca	Plant Hire? (Repeater 169.9625).
165.1875	n.f.m.	-	-	S.Birmingham	anon	SellyOak Hospital porters.
165.200	n.f.m.	-	-	Bere Regis	ca	Ferndown Skip Hire (Duplex 170.000).
165.2875	n.f.m.	-	-	Rochester	ca	Marcani Avionics Sec./Fire (Duplex 170.0875).
165.3625	n.f.m.	-	-	Mendlesham	ca	Norcom Sky1/2 (Repeater 170.1625).
165.3875	n.f.m.	-	-	Medway	ca	Kingsferry Coaches (Duplex 170.1875).
165.400	n.f.m.	-	-	London	ca	Saunders Heavy Rescue (Repeater 170.200).
165.4125	n.f.m.	-	-	South Devon	ca	Plumbing contractors (Repeater 170.2125).
165.4375	n.f.m.	-	-	Brecon	ca	Mountain Rescue (Duplex 170.2375).
165.5625	n.f.m.	-	-	Stafford	ca	Tree Surgeons (Repeater 170.3625).
166.2000	n.f.m.	-	CASTLE	West Mids.	anon	Ambulance Patient Transport Services.
166.2750	n.f.m.	-	METRO	West Mids.	anon	Ambulance 'Data Ch.' Automatic Vehicle Location.
166.2875	n.f.m.	-	-	Nottingham	anon	Ambulance.
166.3000	n.f.m.	-	-	Leicester	anon	Ambulance.
166.3125	n.f.m.	-	-	Derbyshire	anon	Ambulance.
166.3500	n.f.m.	-	CASTLE	West Mids.	anon	Ambulance Patient Transport Services.
166.3750	n.f.m.	-	-	Derbyshire	anon	Ambulance.
166.3875	n.f.m.	-	TROJAN	Staffs.	anon	Ambulance 'North' Ch 3 A&E.
166.4000	n.f.m.	-	-	Derbyshire	anon	Ambulance.
166.4100	n.f.m.	-	-	Salop	anon	Ambulance.
166.4125	n.f.m.	-	-	Leicester	anon	Ambulance.
166.4375	n.f.m.	-	-	-	anon	Ambulance Emergency Ch.Heli-Med 03 Air Amb. to Cosford.

# FREQUENCY EXCHANGE

MHz	Mode	Time	Call	Location	Monitor	Notes
166.4400	n.f.m.	-	TROJAN	Staffs.	anon	Ambulance Patient Transport Services.
166.4450	n.f.m.	-	-	W.Birmingham	anon	Community Midwives Aston Lozells.
166.4625	n.f.m.	-	-	Cwyd	anon	and Wrexham Ambulance (Signal Strength 4/5 at home QTH, Staffordshire).
166.4625	n.f.m.	-	METRO	West Mids	anon	Ambulance B Div. Ch 2 A&E.
166.4750	n.f.m.	-	-	Hereford	anon	Ambulance.
166.4880	n.f.m.	-	TROJAN	Staffs.	anon	Ambulance 'South' Patient Transport Services.
166.5000	n.f.m.	-	-	S.Birmingham	anon	SellyOak Hospital transport.
166.5000	n.f.m.	-	-	Warwickshire	anon	Ambulance.
166.5125	n.f.m.	-	-	Salop	anon	Ambulance.
166.5125	n.f.m.	-	-	Warwickshire	anon	Ambulance.
166.5250	n.f.m.	-	-	Warwickshire	anon	Ambulance.
166.5375	n.f.m.	-	-	Leicester	anon	Ambulance.
166.5625	n.f.m.	-	-	Hereford	anon	Ambulance.
166.5750	n.f.m.	-	-	Hereford	anon	Ambulance.
166.5875	n.f.m.	-	TROJAN	Staffs.	anon	Ambulance 'On Scene Major Incidents' Ch 4.
166.6000	n.f.m.	-	METRO	West Mids	anon	Ambulance A Div. Ch 3 A&E.
166.6125	n.f.m.	-	TROJAN	Staffs.	anon	Ambulance 'South' Ch 2 A&E.
166.950	n.f.m.	-	-	Southampton	ca	'Candoc' Doctors (Repeater 171.750).
167.025	n.f.m.	-	-	North Kent	co	Mobile Garage (Duplex 171.825).
167.125	n.f.m.	-	-	Slough?	ca	Door and window supplier (Repeater 171.925).
167.1250	n.f.m.	w/ends	-	Donning	kr	Castle Donnington Racing (Rescue).
167.290	n.f.m.	1247	-	Birmingham	tt	Taxi Firm (Sheldon area).
167.3125	n.f.m.	-	-	Essex	ca	Vulture Osprey CH Mil (Repeater 172.1125).
167.525	n.f.m.	-	-	Bolsover	ca	Leeds Castle Staff-Sec. (Repeater 172.325).
167.550	n.f.m.	-	-	Cheltenham	co	Fort Regent Leisure Complex CH1. (Repeater 172.350).
167.6125	n.f.m.	-	-	Hollingborne	ca	Security Co. (Repeater 172.4125).
167.625	n.f.m.	-	-	Jersey	ca	Hospital Patient Transport Service (Duplex 172.425).
168.000	n.f.m.	-	-	Millbank	co	Brewers Quay Exhibition.
168.2875	n.f.m.	-	-	Nationwide	ca	OAP Warden CTL.
168.850	n.f.m.	-	-	Weymouth	ca	Mount Vernon Post Office.
168.975	n.f.m.	-	-	Exeter	ca	Ambulance and Fire CTL.
168.975	n.f.m.	-	-	London	ca	Market.
169.0125	n.f.m.	-	-	Glasgow	co	Army Ops Discrete.
169.0125	n.f.m.	-	-	Liverpool	co	UNID Men working on a roof at night.
169.025	n.f.m.	-	-	Brockwood	ca	Chippenham Shopping Centre.
169.0250	n.f.m.	-	-	Birmingham	anon	St. John Ambulance Ch.2 Birmingham/Sutton Area Channel/Not Freq: 2.
169.0375	n.f.m.	-	-	Zoo Staff	ca	
169.0625	n.f.m.	-	-	W' Stadium	ca	Pavillion Shopping Centre Security.
169.075	n.f.m.	-	-	London	ca	QPR FC Stewards.
169.1125	n.f.m.	-	-	N. London	ca	Power Station.
169.125	n.f.m.	-	-	Oldham	ca	Merryhill Shopping Centre.
169.1375	n.f.m.	-	-	London	ca	Sega Mega World Staff.
169.1375	n.f.m.	-	-	Sizewell	ca	Old Warden Airfield Fire Service.
169.150	n.f.m.	-	-	London	ca	Phoenix Alexandra Place Staff.
169.1875	n.f.m.	-	-	London	ca	Seag Mega World Staff.
169.200	n.f.m.	-	-	Essex	ca	Harvey Nichols Shop.
169.2125	n.f.m.	-	-	Biggleswade	co	WKAEA.
169.225	n.f.m.	-	-	Harwell	ca	North Weald Airfield Sec./Fire.
169.2375	n.f.m.	-	-	London	ca	Knightsbridge, Dolcis Shoes Ordering Net.
169.250	n.f.m.	-	-	Waltham Cross	ca	Market Traders.
169.2500	n.f.m.	-	-	S.Birmingham	anon	SellyOak Hospital (Outside Contractor).
169.3125	n.f.m.	-	-	Essex	ca	North Weald Airfield MKT Car Park Stewards.
169.3375	n.f.m.	w/ends	-	Brands	kr	Brands Hatch Racing (Rescue).
169.3375	n.f.m.	w/ends	-	Knockhill	kr	Knockhill Racing (Marshalls/Rescue).
169.3375	n.f.m.	w/ends	-	Oulton	kr	Oulton Park Racing (Marshalls/Rescue).
169.3375	n.f.m.	w/ends	-	Silverstone	kr	Silverstone Racing (Marshalls/Rescue).
169.3375	n.f.m.	w/ends	-	Snetterton	kr	Snetterton Racing (Marshalls/Rescue).
169.3375	n.f.m.	w/ends	-	Thruxton	kr	Thruxton Racing (Marshalls/Rescue).
169.3625	n.f.m.	-	-	Birmingham	anon	St. John Ambulance Ch.1 Brigade National Frequency: 1.
169.5250	n.f.m.	-	-	Birmingham	anon	'Ambicare' Private Ambulances.
169.7625	n.f.m.	-	-	W'hampton	ca	Tower Records.
169.965	n.f.m.	24hrs	-	Northampton	kr	Billing Aquadrome Ch1.
171.5500	n.f.m.	24hrs	-	Northampton	kr	Billing Aquadrome Ch2.
177.7625	n.f.m.	-	-	London	ca	RSPCA Vans (Repeater 185.7625).
178.0625	n.f.m.	-	-	London	ca	RSPCA Vans (Repeater 186.0625).
178.325	n.f.m.	-	-	London	ca	Hammersmith-Fulham Council (Repeater 186.325).
178.475	n.f.m.	-	-	London	ca	Thames Water (Repeater 186.475).
180.1625	n.f.m.	-	-	London	ca	BIS Bus Co Tours (Repeater 188.1625).
207.200	n.f.m.	-	-	London	ca	Securiplan Security (Repeater 199.200).
440.375	n.f.m.	-	-	London	ca	Redbridge Council (Repeater 425.875).
440.450	n.f.m.	-	-	London	ca	Whittington/BARTS Hospital (Repeater 425.950).
440.925	n.f.m.	-	-	London	ca	Barking Council (Repeater 426.425).
441.425	n.f.m.	-	-	London	ca	Motorola Engineers (Repeater 426.925).
441.650	n.f.m.	-	-	London	ca	OAP Transport Service (Repeater 427-150).
441.925	n.f.m.	-	-	Ch' St. Peters	ca	Frabel Institute (Repeater 427.425).
442.100	n.f.m.	-	-	London	ca	Grove Fair Security/Apollo Dispatch (Repeater 427.600).
442.125	n.f.m.	-	-	London	co	Lynx (Repeater 427.625).
442.150	n.f.m.	-	-	London	co	Ircheck (Repeater 427.650).
442.200	n.f.m.	-	-	London	ca	Greenwich Council (Repeater 427.700).
450.6250	n.f.m.	24hrs	XSS	Northampton	kr	Police Helicopter Ch 88.
451.450	n.f.m.	1315	TA	Atherstone	tt	Police.

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# Mil - Air

Firstly, let me thank those of you who wrote in to comment favourably on the new MilAir column. Having said that I was a bit disappointed to only receive three letters with questions or information during the past month. Consequently, a slightly shorter column this month due because of this and also a reduced lead time for copy because of Christmas. Come on you airband enthusiasts, lets see you put pen to paper!

## GPS

A reader from Bedfordshire asks if the hand-held Global Positioning Systems reviewed in SWM would be of use to military aviation and airband enthusiasts. As a result of his letter, I borrowed a Garmin GPS-45 from a colleague to evaluate the unit and to see if I could answer the question. The first thing that becomes apparent is that it is an amazing little box of tricks. Even with the US military installed accuracy degradation, it is still an amazingly accurate piece of Navigational equipment. If your hobbies were Orienteering, Walking, Hiking, Sailing, etc., I would say this was the item of electronic wizardry just for

you, but as an aid for the aviation enthusiast I really cannot see it being of that much use.

Lakenheath

Thanks go to 'Big Ears' and Tony Gaunt who both answered the request I had for information relating to the Operations frequencies at RAF Lakenheath. Information has also come in from other sources but there still seems to be a couple of queries as to whether certain frequencies are Air to Air, Aux. or general operations. Essentially, Aux. frequencies appear to be Air to Air anyway, so I have listed them as such. Having combined all the various lists including channel numbers, I hope the enclosed column is an fairly accurate representation:

If information is forthcoming, the next airfield to be covered in the same way as Lakenheath will be Yeovilton - so all discrete frequencies, studs, etc. would be welcome.

## Frequency Focus

Brian from Portsmouth asks if there is still any Fleet Air Arm activity at Lee-on-Solent and

if so what are the frequencies? As far as I am aware the Navy moved out earlier this year taking the Air Traffic Control unit with them, thus leaving only the Search and Rescue helicopters. A word with a friend who lives nearby confirms that since around May the SAR helicopters use what is thought to be a new Fleetlands Air/Ground frequency on **135.7**.

Tony asks if anyone knows who the aggressors were during an exercise in the Welsh mountains on the 29th November. An AWACS (Magic 67), was heard working various aircraft formations on

**250.9** with the formation call signs, Black, Silver, Savage, Warhog, Triplex and Lancer.

Please write in with information or queries, much of the content of this column is dependant on your input - see you next month.

That's it for this month - Best wishes to all of you for the festive season and 1997.

### 492 FS (Fighter Squadron)

Ch01	300.075
Ch11	242.375
Ch12	248.275
Ch13	369.375

'Bolar Ops.'  
Air/Air  
Air/Air  
Air/Air

### 493 FS

Ch01	316.7
Ch05	280.725
Ch06	343.6
Ch07	293.725
Ch08	367.2
Ch11	343.475
Ch12	367.475
Ch13	361.95

'Reaper Ops.'  
Air/Air  
Air/Air  
Air/Air  
Air/Air  
Air/Air  
Air/Air

### 494 FS

Ch01	299.5
Ch11	276.225
Ch12	317.375
Ch13	339.875

'Panther Ops.'  
Air/Air  
Air/Air  
Air/Air

### General Ops. (Safety Officer)

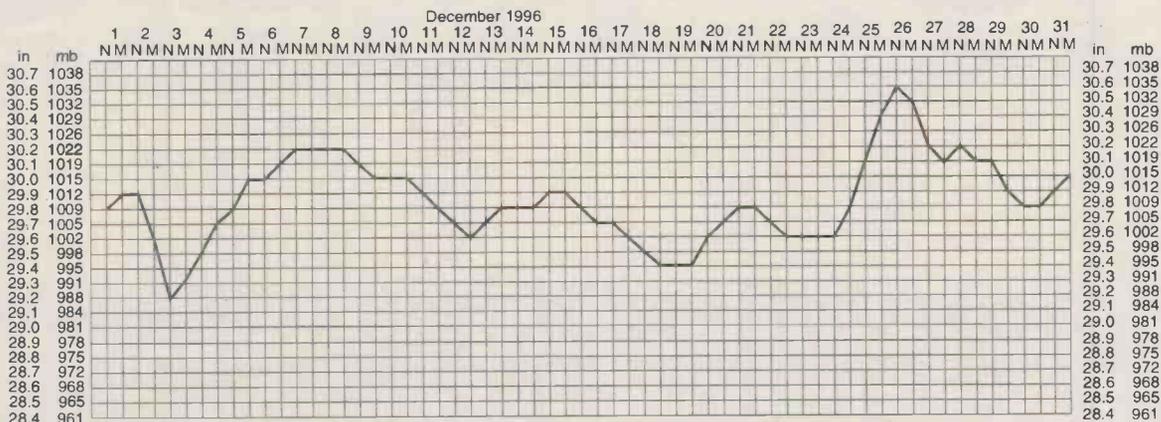
	282.15
	343.675
	361.95
Ch07	269.075
	300.825
Ch09	362.125

Standby Air/Air  
Standby Air/Air  
Standby Air/Air  
Command Post  
Ops. Dispatch  
SOF

# Propagation Extra

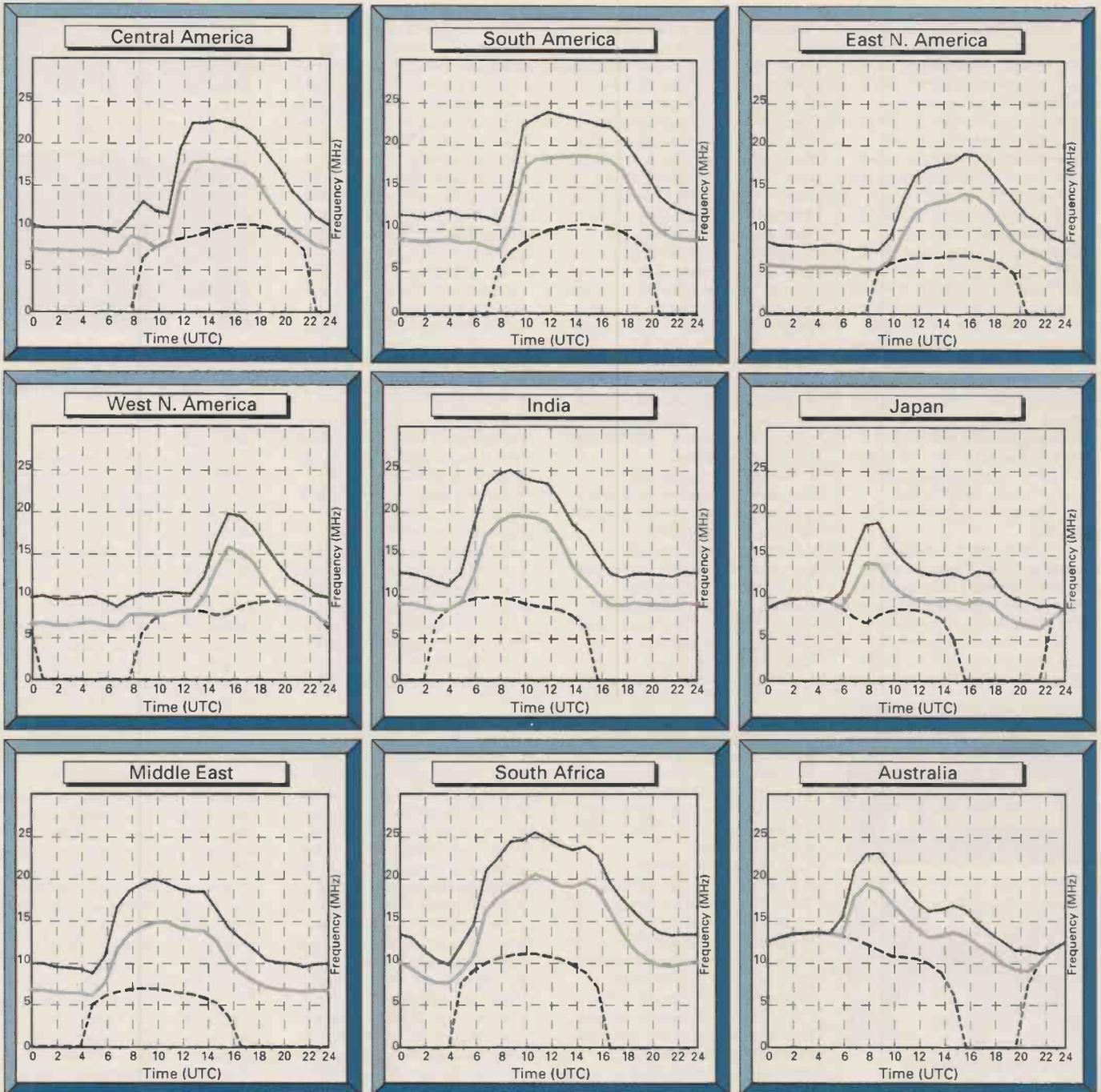
I believe that it is still essential that those readers who have an ongoing interest in propagation still have access to the various pieces of information collated by Ron Ham. I have asked Ron to continue to provide his monthly barometric pressure charts in the same format as before. In the meantime 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's barometric pressure chart for the month of December 1996.



# World Propagation Forecasts February

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.

# Satellite TV News



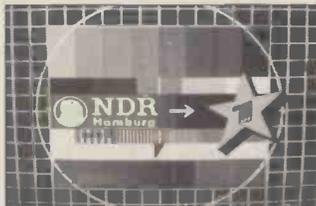
Behind the scenes of GMTV's 'Fun in the Sun' Summer 1996 via Intelsat K.

With the Christmas deadline advancing copy dates we've fewer readers' sightings this month, though the past few weeks have been eventful!

'Burger-Bugs' was the dramatic headline referring to a food poisoning scare that swept parts of Scotland end November and into December, sourced from a butcher's shop in Hamilton. BBC Scotland sent their SNG (satellite news gathering) truck 'BBC-UK1 234' to the area on November 24th with their reporter to send a hard news report live back into their evening news magazine programme via Intelsat K (21.5°W). As I write, the food poisoning outbreak has claimed its 10th victim.

Good to see a new satellite and a late night 'phone call from **John Locker** (Wirral) alerted me to Hot Bird 2 testing at 29°E at 11.795/11.845GHz in Ku-DBS. Both downlinks carried the same generic Eutelsat satellite test film but even for my location, through trees, signals were very strong. Eutelsat some years ago had registered the 29°E slot with the ITU for a future satellite position yet only recently SES Astra had applied for the 28.5°E slot for their soon to launch Astra 2 series parking orbit. Clearly tests at 29°E show to Astra that the 29°E slot is booked by Eutelsat and that a 28.5° adjacent slot is completely unworkable, usually a 3° spacing is sought for high powered Ku-band craft. I'm sure the politics will continue...

I've received a letter from **Bandula Gunasekera** (Sri Lanka), he's now using an offset 600mm dish for his Ku-Telecom band experiments with some success. More recently Intelsat 703 has been moved to the 57°E slot and new channels visible include Indian dialect offerings such as Tamil, Telegu and Malayalam. The new bird has 26 C-band trdrs



A flashy German test card again 7°E.



Not ch.E3 via Sporadic E but Eutelsat II F2 @ 10°E with a news feed.



Welcome back APNA-TV, this time on Orion-1 Atlantic @ 37.5°W (pictures from Roy Carman, John Locker and RB)

up to 37.3dBW and 10 Ku-band up to 45.4dBW - 47.8dBW in the spot beams.

**John Womersley** (Bradford) reports that transponder 11 on Astra currently used by Filmnet will be vacated this winter thus allowing Channel 5 to take over the lease, Filmnet having already moved to new lodgings on Thor (0.8W) at 12.092GHz right hand circular. Filmnet have been bought out by Canal Plus and rumour suggests that the old Canal Plus scrambling codes will be in use! The very weak Dubai TV feed using NTSC (525 lines - 12.728GHz vert) into the 'States via Intelsat K is being received by **Julian Redwood** in Christchurch, Dorset, at weak levels, though magazine reference data suggests that a 6.5m dish is necessary for good signals. Fortunately with good threshold extension signals that were previously at noise floor levels can now be brought up to quite acceptable quality. Julian has gone overboard and equipped with the latest Echostar LT-8700 with inbuilt VC and external D2MAC decoders, performance is extremely impressive. A service tip from Julian, **Grandata** in London can supply all sorts of TV and satellite components at trade prices - **0181-900 2329** - he has found service good.

Across Bournemouth Bay to the Isle of Wight and **Roy Carman** sent in a splendid log covering many weeks. One highlight was the live outside broadcast from Chile of Fidel Castro, he was arriving for the Hispanic Conference on November 9th, followed some 15 minutes later by the King of Spain. PanAmSat 3R - 43°W - was fired up for this event at 12.702GHz horizontal mid-afternoon - significantly a red carpet was rolled out for Fidel! Goonhilly Downs is famed for the BTI earth station that tested the first USA to UK C-band satellite link via **Telstar** back in the very early 1960s - geostationary parking was then unheard of, the moving satellite had to be tracked across the sky and with limited access time before the line of sight signal path between the US and UK via the moving bird was lost. And so Roy found a mid-afternoon test transmission November 26th via PAS-3R (43°W, 12.731GHz hor.) -

'GOONHILLY 1CC UPLINK TO PANAMSAT 3 TRANS 7EK DOWNLINK 12731 H PAL VBW 18MHz Audio 6.6 + 7.2 J17'

**John Locker** in the Wirral is moving house shortly and hopefully to a more friendly satellite receiving environment. He comments that the recent Kirch digital TV package in Germany hasn't been too popular resulting in thousands of digital 'decoders' unused and a few trickling onto the enthusiast market. One such decoder has been acquired by a Scandinavian sat DXer and successfully used to resolve both conventional broadcast TV and news/OB feed links. So it looks as if perhaps enthusiasts will have access to digital equipment within the year. One ongoing problem is LNB stability, the present triple/quad band LNBs have great difficulty in locking up digital signals. Unfortunately manufacturers seem reluctant to offer European digital 'boxes' into the UK market, even for enthusiasts, and the few that have been willing are asking prices of +£600! Hopefully, within the year, MPEG equipment will become available.

A new satellite is always good news and a late night 'phone call December 3rd from John

Locker alerted me to Eutelsat's Hot Bird 2 that flew from Cape Canaveral November 21st was offering test transmissions from 29°E (11.795 + 11.845GHz). Hot Bird will eventually locate to 13°E though the 28-29°E slot is rather controversial - Eutelsat booked 29°E some years ago but more recently SES Astra sought a 28.5°E slot for the new digital Astra series 2 that will launch later in '97. High power birds with only 0.5° spacing will simply not co-exist and Eutelsat sitting at 29°E testing is an interesting challenge to Astra!

