Shortwave magazine

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Reviews

Wilson On Transceivers? -

John Scrutinises the Kenwood TS-570DM DSP Receiver?

AKD's HF FAX Receiver

More War Time Radio Secrets

Denco One Valver Update

JUNE 1997 £2.75 ISSN 0037-4261

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Communications Solutions

Nearfield Test Receiver

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

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For radio quick checks the Xplorer is the unit of choice, no special settings required. Just key your radio and automatically measure the frequency, signal strength, numerical deviation, demodulate the audio, or decode CTCSS, DCS, and DTMF. The Xplorer is a high speed, self tuning, nearfield test receiver with coverage from 30MHz-2GHz in less than one second.

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- Frequency Lockout, Manual Skip, and Auto or Manual Hold capability
- Internal speaker, Audio earphone/headphone jack
- Built-in PC interface with download cable and software included
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- All units supplied with NiCad batteries and external power supply

U.S. Patent No. 5,471,402
Antennas shown are optional

For detailed specifications for each unit contact an Optoelectronics sales representative today.

NEW

Tone Decoder

DC442 CTCSS, DCS, DTMF DECODER

The DC442 instantly decodes CTCSS, DCS, and DTMF. The DC442 has the competition beat with its All Mode Decode function, which switches between decoding functions automatically. Now with built-in RS232 and CI-5 receiver compatibility the DC442 becomes the ultimate instrument for PC decoding applications.

- Decodes 52 CTCSS tones, 106 DCS codes, and 16 DTMF characters
- Built-in RS232 / CI-5 compatible interface
- All Mode Decode: Decodes any CTCSS, DCS, or DTMF automatically without switching functions
- Two line LCD display with EL backlight
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- Use with any receiver or service monitor, internal connection to receivers discriminator circuit required

Multifunction Bench Counter

8040 MULTIFUNCTION FREQUENCY COUNTER

The 8040 bench top frequency counter is a full coverage 10Hz - 3GHz with functions that include:

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- Dual 50 Ohm and 1Meg Ohm input amplifiers with AC/DC coupling, +/- polarity, trigger level Adj, low pass filter, and attenuator
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- Internal clock output/external clock input
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- 10 digit LCD display with electroluminescent backlight

U.S. Patent No. 5,471,402
Antenna shown is optional

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CONTENTS

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Cover Subject
John Wilson reviews the Kenwood TS-570DM DSP Receiver - actually it's a transceiver that Martin Lynch has ensured doesn't transmit!

Regular Columns

Good Listening

Communiqué

SEND YOUR NEWS TO KEVIN NICE AT THE EDITORIAL OFFICES

NRD 345

We have been asked to point out to our readers that the sole UK distributor for JRC amateur products, including the new NRD 345 receiver, is **Lowe Electronics Ltd., Chesterfield Road, Matlock, Derbyshire DE4 5LE**.

Open Day - Miss It Miss Out!

The 7th **Waters & Stanton Electronics** Open Day will take place on **Sunday 1 June 1997** from 10am. In addition to the usual special offers, clearance lines and auction, there will also be free raffles throughout the day and free light refreshments.

This year's event promises to be the biggest yet with no less than three marquees, in addition to the shop floor sales area. You will be able to make deals on many of the leading brand names together with a chance to pick up a bargain at the auction, which takes place at 2pm.

So, to make sure you don't miss out on the biggest ever open day, go along early and cash in with some of the best deals you will ever find, have some free food and drink, meet up with old friends and have a good time - remember - if you miss this, you miss the event of the year!

Waters & Stanton Electronics, Spa House, 22 Main Road, Hockley, Essex SS5 4QS, Tel: (01702) 206835, FAX: (01702) 205843.

RAE In Cambridge

Commencing in September 1997 is an RAE course, being held at **Sawston Village College, Community Centre, Cambridge**. The RAE Tutor is **Peter Buchan G3INR.**

Contact Peter for more information on **(01223) 834492**.

Presentation At BT Tower

A presentation on The Radio Amateurs' Emergency Network's (RAYNET) capabilities was made to a packed audience of strategic User Services at the BT Tower in London back on Wednesday 26 March. The attendees included representatives from the Cabinet Office, Home Office, Scottish Office, Radiocommunications Agency, Environment Agency, Emergency Planning College and Railtrack. Also in attendance were RAYNET's more usual User Services together with the Radio and Emergency Press.

Ian Kyle, President of the Radio Society of Great Britain (RSGB), attended on behalf of the Society's Council. During his presentation, the Network's National Chairman Ron Cowan GM4SRL said that it was unusual to see so many people with emergency planning key roles gathered together in a place other than the Emergency Planning College.

Following on from the presentation, British Telecom hosted a reception in the revolving suite at the top of the BT Tower, from where the guests could look out over London while enjoying the excellent hospitality. The Tower, for security reasons, is now closed to the general public and the Network is indebted to British Telecom for allowing it to be used as the venue of RAYNET's public 'Launch'.

Four Network members, winners of a Network draw, also attended to see the new RAYNET presentation, but unfortunately several invitees, including RAYNET and User Service members from Scotland and the North East of England were held up in a security alert in Darlington and did not manage to attend. The security alert at Wimslow did not affect those travelling from the North West of England.

The RAYNET presentation is now available for national use and the Network Zonal Co-ordinators will be pleased to make the presentation themselves, or to arrange for the Chairman or other Committee of Management member to do so at a mutually convenient time and location.

Madeley Smith G8KVU ZC9 (end left) with delegates at the BT Tower RAYNET Association. *Photo by Ron Cowan.*

The 'Finish' Frostbite '96 - Bickerton Scout Hut, Cheshire RAYNET. *Photo by Dave Mullock G7GFC.*

Redruth TV Station

Redruth, and all of its relay stations, are now equipped for broadcasting BBC 1 and BB2 television programmes with stereo sound, using the BBC developed NICAM 728 digital system. This system uses an additional transmitter signal, which is quite separate from the normal (mono) TV sound signal.

The re-engineering of this site to enable NICAM transmission was carried out by Castle Transmissions International Ltd. on behalf of the BBC. BBC Television started its NICAM stereo service with the launch of the autumn programme schedules at the end of August 1991. Thirty main television stations and over 600 of their relays have now been equipped to transmit the NICAM stereo signal.

The Redruth Television transmitter is situated at Four Lanes, 2.5km south west of Redruth and serves about 200,000 viewers in Cranborne, Helston, Isles of Scilly, Newquay, Penzance, Redruth, St Ives, St Just, Truro and the surrounding areas of west Cornwall.

Details of stereo TV Programmes are published in *Radio Times*, and further engineering information about the BBCs services can be found on Ceefax page 698 (BBC1 or 2) and on the Internet at **http://www.bbc.co.uk/enginfo/**

NEWS • NEWS • NEWS • NEWS • NEWS • NEWS

New Drake SW2

The R.L. Drake Company have proudly introduced the newest addition to its short wave receiver product family - the SW2 Short Wave Receiver. This synthesized a.m./s.s.b. receiver is microprocessor controlled and has continuous coverage capability from 100kHz through 30,000kHz, allowing the user to listen to a.m. broadcast, amateur, citizen band and short wave bands.

Advanced features, like full a.m. and single side band operation, give the user complete coverage of all worldband broadcasts. In addition, the SW2 cleans up fading signals by utilising selectable sideband synchronous detection, a feature typically known only to more expensive short wave receivers.

The smartly priced SW2 even has an optional infared remote control to give the user added flexibility. There are 100 programmable channel memories and user friendly tuning make the SW2 a breeze for anyone to operate. The SW2 comes pre-programmed with 32 memory positions, including many popular North American and global broadcast stations.

The operating frequency of the SW2 can be tuned via a tuning knob, tuning buttons or by direct entry. All tuning controls are conveniently located on the front panel of the receiver, enabling the user to rapidly tune desired frequencies.