A quick check across Orion-1 at 1800UTC December 12th found several signals, 'BBC PLYMOUTH UK1-231' was feeding a live Christmas shopping arcade item from Brewers Key, Weymouth - bands, reindeers, a school choir and olde worlde shops (12.674GHz vertical) back into the Plymouth magazine programme. Meanwhile on 12.652GHz horizontal the 'BT UK1-100' was in technical line-up (colour bars +1kHz tone) for live basketball later that evening.

## News In Space

German broadcaster ZDF is planning a new free-to-air digital TV service - 'ZDF-INFODIG' to air from August '97 taking input from both ORF Austria and SRG Switzerland with contributions from the Franco/German ARTE channel. The ZDF service will take programming from the ORF/SRG/ZDF networks + other public channels. German network ARD also intend launching their own digital TV channel package in mid July '97. SAT-1, the Kirch commercial satellite channel is to open a 'SAT2' variation shortly, mainly to offer programme repeats from the vast library available. Canal Plus are joining with Kirch into a single German digital TV package (DF1) from March '97.

And Spain's Teleconica intends launching their digital satellite TV package late March with partners RTVE, Antena 3 and Mexico's Televisa. They will lag two months behind the Canal Plus Espagne digital package that opens January '97. The new Polish RTL-7 opened up December 7th from Eutelsat's Hot Bird 1 at 11.489GHz vertical offering 18 hours of clear general entertainment programming. Polonia 1 and Canal Plus Polska are both departing Eutelsat 16°E in favour of 13°E residence.

There are strong media rumours that claim a new Iranian satellite channel will open covering Europe, North Africa and the Middle East 'in the near future'. There is no indication of satellite though IRIB state uplinking equipment has been purchased. Other reports suggest that the satellite system 'ZOREH' is being registered with the ITU and is seeking orbital slots at 26, 34, 41, 47, 59 and 61.5°E, the satellite service will 'counter the Western cultural invasion'. Other sources have suggested the satellite is ready to launch, though this may mean that Russia will either launch the satellite or offer carriage via Gorizont.

Another claim to a World TV satellite channel has been made by Daar Communications in Lagos, Nigeria. 'African Independent Television' intends to open late 1996, though initially this may be for African coverage only. Two licences remain valid for satellite TV though the authorities have taken away six commercial TV licences from potential terrestrial broadcasters as no service



Live space feeds via Eutelsat 7°E from the MIR space station.



On the Presidential trail during the US elections, another European distribution feed via Eutelsat II F45 @ 7°E.

actually started!

New name on the block soon may be Gibraltar as GE Americom have applied to the ITU for Ku-band satellite slots at 23, 15, 10°W and 3, 37.5, 47, 51, 97, 100.7, 105.3, 108.2°E to offer an almost world-wide network. Once the Gib government OK the plan, a large teleport and production centre will be built on the 'Rock'. Arabsat are to seek tenders for providing the construction and a future possible launch for an Arabsat-2C satellite as a ground based spare pending a need for replacement or increased capacity at 26°E. Arabsat-2B that launched November 13th has slotted at 30.5°E offering both C and Ku-band transponders for DTH TV, data and general telecommunications work across the Arab world.

Out in New Zealand there's much pioneering work being achieved with the first generation of MPEG digital satellite receivers. Several big names have offered digital equipment but there have been considerable problems in a lack of flexibility, being difficult if not impossible to successfully lock up MPEG programming with differing digital parameters. Generally a PC or Amiga workup with a remote control have been necessary to change FEC and bit rates - if it is possible to change technical specs at all. Equipment from Pace, Nokia and Scientific Atlanta have suffered a lack of flexibility though a fresh arrival has been the Thomson Digiscan SK888 chassis that has already programmed in numerous MPEG standards. It's made in the Far East and over two million have been manufactured to date. The Thomson group has made most of the DirecTV (USA) digital receivers and with 3rd generation chips coming on stream the earlier models complete with dish, LNB have been selling as a complete receive digital package in the 'States for \$49! Things do look better on the digital front.

The American Forces Radio/TV services have delayed the move from B-MAC to coded MPEG-2 from January to mid-summer '97, B-MAC decoders for AFRTS are still being UK advertised, which if purchased will have a glorious but rather short life!

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# Scanning

This month sees a packed column, so, let's get down to the main topic first of all, then move into answering a huge mailbag!

I promised to look at mountings this month, but not in excessive detail. There are many books and excellent articles around on effective rigging, great if you're into putting up masts, but in the case of scanner owners, a usual mount is atop the chimney or on the gable end. That's what I'll look at and also touch on 'free standing' mounts on top of scaffolding poles and the like!

## Safety

Firstly, a brief word on safety. Always, but always make sure that any mount you put up satisfied the following basic criteria. a) - What you put up can be bought down, b) - What you put up can be adjusted accordingly and c) - End of lesson one. What you put up stays up!

Choose your location and bear in mind the basics of any installation. You must not overshadow or work under either power or telephone lines. You should not work when there is a risk of lightning and you must always think of your safety and that of others. A basic rule is that for any work above ground, you bag your tools safely so that they cannot come under the influence of gravity and whack some passer-by on the head!

I've been working aloft in a garden and above ground and I've dropped tools before now, and part of my job was rigging, so I should have know better! Lash all ladders securely and tell someone where you're going. Work within safe limits and if it is wet on the roof, either defer it to a dry day or if you're insistent, at least tie a security line around the chimney and secure yourself to it. You can do this with a karabiner from the local outdoor shop and a basic climbing seat harness.

I would advise you to make up a strap or better still acquire a specialist webbing climbing sling which can be thrown around the chimney on to which you can clip-on with your karabiner. For those not in the know, a screw gate karabiner is the one to use - on second thoughts if you're not in the know you had better leave the whole exercise to someone who is.

Attach yourself via your harness and karabiner to the strap/sling. The only way to work aloft is to be

properly equipped for it, so, unless you have a part-time job in a circus as a tightrope walker or you are a climber, either get an expert to put the installation in or observe the rules and play safe!

Right, Mountings! Suitably outfitted with a strap around the breast, proper secured ladders with ridge hooks, a safety line, having told someone where you are and what you're doing, it's time to lash up and secure. You can buy lashing kits form many places and these are usually simple. They take the form of a wire with a clip, which you wind to take the tension up with. You fit this first, with the mounting pole attached, and always go for a short and stout pole to which you can attach a longer piece. Why? Well, as the tension is taken up you will have to allow for the extra weight, so don't think that the mounting wire you cannot pull by hand once you've fitted it is safe. It isn't! Add pieces to it and it will give again.

Mounting is usually made by a short mast, see Fig. 1 and Fig. 2 for lashing and pole. To this you clip the antenna. Bear in mind the size of the antenna you are putting up and the fact that you will have to incorporate extra support for its physical length. Tip, see Fig. 3 for a 'cop out' I've used to bear the weight, which has, over the years, proved to be good in coastal areas with good gales of wind. Without the lip, you can infill with a piece of non-porpus material, such as an aluminium block. Bear in mind again that you will have to ensure it stays there so go for solid mountings with a minimum of movement.

Once you've clipped the antenna to its mounting pole, check everything again and remember that wind moves any antenna. Do not make the thing so solid that you cannot allow play in it by a good pull. You do not want too much play, but you also do not want a mast so stiff that it breaks under a powerful gale. I work on the rule of a small amount of play to allow for windage, which is then re-tensioned about a month after and always when we've had a few gales. You have to build in play to any mast, or give, or you'll lose it!

After that, check the installation on a regular basis and make sure

that you have greased everything that moves. It doesn't hurt to grease the chimney wire either to stop it rusting. Sensible when you need to take it down!

Fit the feeder and again tape or zip-clip it with a loop, see Fig. 4, and secure it to anything running down like the TV coaxial feeder. or a downspout. Grease the plugs and, if exposed, try taping over with something like Denso tape. Denso tape is the terrible sticky stuff, which is awful to apply, but has the waterproof abilities of the proverbial duck's bottom....! Next, run the feeder into the shack, couple up and look for signals!

Okay, so that's really basic, but, expert installation is always the way to go - if you have to do it yourself, at least do it with care. Different size masts require different sizes of wires and clips, so always buy oversize if in doubt. It's hopeless trying to support a 7.5m GRP vertical with a light lashing clip. Beware the sales pitch that says it can hold it up, the penalties are injury, insurance claims and possibly death. Be aware!

More detailed advice on mounting can be had in the books on masts and antennas, which are part of the magazine book service. Just be cautious and, if any doubts exist in your mind, pay an expert!

Onto the mail! Phenomenal amounts again - so I'll be brief-ish! Thanks to **John T. Wagner** of Pickerington, Ohio, in the USA, for his QSL card. Nice to know I'm read in the US!

Two listeners who reported in about McDonald's and the MoD - thanks! It appears that Ronald got his wires crossed with headsets

purchased in Holland, which were used at Colchester Drive-in.....and which had the MoD hammering away like crazy as the frequencies used were the same as those used by MoD! Bit of a faux-pas on that one, but thankfully 'Big Mac and Fries' wasn't a code used to nuke some poor soul somewhere.....!

**L. Collins** asks for info. on a callsign heard on 123.700 and named 'Sovereign 7' inbound to Leeds, Bradford. Airband is now a separate issue Lee, but I'll go so far as to suggest to you that this is a civvy call used by a carrier and possibly a scheduled flight. Any advances on that anyone?

A letter from **J. Marsh** asks if any overseas listeners would be interested in exchanging audio tapes of scanner action with him? He can be contacted at: **6 Cunnock Close, Helston, Cornwall TR13 8XQ.**

Another letter from **K. Robinson** asks if he has passed his 'sell-by' date for the amateur license at 61. Answer - no! If anyone who

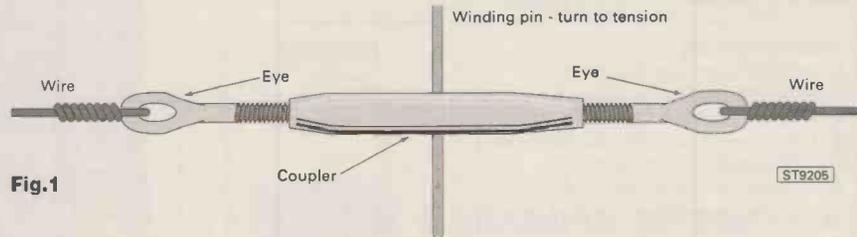


Fig.1

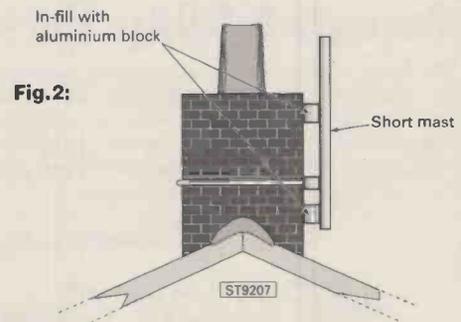


Fig.2:

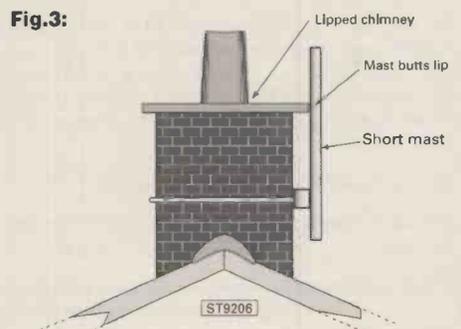


Fig.3:

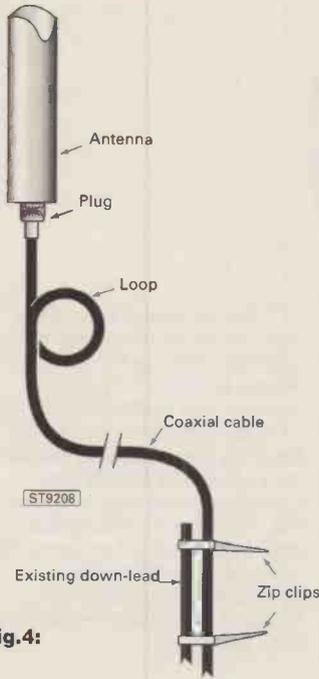


Fig.4:

has taken the exam late in life would like to exchange with Ken, can you contact him on: **40 Auckland Road, Potters Bar, Herts EN6 3EY**. Ken also asks if an a.t.u. and

long wire would be good on his Yupiteru. Hmm, trick one! The front-end of the set may overload with the signals produced by such an arrangement, but I'd be interested in hearing from anyone else who uses and knows of a good a.t.u. for a scanner with a wire antenna for the bands below 30MHz. He has the venerable 7100 if anyone's interested!

It seems my piece on the article carried by *Police Review* on scanners touched a few nerves! Firstly, there were those who said it was not very well informed - on.really? - and that I should stick to 'logging illegal frequencies' and so forth. An enormous raspberry to you all! Misinformation is not as overt as you'd like to think and the article itself was mis-informed.

I'd just also like to say thanks to the three letters of support I got from serving police officers who endorsed my piece and views and added that the average police officer is not out to get scanner owners, but that sometimes the actions of a few draw attention to themselves. I've always endorsed the police force in the UK as I think they do a difficult and dangerous job for very poor acknowledgement. If I

was a bit overzealous, I apologise, but it's something to do with the hysteria about the subject and we caught in it!

Support the law is a good cause for us all to take up and, again, I'd say here that we have a duty to do that. Work together and we'll be fine, but we do sometimes draw attention and the police do have a duty. Many thanks anyway to those officers who wrote to point out a few things to me. Appreciated.

Some frequencies of interest to all now - get cracking on these!

154	.470	Blue dot
154	.600	Green dot
151	.625	Red dot
151	.955	Purple
462	.625	Black
462	.675	Orange
462	.575	White
464	.500	Brown
464	.550	Yellow
467	.580	Silver star
467	.875	Gold star
467	.900	Red star
467	.925	Blue star

GMRS stands for General Mobile Radio Service and this is a low cost

radio service used in the US, but these sets can be purchased in the UK. Identified by a colour-coded dot on the side of the set, would any listener hearing anything from this system please write in? Not, I hasten to add, Proma members!

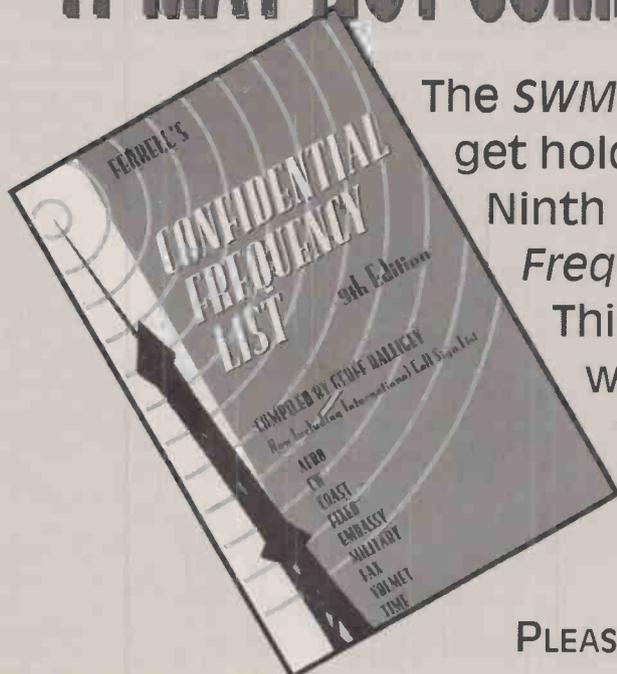
There are more channels but please monitor this bank first and report back on time, location, callsigns, etc., etc.

Right! That should keep you busy for a while! I'll look at basic hand-held sets for beginners next month, straying into sets that are more suited to the experienced listeners, but usually bought by the Novice and then becoming too much to handle, and also touch on why some people hear stuff that you don't....and how to 'scan' properly!

Lastly, my apologies to my regular correspondents for my not writing back as quickly as normal. The old computer died here and, putting it mildly, I cannot afford to replace it yet! I will though, it's just when and the money that's the issue! Rest assured, I'll be in touch!

Until next month, keep the letters coming in and let's keep it legal and all that. Catch you down the log sometime again.

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# SSB Utility Listening

## Balloons

In the past few weeks, the subject of round the world balloon flights has come back into the news media. About a year ago, there were two balloons which seemed to be ready for launch, with a third attempt in the advanced planning stage. All these flights were eventually cancelled due to bad weather at the launch sites.

Now, a year later, there are plans for at least five attempts on the challenge to be the first to circumnavigate the globe. The launch relies on favourable weather conditions at the launch site, so it is impossible to predict if/when any of the launches will take place. The most favourable winds for each flight occur between December and March each year. The launches are taking place from different parts of the globe, and to provide some publicity for each venture there are Internet Web sites set-up for each, to keep interested parties up-to-date with each flight.

Steve Fossett, in the balloon *Solo Spirit*, is now waiting at Busch Stadium in St. Louis, USA. His web page is <http://www.luc.edu/sole>, but it seems to be purely for people to leave messages for the crew. The web pages seem to indicate that there are other pages with all sorts of information about the balloon, crew and flight, but I was unable to access them.

In contrast, the web-site of Richard Branson and Per Lindstrand (balloon *Virgin Global Challenger*) contains a large amount of information about the crew, planned flight-path and the balloon. At the start of December, the crew flew to Marrakech in Morocco (Africa) to prepare for the flight. The web page is <http://www.challenger.iclnet.co.uk>

Next up is the attempt by Australian Bob Martin, flying a balloon named *Dymocks Odyssey*. It will be launched from Australia, the only flight due to launch from the southern hemisphere. This is actually another American attempt on the flight, but is launching from the southern hemisphere so that it can travel westwards around the globe (everyone else is in the northern hemisphere, and floating eastwards). The web page is at <http://www.viva.com/odyssey>

A famous name in the history of round the world flight is that of Dick Rutan. He is also preparing to launch an attempt, but from the western USA. His balloon is named *Aeolus 1*,

and his web pages <http://www.iag.net/~aeolus1/> are jam-packed with information about the balloon, the crew and details of their planned launch.

The final attempt is being mounted from Switzerland, and is sponsored by chronograph manufacturer Breitling. They have been running adverts in major newspapers around Europe, which provide some information about the balloon and crew. The advert even contains their web page address, <http://www.breitling-orbiter.ch> but I have been unable to connect to this page either.

Each of these flights has a ground station/HQ which will be providing information about the progress of their flight; the one for the Virgin Challenger is in a hotel in London. As with previous balloon flights by Virgin, they have used Portishead Radio for their long-distance communications, so it is worth keeping a watch on the Portishead frequencies once you hear that the balloon has been launched. A likely frequency is 5.610MHz, which has been used in the past by Richard Branson in previous balloon flights. I would expect that the Breitling balloon would attempt to use Berne Radio for h.f. communications, while the Americans would probably use US based LDOC stations.

## Vigilant

When was the last time that you heard a Royal Navy nuclear submarine on h.f.? Because of the nature of their work, they are hardly ever heard on any frequency, so the chance to hear one is not to be missed.

During the middle of November, a message was put onto the Internet explaining that a Royal Navy submarine would be joining a Sea Cadet Corps (SCC) net on a particular Saturday. No mention was made of the name of the submarine, or where it would be, but it did list the frequency and time.

I tuned in to the SCC frequency (6.9925MHz) about 30 minutes before the scheduled call-up time, and the very first signal was from Submarine *Vigilant* calling the SCC units. Over the next few hours, several SCC units contacted the submarine, including stations from London and Scotland. At the time, I was not able to confirm the exact location of the submarine, but I subsequently wrote to one of the

SCC units asking for some more information. The submarine had planned to visit Douglas in the Isle of Man, but the sea was a bit too rough. Instead, a local fishing vessel took parties of SCC cadets out to see the submarine.

A few days later, I went to a local library, and looked-up some details of this submarine in *Janes Fighting Ships*. I was very surprised to read that *HMS Vigilant* is a nuclear powered Vanguard Class strategic missile submarine. It just goes to show what you can pick-up by keeping your eyes open for information. Now, how do I QSL a nuclear submarine?

## Diary Dates

At the Leicester Show in October, I spoke with somebody at length about military exercises, and he asked if I knew of any dates for military exercises in 1997. At that time, the information was not available, but since then I have received a list, from which the following events will probably be of interest to utility listeners.

In 1997, there will be three Joint Maritime Courses (JMC) held in UK waters. These are exercises which involve large-scale naval and air force task-forces, and always generates a lot of h.f. communications traffic. The exercises attract both aircraft and ships from NATO nations, so there are plenty of chances to hear the signals. The 1997 dates are as follows: JMC 97-1, 24th February until 7th March; JMC 97-2, 6th June until 23rd June; JMC 97-3, November 1997.

There are another two military exercises during 1997 which may be of interest. They are principally air defence exercises, but there are usually a large number of tanker and transport aircraft involved as well. Since this is an air defence exercise, there will also be AWACS radar aircraft controlling both sides, and this means that h.f. communications get used a lot more than normal. The exercises are called Northern Adventure (20th January - 7th February), and Brilliant Invader (27th May - 30th May).

## This Year

Well, here we are at the start of 1997. Last year I received a few letters and requests asking me to continue with the Traffic Log. I did mention why I dropped it from this column last year, but I am prepared to start including it again every month if I receive some logs from you. What I need are interesting logs of things happening on unusual frequencies, or rare or momentous events heard. What I'm not looking for are pages and pages of logs for RAF and USAF frequencies. Try some new frequencies, especially the marine bands. I used to get very few logs for traffic in the marine bands, and it would be nice to do a whole column devoted entirely to these bands. Of course, I can only do it with your assistance and letters, so please find the time to contact me at least once during the year.

I'm also on the look-out for some more readers questions. I have one or two left, which I will be covering in the next few months, but after that, I don't know what I will do.



The capsule of the Virgin Balloon

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73 from Dave G4KQH, Technical Manager.



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# 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.

There does seem to be a slight feel on the bands that we've passed the nadir and are on the upturn.

Of course, we won't know in which month the upturn actually occurred until six months later, when the 'smoothed' data appears. 'Smoothing' is a mathematical procedure which, in effect, takes out the daily random variations which obscure the long-term trend. Whatever, we want a spotty-faced sun!

## Equipment Location

In the modern tiny house this is a mighty problem especially if you have a young family. In such a case there isn't a hope of a room for your gear. An outside shed is probably an open invitation to thieves, and even in years gone by when theft was not a problem, taking refuge at the bottom of the garden was regarded as a bit antisocial.

So - where? Do try and be a bit open-minded. I've seen a successful radio shack set-up in a small house where the architect had designed in a slightly larger-than-usual landing. Both functions - landing and radio shack - were admirably served, although the lady of the house did call for a curtain as a screen when the gear was out of use. Another shack I remember well, was my own when I was first licensed 40-plus years back; this was a cupboard under the stairs on the first floor, so small that my back projected into the bedroom when operating. Someone I know took over the downstairs loo; another one looked in the roof-space of his bungalow when he moved in, and promptly built into it a beautifully-appointed operating area, workshop, and an area set aside for another hobby. Radiators, windows, the lot.

Which brings me to the major consideration namely *ventilation*. Firstly, of course, for your gear's sake - it wants to get rid of heat. Secondly, for yourself. 'A nice fug' in the shack is not the way to remain alert. No-one wants to see that expensive heat disappearing outside, but you can discharge it into, say, another room.

## Letters

Let's begin with **Dennis Miller** in Dawlish who heard WW2Y on Top Band, along with EA5GCT, LA5FHA, OK2RZ, SM5AQD, UY0QY, and 7X5JF. At 3.5MHz C31SD, EA8AH, EA9PD, HJ6PPN, LU11V, RX9JM, VE3KPU, VK3DZM, W9QQ, 4L4MM, 4X4BL, 5X1T, and 7X5JF. Skipping Forty, Dennis went on to 14MHz for A51J, KP2W5SJ, KP4AAQ, SU3AM, SV2ASP/A on Mount Athos, VU2DVP, 3A2MD, and 4K7DWZ. As for 21MHz the pickings here included FR/EA2KL, S92/Port/KE1AT, XZ1N in Myanmar, YC9VX, Y11XW, 5N9SA,

9J2BO, 9K2CE, and 9M2KQ. There have been some interesting callsigns about on 14MHz says **Ted Hearn** from Newcastle, Staffs who starts at Top Band with Europeans, including M6T, one of the new UK contest calls and 9A800S as a commemorative. Turning to 3.5MHz Ted mentions JA6BJT, SM7DLZ(Oland Is), OX5TS, OY1HJ, XT2DP, JH7JGG, RX6LF, VO1FG, 9H1EU, and DS5RNM. On 7MHz the wings were spread wider to include DU2XOX, BY3VAM/2, AP2TM, T77C, A92FZ, ZL4BO, VK4MR, VK7TS, 1B/DL6NBR, ZD8Z, C31OF, JG1GBY. Up again to 14MHz where VE7XR, 9H4CSG/J, VA3RJR, TA2KK, EA8ZS, GJ1EH who must have been a misreading or a pirate, PJ9E, EA9IE, VE9DH, 4X6TT, OX3RO, VU2DK, VO1FK, 4Z4UR, AA4Z, WM2V, KC2MF, 7S4RL, Z22JE, OD5OD, 9K2KW, A71BY, 3D2AD, VR2KF, TA1BM, HL3VO, ZZ1ZZ, PY6JJ, C21NJ, A35HB, and UE1ALK aboard an icebreaker ship. At 21MHz the tally came to Z23AZ, ZP5WYV, A41KT, EA9EA, WA2QZQ, ON4UNYR2R, V51BP, and PY7CPC. Finally a report on 28MHz where IK4FMS, I3FNG, IK2UVR, and 9A1ATC were all logged. And of course though not listed here, the usual crop of smaller fry, common Europeans and the like.

It's a long time since I last heard from **Philip Davies** in Market Drayton. Firstly Philip has clarification for L75AA - this one is for the Argentine Radio Club's 75th anniversary and QSLs go via LU4AA. Secondly EM1KA and EM1U are both at the Ukrainian Antarctic base 'Vernadasky' on Argentine Island, IOTA-AN 006. EM1KA is ex-4K2OT. QSLs for EM1KA is via JA2JPA, while EM1U's cards go via 9H3UP. Finally, DX1A; Philip reckons it isn't quite an impossibility as DX calls have been known in major contests; on the other hand it might be a misreading of DX1EA - Philip took twenty minutes of careful concentration before he was certain he had it right. Philip listened on 3.5MHz to hook A92FZ, AC6CX in California, DS5RNM in S. Korea, EO6F in Ukraine, FM5GU, JW8GV, R1FJZ(Franz Josef Land), SV2ASP/A, UN7TX, VP2MAE, XT2DP, YB3OSE, YK1AO, 5N0MVE, and 5X1T while on 7MHz we see A71EM, BV5BG, CE8EIO, EX0V, FT5WE(Crozet Is), UA0OP, VU2RX, ZP7BIA, 3E1DX (IOTA NA-072, QSLs via KU9C), 3V8BB, 4L5O, and 5X1T. Next it was the turn of 14MHz and here A61AN, J68AS, JT1BG, R1ASP(Kotlin Island), XZ1N, and 8S0FRO for the 50th anniversary of the founding of the Swedish Voluntary Radio Service. At 18MHz Philip noted HK0TCN(San Andres Is), T77C, 4L7AA, and 5Z4T and on 21MHz the crop included LW5DRL, VK8KTCI(Groote Is, IOTA OC-141), and XZ1N.

Now we come to **Colin Dean** in Barnsley, who stuck to the lower bands.

Top Band accounted for DJ8WL, EA8AH, LA7WCA, OH1TX, ON4AEK, OZ1ING and SP9IEK. Next came a peep at 3.5MHz where Colin noticed A61AJ, A92FZ, C31HK, C31LD, DK1BN/C6A, EY8MM, FM5DP, FM5GU, HC1JQ, HP1DA, JA5AQC, JA9CNG, JT1BCT, KB9FIG/AM over mid-Scandinavia, OD5NJ, PZ5HP, R1RFZ, SV2ASP/A, T14CF, T77C, UN0AA, VK1DH, VK3DZM, VK3EW, VK5PO, VK6APZ, VP9KK, V21AC, YK1AO, 3A2MD, 4L1UN, 4L7AT, 5X1T, 9K2HN, and 9K2MU. Finally, the maestro at 7MHz yielded CO8SC, FT5VE, T14CF, VK3AJJ, XE3RN, 8R1RPN, and 9G1YR.

Everything so far has been noted as single-sideband telephony. Now we move to a c.w. addict by way of **Ted Trowell** in the Isle of Sheppey. Ted is another who thinks conditions picked up in the period reported on. On Top Band, Ted found KC1XX, CG1ZZ and OY9JD all around 0600z; on 3.5MHz around 2100z JA2EPW was entered in the book. Early-morning sessions on 7MHz gave ZL1BVB and VE3EJ/HCS, and in the evenings around 2000z Ted noted VK3KM, VK8AV and WA4DAN/CY0. At teatime Ted tried 10MHz where he noted DU/AH8F, 3C1DX, 9H1AL, XU6WV, ET3BN, 5N3/SP5XAR, while a little later, around 1900 he found FY5YE and EA9PB. On 14MHz around 1600z Ted noted ZS6QU, VQ9QM, W7SE, VE7NH, K3TEJ/C6A, 8P9Z, V2/G6QQ, JW5VK and HS2B. Mid-morning on 18MHz was the time for JY9QJ, while 1600z was right for VQ9QM, ZS6QU, HP6LK, 9U5DX, HK7AAG, 6W6JX, 9J2BO, KG4O, 9L1KA, V31VT, N5KO/HCS, V47VJ, 8P9HT and 8P9Z. Finally on 21MHz a session at 1100z located LU4FM, LU5UAI, J68AH and at 1600 Ted logged D44BC and 8P9Z again. On a different tack, Ted Trowell is decidedly uptight about the invasion of the whole c.w. end of the Top Band by sideband stations during the 'CQ WWW SSB Contest' - but hardly anything above 1.850MHz in the proper sideband segment. As he says, "it's a bit much".

## QSLs

Ted Trowell again. For J68AH, send to AC0S; 9L1KA to W0HSC; XU6WV to K0TLM; JY9QJ to DL5MBY; and 3C1DX to EA6BH. Incidentally, if your cards go via the Bureau, you should still mark them, as these are the stations that in the end will answer your cards.

## More Letters

Our anonymous correspondent again this time on the topic of 'what constitutes a valid hearing?' I suppose we all have our own ideas. Personally I exclude stations calling CQ - purely as my own preference I agree - and in a pile-up or if in doubt I stick around until

I'm quite **sure** that I've got his callsign right and got it from the owner. Once I've copied it in full from him, then I probably dig amongst the pile-up until someone else verifies my own reading of the call. Two reasons: firstly because I frequently receive logs from people where I *know* that they've got the call from someone calling the DX and probably haven't heard the DX at all; and secondly because I personally won't enter anything into my log until I'm absolutely sure. On the other hand that begs the definition of 'sure' and I'm sure there are as many definitions of that as there are s.w.i.s. All that being said some logs I receive never show an obvious mishearing, others are full of 'em, often as basic as failing to allow for imperfect pronunciation - and yet others I suspect hear them right but omit something in the logging, such as a digit omitted from a callsign.

A final letter comes from **John Charles** from Louth; John tried 14MHz where his log shows 4X4JU, VK2CSZ by the short path and ZP5WBM. On 18MHz we see XY8HI, 9K2QQ, 9H4CM, 7X5JF, TM2P, EA8BYR, 9H4M, AA3GZ, W11JU, 4X1FQ, 9H1DE, W4XJ, VE2YV, 9K2QQ again, J52AK, 9H4CM, TA1AL, WD4DD, NM1B, A71CD, and the usual crop of European signals. 21MHz saw ZS8IR, N2II, 7X5JS, 9H1DL, N8II, UY0QY, Z31ET, HK6QQ, XZ1N, CN8SN, PT7BZ, and CN8VK while the 24MHz band offered Europeans plus 9H1MF.

## Here and There

The 1997 Heard Island DX-pedition looks to have the following schedule: December 29 to January 2 on Reunion FR, using the call TO0R; January 8/9 on FT8W, Crozet with TX0C as the call; 13 to 27 January VK0IR on Heard Island; January 30/31 on Kerguelen Is signing TX0K, and February 6-9 back on Reunion and TOOR. Fully half of the team of 20 are experts on the lower bands, and Heard Island in particular will be perched on the 'grey line' for fully eight hours each day, and extended low-band openings into Europe are likely. On arrival at Heard Island, the first exercise will be to set up the NCDXF five-band beacon. Activity on Top Band will be on 1826.5kHz, and when they are not on Top Band, there will also be a beacon on that frequency.

## Final-Final

That's the lot for this time, put together a mite hastily to beat the Christmas mail problems. As ever, your letters are welcomed, addressed to me at PO Box 4, Newtown, Powys SY16 1ZZ to arrive by the first of the month.

# DX Television

November was less impressive than the previous month for long-distance TV reception. Tropospheric reception was minimal but, fortunately, Sporadic-E activity was noted on several dates, the best being the 10th. There was an upsurge of Meteor-Shower activity in Band I on the 14th and 15th but nothing could be identified.

## Reception Reports

**Peter Barber** (Coventry) is fortunate in being able to devote much of his spare time tuning through Band I in search of signals. It pays off and virtually every day throughout November signals of some description were encountered on Channel E3. Much of the reception is usually too brief to identify (especially with Meteor-Shower signals). Fortunately, there were longer openings too, with a three-hour session on the 10th with watchable pictures from the Ukraine (YT-1 on Channel R2 from Minsk), Austria (ORF-1 on Channel



**Fig. 3: The Fremont Point TV mast in the Channel Islands. Photo supplied by Roger Bunney (Romsey).**

E2a from Jauerling) and Italy (RAI Uno on Channel IA). An Italian private station 'TVA' was also identified during the opening on 53.740MHz. Peter identified Rumania (TVR-2 on Channel R2 from Bucuresti) during a shorter opening on the 19th at 1433UTC. **Tom Crane** (Hawkwell, Essex)

also identified signals from the Ukraine during the Sporadic-E opening on November 10th.

**Stephen Michie** (Bristol) also witnessed the opening of the 10th and resolved pictures from Estonia (ETV on Channel R2 from Tallinn) and Italy (RAI Uno on Channel IA). There was a glimmer of tropospheric reception on the 15th and 16th with low-level signals from Dutch and French transmitters in Band III and u.h.f.

## TVA Transmitters

There seems to be at least two 'TVA' transmitters operating around the Channel IA frequency. Several times during the summer, a 'TVA' station was identified at 200kHz above the Channel IA nominal vision frequency of 53.75MHz. Tom Crane (Hawkwell, Essex) has also commented on the possibility of there being a second, or even a third, 'TVA' outlet. Signals have been noted on 54.079MHz, i.e. having an offset of +347kHz. During this reception, Tom was able to separate TVA from a RAI Uno signal on Channel IA using the reduced i.f. bandwidth facility of his D-100 converter. The TVA logo has occasionally carried the additional identification 'NAPOLI'.

## Directional Transmissions

**Andrew Burfield** (Braintree, Essex) is able to receive signals from the Mendip and Oxford transmitters on a daily basis. Both transmitters are in Group C/D with 500kW e.r.p. However, the Mendip outlet comes in stronger despite it being further away and Andrew wonders why. One likely explanation is that the radiation pattern of the latter transmitter directs the signal to the east. There is also a good reception path from the Mendip area across to the east. This is confirmed by Stephen Michie in Bristol where he can tune into the Goes (Netherlands) Channel E35 transmitter on a daily basis using a wideband grid antenna indoors.

## Service Information

Netherlands: Stephen Michie (Bristol) advises that current test

transmission schedules for the Dutch 2nd network are as follows:- 'FuBK test pattern with 'ZENDER LOPIK' identification until 0745. Widescreen (16:9) Philips PM5544-type test card until 1050. Normal (4:5) PM5544 with 'NEDERLAND-2' identification until 1130. Station opening: clock followed by '2' logo bursting out of bubbles followed by '2' symbol with the name 'TELEAC'.

**Gssta van der Linden** (Netherlands) advises that a new regional service, 'TV-WEST', is now available via cable in The Hague, Zoetermeer, Leiden and Gouda-en- Delft regions.

Germany: The 'WEST-3' (also identified by the initials 'WDR') network in Germany has recently introduced local news bulletins. Meanwhile, the German MDR network is making use of their stereo sound channel for dual-language broadcasts: Channel 1 is in German while Channel 2 is in Sorbian.

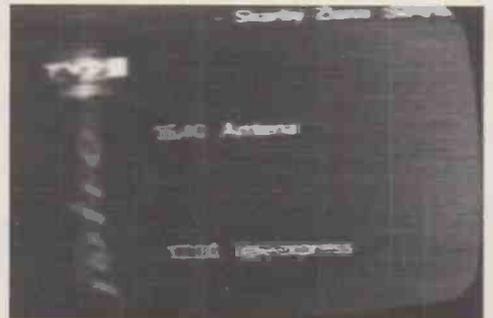
## Channel 5 Tests Commence

Most DX-ers are bracing themselves for the onslaught of the Channel 5 network. The new network uses channels previously unused (or little used) by other transmitters in the United Kingdom. Most of the main transmitters such as Sutton Coldfield, Emley Moor, Black Hill, Mendip and Croydon are using Channel 37, so the first hint of tropospheric activity will show up all the technical shortcomings of the new Channel 5 network.

By the time you read this, several transmitters will have introduced test transmissions,



**Fig. 1: An early Portuguese test card.**

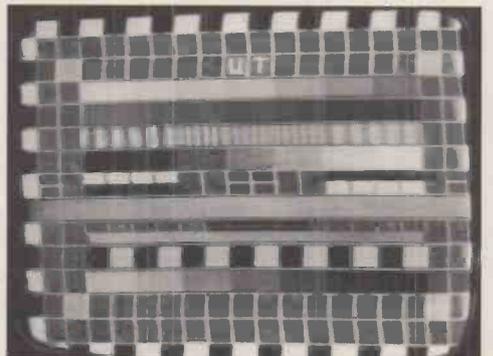


**Fig. 2: Polish TV programme schedules received in the UK on Channel R3 from the Zielona Gora transmitter.**

albeit on a limited basis in order to prevent interference with equipment such as video recorders and satellite receivers which have not yet had their modulators returned to a clear frequency. Already Sutton Coldfield (Channel 37) and Belmont (Channel 56) have been on test, although the latter transmitter is unlikely to cause interference to modulators which traditionally use the Channel 30-40 part of the band. If you have not seen the test pattern, it consists of colour bars with the 'Give Me 5' phrase emblazoned across the screen.

## TV In The Fifties

A cutting from a 1959 issue of *Wireless World* magazine came to light recently with details of test cards and TV channel allocations for various countries. According to the information, East Germany had their own exclusive channel allocations in the Fifties:-



**Fig. 4: An unusual colour test pattern occasionally radiated by Ukraine TV during the Eighties.**

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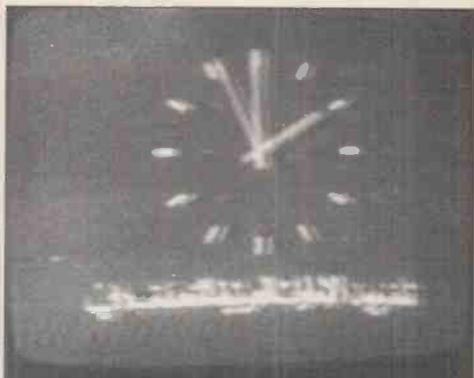
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**Fig. 5: Dubai clock received by Lt. Col. Rana Roy (India) via Sporadic-E propagation on Channel E2.**

Channel 1 (Leipzig 100kW):  
59.25MHz vision /64.75MHz sound  
Channel 2 (Katzenstein/Dresden)  
100kW: 145.25MHz / 150.75 MHz!  
Channel 3 (Helfterberg. ERP not  
given): 55.25MHz / 60.75MHz  
Channel 5 (Berlin 100kW)  
175.25MHz / 180.75MHz.

Genned-up enthusiasts will recognise that the above Channel 1 vision frequency is the same as Channel R2 as used in Russia but using the 5.5MHz sound spacing. The Channel 2 video frequency is most interesting. Perhaps some of our veteran DX enthusiasts can tell us whether these transmitters were ever received in the UK?

The article also mentioned commercial TV stations operating in Saarland using the 819-line system. The stations closed before it became part of the Federal Republic of Germany. The Saarland test card resembled the old ORTF (early French) type with frequency wedges extending outside the centre circle radiating like cat's whiskers. A similar test card was used by the Portuguese service, RTP (see Fig. 1). Luxembourg was using a test card similar to BBC Test Card C but with a letter 'G' instead. However, there was no outer circle present on this version of Test Card G, unlike the ones used by other services at the time. It's a pity the rest of the article was missing!



**Fig. 6: This month's photo from the archives. The Identification Symbol radiated in the early Eighties by BBC Scotland.**

test cards, clocks, identification captions, etc. Other sections give detailed information about TV systems used around the world, TV services country-by-country and additional advice about many TV stations. The publication makes essential reading for all DXTV enthusiasts. It should also prove to be ideal for those who are interested in world-wide television graphics. Details about the book should be included in

this month's Book Store section; if not, just give Book Store a ring on (01202) 659930, for more information!



### Keep On Writing!

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

### Test Card Book

The 3rd edition of *Guide To World-Wide Television Test Cards* is now available from the SWM Book Store. The 60-page book, which was produced to help DXTV enthusiasts identify reception, features over 200 photographs of

# WIN

a £200 Roberts Radio R861



## FINAL QUESTION

So, you read Simon Spanswick's review of the Roberts R861 in the December '96 issue of SWM\* - or you should have done! Roberts Radio have generously donated a brand new R861 world-band portable radio as the prize in a SWM two-part competition - and you could be the lucky winner!

Entering this competition is simple. Just write your answer to the simple question below in the appropriate space on the entry form, together with the answer to the question posed in last month's issue of SWM\*. Send the completed form, together with the Corner Flashes from this page and last month's issue, to: R861 Competition, *Short Wave Magazine*, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW.

The lucky winner will be drawn out of the Editorial Hat containing the correct entries.

The competition closes on 28 March 1997. The Editor's decision is final.

\* The December '96 and January '97 issues of SWM are still available by using the Order Form on page 87.

### Question 2: How many different cities around the world have their time programmed into the R861's sophisticated clock?

My answer to Question 1:

My answer to Question 2:

Name: .....

Address: .....

.....

.....

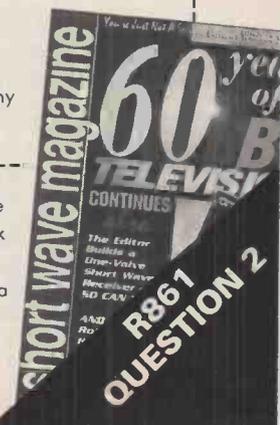
.....

Post Code: .....

Daytime telephone number: .....

Please tick the box if you do not wish to receive any future mailing re: Roberts products.

\* If you missed the December 1996 issue of *Short Wave Magazine* containing the R861 review don't worry, back issues are available at £2.60 including P&P from the address on page 87. You can also obtain back issues via 'phone on (01 202) 659930 by using your credit card.



# Airband



Rotorway Executive. Christine Mlynek.

Best of luck to Marie (North East Yorkshire) with the RAE and Morse. Not a good location for v.h.f., but when conditions 'lift' the sea path brings in interesting stuff from Europe, to the east. At the end of October, Marie found plenty of amateurs (including on 432MHz) from that direction. This could be a good indicator of v.h.f./u.h.f. conditions in general, on other (non-amateur) bands.

Now to help with some frequencies that Marie asks about (all MHz). 118.75 Dusseldorf ACC Sector 3; 118.975 Ekofisk VOLMET (helideck is on 130.55); 119.4 Dusseldorf Arrival Radar; 127.625 Maastricht ACC; 128.0 Stavanger ACC, Sector W; 128.55 Dusseldorf ACC Sector WR2; 129.3 Amsterdam ACC controlling B1/UB1; 132.75 Maastricht ACC W sector.

Please note that frequencies in the v.h.f. communication airband are spaced at 25kHz so 126.1375 is not possible, it must be 126.125 or 126.150MHz. An unidentified one is 128.825, who will tell me what it is?

## Information Sources

The most common enquiry that I receive is from readers wanting to know the frequency for some aerodrome or airway. All basic information is published, but knowing the sources is the key. Start by sending a self-addressed, post-paid envelope (big enough to hold two A4 sheets) to the Broadstone Editorial Offices (not to me!). Ask for the *Airband Factsheet*.

Currently on Issue 5, the *Factsheet* lists contact addresses and 'phone numbers for official publishers of information who sell to the public by mail order. Among these are Aerad (part of British Airways) and the RAF.

The latest issue also includes the only chart of supersonic routes intended for enthusiasts, courtesy of my Museum. When choosing information sources, you'll be spoilt for choice - so read the guidance I offered on page 26 of the July 1996 issue ('Sources of Aeronautical Information'). If you haven't kept that issue, you can order back-numbers from Broadstone (£2.60 each).

I recommend Marie to buy the *Aerad En-Route Supplement Europe and Middle East* as it will

help to locate the frequencies mentioned above. It also tells you which runway directions are available at each airport, this information can sort out confusion. For example, an airport with runway 5R must be Dusseldorf and not Frankfurt. Beware that there aren't enough frequencies to go round, so they are re-used throughout the world but with wide geographical separation. Lift conditions can cause problems, though!

Marie already has the *ABC World Airways Guide*. Each month, your local travel agent receives a new copy. Why not beg the old one for yourself? It will still contain plenty of current information about schedules and flight numbers.

Of interest to Mike Richards' 'Decode' column, too, is Arthur Budd's (Southport) observation that the Meteorological Office, Bracknell, transmit the 'Airep' service on 4.489MHz. North Atlantic tracks are included as well as atmospheric conditions.

## Flight Ops Dept.

Concorde remains a popular subject (September '96 'Airband' and subsequently). Arthur notes that British Airways flights are followed closely by Air France, a separation of 20 minutes equating to about 250nm by my calculation (say Mach 2.2).

Air France Concordes (according to Andy Higginbotham from Cornwall) call Shannon Oceanic Transition Area on 135.6MHz above FL480. Air France 002 passes 15°W between 11:10 and 11:30. Next call would be on NAT-C 5.649MHz.

Despite decelerating away from land, Speedbird Concorde 2 at 16:45 or Concorde 4 at 21:45 can still rattle Andy's windows. If all goes to plan, no damage should result but I don't know to whom you should complain if anything does happen. Andy recommends BBC1 teletext page 444 as it shows Terminal 4 flight arrivals from which you can predict the passage of both the above Speedbird flights.

Living in Uckfield, John Stitt is naturally interested in Gatwick. I can tell John that TIGER is a reporting point where A20 and R8 cross.

TIMBA is Mayfield 312R 7d, as shown on certain charts. Have

you ever wondered what that all means? Well, Mayfield is a v.o.r. beacon, a radio-navigation aid that tells the pilot in which direction to fly to get to it. If you were following the 312° radial (R for radial, you see) then, if the wind was calm, you would fly a compass heading of 312° to arrive overhead the beacon from your present position. Also, if your present position is 7nm from the beacon, you'd actually be at the TIMBA point. The 7d means 7 distance (in nautical miles, indicated by distance measuring equipment, another navigation aid triggered by the ground beacon).

Eastwood has been deleted as there is no longer a Standard Terminal Arrival Route (STAR) based on it. Where do you obtain this information? Try the *London Area Chart* and a set of Gatwick let-down plates, all from Aerad. The *Factsheet* (see above) tells you how to contact Aerad. All replies to enquiries appear in the column, John, and cannot, unfortunately, be sent direct.

Some interesting frequency information is supplied by Geoffrey Powell (Tamworth). Auckland VOLMET on 6.679, 8.828 and 13.282MHz transmits at 20 and 50 minutes past the hour with 5kW to a vertical monopole. The frequencies are shared (minutes past the hour in brackets) with: Anchorage (25 & 55); Hong Kong (15 & 45); Honolulu (00 & 30); Oakland (05 & 35) and Tokyo (10 & 40). Each broadcast occupies a five minute slot.

## The Unexplained?

An anonymous reader wrote about a subject that would also interest John Griffiths, our 'Scanning' columnist. The suggestion is that something has flown through controlled airspace without painting on either primary or secondary radar. Whereas a stealth aircraft could do this, the military are generally sensible enough not to try this sort of thing unless properly co-ordinated with

air traffic control.

Other, more likely, possibilities are balloons, airships, gliders or wooden aircraft. These leave a poor (or no) primary return and might not be equipped with a transponder. Private pilots are not immune from accidental airspace infringements due to navigational problems. There have been isolated but documented cases of naughty pilots going through a control zone "to save time"(!).

I don't agree that 'UFO' automatically means 'visitor from outer space.' Are such visits even possible? In our universe, the laws of physics tell us that you can't go faster than the speed of light, you just get heavier. So the journey to the nearest star with a life-supporting stellar system would be many years at least. To accelerate a human to light speed would take nearly two and a half years, with just as long to decelerate again, assuming the person could tolerate a continuous 4g acceleration - an uncomfortable prospect.