Also located on the front panel is an adjustable r.f. gain control and an extra large front panel l.e.d. display that shows the receive frequency and metre band designation. Memory mode operation and connection to an a.c. (or d.c.) power source are indicated by additional front panel l.e.d.s

The SW2 offers the same quality that is built into every Drake communictions receiver. Excellent sensitivity, selectivity and dynamic range produce clear, crisp reception. "Advanced sensitivity, selectivity and selectable sideband with synchronous detection are impressive features for a unit in this price range. It easily outperforms otherds in its class," says Rich Renken, National Sales Manager.

The flexible SW2 also offers dual antenna input terminals on the rear panel. This feature provides versatile and practical connection of either a coaxial 50Ω feedline or a wire antenna to the receiver. In addition, the 12V capability of the SW2 combined with an optional mobile mount antenna make the receiver exceptional for vehicle applications.

Retail price for the SW2 is £499 plus £49 for the remote control. A mobile mounting bracket is also available at a price of £15.

More information can be obtained from **Nevada Communications, 189 London Road, North End, Portsmouth, Hants PO2 9AE, Tel: (01705) 662145, FAX: (01705) 690626.**

Air Tattoo Competition Winners

The following readers have won tickets to the International Air Tattoo at Fairford on the 19 and 20th July.

Mr J. Smith, Bristol
Peter J. Kay, N. Wales
Anthony Drinkwater, Cambs
Mr D. W. M. Andrews, N. Devon
Alan Maulsdale, Bristal
Peter Long, W. Sussex
Kenneth Beaman, Shropshire
R. Merritt, Dorset
T. Easten, Shetland
Anthony White, Cheltenham
N. J. Wilcox, Bristol
Peter N. Grimmitt, Worcs
L. A. Bjarck, Oxfordshire
Geoff Spain, East Riding of Yorkshire
Martin Carr, Cornwall

Roberts Winner

We are pleased to announced that **Mr J. T. M. Baker** of Mid Glamorgan is the lucky winner of the competition to win a Roberts Radio R861, which ran in the January and February 1997 issues of *SWM*. Well done!

'International Marconi Day' at Martin Lynch a success!

19th of April saw Northfield Avenue in Ealing descended upon by visitors from all over the country. This relatively busy street in West London is used to being mobbed at least one day of every year, usually in November when Martin Lynch & his team open the doors to their yearly extravaganza.

The 'Marconi Day' at Lynch's was a great success with representatives from all three leading manufacturers, Yaesu (Barry Cooper), Icom (Dennis Goodwin) and Kenwood UK (David Wilkins) in attendance.

In particular two new models never seen before in the UK were also on show at the store, the new Yaesu FT-920 HF+6m transceiver, shipped over from Japan especially for the event and the new Icom IC-706mkII, replacing the original version.

Food and drink was (as usual!) free flowing and contributed to the days success.

Cirkit Catalogue Comp!

Together with the launch of their new Summer '97 catalogue, Cirkit announce that again there is a chance to win three of the catalogue contents. Namely a 15in CTX SVGA colour monitor, a professional capacitance meter and a mini strobe light. We understand that the competition is open to all purchasers of the new catalogue.

Aside from any prices that can be won, the Cirkit catalogue contains 232 pages of computers, components and kits. It is a valuable source of parts for r.f. projects such as those featured in *SWM*. Cirkit are the importers of Toko wirewound components.

Cirkit can be contacted at **Park Lane, Broxbourne, Hertfordshire EN10 7NQ. Tel: (01992) 444111, FAX: (01992) 441306 or E-mail: enquiries@cirkit.co.uk**

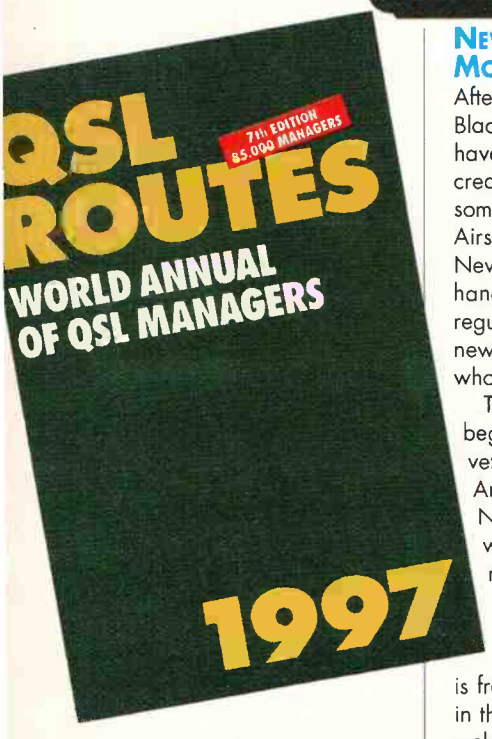
'MicroHenry' taking telephone orders sitting at Dad's desk!