Could an alien life-form undertake this physically demanding adventure? If the alien is from a different universe, then our laws of physics might not apply, the alien's journey then being easier than our own, perhaps.

Unfortunately, we could only detect the alien's presence by physical means. Hence, the alien would not be detectable in our universe and we wouldn't know that it had visited! My opinion? Chance of life-forms, probably intelligent, elsewhere in the universe: very high. Chance of an encounter with them: extremely low.

## Follow-Ups

Roy Dent (Harrow) is following the development by NASA of a neural-network flight control system. As outlined in the September '96 'Airband' this system learns to take control of a damaged aircraft. The pilot is

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## SHORT WAVE MAGAZINE

# PCB SERVICE

Printed circuit boards for SWM constructional projects are available from the SWM PCB Service. The boards are made in 1.5mm glass-fibre and are fully tinned and drilled. For a list of boards see May '95 issue of *Short Wave Magazine* (p.48).

Orders and remittances should be sent to: **Badger Boards, 87 Blackberry Lane, Four Oaks, Sutton Coldfield B74 4JF. Tel: 0956 374918** (Mon-Fri 9am-5.30pm) marking your envelope **SWM PCB Service**. Cheques should be crossed and made payable to **Badger Boards**. When ordering please state the Article Title as well as the Board Number. Please print your name and address clearly in block capitals and do not enclose any other correspondence with your order.

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enabled to fly as normally as possible while the computer interprets control demands and operates the control surfaces unconventionally so as to compensate for the damage. An eight foot long, remotely piloted aircraft called 'LoFLYTE' will operate the trials. Although potentially capable of hypersonic speeds, this won't be called for in the trials.

## Frequency & Operational News

If you find the CAA's Cheltenham (Printing and Publication Services) 'phone number (01242) 584139 is now a FAX machine, try 235151 instead (see *Airband Factsheet*). They seem to have swapped the old voice and FAX numbers over. If you find they've changed them back again, let me know!

Amendments to the *UK Aeronautical Information Publication* ('Air Pilot') come from **Martin Sutton** (CAA) to whom grateful thanks on behalf of all readers. You can inspect the current edition of the *Publication* at flying clubs and aerodromes.

Aerodromes: Farnborough runway 18/36 withdrawn except as a taxiway. Stubton Park is a new aerodrome, no further

information, anyone know where it is or its frequency? Looking back to my comments last month under 'Flight Ops Dept.' and I can now officially confirm that Wattisham has changed to 125.8 (was 124.925MHz).

Reporting points: new ones are BOYSI, CLIPY and DELBO, this latter being a new hold for Gatwick arrivals. I don't want to clog up the pages with lists of latitude/longitude fixes for reporting points, so if you need the location of any new one then write in (stating in which month's column I mentioned it). As no-one has yet made such a request, I assume you've all got the latest charts and know where these points are! Suppliers of charts are, as ever, listed on *Airband Factsheet* (see above).

The Southport airshow is actually controlled by Woodvale (119.75MHz) according to Arthur Budd, who lives locally.

The next three deadlines (for topical information) are February 17, March 17 and April 14. 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).



**Dragon Rapide.** *Christine Mlynec.*

## Abbreviations

ACC	Area Control Centre
CAA	Civil Aviation Authority
FL	flight level
g	acceleration due to gravity
kHz	kilohertz
MHz	megahertz
nm	nautical miles
RAE	Radio Amateurs' Examination
u.h.f.	ultra high frequency
v.h.f.	very high frequency
v.o.r.	very high frequency omni-directional radio range

**We're well into the New Year now, so, along with the Rallies on page 8, we've got room to squeeze a few more in for you! Take a look at this list and decide which Rallies you will be attending this year. Please note, this list only contains details of Rallies which we have received at the time of going to press.**

**February 23:** The Kidderminster Radio & Electronics Fair is to be held at the Kidderminster College, Hoo Road, Kidderminster, Worcestershire. Doors open at 10.30am to 3pm. Admission is £1. There will be traders, a Bring & Buy, Flea Market, food and drinks and talk-in on S22. **John G8MCK** on (01527) 545823 or mobile on (0860) 147954 or **Tony G4ALT** on (01562) 69652 or mobile on (0860) 902165.

**March 1:** The 4th West Wales Amateur Radio & Computer Rally will take place at Penparcau School, Aberystwyth. Doors open at 10.30am to 4pm [disabled visitors 10am]. Admission is £1. All on one level with ample free parking. There will be trade stands, computers and radio, Bring & Buy, special interest groups, Repeater Group, West Wales Pocket Group. Listen out for h.f. and v.h.f. GCQARA on the air. There's also lots more for the amateur radio and computer hobbyist, this is where the bargains are. Talk-in on S22. Further details and trade bookings from **Katy** on (01545) 580675.

**\*March 8-9:** The London Amateur Radio & Computer Show is to be held at the Lee Valley Leisure Centre, Picketts Lock Lane, Edmonton, London, N9. Doors open 10am to 5pm each day [disabled visitors from 9.30am]. There will be a trade show, with over 100 exhibitors, Bring & Buy, RSGB Committee and book stands, on-demand Morse tests, talk-in on 2m and 70cm, special interest groups, disabled facilities, priority admission for disabled persons, bars, restaurants, ample free car parking and lectures. (01923) 893929.

**March 9:** The Wythall Radio Club are holding their 12th Annual Radio Club Rally on Sunday at Wythall Park, Silver Street, Wythall, near Birmingham on the A435, just two miles from junction 3 of the M42. Doors open from 10am to 4pm. Admission is just £1. The usual traders in three halls and a large marquee. Bar and refreshment facilities on site, big Bring & Buy stand and talk-in on S22. More information from Rally Organiser, **Chris GOEYO** on 0121-430 7267 evenings, weekends for details.

**March 16:** The Mid-Devon Rally, sponsored and arranged by the Triverton South West Radio Club is a permanent fixture, set for the 3rd Sunday in March, so no need to watch the magazines for the

date in future! There will be a wide selection of traders to the rally, no matter what your interest, you will be able to find something useful to take home to the shack. There will also be all the usual, excellent catering facilities. More details from **Alan G0MAS** on (0884) 252259.

**March 23:** The Bournemouth Radio Society will hold its 10th annual sale at the Kinson Community Centre, Pelhams, Kinson, Bournemouth, Dorset. Doors open from 10am until 4pm. Talk-in by RAYNET will be available on S22. As usual, there will be a mixture of radio and computer equipment on sale plus a Bring & Buy stall. More details can be obtained from **John G1HOK** on (01202) 535219 or mobile (0850) 240931. Those with Internet can contact **John G1HOK@bournemouth.ac.uk** or via pocket as **G1HOK@GB7BNM** with 'BRS Sale' as the subject.

**March 23:** The Pontefract & District Amateur Radio Society are holding their 17th Components Fair & Spring Rally at the Carlton High School, 300 yds from Carlton Community Centre. Doors open at 11am [disabled visitors at 10.30am]. There will be many traders on the ground floor and in the main building, admission by prize programme. **Colin Wilkinson G0NQE** on (01977) 677006.

**May 18:** The Dunstable Downs Radio Club are holding their 14th Annual National Amateur Radio and Car Boot Sale at Stockwood Country Park, Luton, nr. junction 10, M1. Doors open 10am to 4pm. Talk-in on 2m. Free entry to Mossman collection of Horse drawn vehicles, craft museum, plus much, much more. Plot details on (01582) 613899, pre-bookings for plots until May 14th. Plots can be purchased on the day.

**May 25:** The Plymouth Radio Club is holding its rally at the College of Further Education, Kings Road, Devonport, Plymouth. Admission is £1. Doors open at 10am for disabled visitors and 10.30am for others. Anyone wanting further information, contact **Stephen Ramsden G7UXL** on (01752) 662051 during office hours or before 9pm on (01752) 777189.

**\*June 27-29:** Ham Radio '97 - Europe's largest Hamfest will take place in Friedrichshafen, Germany. The Barmsey & DARC in conjunction with the RSGB will again be organising a UK coach trip to this Hamfest. More information from **Ernie G4LUE** on (01226) 16339 or mobile on (0836) 748958.

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

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

**July 27:** The Colchester Radio & Computer Rally with a hobbies and leisure fair is to be held at St Helena School at 10am. This is a family event. Further info. from **Frank Howe G3FLU** on (01206) 851189.

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

**August 10:** The Derby & District Amateur Radio Society are holding their 40th Derby Mobile Rally at the Littleover Community School, Derby. More information on (01332) 556875.

**August 15:** The Cockenzie & Port Seton Amateur Radio Club are holding their 4th Annual Radio Junk Night at the Cockenzie & Port Seton Community Centre, South Seton Park, Port Seton. Doors open 18.30 to 21.30. Bring along your own junk and sell it yourself. Tables will be provided on a first come first served basis (no charge for the table). Raffle at approx. 21.00. Refreshments will be available. Disabled persons access. Entrance fee is £1 for all persons. All money raised is donated to the British Heart Foundation. Further details from **Bob Glasgow GM4UYZ** on (01875) 811723.

**August 25:** The Torbay ARS are holding their rally at the Torbay Leisure Centre, Paignton. Doors open at 10am. Talk-in on S22 by **G8NUA/P**. Further details can be obtained from **Alan G7UEK** on (01803) 214445.

**November 9:** The Midland Amateur Radio Society Birmingham 9th Radio & Computer Rally is being held at Stockland Green Leisure Centre, Slade Road, Erdington, Birmingham. Doors open 10am to 4pm and admission is £1. There is a large free car park, free hampers draw, trade stands, local clubs, special interest exhibits. Trader details from **Norman G8BHE** on 0121-422 9787 or general information from **Peter Haylor** on 0121-443 1189.

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

**RALLIES  
EXTRA**

**\* Short Wave Magazine & Practical Wireless in attendance**

# Info In Orbit



Fig.11: Buran seen in Gorky Park.

New Year begins again so perhaps a brief summary of 'Info's' purpose in life would be appropriate. The column is mostly about weather satellites (WXSATs in radio parlance), so readers can expect to keep up-to-date with current events on a monthly basis. In addition, many correspondents have expressed an interest in the coverage of news about the American Shuttle and the Russian manned space station MIR, and as these happen to be pet interests of mine I am keen to include occasional features.

The world of WXSATs is heading towards a significant milestone. Since the sixties we have been able to receive WXSAT transmissions while using ever more advanced hardware. Meanwhile, the satellites themselves have provided transmissions in a format which has remained essentially unchanged since that decade. This will all change as we move beyond the year 2000. The next generation of METEOSATs, NOAAs and METEORs will carry new equipment designed to provide ever better imagery. 'Info' will provide information on the new systems as it becomes available.

## Current WXSATs

Operations with SICH-1 and OKEAN-4 (1-7) (occasional transmissions on 137.40MHz) have been of great interest recently. Alex Ivanov provides a transmission schedule via the Internet for both these radar-imaging satellites, but the cessation of operations on both OKEAN and SICH occurred when the side-looking radar imagers appeared to have failed. Alex reported that "Some time later it somehow recovered and produced acceptable images again" - looks like nobody knows for sure why (why faulted and why recovered). Taking into account this fact, and to spare SLR's resource, they decided to use only one of the satellites in a period of time. Until March 1, 1997 OKEAN 1-7 must work - of course if its Radar doesn't jam again before this date.

On 25 November he reported that a new schedule had been released, as had one for SICH-1. The SICH schedule ends with the remark: "... from December 1, 1996 to March 1, 1997 SICH/SLR operation will be planned only for purposes of checking the system work ability..."

At the time of writing (9 December due to publication

schedule limits prior to Christmas) METEOR 3-5 remains transmitting as the sunlit part of its orbit drifts towards the morning terminator. It will shortly be switched off because of the poor illumination of its solar panels, and is not scheduled to be re-activated until 7 January. METEOR 2-21 won't be activated because its orbit is under similar constraints. A glance at the orbits of both METEORs shows that they are in similar planes - southbound in eclipse during the early evening.

## WXSAT Decoding Using A Sound Card

Steve Bonnett of Christchurch wrote to me some time ago with details of his WXSAT development project, which has already produced viable results. Steve started monitoring the 2m band using a wide range scanner, an AOR AR1500, and decided to investigate the possibilities of receiving and decoding satellite images. At a time when funds were limited, Steve bought the Cirkit 137MHz receiver. He already had a 486PC fitted with a sound card and decided to try to use it to interface the PC to the receiver.

Steve is a software engineer and eventually produced a program running on the Windows platform.

## 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 & 1694.5MHz for WEFAX  
 GOES-8 (western horizon) uses 1691MHz for WEFAX

His program tracks a single satellite, and when this rises above the horizon, its signal is recorded as a WAV format file. The Cirkit receiver output is connected to the microphone input on the sound card, then the mixer controls on the card are set - depending on the card's software. The 'tuning' option allows the connections to be checked. A display allows the spectrum of the signal to be monitored.

After the end of the pass, the program converts the WAV file into an image file in BMP format. For those not too familiar with file formats, WAV (wave) is a multimedia file containing digitised sound which has been sampled at high speed and can be replayed

using suitable software to reproduce the original sound. BMP file (bitmap) is an image format which can be displayed by using a bitmap editing package such as Paintbrush.

Steve describes his early results as "essentially satisfactory", but because his initial experiments took no account of the Doppler effect (the WXSAT is approaching the observer and then receding,) the effect of the changing frequency is consequent image distortion.

Steve tackled the Doppler problem in two ways. Firstly, the provision of an option which causes the software to try to lock to the 2400Hz sub-carrier. Steve reports that this works when playing back taped recordings in which wow-and-flutter are evident, but in general he found it too slow.

Fig. 2 is an OKEAN-4 image showing Iceland at the top. This was taken using the 'monitor' option on Steve's software, which locks to the sub-carrier and triggers image collection, in which OKEAN's transmission on 137.40MHz was recorded.

The second option in Steve's software is based on calculating the relative motion of the WXSAT for each line in the image, and then calculating what the actual Doppler shift (of the 2400Hz sub-carrier) should be. This is then used to



Fig.6: NOAA10 NOAA image of Greenland in May from Martin Duinen.

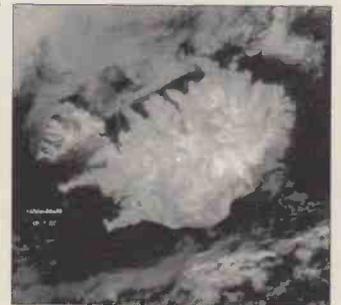


Fig.7: NOAA image of Iceland from Martin Duinen.

## A PC-BASED METEOSAT-PDUS STATION



Fig.5: Diagram of a PC-based NOAA-h.r.p.t. receiving system - from Martin Duinen.

understand he may be considering making more widely available. As described, the main requirements are a PC, a sound card and a suitable WXSAT receiver.

## An Amiga System

I receive occasional queries from Amiga and Atari users asking about the availability of software and WXSAT decoding hardware for these computers. I have managed to obtain satellite tracking software for both machines - which I can provide if readers supply one standard PC disk, a return stamped

addressed envelope and 50p coin. **Ray Holmes** of Stockport has sent me an image obtained from his Amiga 1200 computer on which he runs 'Telfax' (French version 1.33) from AARUG. Ray's equipment includes a Yupiteru MVT-7100 receiver, a crossed-dipole, the Maplin interface and StereoMaster Sound Sampler.



Fig.1: Steve Bonnett's program.

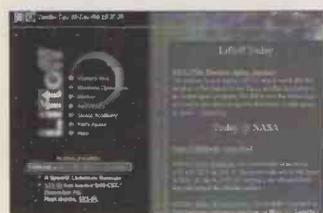


Fig.9: Web page linked to NASA's home page.

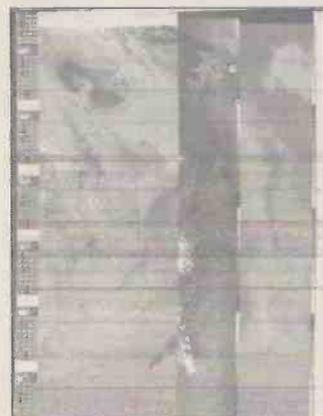


Fig.2: Okean capture from Steve Bonnett



Fig.4: Iceland and Greenland from Ray Holmes.

Considering the limitations of the Yupiteru receiver - which I doubt will be optimised for WXSAT use - the print-out which Ray sent me clearly reveals Iceland and the east coast of Greenland, imaged by METEOR 3-5 on 7 November. Ray only recently set-up his system and had not had much experience at identifying land masses, but he quickly recognised this image as Greenland and Iceland. Ray reports

that his experience at recognising land is rapidly improving as the images of the North African coast, Gibraltar and the Mediterranean Sea are seen on most days.

## HRPT Reception In Holland

Following my request, **Dr. Martin Th. A. van Duinen** sent further details of his NOAA high resolution picture telemetry system set-up in Holland. This is the imagery obtained from the Advanced Very High Resolution Radiometers (AVHRR) carried by the NOAA WXSATs. Because of the very high data rate which has to be transmitted in order to provide high resolution images, the carrier frequency (which carries the digital image information) has to be suitably high. NOAA h.r.p.t. is therefore transmitted on 1698MHz (for even-numbered NOAAs) and on 1707MHz (for odd-numbered NOAAs). As with METEOSAT WEFAX and PDUS (low and high resolution imagery respectively) an antenna suitable for this frequency must be used; a dish - usually about 1m diameter - controlled by computer is the usual method. Unlike the geostationary METEOSAT (for which a fixed dish can be used), an antenna for NOAA h.r.p.t. must be driven to follow the WXSAT, because of the narrow beamwidth.

Martin uses a Hansen WSR (WXSAT receiver) system which includes software and a card for the PC. Martin emphasises that the product is a complete system which can also receive METEOSAT PDUS, but he restricts himself to NOAA imaging using a 1.2m dish mounted on the Yaesu-Musen G5400 B rotor to track the satellites. After one year's operation he found the outside feed-mounted low noise amplifier (LNA) cable was suffering from some corrosion. Consequently he moved the LNA indoors and connected it via some 15m cable to the circular feed on the dish.

Martin's system can use a tracking program to directly control the dish - as long as recent Kepler elements are available. As the elements become older, the tracking loses accuracy, so he prefers to do the tracking manually, using the four switches on the rotor controller, guided by the acoustic signal and the 'S-meter'. Martin comments that experience of manual tracking came with practise and he no longer needs the latest Kepler elements.

The Hansen software includes options to display a composite five-channel view, or one channel in full resolution. Martin uses a Pentium computer running Windows-95, with the 16-bit ISA card fitted. A large capacity hard drive is required because one pass can occupy 60-70Mb disk space. Martin has accumulated some 200 images in different categories. From the set that Martin sent me, I have selected **Fig. 6**, a channel two infra-red image of the east coast of

Greenland which Martin collected last year, and **Fig. 7**.

## Internet Site Update

The spread of the Internet has encouraged the two-way flow of information from Russia and the west at an unprecedented rate. Images of American and Russian space vehicles and information about their use is now available within minutes - if you know where to look! I have been monitoring the joint releases by NASA and the Russian Space Agency (RKA) of details about the Buran vehicle, once expected to become the Russian 'Shuttle'. The RKA is headed by Yuri Koptev (featured in the picture), who has a role not unlike that of NASA's administrator.

The web page, <http://liftoff.msfc.nasa.gov/rasafsa.html> includes background information on the history, programs, administration and launch control of RKA. The Military Space Forces (VKS) is the military counterpart of the RKA and controls Russia's Plesetsk Cosmodrome launch facility. RKA and VKS share control of the Baikonur Cosmodrome. A link on the web, <http://liftoff.msfc.nasa.gov/home/liftoffnpi.html> is provided to collections of images of Russian space vehicles, some of which I have included here - courtesy of NASA/RKA.

## BURAN - the Russian 'Shuttle'

Funding for the BURAN project was cut after the first flight, and officially cancelled in 1993. The second orbiter, *Ptichka* ('Little Bird' in Russian) was originally scheduled for completion in 1990, and the third was due in 1992. Neither was finished. The partially completed shuttles were dismantled at their production site. The manufacturing plant is to be converted for production of buses, syringes, and nappies.

## Shuttle Launch Schedule

The first flight of 1997 is the fifth in the series of link-ups with the orbiting MIR space station, taking another module. The February flight is the second Hubble telescope servicing mission.

STS-81 (*Atlantis*) launch date 12 January into a 51.6° inclination orbit for the 5th MIR link-up.

STS-82 (*Discovery*) launch date 13 February into a 28.45° inclination orbit for servicing the HST.

A comprehensive listing of all Shuttle flights and payloads, together with associated information is available from me as the 'Shuttle pack'. Please include a secured £1 and stamped s.a.e. for the A4 booklet. If you are writing from outside the UK, please provide IRCs (international reply coupons) to the correct value.



Fig.3: NOAA-14 visible-light 8 June 1202.

## Kepler Elements - MIR and Shuttle

- 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. Transmission frequencies are given for operating satellites. This data originates from NASA. I send Kepler elements by return-of-post.
- I also send monthly Kepler print-outs to many people. To join the list please send a 'subscription' of £1 (secured, plus four self-addressed, stamped envelopes) for four editions. Non-UK requests should include IRCs instead.
- You can have the data as a computer disk file containing recent elements for the WXSATs, and a large file holding elements for thousands of satellites. A print-out is included, identifying NASA catalogue numbers (for the WXSATs, Amateur Radio satellites, and others of general interest), ideal for automatic updating of your tracking software. Please enclose 50p with your PC-formatted disk and stamped envelope.

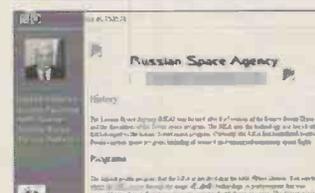
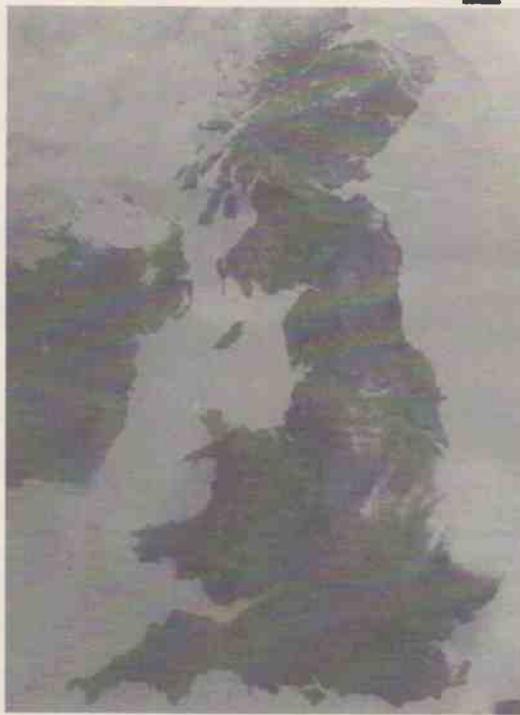


Fig.8: Russian Space Agency

# Timestep

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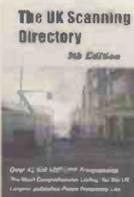
## Special offers for 1997



### Shortwave Eavesdropper CD-ROM

A huge step forward in the accessibility of shortwave utility information has been made with the *Shortwave Eavesdropper* CD-ROM. It gives instant access to well over 32,000 frequencies and 42,000 callsigns listing military, tactical, ships - naval and merchant, embassies, aeronautical, press agencies, weather stations and countless more. In-depth country by country information containing QSL addresses, schedules, examples of traffic, and maps, DX Edge are also included.

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# Decode

## All the Data Modes

### RTTY Tune-up

One of the common problems that arrive on my desk is that of how to get started with RTTY. Whilst many are able to load and run programs like HAMCOMM the problem comes when they try to find a suitable station to monitor. If you don't know what RTTY sounds like or how to set the variables like speed, shift, polarity, etc. it's not surprising new listeners have problems getting started. I've tackled similar problems before, but I think a new approach may be helpful.

One of the fundamentals is finding a real RTTY station to monitor. Tuning around the h.f. bands you can find a host of whirs and warbles that really sound like convincing RTTY signals even to the trained ear so what chance does the new listener stand? To help with this, I've included an extract from the *Day Watson Beginners Frequency List* in this month's Decode. This list concentrates on RTTY stations, but lists them by time of day rather than just by frequency. This is done specifically to make life easier - all you do is check the time of day and then move directly to the appropriate part of the list.

Before you start trying to decode signals it's a good idea to tune around some of these frequencies so you can get used to the sounds of a RTTY signal. With this buttoned-up you next need to run your decoder, set it to RTTY or Baudot and set the basic parameters to match those of the signal you're trying to receive. These are all listed in the Beginners list using the format speed/polarity/shift where the speed is in baud, polarity is normal or reversed and the shift is in Hz. Whilst I can accurately state the speed and shift the polarity is slightly different and depends somewhat on your listening set-up. However, you should find the list is correct in most cases if you tune with your receiver set to upper sideband.

Next step is to familiarise yourself with your decoder's tuning display as this is the main tool used to get the tuning spot-on. If you're using HAMCOMM you have several options available. The latest version (3.1) has a handy tuning indicator that sits on the left-hand edge of the screen. In this case you need to adjust the tuning so that the bars that represent your signal straddle the two on-screen markers. A more accurate alternative is to use

HAMCOMM's Spectrum display. To select this press 'Alt M' then 'P' and you will be presented with a display showing a horizontal line with two vertical lines. The trick here is to alter the receiver's tuning so that the broad humps that correspond to the RTTY signal align with the two vertical lines. It may sound complicated but if you get the screen up whilst reading this it really will make sense!

Once this exercise is complete, just press 'Alt F4' to return to the main receive screen. If you're still not receiving some form of intelligible information, go to the Keying menu and alter the polarity from normal to reverse or vice versa. If you still not receiving the signal check all the settings once again to find where you've gone wrong.

### On Target AKD Style

The Target HF-3 receiver has caused quite a stir since its introduction last year. The prime attraction is obviously price as where else can you get your hands on a communications receiver for just £159? The big question for 'Decode' readers must be how good is it for utility decoding? I recently had an opportunity to get my hands on a current model and put it through its paces so I thought you might be interested in the results. The Target has a number of fairly obvious advantages over the Japanese portables that form its main price competition.

For a start it looks like a communications receiver, has a proper well balanced tuning knob and a decent frequency readout. But it doesn't end there as the Target has been specifically designed to be a communications receiver by making best use of today's modern components. One of the first techniques you will need to acquire is a mastery of the tuning control. As the Target doesn't have any direct frequency entry facilities you have to make all changes with this knob. This potentially laborious process has been simplified with four automatically selected tuning rates that are linked to the rate at which you spin the knob. This proved to be very effective and, with a little practice, I was zooming effortlessly around the bands.

So what about utilities? The tuning steps available from the main tuning knob are set at 1kHz which would normally be far too coarse for utility work. However, the solution is to be found in the clarifier which has a range of  $\pm 800\text{Hz}$  from the main tuning

frequency. This enables interpolation between the 1kHz steps and effectively provides continuous coverage from 30kHz right through to 30MHz. Next comes the frequency stability which has to be very good to support the reception of FAX images.

The long term stability proved to be very good indeed and well up to the required standard for general FAX reception. I used the Target to receive FAX images continuously from Bracknell (GFE25) on 2.6185MHz without problem. The Target did suffer a degree of synthesiser wobble that sounds most unpleasant when listening to a steady carrier but has a very marginal effect on the quality of basic FAX and RTTY signals. This may prove to be a more serious problem if you're into some of the sophisticated narrow band modes but, if you can afford the expensive decoders, you're unlikely to even consider the humble Target receiver!

The other area of the Target's performance you need to be aware of is its r.f. screening. As most utility listeners use computer based decoding systems you may find the Target susceptible to direct pick-up of interference as the case is unscreened. The solution could be as simple as making sure the receiver's not right next to the computer or maybe providing some addition screening outside the case - take care not to block any ventilation holes. One of the cost compromises of the Target is the omission of any form of line or other fixed level audio output. Other than the internal speaker, the only output is the external speaker socket on the rear panel.

I was pleased to see that this has now been modified to reference it to ground rather than the positive rail! To connect your decoder and still be able to monitor the signal you will need to buy yourself an external speaker and a 3.5mm 'Y' connector. These are readily available from most hi-fi shops or component suppliers so shouldn't present a problem.

So what's the conclusion? The Target is certainly okay for most general utility work and is a very worthy competitor for the Japanese super portables. Despite the obvious similarities it doesn't compare with the Lowe HF-150 - but then neither does the price.

### Yet More T2FD

Yes, the saga continues! My mentioning this antenna a few months ago has certainly aroused

considerable interest. This is not surprising really as most listeners appear to use some form of random wire and the T2FD offers a useful advantage for those that have sufficient room. If you missed my original feature, the main advantages of the T2FD are wide bandwidth and lower noise. The latest information comes from George Talbot who's based in Bryanston, South Africa. He has recently bought himself a Barker & Williamson model BWD1.8-30 broadband folded dipole, i.e. T2FD.

This is a full blown commercial antenna system that's rated for operation between 1.8 and 30MHz and can be used for transmission as well as reception - mind you the price in the US is nearly \$200. If you are into transmitting, this antenna could be ideal as it's all weather rated for 1-2kW p.e.p. The overall length is just 27.4m and it's available in two versions using either hard drawn copper or stranded stainless steel wire. Other than the fact that it's ready built, the main difference between this antenna and the home made version I've described rests in the balun and balancing networks. It's careful design in these areas that extends the bandwidth and maintains the s.w.r. at less than 2:1 over the 2 to 28MHz range. If you'd like more information **Barker & Williamson** can be found at **10 Canal Street, Bristol PA 19007 USA**. The 'phone number is: **001 215 788-5581**.

### Readers Special Offers

The *FactPacks* and *Frequency Lists* remain temporarily withdrawn, but watch this space for a revised service. Looking on the bright side, I do still have the 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 so 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. IBM PC Software (1.44Mb disks): Disk A - JVFX 7.0, HAMCOMM 3.1 and WFXFX 3.2. Disk B - DSP Starter plus Texas device selection software. Disk C - NuMorse 1.3 Disk D - UltraPak 4.0. Disk E - Mscan 1.3 and 2.0.

## Sample Beginners' Frequency List

Time	Station Name	Type	Mode	Params	Frequencies (MHz)	Notes
0630-0800	MFA Belgrade	[DP]	RTTY	75/R/400	5.312, 7.808, 9.046	Serb occ English.
0630	MFA Warsaw	[DP]	RTTY	75/R/250	5.923, 8.154, 9.153	Polish.
0700						
0800-0900	Bracknell Met	[MR]	RTTY	50/N/400	4.489, 10.5513	Regional met.
	Moscow Met	[MR]	RTTY	50/N/999	7.685, 11.450, 13.530	Regional met.
	TANJUG Belgrade	[PR]	RTTY	50/N/400	11.604, 12.2125, 13.440	English press.
	Hamburg Met	[MR]	RTTY	50/N/400	4.583, 7.646, 11.638	WX (Germ).
0845						
0900-1000	Bracknell Met	[MR]	RTTY	50/N/400	4.489, 10.5513	Regional met.
	JANJUG Belgrade	[PR]	RTTY	50/N/400	11.604, 12.2125, 13.440	English press.
	MENA Cairo	[PR]	RTTY	75/N/470	15.935	Eng/Fr press.
0900	ROMPRES Buchrst	[PR]	RTTY	50/N/500	9.797	English press.
0930	Portishead R.	[MM]	FEC	100/N/170	4.211, 6.315, 8.417	Atlantic WX.
1000-1100	Bracknell Met	[MR]	RTTY	50/N/400	4.489, 10.5513	Regional met.
	TANJUG Belgrade	[PR]	RTTY	50/N/400	11.604, 12.2125, 13.440	English press.
	Santa Maria Air	[AE]	RTTY	50/R/800	9.994	Air traffic.
	MENA Cairo	[PR]	RTTY	75/N/400	15.935	Eng/Fr press.
1000	MAP Rabat	[PR]	RTTY	50/N/425	7.8424, 14.760, 15.6549	French press.
1000	MTI Budapest	[PR]	RTTY	50/R/425	9.114	English press.
1000	ROMPRES Buchrst	[PR]	RTTY	50/R/500	9.797	French press.
1100-1200	Bracknell Met	[MR]	RTTY	50/N/400	4.489, 10.5513	Regional met.
	TANJUG Belgrade	[PR]	RTTY	50/N/400	11.604, 12.2125, 13.440	English press.
	MENA Cairo	[PR]	RTTY	75/N/470	15.935	Eng/Fr press.
1100	TANJUG Belgrade	[PR]	RTTY	50/N/400	15.705	French press.
1100	JANA Tripoli	[PR]	RTTY	50/R/400	15.462	French press.
1100	ROMPRES Buchrst	[PR]	RTTY	50/N/400	12.110	English press.
1100	AA Ankara	[PR]	RTTY	50/N/800	18.040	Turk/Eng/Fr NX.
1100	XINHUA Beijing	[PR]	RTTY	75/N/400	14.367, 16.136	English press.
1130	XINHUA Beijing	[PR]	RTTY	50/N/425	17.443	French press.
1200-1300	Bracknell Met	[MR]	RTTY	50/N/400	4.489, 10.5513	Regional met.
	TANJUG Belgrade	[PR]	RTTY	50/N/400	11.604, 12.2125, 13.440	English press.
	Santa Maria Air	[AE]	RTTY	50/R/800	9.994	Air traffic.
	MENA Cairo	[PR]	RTTY	75/N/500	15.935	Eng/Fr press.
1200	XINHUA Beijing	[PR]	RTTY	75/N/400	14.367, 16.136	English press.
1200	AA Ankara	[PR]	RTTY	50/N/800	18.040	Turk/Eng/Fr NX.
1200	Hamburg Met	[MR]	RTTY	50/N/400	4.583, 7.646, 11.638	Stormwng Ger/Eng.
1200	MAP Rabat	[PR]	RTTY	50/N/425	14.760, 15.6549, 19.1711	English press.
1240	Chatham R	[MM]	FEC	100/N/170	16.817	WX.
1300-1400	Bracknell Met	[MR]	RTTY	50/N/400	4.489, 10.5513	Regional met.
	TANJUG Belgrade	[PR]	RTTY	50/N/400	11.604, 12.2125, 13.440	English press.
	MENA Cairo	[PR]	RTTY	75/N/470	15.935	Eng/Fr press.
1300	Dakar Met	[MR]	RTTY	50/R/400	19.7475	Met traffic.
1400-1500	MAP Rabat	[PR]	RTTY	50/N/425	14.760, 15.6549, 19.1711	English press.
	Bracknell Met	[MR]	RTTY	50/N/400	4.489, 10.5513	Regional met.
	TANJUG Belgrade	[PR]	RTTY	50/N/400	11.604, 12.2125, 13.440	English press.
	Santa Maria Air	[AE]	RTTY	50/R/810	9.994	Air traffic.
	Nairobi Air	[AE]	RTTY	50/R/170	13.3665	Air traffic.
	MENA Cairo	[PR]	RTTY	75/N/500	15.935	Eng/Fr press.
	Dakar Met	[MR]	RTTY	50/R/400	19.7475	Met traffic.
1430	MFA Belgrade	[DP]	RTTY	75/R/400	13.3999, 17.432, 18.055	Serb occ English.
1430	XINHUA Beijing	[PR]	RTTY	75/N/400	11.680, 12.2284	English press.
1500-1600	Bracknell Met	[MR]	RTTY	50/N/400	4.489, 10.5513	Regional met.
	TANJUG Belgrade	[PR]	RTTY	50/N/400	11.604, 12.2125, 13.440	English press.
	MENA Cairo	[PR]	RTTY	75/N/470	15.935	Eng/Fr press.
	Dakar Met	[MR]	RTTY	50/R/400	19.7475	Met traffic.
1500	XINHUA Beijing	[PR]	RTTY	75/N/400	11.680, 12.2284	English press.
1530	MAP Rabat	[PR]	RTTY	50/N/400	7.8424, 10.6341, 15.6549	French press.
1600-1700	Bracknell Met	[MR]	RTTY	50/N/400	4.489, 10.5513	Regional met.
	TANJUG Belgrade	[PR]	RTTY	50/N/400	11.604, 12.2125, 13.440	English press.
	Santa Maria Air	[AE]	RTTY	50/R/850	9.994	Air traffic.
	Rome Met	[MR]	RTTY	50/R/850	5.867, 11.453	Met traffic.
	Dakar Met	[MR]	RTTY	50/R/400	19.7475	Met traffic.
	MENA Cairo	[PR]	RTTY	75/N/425	5.275	Eng/Fr press.
1600	MAP Rabat	[PR]	RTTY	50/N/400	7.8424, 10.6341, 15.6549	
1600	JANA Tripoli	[PR]	RTTY	50/N/400	14.573	English press.
1630	ROMPRES Bchrst	[PR]	RTTY	50/N/500	6.972	Fr/English press.
1630	USCG Boston	[MM]	FEC	100/N/170	12.579, 16.8065	WX/Nav warnings.
1630	ROMPRES Buchrst	[PR]	RTTY	50/N/500	6.972	Fr/English Press.
1700-1800	Bracknell Met	[MR]	RTTY	50/N/400	4.489, 10.5513	Regional met.
	TANJUG Belgrade	[PR]	RTTY	50/N/400	5.240, 7.658, 7.806	English press.
	Santa Maria Air	[AE]	RTTY	50/R/800	9.994	Air traffic.
1700	TANJUG Belgrade	[PR]	RTTY	50/N/400	12.2125	French press.
1700	MENA Cairo	[PR]	RTTY	75/N/425	5.275	English press.
1700	MTI Budapest	[PR]	RTTY	50/R/400	9.114	English press.
1700	ROMPRES Buchrst	[PR]	RTTY	50/N/500	6.9732	Fr/English press.
1705	Hamburg Met	[MR]	RTTY	50/N/400	4.583, 7.646	NAVwng Ger/Eng.
1800-1900	Bracknell Met	[MR]	RTTY	50/N/400	4.489, 6.835, 10.5513	Regional met.
	TANJUG Belgrade	[PR]	RTTY	50/N/400	5.240, 7.658, 7.806	English press.
	Santa Maria Air	[AE]	RTTY	50/R/850	9.994	Air Traffic.
1800	Hamburg Met	[MR]	RTTY	50/N/400	4.583, 7.646	Strmwngs/codes.
1800	Nairobi Air	[AE]	RTTY	50/R/250	7.423, 13.3666	Air traffic.
1800	ROMPRES Buchrst	[PR]	RTTY	50/N/500	6.972	Fr/English press.
1900-2000	Bracknell Met	[MR]	RTTY	50/N/400	4.489, 6.835, 10.5513	Regional met.
	TANJUG Belgrade	[PR]	RTTY	50/N/400	5.240, 7.658, 7.806	English press.
1900	IRNA Tehran	[PR]	RTTY	50/N/400	7.959, 8.049	English press.
2000-2100	Bracknell Met	[MR]	RTTY	50/N/400	4.489, 6.835	Regional met.
	TANJUG Belgrade	[PR]	RTTY	50/N/400	5.240, 7.658, 7.806	English press.
	Niton Radio	[MM]	FEC	100/N/170	518kHz	WX/Nav warnings.
2018	Cullercoats Radio	[MM]	FEC	100/N/170	518kHz	WX/Nav warnings.
2048						
2100-2200	Bracknell Met	[MR]	RTTY	50/N/400	4.489, 6.835	Regional met.
	TANJUG Belgrade	[PR]	RTTY	50/N/400	5.240, 7.658, 7.806	English press.
	Hamburg Met	[MR]	RTTY	50/N/400	4.583, 7.646	WX (Germ).
2100	Portishead Radio	[MM]	FEC	100/N/170	4.211, 6.315	Atlantic WX.
2130	Port Patrick Radio	[MM]	FEC	100/N/170	518kHz	WX/Nav warnings.
2200-2300	Bracknell Met	[MR]	RTTY	50/N/400	4.489, 6.835	Regional met.
	TANJUG Belgrade	[PR]	RTTY	50/N/400	5.240, 7.658, 7.806	English press.
	CF Halifax	[MR]	RTTY	75/N/600	4.271, 6.4964	Met Traffic.
2230						
2300-2400	Bracknell Met	[MR]	RTTY	50/N/400	4.489, 6.835	Regional met.
	TANJUG Belgrade	[PR]	RTTY	50/N/400	5.240, 7.658, 7.806	English press.
2321	CF Halifax	[MR]	RTTY	75/N/600	4.271, 6.4964	Wx. Fcst at 2345.

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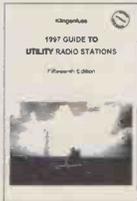


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# ShackWare

There's no doubt that the dark winter evenings serve only to deepen our interest in trawling the ether for the distant and unusual, and what does a deepening interesting equate to (for *SWM* columnists at least)? Problems, requests and queries! So, without further ado, let's press on to this quarter's bulging mail bag...

## Reader Mail

First up is **J. F. Nichols** of Birchwood, Lincoln who has acquired an Atari 130XE complete with "...tape drive, joystick and about ten games". Mr Nichols's comprehensive shack consists of a Yaesu FRG-100, Realistic PRO2006 and an MVT-7100 and he wants to know if there's anything useful he can do with the Atari such as "...keep an inventory of frequencies and connect my receivers to decode the data modes?"

The answer, of course, is an emphatic **yes**, though you'll need to get hold of a disk drive before the machine can really be put to work. Fortunately, drives are cheap and relatively plentiful. Several models are available though you're likely to encounter just two: the 810, a single-sided breeze block of a drive offering 90Kb (!) of data storage or the later 1050, an altogether smaller and more stylish device offering enhanced data capabilities of 130Kb.

Several commercial outlets cater to the Atari 8-bits and principal among them is **Micro Discount at 265 Chester Road, Streetly, West Midlands B74 3EA. Tel: 0121-353 5730**. Alternatively, there's always the good old boot sale which is where virtually all of my stuff comes from. Pay no more than around a fiver for a drive at a boot sale, and between £15 and £25 for a reconditioned drive from Micro Discount (depending upon model).

And when you've sourced a drive, write again with a formatted 5.25in disk and I'll provide you with software for FAX and c.w. decoding as I did for **Mick Bolstridge** of Ilkeston, Derbyshire who has several Atari Classics and a Yaesu FRG-100.

The other half of my pair of Apple Mac enquiries makes his appearance this quarter. **Mr T. Stalker GM7TZU** has a llcx and a yen for "radio-related software - could you point me in the right direction?". Hopefully Mr Stalker is now enjoying the copy of WEFAX decode software *RadFax* I sent him.

York's **T. G. James** rallied to my plea for help with a source of Spectrum spares and writes "... the following companies may be of use.

**Trading Post, Victoria Road, Shifnal, Shropshire. Tel: (01952) 462135. Another source is Brympton Cottage, Brunswick Road, Worthing, Sussex** (send an A5 s.a.e for lists) or alternatively, subscribe to *8BIT*, the mag for 8-bit computer users. Details from **Brian Watson, 39 High Street, Sutton-in-the-Isle, Ely, Cambs CB6 2RA. Tel: (01353) 77006**". Thanks for that, Mr James.

**Brian Watson** did in fact make contact too, with a description of *8BIT* magazine. Unfortunately, he didn't send me a copy (hint!) so I can't tell you what it's like, though it's always a good idea to support effort like this because it benefits everyone.

## Fax on a Spectrum

From Leicester, **Andy Hall**, writes with compliments for ShackWare (which modesty forbids me from publishing here!) and says that he likes "the idea of a column which covers older computers rather than the £1500-plus PCs". Andy has recently acquired a Spectrum +2 for £2 at a boot sale which he's now using with the RAMS IV software for RTTY, Morse and SSTV. Andy wants to have a go at FAX and wonders what's available.

Well, I use Technical Software's excellent FAX and APT package which, uniquely I think, uses the Spectrum for the actual decode but a printer for the display, thereby side-stepping the Spectrum's limited screen resolution and making full use of the dots-per-inch quotient of the average Epson. This means that full resolution is possible along with a reasonable stab at reproducing greyscales. The software responds to sync tones and will start and stop automatically with a reasonable success rate after each FAX, and there's an on-screen tuning aid which helps enormously with setting-up. All in all, a super piece of software and the only surprise is that it's not still available commercially - why pay possibly hundreds when you can pay a few tens and get the computer, too!

Ah well, just a thought. Technical Software is no longer in the amateur radio software business, but the FAX software is certainly available second-hand, which is how I acquired mine. And if you're out there, Technical Software people, thanks for a great package!

This quarter I've had several queries from readers with STs of one sort or another, but I'm afraid I've had to disappoint them all. There certainly is software out there, some of it available from public domain

outlets (such as **Goodman PDL at 16 Conrad Close, Meir Hay Estate, Longton, Stoke-on-Trent ST3 1SW. Tel: (01782) 335650**), but tracking it down is proving difficult and finding the interfaces it was originally intended to work with even harder!

I did once see what looked like an excellent FAX program (which I believe required no special interface) sent in by a correspondent to Mike Richards's 'Decode' column but what became of it, I don't know (and if anyone does, write and tell me so I can share the good news!). There's also a public domain APT decode program for use with the Maplin satellite receiver and decoder which I can pass on to anyone who has the required combination of hardware who sends me a blank disk.

So for **Matt Currie, Peter Lee** et al sorry, but I'll keep trying and when I find something, you'll be the first to know.

Finally, a tale of woe. **Keith Cope** of Dudley in the West Midlands says that "...I got the radio bug just over 12 months ago, starting with a Sangean ATS-803A and have now moved to a NRD-535 connected to 70 feet (21m) of wire. I also bought an MCL1100 data decoder to resolve RTTY and c.w. signals."

Sounds reasonable but Mr Cope has problems...

"Having spent many hours tuning around the bands I have logged only four frequencies. I have a pocket guide to RTTY and FAX but it's not just a matter of putting in a frequency and away you go. The RTTY and c.w. signals I'm picking-up make no sense as they all seem to be coded."

All of which just go to show that, working by yourself, it's often very difficult to bring the necessary factors together in order to resolve a data mode - even the so-called 'easy' ones!

On the whole the data modes are transmitted using single side-band which means that you have to tune your receiver to a frequency around 2Hz lower than the published frequency for upper side-band transmissions and 2Hz higher than that published for lower side-band. With a receiver which reinserts the carrier you enter say, the u.s.b. frequency minus a couple of hertz and then fine tune, but with a b.f.o.-based receiver such as the Sangean, you enter the frequency and twirl the b.f.o. control very slowly until the signal is resolved.

With the correct tuning however, your problems are just beginning. RTTY is transmitted in a variety of speeds, shifts and polarities and

these three things alone can leave you struggling for hours. Get just one factor wrong and the result is pages and pages of scrolling text which looks for all the world like it has been encoded by the combined forces of the world's secret services! Morse code (c.w.) is easier, but Morse keyers have a shorthand all their own which, even if you resolve the signal correctly, could still be unintelligible for the uninitiated.

Therefore, Keith, I'd suggest you need a couple of 'tools' to help you to successful decoding: a good beginner's frequency list showing speed, shift and polarity such as that compiled by Day Watson, (a portion of which is included in Mike Richards' 'Decode' column this month - KN), and a good text introducing ham radio with a potted listing of Morse shorthand. Those published by Bernard Babani and available from bookshops everywhere are exceptionally cheap and very well written.

Perhaps the best advice though, is to watch someone who has experience resolving data modes (either a friend, a local club's public evening or one of the demonstrations given at radio rallies), because seeing it done properly will certainly help solve many of your problems.

Finally, remember that everyone has difficulty from time to time. I have problems tracking down maritime beacons for example, yet a regular contributor to the *SWM*'s quarterly 'beacons' column, **Ross Workman** who also lives very close to me in Shoreham and uses identical equipment, seems to manage just fine!

## Late News

Anyone who's about to contact the LACE Atari enthusiast's club featured in the last 'Shackware' should wait until the next instalment, when I will have located a contact address for TWAUG (Tyne and Wear Atari User Group) instead. After more than a decade serving Atari-owning enthusiasts LACE, unfortunately, is about to close down.

## And Finally...

That's it for this quarter. With so many letters, I simply didn't have space for the Quarterly Computer Cameo (which will return in the next Shackware), or the review of the German decode program I've recently discovered. Watch this space. And until next quarter, good listening.



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# LM&S

## Long, Medium and Short Waves

Most of the new receivers advertised in this magazine are complex and therefore expensive. However, even a simple receiver will enable a listener to search the broadcast bands and derive endless hours of pleasure.

Anyone starting out on this hobby should not overlook the one-valve set described by Dick Ganderton (SWM Editor) in the December issue of this magazine.

### 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 November.

The 10kW transmission from the Radiotelevisione Italiana (RAI) outlet at Caltanissetta, Italy on 189kHz reached the UK during some evenings. At 1941UTC on October 25 it was rated SINPO 33223 by **Tony Stickells** in Thornton Heath. On November 13 it was noted as 33333 at 2000 by **Paul Bowery** in Burnham-on-Crouch; on the 18th as 33343 at 2052 by **John Eaton** in Woking and SIO222 by **Kenneth Buck** in Edinburgh; on the 24th as 'just audible' at 2025 by **Norman Thompson** in Oadby; on the 29th as 13232 at 2149 by **Fred Pallant** in Storrington.