Brian G3THQ providing a free 'health check' for a customer.

QSL Routes 1997

Just landed on the newsdesk is a book that could be just for you. If you are an amateur band listener who is seriously interested in QSLing. This latest edition - the 7th - of *QSL Routes World Annual Of QSL Managers* has over 85000 entries. Contained is a wealth of detailed information gathered by active DXers from all around our planet.

The Annual is published by the Theuberger Verlag GmbH - the publishers of *Funk Amateur* - the German Radio Amateur magazine. To obtain your copy send payment of 20$ or 30DM which includes surface mail P&P or 30$ or 50DM for Airmail, to: **QSL-Routes, Theuberger Verlag GmbH, PO Box 73, 10122 Berlin, Germany**. Acceptable methods of payment are Visa, Mastercard, AMEX or cheque payable to Theuberger Verlag Berlin.



Alinco Export Boss Visits UK

During a recent visit to the UK, Mr Tsunemi, Alinco's Export Manager, completed the signing of an exclusive distribution agreement with Partsmouth based Nevada.

The UK visit was also an opportunity to reveal a sample of the new Alinco DJX10 scanning receiver covering 100kHz to 2GHz.

Although just released for the Japanese market this model is not suitable for the UK. A European version, the DJX10E with full CE approval and several enhancements for the European market is due to be released in August this year. The set is expected to cost around £349.

Mike Devereux (left) of Nevada, with Mr Tsunemi of Alinco after signing their exclusive UK distribution agreement.

The new Alinco DJX10 scanner.

New Aviation Monitoring Group

After the recent demise of the Black Cat Aviation Group, we have been advised of the creation of a new group by some of its former members. Airscan Aviation Monitoring News Group has a more hands on approach with regular meetings and a regular newsletter for those members who cannot attend meetings.

The group is open to both beginners and seasoned veteran enthusiasts alike. The Arisen Aviation Monitoring News Group caters for those with an interest in airband radio - h.f., v.h.f., u.h.f. and beyond - covering both Civil and Military aviation.

Membership to the group is free of charge. Those living in the East Anglia area are welcome to attend the group meetings, held at Bircham, Norfolk. There will be at least one meeting per month. It is intended that the Newsletter will be produced at the end of each month. The cost per issue of the newsletter will be 50 pence. The will be no subscription facility, members may either collect the current issue while attending the monthly meeting or it may be obtained by sending an s.s.a.e. with 50 pence to the group headquarters.

If you are interested in becoming a member of **Airscan**, then contact them at **70 Monks Close, Bircham Newton, Kings Lynn, Norfolk PE31 6RD** or **Tel: (01485) 578183**.

Radio and TVDX News

A new Danish local TV network 'TV Danmark' has just opened, administered by Scandinavian Broadcasting Systems (SBS). Main production centre is Kanal 2 in Copenhagen which links with seven other smaller TV stations to form the TV Danmark network with over 70% national coverage. The system was set up in opposition to established TV2, this a partnership between Disney, ABC and Viacom.

Several bids have been received for two licences to run Hungary's first national commercial terrestrial TV system. The new licences will run for 10 years at $50 million annually and names such as SBS, CLT, MTM and various Hungarian interests have applied, the new channel will be on-air September '97.

'NRK Activum', part of Norway's NRK has been formed to sell locally made programmes and to promote the growth of extra channels. Activum is talking with the TV2 network about forming a commercial sports channel, similar to Denmark's TVS service.