### Medium Wave Reports

Broadcasts from some of the m.w. stations in E.Canada and E.USA were received in the UK after dark - see chart. Favourable conditions were noted on the 4th by **Harry Richards** in Barton-on-Humber. He logged WNRB on 1510 as 24232 at 0240. WBBR in New York on 1130 was just audible. Good conditions were also noted on the 4th by **Tony Stickells**. The highlight for him was hearing during the four nights 4th-12th WLPZ in Portland, ME on 1440, which runs just 5kW!

November proved to be another good month for **David Sayles** in Doncaster - he added five stations to his growing list of DX! On the 6th he logged CJYQ on 930 as SIO333 at 2330. Most of his other entries were heard during the nights of the 4th, 10th, 11th, 12th, 13th & 18th. On the 23rd he heard WHAS in Louisville, KY on 840 at 0531; also WFAN on 660 at 0622, but reception was poor.

In anticipation of good conditions **David Edwardson** (Wallsend) erected a three turn wall mounted 2.5m by 2.5m loop

aimed East/West. Whilst using it during the second week of November he found that VOXM on 590 became audible around 2040. He also heard VOXM being relayed by CKGA in Gander, NF on 650 at 0630. In Derby **Roy Patrick** logged VOXM at 2330 but CJYQ was heard more often at 2315.

Up in Shetland **John Slater** (Scalloway) found the conditions favourable around 0700 on the 20th, logging CJYQ on 930 as SIO322 and VOXM on 590 as SIO222. At 0810 on the 21st WBBR on 1130 was peaking SIO433! The band was often searched before sunrise by **Paul Crankshaw** in Troon. On the 30th he heard for the first time WWL in New Orleans, LA on 870 at 0750. Sunrise with him was at 0815.

Over in Canada **Alan Roberts** (Quebec) joined a group of local DXers and spent a long weekend in St. Bernard de Lacolle, some 50km South of Montreal. Two Beverage antennas were erected, aimed at NE Europe and E.Africa. At 0335 on November 2 he logged Egyptian Radio via Santah (500kW) on 864kHz as SIO333. During the next night he heard France-Inter via Marseille (600kW) on 675, which rated SIO222 at 0105.

Some broadcasts from the Middle East and N.Africa also reached the UK after dark - see chart. Many European stations were heard before dusk. The broadcasts from RTL via Marnach on 1440 usually reach the UK via sky wave paths after dark but Harry Richards has been able to hear them all day!

A test transmission from the new ILR Valleys Radio on 1116 was rated SIO322 at 1103 by **David Matthews** in Llandrindod Wells. Whilst in London, **Ross Lockley** (Galashiels) noticed that ILR Viva 963 has adopted the name '963 Liberty'.

### Short Wave Reports

It seems unlikely that international broadcasters will use the **25MHz (11m)** band in 1997.

Although the propagation conditions in the **21MHz (13m)** band are unreliable R.Australia's broadcast to Asia via Darwin on 21.725 (Eng 0630-1100) often reaches the UK - sometimes remarkably well. It was rated 44444 at 0908 by **Ron Damp** in E.Worthing; 55544 at 0955 by **Stan Evans** in Herstmonceux and 54444 at 1130 by **Tom Winzor** in Plymouth.

Other broadcasters using this band include RFI via Allouis?

### Long Wave Chart

Freq (kHz)	Station	Country	Power (kW)	Listener
153	Becar	Algeria	1000	D*,J*
153	Donebach DLF	Germany	500	A,B,C,D*,E*,F*,G,I,J,K*,L,M*
153	Bod	Romania	1200	A,B
162	Allouis	France	2000	A,B,C,D*,E*,F*,G,I,J,K*,L
171	Nador Medi-1	Morocco	2000	A*,D*,L*
171	B'snakovo etc	Russia	1200	A*,B*,E*,F*,H*,I,J*,L*
171	Minsk	Belarus	1000	G
177	Dranienburg	Germany	750	A,B,C,D*,E*,G,H*,I,J*,K*,L
183	Saarouis	Germany	2000	A,B,C,D*,E*,F*,G,I,J,K*,L,M*
189	Caltanissetta	Italy	10	A*,B*,D*,J*,L*,M*
198	BBC R-4 via ?	UK	?	K*
198	Droitwich BBC	UK	500	A,C,E*,F,G,H*,I,L,M*
198	WesterglenBBC	UK	50	B
207	Munich DLF	Germany	500	A,B,C,D*,E*,G,H*,I,J,L*,M*
207	Azilal	Morocco	800	A*,G*,J*,L*
207	Kiev	Ukraine	500	A*
216	Roumoules RMC	S.France	1400	A,B,C,D*,E*,F*,G,I,J,K*,L,M*
225	Raszyn Resv	Poland	?	A,B,C,D*,E*,F*,G,H*,I,J,K*,L*,M*
234	Beidweiler	Luxembourg	2000	A,B,C,D*,E*,G,H*,I,J,K*,L,M*
234	Ar'gelsk etc	Russia	500	B*
243	Kalundborg	Denmark	300	A,B,C,D*,E*,F,G,H,I,J,L
252	Tipaza	Algeria	1500	A*,F*,H*,J*,L*
252	Atlantic 252	S.Ireland	500	A,B,C,D*,E*,F,G,H*,I,J,K*,L,M*,N*
261	Burg(R.Rope)	Germany	200	A,B,D*,F*,G,I,J,L
261	Taldom Moscow	Russia	2500	A*,B*,D*,E*,F*,H*,J*,L*
270	Topolna	Czech Rep	1500	A*,B,D*,E*,F*,G,H*,I,J,K*,L*,M*
279	Ashgebat	Turkmenistan	150	A*
279	Minsk	Belarus	500	A*,B,D*,E*,F*,G*,H*,I,J*,L*,M*

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

Listeners:-

- |                                     |                                    |                                     |
|-------------------------------------|------------------------------------|-------------------------------------|
| (A) Paul Bowery, Burnham-on-Crouch. | (E) Ted Harris, Manchester.        | (J) Fred Pallant, Storrington.      |
| (B) Kenneth Buck, Edinburgh.        | (F) Sheila Hughes, Morden.         | (K) Tom Smyth, Co.Fermanagh.        |
| (C) Martin Dale, Stockport.         | (G) Ronald Jefferies, Berkeley.    | (L) Tony Stickells, Thornton Heath. |
| (D) John Eaton, Woking.             | (H) Eddie McKeown, Newry.          | (M) Norman Thompson, Oadby.         |
|                                     | (I) George Millmore, Wootton, IoW. | (N) Thomas Williams, Truro.         |

21.580 (Fr to Africa? 0900?-1500?) rated 45554 at 0940 by **John Parry** in Larnaca, Cyprus; BSKSA Saudi Arabia 21.495 (Ar [Holy Quran] to S.E.Asia 0900-1200) 34333 at 1018 by **Rhoderick Illman** in Oxted; BSKSA Riyadh, Saudi Arabia 21.665 (Ind to S.E.Asia 1000-1200) 35433 at 1045 by **Eric Shaw** in Chester; UAER, Dubai 21.605 (Eng to Eur 1030-1055) 54444 at 1047 by **Chris Shorten** in Norwich; UAER, Abu Dhabi 21.735 (Ar to Far East? 1100-1300) 34343 at 1125 in Scalloway; RFI via Issoudun 21.620 (Fr to E.Africa 0800-1500?) 23232 at 1210 by **Robert Connolly** in Kilkeel; BBC via Ascension Is 21.660 (Eng to W/E/S.Africa 1100-1700) 35333 at 1225 by **Michael Griffin** in Ross-on-Wye; BBC via Limassol, Cyprus 21.470 (Eng to E.Africa 1300-1700) 33333 at 1300 by **Peter Pollard** in Rugby; UAER, Dubai 21.605 (Eng to Eur 1330-1355) 45444 at 1330 by Eddie McKeown in Newry; REE via Noblejas 21.570 (Sp to S.America 1200-1800) 33243 at 1404 in Woking; HCJB Quito, Ecuador 21.455 (Eng, u.s.b. + p.c.) 24332 at 1530 by **Darren Beasley** in Bridgwater; WYFR via Okeechobee, USA 21.525 (Eng, Fr, Ger, Port to W.Africa 1600-2045) 22222 at 1645 by **Thomas Williams** in Truro.

The propagation conditions in the **17MHz (16m)** band also vary daily. During the morning R.Pakistan via Karachi 17.900 (Eng to Eur 0800-0845) was 54444 at 0800 in Norwich; R.Australia via Darwin 17.715 (Eng to Asia, Pacific 0200-0858) 44444 at 0825 in Plymouth; Africa No.1, Gabon 17.630 (Fr to W.Africa 0700-1600) 55534 at 1004 by **Richard Reynolds** in Guildford; BBC via Wofferton, UK 17.640 (Eng to Eur 0800-1500) 44333 at 1025 by **Tony Hall** in Freshwater Bay; R.Austria

Int via Moosbrunn 17.870 (Ger, Eng to Australia 0800-1100) 43333 at 1030 in Truro; BSKSA Saudi Arabia 17.880 (Ar [Holy Quran] to S.E.Asia 0900-1200) 43443 at 1042 in Oxted; AIR via Bangalore 17.387 (Eng to Pacific areas 1000-1100) 43433 at 1050 in Herstmonceux; DW via Rwanda? 17.800 (Eng to W.Africa 1100-1150) 44444 at 1105 by **Sheila Hughes** in Morden; R.Pakistan, Islamabad 17.900 (Ur to Eur 0845-?) 34434 at 1120 in Oadby.

After mid-day BBC via Mayhe, Seychelles 17.885 (Eng to E.Africa 0500-1400) was 22332 at 1225 in Kilkeel; Israel R, Jerusalem 17.545 (Heb [Home Sce rly] to W.Europe, N.America 0800-1425) 44444 at 1305 in Rugby; BBC via Ascension Is 17.830 (Eng to W/C.Africa 0730-2100) 34223 at 1320 in Thornton Heath; V of Russia 17.860 (Eng [WS]) 43334 at 1400 by **Gerald Guest** in Dudley; RAI via 17.780 (It [R.Uno] to America 1330?-1630? Sun) 45554 at 1406 in Wallsend; RFI via Moyabi, Gabon 17.560 (Eng to M.East 1400-1500) SIO232 at 1425 in Woking; Monitor R via WSHB? 18.930 (Eng [Various Sun] to Eur? 1600-1800?) 34333 at 1701 in Bridgwater; R.Nederlands via Bonaire 17.605 (Eng to S/E/W.Africa 1830-2025) 44243 at 1906 in Newry.

Noted in the **15MHz (19m)** band before noon were BBC via Rampisham, UK 15.575 (Eng to Eur, M.East, W.Asia 0400-1615), logged as 44554 at 0645 in Cyprus; R.Japan via Moyabi, Gabon 15.165 (Eng 0700-0800) 32222 at 0700 by **Clare Pinder** in Appleby; R.Pyongyang, Korea 15.340 (Eng to SE.Asia 0700-0750) 22222 at 0705 in Norwich; R.Pakistan, Islamabad 15.470 (Eng to Eur 0800-0848) 33333 at 0804 in Plymouth; BCC via Pali, Taiwan 15.125 (China to

# Medium Wave Chart

Freq (kHz)	Station	Country	Power (kW)	Listener	Freq (kHz)	Station	Country	Power (kW)	Listener	Freq (kHz)	Station	Country	Power (kW)	Listener
520	Hof/Hurzberg (BR)	Germany	0.2	K*,R*	837	Nancy	France	200	A,K*,L*,R*	1260	Szczecin	Poland	160	A*,R*
531	Ain Beida	Algeria	600/300	A*,C*,L*,R*	837	COPE via ?	Spain	?	C*,H,K*,L*,R*	1260	SER via ?	Spain	?	C*,K*,R*
531	Torshavn	Faeroe Is.	100	A*	837	Sombor	Yugoslavia	?	A*	1260	Guildford (V)	UK	0.5	L,R
531	Leipzig	Germany	100	A*,C*,K*,L,Q,R,S*	846	Rome	Italy	150	A*,R*	1269	Neumunster(DLF)	Germany	600	A,C*,E*,H*,K*,L*,Q,R,S*,T
531	RNE5 via ?	Spain	?	K*,R*	846	Noginsk	Russia	540	A*					C*
531	Beromunster	Switzerland	500	E*,H,L,R*	855	Berlin	Germany	100	C*,K*,S*	1269	COPE via ?	Spain	?	
540	Wavre	Belgium	150/50	A,C*,H,K*,L,Q,R,S*	855	RNE1 via ?	Spain	?	C*,H*,K*,L*,Q,R*	1269	Novi Sad	Yugoslavia	600/150	A*
540	Solt	Hungary	2000	A*,R*	864	Santah	Egypt	500	D*,L*,R*	1278	Strasbourg	France	300	A,C*,R*,S*
540	Sidi Bennour	Morocco	600	A*,C*,K*,L*,R*	864	Paris	France	300	A,C*,H,K*,L,R	1278	Dublin/Cork(RTEZ)	Ireland (S)	10	C,G*,H,L,Q,R
540	Victoria(E)	Spain	10	A*,R*	864	Socuellamos(RNE1)	Spain	?	L*,R*	1287	RFE via ?	Czech Rep.	400	C*,H,K*,L*,Q,R,S*
549	Les Trembles	Algeria	600	A*,C*,H*,K*,L*,R*	873	Frankfurt(AFN)	Germany	150	A*,C*,E*,J,K*,L*,R*,S*	1287	Leiridal(SER)	Spain	10	C*,H,R*
549	Thurau (DLF)	Germany	200	A,C*,E*,H,K*,L*,Q,R*	873	Zaragoza(SER)	Spain	20	K*,L*,R*	1296	Kardzali	Bulgaria	150	L*
558	Espoo	Finland	100	B*	873	Enniskillen(R.U.I)	UK	1	PD	1296	Valencia(COPE)	Spain	10	A*,C*,H*,R*
558	Rostock(NDR)	Germany	20	K*	882	COPE via ?	Spain	?	K*,L*,R*	1296	Orfordness(BBC)	UK	500	A,C*,H*,Q,R,S*
558	RNE5 via ?	Spain	?	C*,K*,L*,Q*	892	Washford(BBCWales)	UK	100	A,B*,C*,E*,H,L,Q,R,S*	1305	Rzeszow	Poland	100	A*,K*
558	Berlin	Germany	100	K*	891	Algiers	Algeria	600/300	A*,C*,K*,L*,R*	1305	RNE5 via ?	Spain	?	C*,K*,R*
567	Tullamore(RTE1)	Ireland (S)	500	A,C*,E*,H,L,Q,R,S*	891	Huisberg	Netherlands	20	A,H,L	1314	R.Due via ?	Italy	?	A*
567	Bologna	Italy	20	R*	900	Bmo(CRoZ)	Czech Rep	25	K*,L*	1314	Kvitsoy	Norway	1200	A,B*,C*,E*,H,K,L,N,Q,R,T
567	RNE5 via ?	Spain	?	R*	900	Milan	Italy	600	A*,C*,H*,K*,R*,S*					M,R*
576	Mihlacker(SDR)	Germany	500	A,C*,E*,H,K*,R	900	COPE via ?	Spain	?	L*,R*	1323	Zyvi(BBC)	Cyprus	200	M,R*
576	Riga	Latvia	500	L*,R*	900	Quryyat	Saudi Arabia	1000	L*	1323	W'brunn (V.Russia)	Germany	1000/150	A,C*,E*,G,H,K,R*
576	Barcelona(RNE5)	Spain	50	A,C*,D*,K*,L*,R*	909	B'mans Pk(BBC5)	UK	140	A,E*,L,Q,R,S*	1332	Rome	Italy	300	A*,B*,L*,R*
585	Paris(FIP)	France	8	A,H,K*,L,R,S*	909	Exeter(BBC5)	UK	1	H	1341	Lakihegy	Hungary	300	A,C*,R*
585	Madrid(RNE1)	Spain	200	A*,C*,H*,K*,L*,Q,R*	909	M'side Edge(BBC5)	UK	200	C	1341	Lisnagarvey(BBC)	Ireland (N)	100	A,C,G,H,L,Q,R
585	Gafsa	Tunisia	350	D*	918	Plesivec(Sloveni nR)	Slovenia	600/100	A*,C*,H*,K*,L*,R*,S*	1341	Tarasal(SER)	Spain	2	R*
585	Dumfriess(BBCScott)	UK	2	C,I,J,R*	918	Madrid(R.Int)	Spain	20	A*,C*,K*,L*,Q,R*	1350	Nancy/Nice	France	100	C*,H*,K*,L*,Q,R*
594	Frankfurt(HR)	Germany	1000/400	A,C*,E*,H,K*,L*,Q,R*	927	Wolvertam	Germany	300	A,C*,E*,H,K,L,Q,R,S*	1350	Pecs	Hungary	10	R*
594	Oujda-1	Morocco	100	L*,R*	936	Bremen	Germany	100	A,C*,E*,K*,L*,Q,R*	1350	Cesvaine/Kuldiga	Latvia	50	K*,R*
594	Muge	Portugal	100	C*,D*,H*,K*	936	Venezia	Italy	20	L*,R*	1359	Arganda (RNE-FS)	Spain	600	C*,K*,L*,R*
603	Lyon	France	300	Q,R*,S*	936	RNE5 via ?	Spain	?	L*,R*	1368	Foxdale(Manx R)	I.D.M.	20	A*,B*,C*,E*,H,K,L,Q,R*
603	Sevilla(RNE5)	Spain	50	C*,L*,R*	945	Toulouse	France	300	A*,C*,H*,K*,L*,Q,R,S*	1377	Lille	France	300	A,C*,H,K,L,R
603	Newcastle(BBC)	UK	2	C						1386	Ahwaz	Iran	400	R*
612	Athlone(RTEZ)	Ireland (S)	100	A*,B*,C*,E*,H,L,Q,R*	954	Brno (CroZ)	Czech Rep.	200	A,C*,L*,R*,S*	1386	Bolshakovo	Russia	2500	A*,C*,G*,H,K*,L*,Q,R*,T
612	Sebba Aijun	Morocco	300	R*	954	Madrid(CI)	Spain	20	A*,C*,L*,R*					A*,C*,G*,H
612	RNE1 via ?	Spain	10	L*,R*	963	Pori	Finland	600	A*,C*,H,K*,L*,R*,S*					C*,Q
621	Wavre	Belgium	80	A,C*,E*,H,K*,L,R	963	Tir Chonail	Ireland (S)	10	Q	1395	Lushnje(Tirana)	Albania	1000	C*,R
621	Batna	Egypt	2000	S*	972	Hamburg(NDR)	Germany	300	A,C*,E*,G*,H,K*,L*,R,S*	1395	TWR via Lushnje	Albania	500	C*,Q
621	RNE1 via ?	Spain	10	K*						1395	Lopic	Netherlands	120/40	A,C*,H,K,L,R
621	Barcelona(OCR)	Spain	50	L*	972	RNE1 via ?	Spain	?	R*	1404	Brest	France	20	A,C*,H,K*,L,R
630	Dannenberg(NDR)	Germany	100	C*	981	Alger	Algeria	600/300	C*,G*,H*,L*,R*,S*	1404	Sighet	Romania	?	A
630	Vigra	Norway	100	A*,C*,E*,H*,K*,L*,R*,S*	990	Berlin	Germany	300	C*,E*,L*,R*,S*	1413	RNE5 via ?	Spain	?	H,K*,L*,R*
630	Tunis-Djedeida	Tunisia	600	A*,C*,L*,R*	990	R.Bilbao(SER)	Spain	10	C*,K*,L*,R*	1422	Heusweiler(DLF)	Germany	1200/600	A,C*,E*,H,K,L,R
639	Praha(Libice)	Czech	1500	A*,C*,E*,K*,L*,R*	990	Redmoss(BBC)	UK	1	K*	1422	Valmiera	Latvia	50	R*
639	RNE1 via ?	Spain	?	C*,H,K*,R*	990	Tywyn(BBC)	UK	1	I,R*	1431	Kopani	Ukraine	500	H*,K*
648	RNE1 via ?	Spain	10	H*,K*,R*	999	Schwern (RIAS)	Germany	20	C*	1440	Marnach(RTL)	Luxembourg	1200	A,B*,C*,E*,F*,H,K,L,Q,R,R,T
648	Orfordness(BBC)	UK	500	A,C*,E*,H,L,R,S*	999	Torino	Italy	20	R*					R*
657	Neubrandenburg(NDR)	Germany	250	A,C*,E*,K*,R*	999	Madrid(COPE)	Spain	50	H*,K*,Q,R*,S*	1440	St.Petersburg(RFI)	Russia	10	R*
657	Tel Aviv	Israel	200	A*	1008	SER via ?	Canaries/Spain	?	C*,R*	1440	Damman	Saudi Arabia	1600	K*
657	Napoli	Italy	120	L*,R*	1008	Rheinhilf-Si	Holland	400	A,C*,E*,H,K,L,Q,R,S*,T	1449	Squinzano	Italy	50	A*,R*
657	Madrid(RNE5)	Spain	20	A*,H*,K*,L*,R*,S*	1017	Flevisender(SWF)	Germany	600	A,C*,E*,G*,H*,K*,L*,R	1449	Redmoss(BBC)	UK	2	A*,E*,H,K,R*
657	Wrexham(BBCWales)	UK	2	A,C*,E*,J,Q,R	1017	RNE5 via ?	Spain	?	L*,R*	1458	Filake	Albania	500	A*
666	Messkirch(Rohrd/SWF)	Germany	150	A,C*,E*,K*,R*	1026	SER via ?	Spain	?	C*,L*,R*	1467	Maiaç	Moldova	150	A*
666	Sitkuna(R.Vilnius)	Lithuania	500	K*,R*	1035	Lisbon(Prog3)	Portugal	120	C*,K*	1467	Monte Carlo(TWR)	Monaco	1000/400	A*,C*,E*,H,K*,L*,R*
666	Listoia	Portugal	135	A*,L*	1044	Gresden(MDR)	Germany	250	C*,E*,K*,L*,Q,R*,S*	1476	Dubai	UAE	1500	A*,R*
666	Barcelona(COPE)	Spain	10	A*,R*	1044	Sebba-Aijun	Morocco	300	L*	1485	AFN via ?	Germany	1	R*
675	Marseille	France	600	A*,K*,L*,R*	1053	SER via ?	Spain	?	H,L*,R*	1485	SER via ?	Spain	?	C*,H
675	Lopic(R10 Gold)	Holland	120	A,B*,C*,E*,H,K*,L,Q,R,S*	1053	tasi	Romania	1000	R*	1494	Clermont-Ferrand	France	20	A,H,K,R
684	Sevilla(RNE1)	Spain	500	A*,C*,H*,K*,L*,R*	1062	Zaragoza(COPE)	Spain	10	C*,K*,R*	1494	St.Petersburg	Russia	1000	A*,H*,K*,L*,R*,T
684	Avatol(Beograd-1)	Yugoslavia	2000	A*,C*,L*,R*,S*	1062	Talk R.UK via ?	UK	?	B*,C*,E*,H,L,Q,R	1503	Stargard	Poland	300	C*,H
693	Tortosa(RNE1)	Spain	2	K*,R*	1071	Kalundborg	Denmark	250	A,C*,H,K,L,R	1503	RNE5 via ?	Spain	?	L*,R*
693	Droitwich(BBCS)	UK	150	A,C*,E*,H,L,Q,R,S*	1071	R.Unc via ?	Italy	?	H*,R*	1503	Beograd	Yugoslavia	10	A
702	Flensburg(NDR)	Germany	5	A,C*,E*,K*,R*	1071	R.France via ?	France	?	A,C*,H,K*,L,R,S*	1512	Wolvertem	Belgium	600	A,C*,G*,H,K,L,N,R,T
702	Monte Carlo	Monaco	40	L*	1071	Riga	Latvia	50	L*	1512	Jeddah	Saudi Arabia	1000	R*
702	TWR via Monte Carlo	Monaco	300	R	1071	Bilbao(EI)	Spain	5	C*,L*,R*	1521	Kosice(Gaztice)	Slovakia	600	C*,L*
702	Slovensko 1 via ?	Slovak Rep.	?	R*	1071	Talk Radio UK via ?	UK	?	R*	1521	Duba	Saudi Arabia	2000	A,I*
702	Zamorat(RNE1)	Spain	10	R*	1080	Katowice	Poland	1500	C*,L*,R*	1530	Vatican R	Italy	150/450	A*,C*,K*,L*,R
711	Rennes 1	France	300	A,H,L,R	1080	SER via ?	Spain	?	H*,K*,L*,R*	1539	Mannfingen(7ERF)	Germany	700	A,C*,E*,K*,L*,R
711	Heidelberg	Germany	5	A*,E*,K*,R	1089	Krasnodar	Russia	300	K*	1539	SER via ?	Spain	?	H,R*
711	Laayoune	Morocco	600	L*,R*	1089	Talk Radio UK via ?	UK	?	C*,E*,H,L,Q,R,S*	1557	Nice	France	300	A,H,R*
711	Murcia(COPE)	Spain	5	C*	1098	Nitra(Larok)	Slovakia	1500	A,C*,H,K*,L*,R*	1566	Mjadzle	Belarus	10	A
720	Norte	Portugal	100	A*,K*,L*	1098	RNE5 via ?	Spain	?	K*,L*,R*	1566	Samen	Switzerland	300	A,C*,H,L
720	Lots Rd.Ldn(BBC4)	UK	0.5	A,C*,E*,H,L,Q,R*	1107	AFN via ?	Germany	10	C*,E*,K*,R*	1575	Genova	Italy	50	A*,C*,K*,L*,R*
729	Cork(RTE1)	Ireland (S)	10	A*,E*,H,L,K*,Q,R*	1107	RNE5 via ?	Spain	?	R*	1575	SER via ?	Spain	5	C*,H,L*,R*
729	RNE1 via ?	Spain	?	C*,H*,K*,L*,R*	1117	Talk R.UK via ?	UK	?	C*,E*,H,L,R	1584	SER via ?	Spain	2	A*,C*,L*,R*
738	Paris	France	4	A,L,R	1116	Bari	Italy	150	L*,R*	1593	Holkirchen(VDA)	Germany	150	A*,C*,H*,K*,L*,R*
738	Poznan	Poland	300	A,R*,S*	1125	Portevedral(SER)	Spain	5	R*	1602	SER via ?	Spain	?	C*,L*,R*
738	Barcelona(RNE1)	Spain	500	A*,C*,K*,L*,Q,R*	1125	La Louviere	Belgium	20	A,K*,L*,R	1602	Vitoria(EI)	Spain	10	A*,C*,H,L*,R*
747	Flevo(Hilv2)	Holland	400	A,C*,E*,H,K*,L,Q,R,S*,T	1125	Deanovec	Croatia	100	R*	1611	Vatican R	Italy	15	A*,E*,H*,R*
747	Cadix(RNE5)	Spain	10	COPE via ?	1125	RNE5 via ?	Spain	?	C*,H*,K*,L*,R*					
756	Braunschweig(DLF)	Germany	800/200	A,C*,E*,H*,K*,L*,Q,R*	1125	Ulandindod Wells	UK	1	H,J					
756	Bilbao(EI)	Spain	5	L*,R*	1134	COPE via ?	Spain	2	H*,L*,R					
756	Redruth(BBC)	UK	2	K*,L	1134	Zadar(Croatian R)	Yugoslavia	600/1200	C*,H,K*,L*,Q,R*,S*					
765	Sottens	Switzerland	500	C*,E*,H*,K*,L*,R*,S*	1143	AFN via ?	Germany	1	A*,E*,H,K*,R*					
774	Sofia	Bulgaria	50	L*	1143	COPE via ?	Spain	2	H*,L*,R*					
774	Abis	Egypt	500	S*	1143	RNE5 via ?	Spain	10	L*,R*					
774	Enniskillen(BBC)	Ireland (N)	1	Q	1152	RNE5 via ?	Spain	?	R*					
774	RNE1 via ?	Spain	?	C*,K*,L*,R*	1161	Strasbourg(Fint)	France	200	C*,K*,L*,R*					
783	Leipzig(MDR)	Germany	100	C*,E*,H*,K*,L*,R*	1161	S.Sebastian(EI)	Spain	50	R*					
783	Miramant(R.Porto)	Portugal	100	K*	1179	SER via ?	Spain	?	C*,R*					
783	Damman	Saudi Arabia	100	L*	1179	Solvsborg	Sweden	600	A,B*,C*,E*,H,K*,L*,Q,R,S*,T					
792	Limoges	France	300	A,H,L,R,S*	1188	Kuurne	Belgium	5	A,C*,K*,L*,R					
792	Lingen(NDR)	Germany	5	A*,E*,K*,L*,R*	1188	Reichenbach(MDR)	Germany	5	E*,R*					
792	Kavala(VOA)	Greece	500	M*	1188	Szolnok	Hungary	135	K*,L*,R*					
792	Sevilla(SER)	Spain	20	A*,H*,K*,L*,R*	1188	San Remo	Italy	6	R*					
801	Munchen-Ismaning	Germany	300	A,C*,E*,K*,L*,Q,R*	1197	Munich(VOA)	Germany	300	C*,K*,R*,S*					
801	Ajoun	Jordan	2000	L*	1197	Virgin via ?	UK	?	C*,E*,H,L,Q,R					
801	RNE1 via ?	Spain	?	C*,H*,K*,L*,R*	1206	Bordeaux	France	100	A,K*,L,R,S*					
810	Madrid(SER)	Spain	20	A*,C*,K*,R*	1206	Wroclaw	Poland	200	K*,L*,R*					
810	Westerglen(BBCScott)	UK	100	A,C*,E*,H,L,J,L,P,Q,R	1215	Virgin via ?	UK	?	C*,E*,H,L,Q,R,S*,U*					
819	Batna	Egypt	450	K*,L*,R*,S*	1224	Lelystad	Holland	50	A,C*,H,K,R					
819	Toulouse	France	50	A*,K*	1224	Manningtree(V)	UK	0.5	L					