The spread of the new UK 'Channel 5' has been less than spectacular with recent press statements that only 45% of the UK is covered adequately. One main problem has been the generally lower radiated powers and lack of transmitter co-siting. Southampton for example has a 1kW Channel 5 transmitter atop the Fawley power station, the other four local channels radiate ex Rowridge, IoW at 500kW each! Many South London boroughs suffer ghosting from the Croydon transmissions, caused by reflections from the main London transmitting mast at Crystal Palace! With many ch.35ish transmissions out of the traditional Group A antenna coverage (they cut-off at ch.34) so several manufacturers have produced narrow band ch.35 Yagis to be used in conjunction with special dual input diplex filters. These feature a narrow bandpass ch.35 for the Channel 5 antenna and a channel 35 notch in the otherwise wideband input at the other input. Narrowband ch.35 head amplifiers are also available to improve signal noise figures and to lift up signal voltage levels to other local main station channels. Unfortunately for TVDXers it means that more u.h.f. channels have been lost!

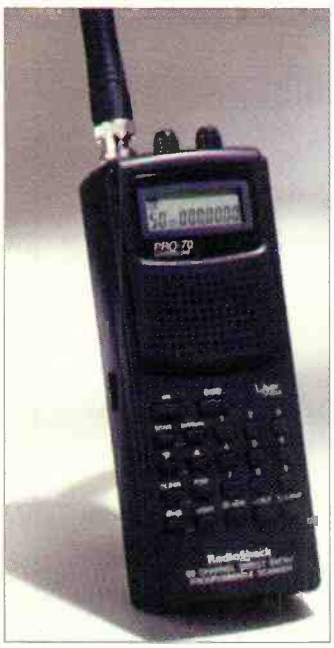
The new identification logo for TV Danmarks.

Link Two New Scanners!

Link Electronics announce the **PRO-70** which is the latest budget price scanner to be released by Realistic. This 50 channel hand-held boasts a very useful coverage of 66-88, 137-174, 380-512MHz and can scan at 25 channels per second in memory mode, or 50 steps per second in search mode. Frequency steps are 5kHz on v.h.f. and 12.5kHz on u.h.f. The scanner has "all the normal whistles and bells that an enthusiasts would expect to find", say Link. The PRO-70 can be powered by six AA size dry cells, NiCads or a 9V p.s.u. It comes complete with antenna, belt clip, plus manual and retails at **£109.99**.

Also from Link the **PRO-2045** is the very latest base scanner to come from the Realistic stable. The 210 channel base scanner has a discontinuous coverage as follows 68-88, 108-174, 216-512 and 806-1GHz. Scan speed is 50 memory channels per second, 100 steps per second in Hypersearch or a 'staggering' 300 steps per second when using 5kHz steps! This ensures that no stations are missed, and being a.m./w.f.m./n.f.m. switchable all the common modes can be monitored.

The 'Auto Store' feature quickly logs all active frequencies only once so that memories are available for all the new stations monitored, whilst the 'Data Skip' mode enables blocks of frequencies to be jumped over. The triple conversion architecture is claimed to virtually eliminate any interference from i.f. images. The PRO-2045 can be powered by 240V a.c., or from a 12V d.c. supply. This attractive base scanner with both rotary and keypad entry comes complete with whip antenna (with BNC antenna socket), manual and retails at **£299.99**. The PRO-2045 is CE approved. All the Realistic scanner range are available from: **Link Electronics, 216 Lincoln Rd., Peterborough PE1 2NE, Tel: (01733) 345731, FAX: (01733) 346770** or take a peek at: **http://ourworld.compuserve.com/homepages/realistic_scanners**



One-Valver Power Supply Caution

We received the following notes from reader N.L. Smith of Stoke-on-Trent and fully endorse what he says.

The power supply unit for the single valve RX (March issue) may be an introduction to mains supplies for some SWM constructors who may not be fully aware that such supplies can be lethal or present a fire hazard if precautions are not observed.

It is good policy to use either a reliable mains plug/socket such as IEC or a properly secured mains cable with a good quality connecting block and shrouds on any exposed live connections such as the mains socket, switch and a fuse holder, fitted with a fuse of the correct value and type. A double pole on/off switch incorporating a neon indicator gives warning of live mains and an earthed metal case or internal metal chassis if a plastics case is used gives better protection. The continuity of the earth connection from the mains plug to the case/chassis should be checked at intervals as the plug screws tend to loosen after much use.