# Transatlantic DX Chart

Freq (kHz)	Station	Location	Time (UTC)	DXer
<b>USA</b>				
660	WFAN	New York, NY	0622	C,G
680	WRKO	Boston, MA	0104	C
770	WABC	New York, NY	0005	C
840	WHAS	Louisville, KY	0531	G
850	WEEI	Boston, MA	0004	A,C
870	WVU	New Orleans, LA	0750	C
880	WCBS	New York, NY	0259	C,G
1010	WINS	New York, NY	0011	A,C,G,I
1050	WEVD	New York, NY	0010	C,D
1080	WTIC	Hartford, CT	2358	C
1130	WBBR	New York	0130	A,C,G,H,I
1180	WHAM	Rochester, NY	0001	C,G
1440	WLPZ	Portland, MA	0905	C,I
1470	WRBD	Fort Lauderdale, FL	0140	I
1500	WTOP	Washington, D.C.	0119	A,D,G,I
1510	WNRB	Boston, MA	0005	A,C,D,F,G,I
1520	WVKB	Buffalo, NY	0747	C
1540	WDCD	Albany, NY	2359	C
1560	WQEW	New York	0027	A,C,D
1590	WARV	Warwick, RI	0000	C
1660	WJDM	Elizabeth, NJ	0012	C
<b>CANADA</b>				
560	CHVO	Carbonear, NF	2141	C
580	CJFX	Antigonish, NS	2350	C
590	VOCM	St. John's, NF	2330	C,D,E,G,H
620	CKCM	Grand Falls, NF	0000	C
640	CBN	St. John's, NF	0045	C
650	CKGA	Gander, NF	2144	C,D
680	CFTR	Toronto, ON	0921	C
700	CHSJ	St. John, NB	0750	C
710	CKVD	Clareville, NF	0150	B,C
730	CKAC	Montreal, PQ	2347	C
740	CHCM	Marystown, NF	2324	C
750	CBGY	Bonavista Bay, NF	0002	C
780	CFDR	Dartmouth, NS	0751	C
820	CHAM	Hamilton, ON	0215	B
920	CJCH	Halifax, NS	0100	C,G,I
930	CJYO	St. John's, NF	2315	A,C,E,G,H,I
950	CHER	Sydney, NS	0750	C
1010	CFRB	Toronto, ON	0007	C
1140	CBI	Sydney, NS	0747	C
1380	CFDA	Victoria, BC	0404	I
1410	CIGO	Pt. Hawkesbury, NS	0723	G

**DXers:-**

- (A) Paul Bowery, Burnham-on-Crouch.
- (B) Robert Connolly, Kilkeel.
- (C) Paul Crankshaw, Troon.
- (D) David Edwardson, Wallsend.
- (E) Roy Patrick, Derby.
- (F) Harry Richards, Barton-on-Humber.
- (G) David Sayles, Doncaster.
- (H) John Slater, Scalloway.
- (I) Tony Stickells, Thornton Heath.

Also noted during the morning were Slovak R.Int. via Velke Kostolany 11.990 (Eng to Australia 0830-0857) SIO444 at 0849 by Francis Hearne in N.Bristol; R.Cairo via Abis 12.050 (Ar [Home Sce Relay]) 34334 at 1045 in Oadby; Vatican R, Italy 11.740 (It, Fr, Eng to Eur 1100-1130) SIO323 at 1115 in Co.Fermanagh.

During the afternoon R.Jordan via Al Karanah 11.690 (Eng to W.Eur, E.USA 1200-1700) was 45444 at 1200 in Derby; R.Australia via Darwin 11.660 (Eng to SE.Asia 1130-1300) 32222 at 1213 in Truro; R.Sweden via Horby? 11.650 (Eng to N.America 1230-1300) 53433 at 1240 in Herstmonceux; Polish R, Warsaw 11.815 (Eng to Europe 1300-1355) 33333 at 1329 in Rugby; Voice of Vietnam, Hanoi 12.020 (Eng to F.East 1330-1400) 23322 at 1334 in Newry; WWCN Nashville, USA 12.160 (Eng to Eur? 1400-2300) 32233 at 1400 in Stalbridge; RCI via Sackville 11.855 (Eng to USA, Caribbean 1300-1500) 34433 at 1410 in Kilkeel; WYFR via VOFC Taiwan 11.550 (Eng to Asia 1302-1502) SIO232 at 1416 in Woking; BBC via Woofferton, UK 12.095 (Eng to Eur, N/W.Africa 1000-2230) 33333 at 1657 in Oxted.

Later, R.Nederlands via Meyerton, S.Africa 11.655 (Eng to Africa 1730-2025) 32233 at 1752 in Woodhall Spa; WEWN Birmingham, USA 11.875 (Eng to N.America 1200-1755, Sp to S.America 1755-?) SIO322 at 1755 by Philip Rambaut in Macclesfield; Monitor R.via WSHB 11.550 (Eng to Eur 1800-1958) 44444 at 1800 in Morden; Voice of Tanzania Zanzibar via Dole 11.734 (Swa 1200-2000) 34333 at 1905 in Burnham-on-Crouch; REE via Noblejas, Spain 11.775 (Eng to Eur 2000-2055) 35554 at 2003 in Storrington; HCJB Quito, Ecuador 11.960 (Eng to Eur 1900?-2200) 35433 at 2004 in Bridgwater; RCI via Sackville 11.945 (Fr, Eng to Eur, M.East, Africa 2000-2230) 44444 at 2020 in Chester; BBC via Ascension Is 11.835 (Eng to W.Africa 1930-2315) 44434 at 2022 in Freshwater Bay; R.Kuwait via Kabd 11.990 (Eng to Eur, N.America 1800-2100) 43333 at 2022 in E.Worthing; R.Damascus via Adra 12.085 (Eng to Eur 2005-2105) 43333 at 2054 in Norwich; AIR via Bangalore 11.620 (Eng, Hi to Eur 1745-2230) 54444 at 2135 in Plymouth; R.Nac da Amazonia, Brazil 11.780 (Port 0900-0200) 24322 at 2332 in Guildford.

In the **9MHz (31m)** band R.New Zealand has been reaching the UK. Their broadcast to Pacific areas on 9.700 (Eng Mon-Fri 0816-1206, Sat/Sun 0758-1206) was rated 44544 at 0840 in Herstmonceux, 35553 at 0906 in Wallsend and 35433 at 0948 in Guildford; 22222 at 1030 in Truro. Also received before noon were KOL Israel 9.435 (Eng 0500-0515) SIO434 at 0500 in Co.Fermanagh; Voice of Greece, Athens 9.425 (Gr, Eng to Eur 0700-0750) 54444 at

0748 in Plymouth; SRI via Fr.Guiana 9.885 (It, Eng, Fr, Ger, Port to Australasia 0830-1100) 34222 at 0904 in Newry; KTWR Guam 9.870 (Eng to Asia 1000-1100) SIO322 at 1100 in Macclesfield.

In the afternoon DW via ? 9.665 (Chin to Far East, Asia 1200-1320) was 44554 at 1230 in Cyprus; Polish R, Warsaw 9.525 (Eng to Eur 1300-1355) 44333 at 1320 in Morden; VOA via Poro, Philippines 9.760 (Eng to Asia, Pacific 1100-1500) 33333 at 1440 in Kilkeel; KOL Israel 9.390 (Eng to Eur 1500-1530) 55555 at 1500 in Appleby; R.Mediterranean Int via Nardor, Morocco 9.575 (Fr, Ar to N.Africa, S.Eur 0500-0100) 32323 at 1523 in Woking; R.Australia via Darwin 9.615 (Eng to Asia 1500?-1755) 44444 at 1628 in Woodhall Spa.

During the evening TWR Manzini, Swaziland 9.500 (Eng to E.Africa 1600-1830) was 34333 at 1800 in Scalloway; AIR via Delhi? 9.950 (Eng to W/N.Africa, M.East 1745-1945) 43333 at 1807 in Norwich; Africa No.1, Gabon 9.580 (Fr to C.Africa 0500-2300) 23343 at 1923 in Storrington; R.Nederlands via Madagascar 9.605 (Eng to S/E/W.Africa 1730-2025) 43432 at 1954 in Oxted; Voice of Indonesia, Jakarta 9.525 (Eng to Eur 2000-2030) 34332 at 2012 in Chester; VOIRI Tehran, Iran 9.022 (Eng to Eur 1930-2027) 44444 at 2024 in E.Worthing; WVHA via Scotts Corner, USA 9.930 (Eng to Eur, Africa 1900?-2200?) 44334 at 2038 in Freshwater Bay.

Later R.Bulgaria, Sofia 9.700 (Eng to Eur? 2200-2230) was 42223 at 2200 in Dudley; RCI via Sackville 9.805 (Eng to Eur, Africa 2100-2230) 34444 at 2125 by Martin Cowen in Kirkby Stephen; WWCN Nashville, USA 9.475 (Eng 1100?-2300) 32223 at 2140 in Stalbridge; R.Cairo via Abis 9.900 (Eng to Eur 2115-2245) 44232 at 2228 in Bridgwater; SRI via Sottens 9.885 (Eng, Ger, It, Fr to S.America 2215-0000) SIO233 at 2318 by **Ted Walden-Vincent** in Gt.Yarmouth; Voice of Turkey, Ankara 9.655 (Eng to Eur, N.America 2300-0000) SIO333 at 2354 in N.Bristol; HCJB Quito, Ecuador 9.745 (Eng to N.America 0030-0700) 33443 at 0035 in Ross-on-Wye; R.Havana, Cuba 9.820 (Eng to N.America 0200-0500) 23333 at 0330 in Rugby.

In the **7MHz (41m)** band WYFR via Okeechobee 7.355 (Eng to Eur, Africa 0600-0800) was 44444 at 0721 in Plymouth; Vatican R, Italy 7.250 (Eng to Eur 0730-0745) 54444 at 0730 in Morden; TWR Monte Carlo, Monaco 7.115 (Eng to Eur 0640-0820) 55455 at 0745 in Newry; R.Denmark via RNI 7.295 (Da to Eur, N.America 1130-1200) 33223 at 1138 in Truro; R.Nederlands via Nauen 7.190 (Eng to Eur 1130-1325) 33333 at 1225 in Rugby; R.Australia via ? 7.330 (Eng to S.Asia 1800?-2100) SIO211 at 1830 in Macclesfield; R.Thailand via

(Eng to Asia, Pacific 1230-1300) was 23333 at 1248 in Rugby; BBC via Masirah Is, Oman 15.310 (Eng to S.Asia 0300-0915, 1000-1500?) 32322 at 1310 in Kilkeel; WEWN Vandiver, USA 15.665 (Eng to Eur 1200-1756?) 55544 at 1330 in Herstmonceux; BBC via Cyprus 15.565 (Eng to ? 0900?-1500) 35553 at 1424 in Wallsend; RCI via Sines, Portugal 15.325 (Eng to Eur, M.East, Africa 1430-1500) 54534 at 1435 in Ross-on-Wye; Channel Africa via Meyerton 15.240 (Eng to C/W Africa 1600-1700) 45433 at 1605 in Bridgwater; China R.Int via Mali 15.130 (Eng to E/S.Africa 1600-1657) 12332 at 1638 in Storrington; WWCN Nashville, USA 15.685 (Eng to Eur 1100-0000) 34443 at 1652 in Oxted; Africa No.1, Gabon 15.475 (Fr to W.Africa 1600-1900) 44434 at 1657 in Woking; WYFR via Okeechobee 15.695 (Eng to Eur, Africa 1600-1900) 44333 at 1730 in Morden; RNB Brazil 15.265 (Port, Eng, Ger to Eur 1630-2020) 45334 at 1801 in Thornton Heath; VOA via Greenville 15.580 (Eng to Africa 1800-2200) 34332 at 1830 in Chester; R.Nederlands via Bonaire 15.315 (Eng to S/E/W.Africa 1830-2025) 44333 at 1907 in Newry; BBC via Ascension Is 15.400 (Eng to Africa 1430-2330?) 32222 at 2015 in E.Worthing.

In the **13MHz (22m)** band SRI via Sottens? 13.685 (It, Eng, Fr, Ger, Port to Australasia 0830-1100) was rated SIO333 at 0900 by **Tom Smyth** in Co.Fermanagh; R.Austria Int via Moosbrunn

13.730 (Ger, Eng, Fr, Sp to Eur 0400-1800) 44444 at 1030 in Morden; R.Australia via Darwin 13.605 (Eng, Chin to Asia 0900-1200) 33333 at 1032 in Truro; Croatian R, Zargreb 13.830 (Cr, Eng) 54544 at 1205 in Oadby; R.Kuwait via Kabd 13.620 (Ar to Eur, N.America 0930-1605) 54444 at 1212 in Plymouth; ISBS Reykjavik 13.860 (Ic [u.s.b.+ p.c.] to Eur 1215-1300) 45444 at 1215 in Woking; R.Tashkent, Uzbekistan 13.785 (Eng to S.Asia 1200-1258) 23433 at 1218 in Rugby; WVHA via Scotts Corner, MA 13.825 (Eng to Eur 1100-1258) 43343 at 1240 in Scalloway; SRI via Sottens? 13.635 (Eng, Fr, It, Ger to S.E.Asia 1300-1445) 44444 at 1300 in Kilkeel; UAER, Dubai 13.675 (Eng to Eur 1330-1355) 44444 at 1331 in Newry; VOA via Selebi-Phikwe, Botswana 13.710 (Eng to Africa 1600-2130?) 24333 at 1718 in Storrington; WHRI South Bend, USA 13.760 (Eng to E.USA, Eur 1500-2200) 35343 at 1830 in Bridgwater; WWCN Nashville, USA 13.845 (Eng to E.USA 1400-0100) 24432 at 1916 in Oxted; WEWN Birmingham, USA 13.695 (Eng to Eur 2000-2157) 34343 at 2030 in Chester; R.Havana, Cuba 13.715 (Eng to Eur 2100-2200) 33233 at 2100 in Appleby.

R.New Zealand has been reaching the UK in the **11MHz (25m)** band. Their transmission from Rangitaki on 11.905 (Eng to Pacific areas Mon-Fri 0459-0715, Sat/Sun 0459-0758) was rated 34343 at 0745 in Ross-on-Wye.

Udon Thani 7.295 (Eng to Eur 1900-2000) 35543 at 1906 in Wallsend; Voice of Nigeria, Ikorodu 7.255 (Eng to W.Africa 1900-2100) 33333 at 1910 in Kilkeel; VOIRI Tehran 7.260 (Eng to Eur, M.East 1930-2027) SIO323 at 2000 in Co.Fermanagh; R.Denmark

via RNI 7.250 (Da to Eur 2030-2055) 44344 at 2030 in Appleby; Voice of Russia 7.400 (Eng [WS] to Eur) 44444 at 2043 in Woodhall Spa; AIR via Aligarh? 7.412 (Hi, Eng to Eur 1745-2230) 43333 at 2050 in Freshwater Bay; R.Tunisia Int via Sfax 7.475 (Ar [R]ly of

Nat.Network] 0400-0600, 1700-0000) 55444 at 2115 in Chester; Monitor R.Int via WSHB 7.510 (Eng to Eur, Africa 2100-0000?) 54444 at 2141 in Kirkby Stephen; R.Romania Int, Bucharest 7.195 (Eng to Eur 2100-2156) 33333 at 2144 in E.Worthing; China R.Int via

Russia 7.170 (Eng to Eur 2200-2257) 54444 at 2210 in Norwich; VOA via Selebi-Phikwe, Botswana 7.415 (Eng to Africa 1900-2230) SIO223 at 2214 in Gt.Yarmouth; R.Prague, Czech Rep 7.345 (Eng to N.America 2200-2257) SIO444 at 2255 in N.Bristol; Monitor R.Int, via WSHB 7.510 (Eng to S.Eur, W.Africa 2300-2355) 45444 at 2325 in Bridgwater; WJCR Upton, USA 7.490 (Eng to E.U.S.A 24hrs) SIO333 at 2357 in Woking.

## Tropical Bands Chart

Freq (MHz)	Station	Country	UTC	DXer	Freq (MHz)	Station	Country	UTC	DXer
2.310	ABC Alice Springs	Australia	1702	F	4.835	R.Tezululutan, Coban	Guatemala	0120	D
2.485	ABC Katherine	Australia	2045	C	4.835	RTM Bamako	Mali	2132	A,C,D,G,I,J,N,PR
3.210	Em.Nacional, Maputo	Mozambique	0554	J	4.840	Heilongjiang, Harbin	China	1235	R
3.220	Channel Africa	S.Africa	0259	I	4.840	AIR Bombay	India	1545	A,D,G,L,N,PR
3.220	R.Kara, Lome	Togo	2148	P	4.845	R.Fides, La Paz	Bolivia	0150	D
3.223	AIR Simla	India	0055	D,J,R	4.845	RTM Kuala Lumpur	Malaysia	1502	R
3.230	SABC Meyerton	S.Africa	0125	D,J	4.845	ORTM Nouakchott	Mauritania	2144	JR
3.245	AIR Lucknow	India	1738	E,N	4.850	R.Yaounde	Cameroon	1957	E
3.255	BBC via Maseru	Lesotho	2054	B,C,E,I,J,U	4.850	AIR Kohima	India	1515	A,B,K,L,PR
3.270	SWABC 1, Namibia	S.W.Africa	2054	D,E,I,J,R	4.850	Ulan Bator 1	Mongolia	1310	K
3.290	Namibian BC,Windhoek	S.W.Africa	2056	D,E,I,J,PR	4.865	PBS Lanzhou	China	1430	B,E,G,K,PR
3.300	R.Cultural	Guatemala	0020	D,J,P	4.870	R.Cotonou	Benin	2148	E,J,R
3.306	ZBC Prog 2	Zimbabwe	2120	B,J	4.875	R.Roraima, Boa Vista	Brazil	2305	D,P
3.315	AIR Bhopal	India	1638	D,N,PR	4.875	VOA via Meyerton	S.Africa	1855	R
3.316	SBS Goderich	Sierra Leone	2121	A,E,F,J,P	4.879	R.Bangladesh	Bangladesh	1434	B,D
3.320	SABC Meyerton	S.Africa	2030	A,U	4.885	R.Clube do Para	Brazil	0135	D,J,P
3.325	FRCN Lagos	Nigeria	2118	D,J,P	4.885	R.Difusora Acreana	Brazil	0125	D
3.330	Christian Voice	Zambia	1927	E,L,P	4.890	RFI Paris	via Gabon	0357	I
3.335	CBS Taipei	Taiwan	1750	J,PR	4.890	R.Port Moresby	New Guinea	2021	J
3.340	R.Uganda, Kampala	Uganda	1958	J	4.890	ORTS Dakar	Senegal	1812	E,R
3.345	AIR Jaipur	India	0036	D,P	4.895	Voz del Rio Arauca	Colombia	0140	D
3.345	Channel Africa	S.Africa	2118	J	4.895	AIR Kurseong	India	1500	D,R
3.356	R.Botswana	Gabaron	1925	A,B,D,E,I,J,PR	4.895	Pakistan BC	Pakistan	2011	JR
3.365	GBC R-2	Ghana	2122	A,D,F,I,J,N,PR	4.895	RTM Kuching	Sarawak	1417	P
3.365	AIR Delhi	India	1742	B,C,E,N,O,PR	4.900	HaiXia 2	China	1441	B,PR
3.380	R.Chortis	Guatemala	0110	D	4.905	R.Nat.N'djamena	Chad	2010	A,D,E,G,I,J,PR,U
3.390	BBC via Meyerton	S.Africa	1745	D	4.910	AIR Jaipur	India	1335	J,K
3.395	RRI Tanjung Karang	Indonesia	2020	P	4.910	RRI Bukititingi	Indonesia	1320	R
3.900	HuJinbei'er, Hailer	China	1305	R	4.910	R.Zambia, Lusaka	Zambia	1859	A,I,PR,T
3.915	BBC via Kranji	Singapore	2058	E,I,J,N,PR	4.915	R.Anhanguera	Brazil	0713	P
3.950	Qinghai PBS, Xining	China	2318	E,F,PR,U	4.915	GBC-1, Accra	Ghana	2130	A,D,E,I,J,PR,U
3.955	BBC via Skelton	England	2030	D,E,G,H,I,N,S,V	4.920	R.Quito, Quito	Ecuador	0633	E,PR
3.955	R.Budapest	Hungary	2107	U	4.920	AIR Madras	India	0120	D,R
3.960	Xinjiang PBS, Urumqi	China	0115	D	4.935	KBC Gen Sce Nairobi	Kenya	1805	D,F,J,PR,T
3.965	RFI Paris	France	0604	D,G,I,U	4.940	HaiXia 1	China	1230	R
3.970	R.Korea via Skelton	England	1930	G,M	4.940	AIR Guwahati	India	1427	PR
3.975	R.Budapest	Hungary	2000	D,G,M,N,Q,S	4.950	R.Nacional, Mulvenos	Angola	2053	A,P
3.985	Nexus, Milan	Italy	0800	G	4.950	AIR Jammu	India	1545	D,G,J,R
3.985	China R via SRI	Switzerland	2200	M	4.950	R.Madre de Dios	Peru	2358	P
3.985	SRI Beromunster	Switzerland	1805	E	4.950	VOA via Sao Tome	Sao Tome	2030	J,N
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4.828	ZBC R-4	Zimbabwe	2028	J,PR	5.090	Taiwan 2 Sce.Beijing	China	1305	R
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Many of the broadcasts in the **6MHz (49m)** band are intended for listeners in Europe. Some of those noted came from HCJB Quito 5.860 (Eng 0700-0900), rated 45444 at 0700 in Derby; Ross-on-Wyke; R.Austria Int, via Moosbrunn 6.155 (Ger, Eng, Fr, Sp 0400-2300) SIO444 at 0849 in N.Bristol; R.Vlaanderen Int, Belgium 6.035 (Eng 1000-1030 Mon-Sat) 54454 at 1000 in Freshwater Bay; R.Netherlands via Julich 6.045 (Eng 1130-1325) 45344 at 1130 in Newry; WVHA via Scotts Corner, USA 5.850 (Eng 1800-1900 Sun) 44433 at 1810 in Kilkeel; R.Prague via Litomysl 5.835 (Eng 1800-1827) SIO444 at 1815 in Macclesfield; Voice of Russia 5.940 (Eng [WS]) 43343 at 1907 in Kirkby Stephen; China R.Int 6.950 (Eng 2000-2157) 44444 at 2006 in Woodhall Spa; R.Austria Int 5.945 (Eng, Ger, Fr, Sp 1800-2300) 54444 at 2030 in Chester; RCI via Skelton, UK 5.995 (Eng 2100-2230, also to Africa) 43333 at 2100 in Appleby; R.Bremen, Germany 6.190 (Ger 24hrs) 44444 at 2100 in Oadby; AWR via Slovakia 6.055 (Eng 2100-2158) 44444 at 2108 in Plymouth; RCI via Sackville 5.925 (Eng 2100-2200, also to Africa) 23322 at 2115 in Rugby; Polish R, Warsaw 6.035 (Eng 2030-2125) 44434 at 2120 in Ross-on-Wyke; Monitor R.Int, via WSHB 5.835 (Eng 2000?-2200, also to USA) 32233 at 2130 in Stalbridge; R.Korea via ? 6.480 (Eng 2100-2200) 34333 at 2150 in E.Worthing; VOFC Taiwan via WYFR? 5.810 (Eng to Europe 2200-2300) 43333 at 2220 in Norwich; Vatican R, Italy 6.065 (Eng 2245-2315) 43333 at 2245 in Morden; Croatian R, via Deanovec 5.895 (Cr [News in Eng hourly 2300-0400]) 22222 at 2300 in Truro; R.Japan via Skelton 6.180 (Eng, Jap 2300?-0000?) 32542 at 2315 in Bridgwater; WHRI South Bend, USA 5.745 (Eng 2200-0400) 44444 at 2325 in Woking.

Also noted in the reports were Voice of Hope, Lebanon 6.280 (Ar, Eng to M.East 24hrs) rated 45554 at 0925 in Cyprus; RCI via Sackville 5.960 (Eng, Fr to USA, Caribbean 2300-0100) SIO222 at 2315 in Gt.Yarmouth; R.Corp of Singapore (RCS) 6.155 (Eng [R.One] 2200-1600) 53533 at 2324 in Guildford; R.Netherlands via Ned.Antilles 6.165 (Eng to N.America 2330-0125) SIO444 at 0000 in Co.Fermanagh.

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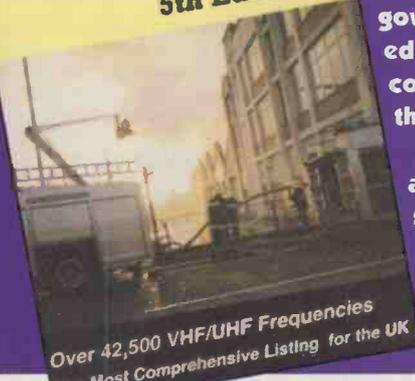
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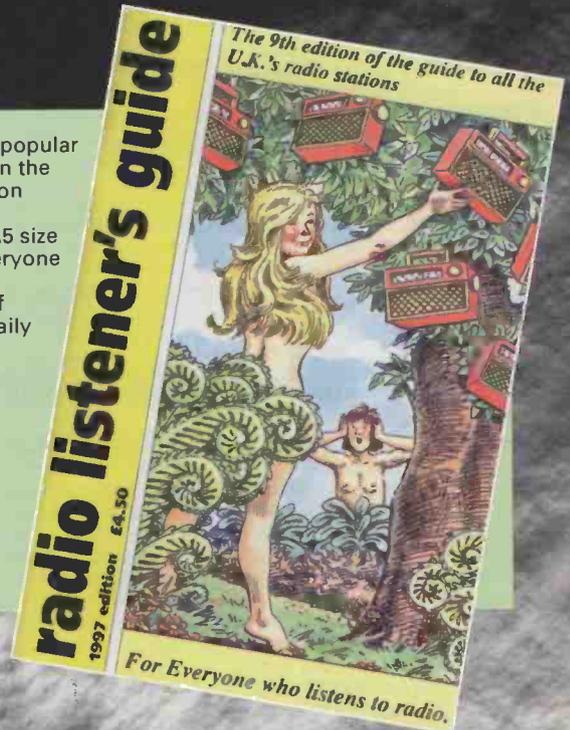


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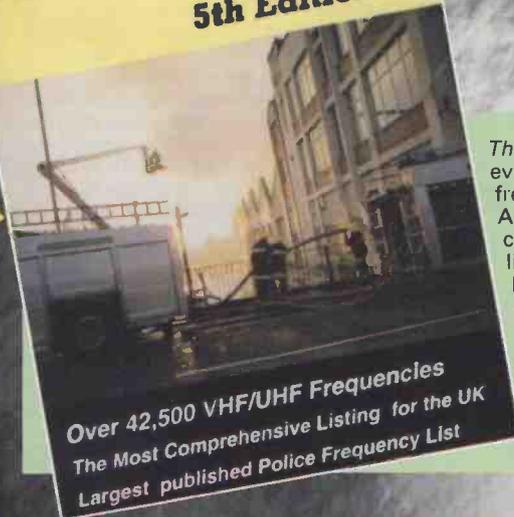
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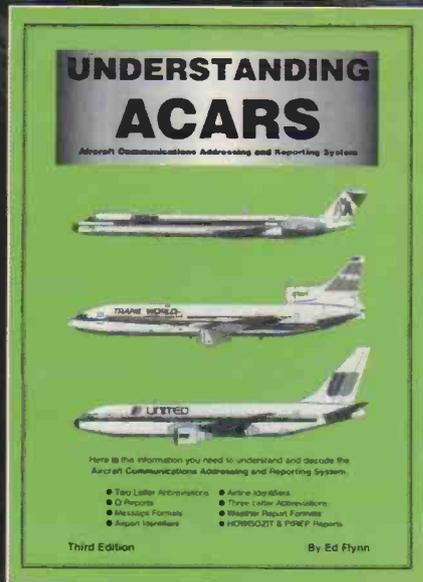
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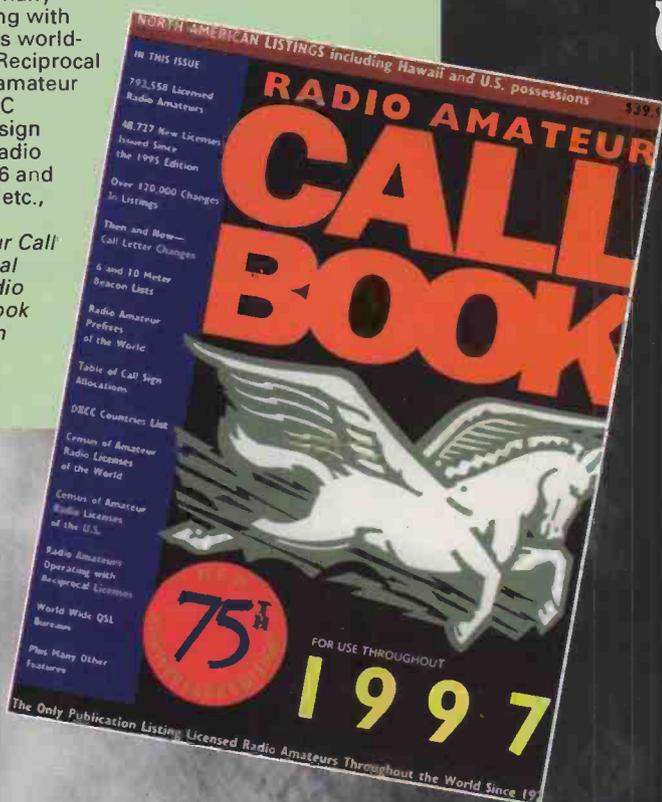
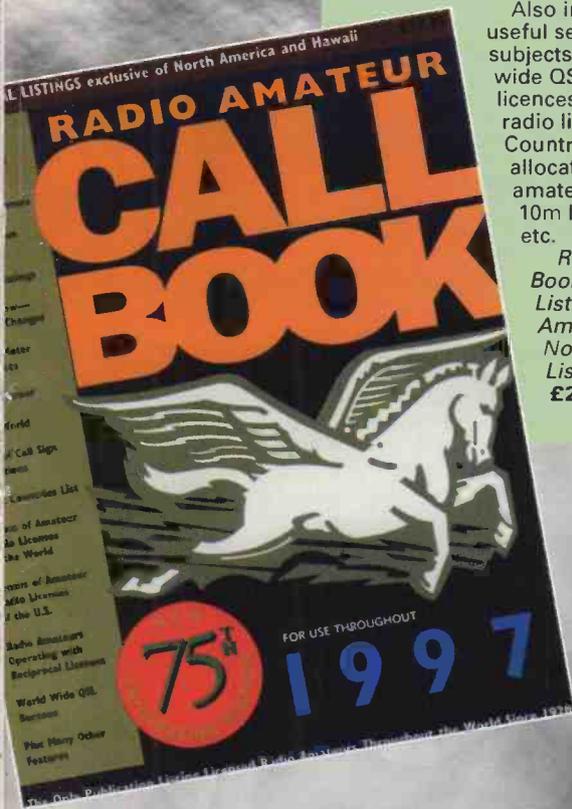
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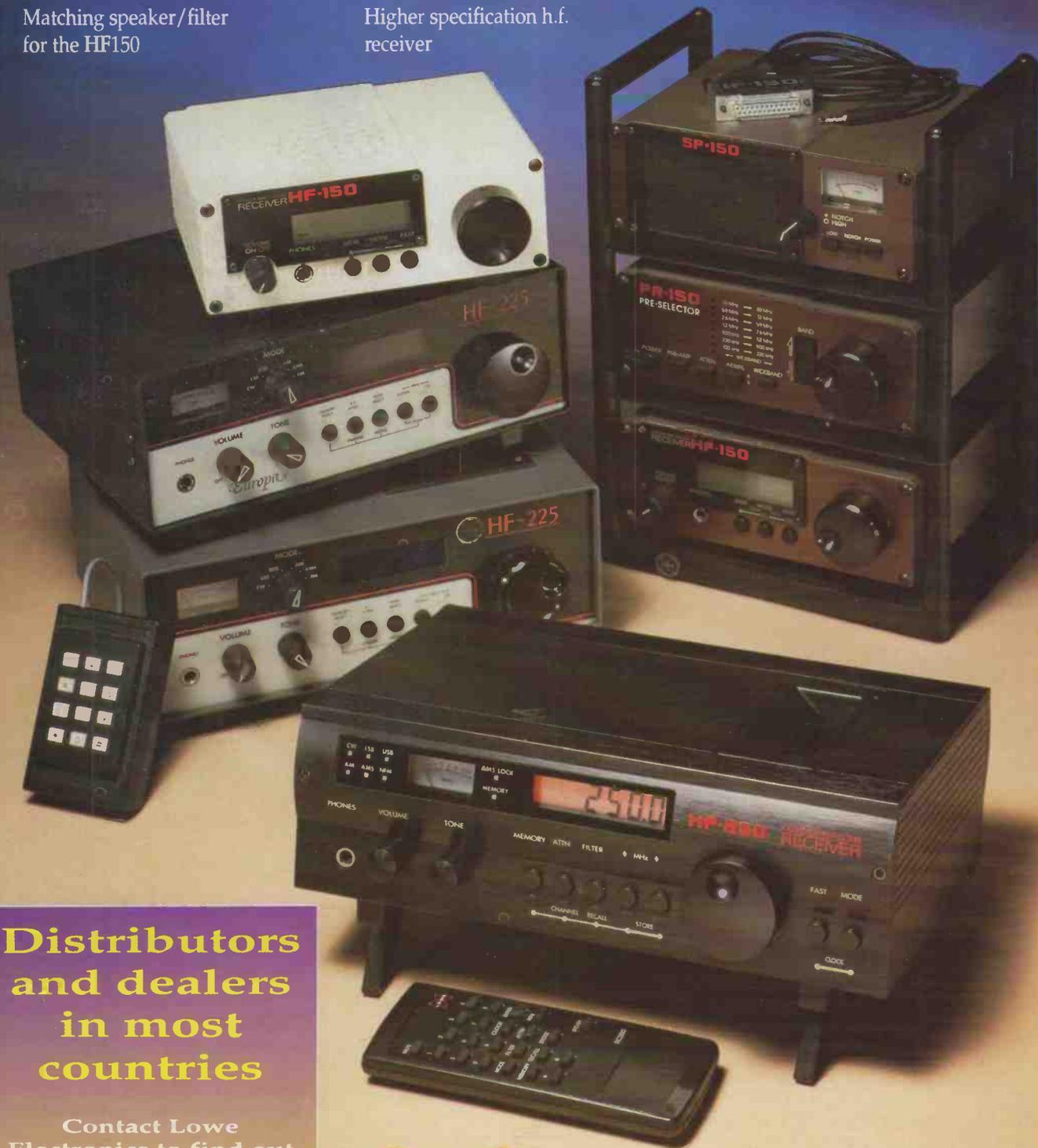


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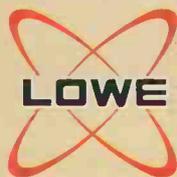
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If you want to hear everything that's going down on the streets, then the R8500 is for you. Covering 100kHz-2GHz in all modes the R8500 gives you the chance to be a REAL nosy-parker! The R8500 includes IF shift, APF, direct RS-232C computer compatibility and will appeal to professionals and serious listeners who demand top performance - but not top prices.

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](mailto:icomsales@icomuk.co.uk)

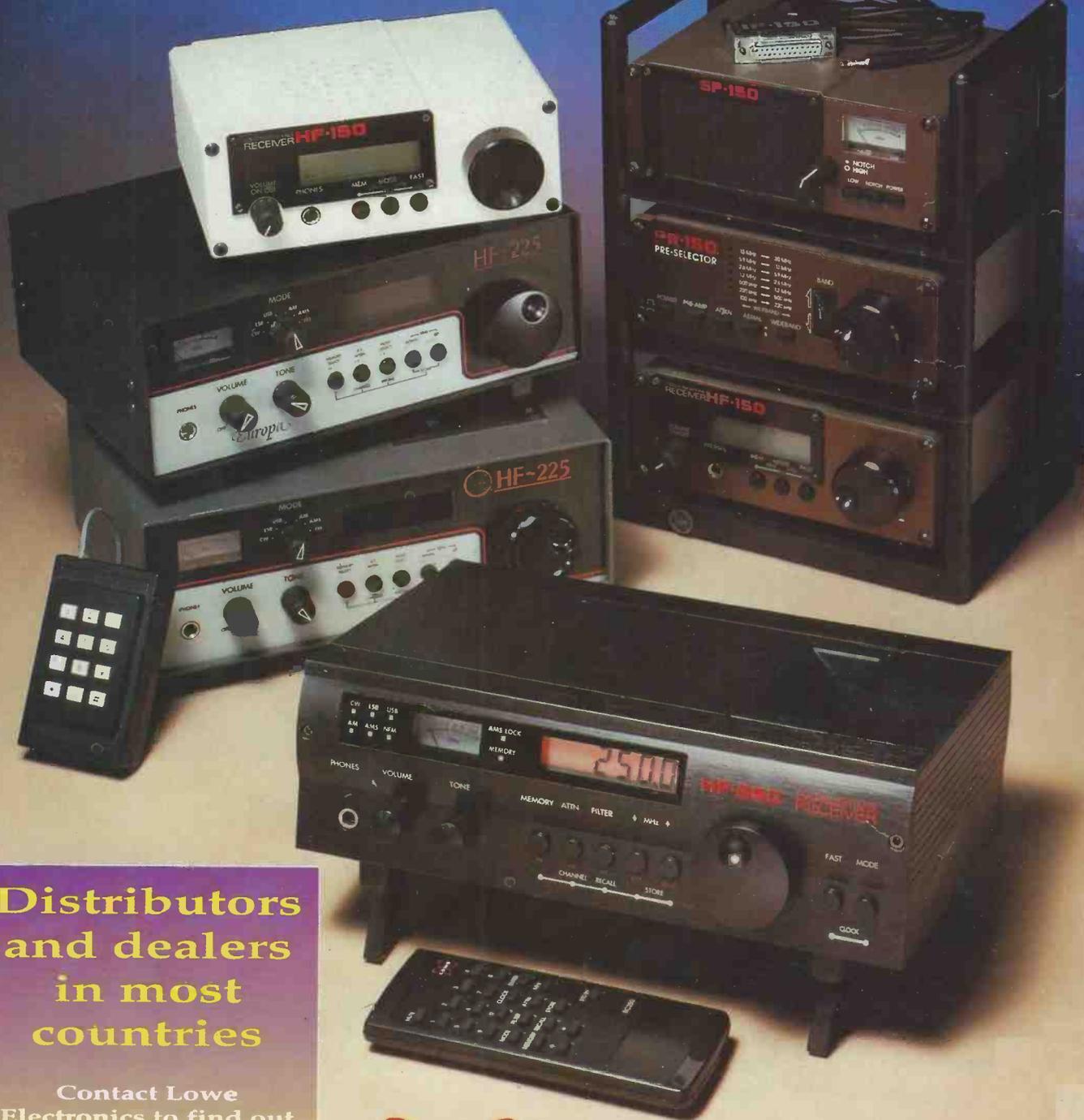
'BIG EARS'  
IS HERE! LISTEN  
TO EVERYTHING  
THAT'S GOING ON

Count on us!

# The Lowe receiver range

Famous  
the world over

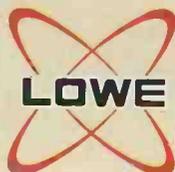
- **HF-150**  
Your first 'real' receiver
- **HF-150M**  
Marine version of the HF150
- **SP-150**  
Matching speaker/filter for the HF150
- **PR-150**  
RF preselector for the HF150
- **RK-150**  
Stack and rack system
- **HF-225**  
Higher specification h.f. receiver
- **HF-225E**  
Super high performance model
- **HF-250E**  
New top line receiver



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and dealers  
in most  
countries**

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Electronics to find out  
your nearest dealer

**Tel: (01629) 580800  
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Manufactured by:  
**Lowe Electronics,  
Chesterfield Road,  
Matlock, Derbyshire, DE4 5LE, UK**

ICOM

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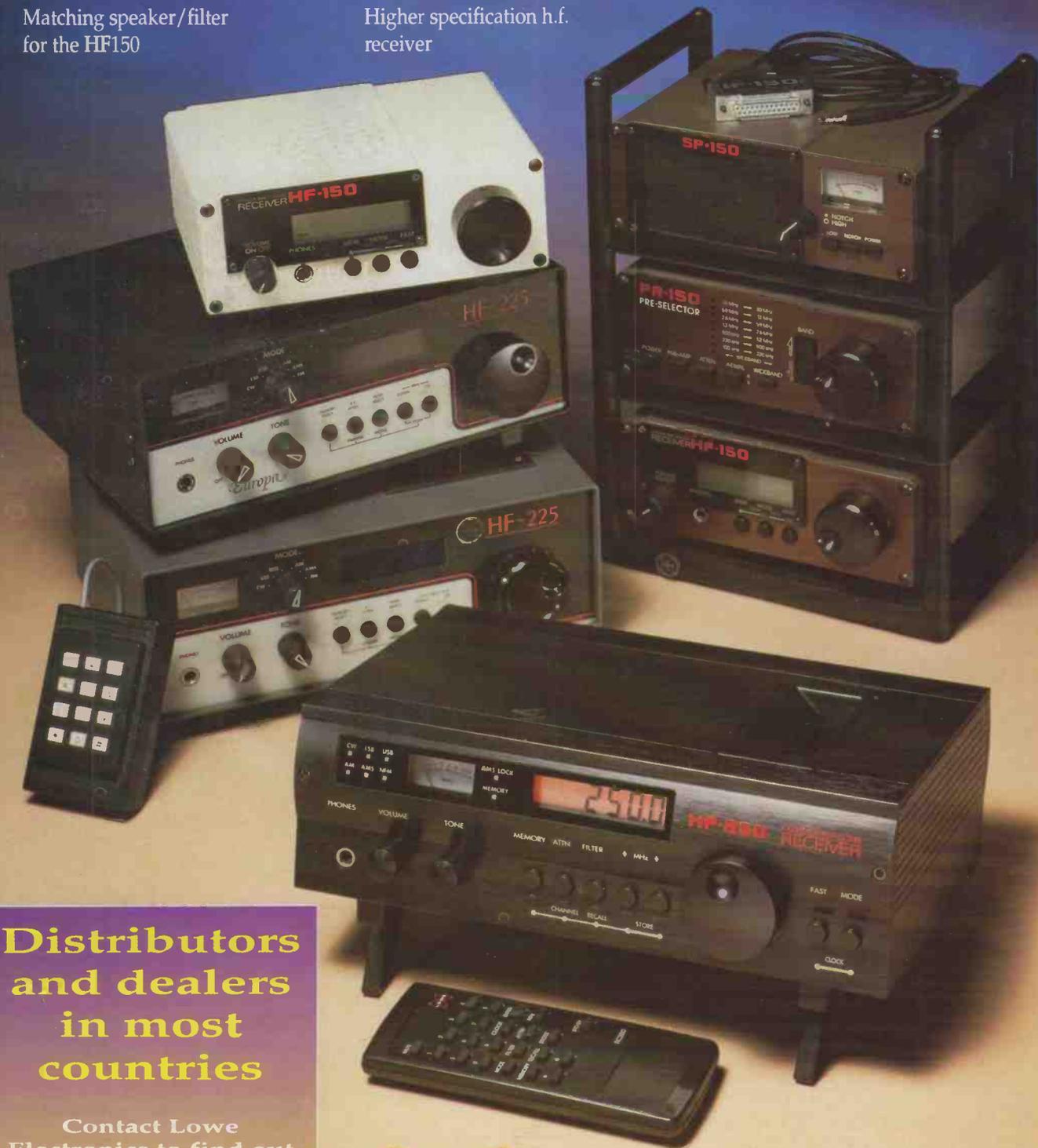


**Count on us!**

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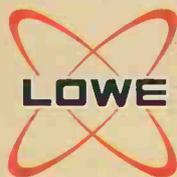
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