Experience has taught me that when you get a high voltage shock you notice a strong salty/acidic taste in the mouth, that's if it's a non-lethal shock! A Residual Circuit Breaker (RCB), as used for power tools, is probably the best investment that can be made by the experimenter in the radio and electronics field.

SEND YOUR NEWS TO KEVIN NICE AT THE EDITORIAL OFFICES

National Transmitter News

Devon: A new BBC transmitting station at Salcombe, South Hams now brings good f.m. radio reception, including stereo, to an extra 6000 people in Salcombe, Chillington, East Portlemouth, Kingsbridge, South Pool and West Alvington.

Located about 2km north east of Salcombe, it entered service following a period of test transmissions which began back in December.

The transmission frequencies are:

Station Details

Channels:	Radio 1	99.1MHz
	Radio 2	89.5MHz
	Radio 3	91.7MHz
	Radio 4	93.9MHZ

On some radios the f.m. band may be marked as v.h.f. Please note that as this transmitter broadcasts only with vertical polarisation, any external or loft mounted aerials must be mounted so that their rods are vertical.

Devon: Another new BBC transmitting station at Holcombe Down now brings good f.m. radio reception, including stereo, to an extra 12000 people in Dawlish, Teignmouth and surrounding areas, including Holcombe.

Located at Holcombe Down Resevoir - Teignmouth, it entered in service following a period of test transmissions, which began back in January.

The transmission frequencies are:

Station Details

Channels:	Radio 1	99.0MHz
	Radio 2	89.4MHz
	Radio 3	91.6MHz
	Radio 4	92.8MHz

Communiqué

Bandscan AUSTRALIA

Rallies

May 25: The Plymouth Radio Club is holding its rally at the College of Further Education, Kings Road, Devanport, 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**.

May 25: The 21st East Suffolk Wireless Revival, Ipswich, is to be held at Stoke High School, SSE main rail station, map ref. TM164435. Radio & Computer Rally open from 10am (9.30am for disabled visitors) until 4pm. Talk-in on S22. **Dave Johnson G7SMX** on **(01394) 285600**, **johnsod6@boat.bt.com**

May 25: The Maidstone Mobile Rally is to be held at the YMCA Sportscentre, Just off Cripple St., Loose, A229 South of Maidstone. There will be amateur radio, CB & computing. Doors open at 10.30am (free entry for severely disabled visitors at 10am). Entry is £1.50 per adult. There will be a snack bar, all day video and free sweets and drinks for juniors, do your own Bring & Buy - outdoor tables for hire, free camping and caravan facilities - YMCA desk on (01622) 743317. Amateur Radio exhibition station GX3TRF. **Bob Wolk** (Trade) (01634) **717426**.

June 8: The Elvaston Castle National Radio Rally is being held at the usual venue, which is the Showground of the Elvaston Castle Country Park. **Keith Ellis G1ZLQ** on **(01332) 662896**.

June 8: The Aldershot Amateur Radio Rally will be held at the Mytchett Community Centre, Mytchett Road, Nr. Camberley, Surrey, easy access from J4/M3. Talk-in on S22. Doors open to the public at 10.30am. Entrance fee is only £1, this includes a free raffle entry ticket, there is also easy access for any disabled visitors. All enquiries to **Roland Brade G3VIR**, Tel/FAX: **(01252) 837860**, E-mail: **rally@venuswww.demon.co.uk**

June 21: The Royal Navy Amateur Radio Society are holding their Annual Mobile Rally at HMS *Collingwood*, Fareham, in conjunction with The Royal Navy Brickwoods Field Gun Competition and HMS *Collingwood* Open Day. This year's rally will have a similar format to last year, plenty of action for all the family including the Free Fall Parachute team and the Hampshire Police Motor Cycle Team, plus all the usual Amateur Radio content for the remainder. **(01705) 365503**.

June 22: BDARS Amateur Radio Rally will take place at Clandeboye Lodge Hotel, Bangor, Co. Down, N. Ireland. There are many attractions - Official Morse Test for aspiring A licensees, demonstrations, pocket radio, amateur television, Bring & Buy, local and mainland traders, something for all the family, so don't miss it! Further details from **Stewart GI4OCK** on **(01247) 454049** or **Norman GI3YMY** on **(01247) 466557**.

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

* Short Wave Magazine & Practical Wireless in attendance

The Australian Broadcasting Corporation (ABC) and Radio Australia (RA) are the big news again this time. I also have some police frequencies and some news on the sale of radio frequency spectrum.

Radio Australia

In the last few of these columns I have discussed the squeeze on ABC funds dictated by last year's federal budget and the Mansfield Review into the future of the ABC. The story continues this time with the fate of RA largely decided but with some issues still in the balance.

Readers will recall that the Mansfield Review recommended that the ABC be no longer required to broadcast to audiences outside Australia. Commentators interpreted this recommendation to mean that RA would be shut down altogether despite some Department of Foreign Affairs and Trade (DFAT) objections.

The DFAT Minister Alexander Downer has been reported as supporting in cabinet the retention of RA but has been receiving little support from high level colleagues. Downer is reported to be arguing that the closure of RA would be a signal to the region that Australia was inward looking and that the closure would severely hamper Australia's efforts to counter negative images of Australia in the region.

He is reported as supportive of the past role of RA in showing Australia's willingness to take its place in the region. He says that the recommendation to close RA fail to take proper account of the genuine trade and foreign policy implications of such a move.

The Department of Foreign Affairs and Trade has however been reported as declining to contribute to the RA budget claiming that to do so would damage RA's authority and independence. Intense discussion in Parliament and the media eventually led to the setting up of a Senate Inquiry into the Role and Future of Radio Australia and Australia Television.

At the inquiry, DFAT officials were tight lipped about their Department's position stating that their views were before cabinet and could not be discussed. This report was due by 14 May but it was generally thought that all the decisions would be made by the time of the annual budget delivered the day before on 13 May 1997.

The difficulty here is that ABC Managing Director Brian Johns has stated that in the face of massive budget cuts there was little other option but to close RA. Still with an eye on the bottom line, Minister for Communications and the Arts Senator Alston has stated that world wide short wave services were declining. He is reported as saying on a television current affairs programme that short wave was 'dramatically less significant in this day and age'.

Many commentators have remarked that the great interest in and the growth of the short wave services of other international broadcasters in this region appears to contradict this statement by the minister. As examples they quote the BBC's expenditure of $60 million (about £28 million) on short wave facilities in Thailand, the establishment of Radio Free Asia and the establishment of Radio Japan in Sri Lanka.

In addition VOA, the BBC World Service and Deutsche Welle are all expressing strong interest in RA's transmission facilities at Shepparton and Darwin. One suggested solution put forward to the RA problem was to cease all foreign language broadcasts and leave an English language only service transmitting via the Indonesian Palapa satellite.

Part of this option was to have these broadcasts re-transmitted by local a.m. radio stations. Although this rump service would only cost a few million dollars critics point out that reception of a satellite service needed a satellite dish and television set. This equipment is beyond the means of many of RA's existing 20 million audience.

In addition some commentators have pointed out that re-broadcast of these signals on local a.m. stations would leave the way open for political censorship in the countries of transmission. As the deadline for this column arrived the federal cabinet has met and decided that RA will continue but with a 70% cut to its budget leaving an annual budget of a mere $7 million (£3.3 million) from an original $23 million (£10.8 million).

Papua New Guinea and South Pacific services will be retained but only in English and Pidgin. China, Indochina and Thailand transmissions will cease and the fate of the Indonesian service has yet to be determined. This means the loss of Mandarin, Cantonese, Khmer, Vietnamese, Thai and French language services and at least half of RA's 144 staff will go.

The Cox Peninsula site near Darwin in the Northern Territory will become redundant despite a recent $6 million (£2.8 million) upgrade and remaining transmissions will be concentrated on Shepparton in Victoria. As these changes work their way through to frequency schedules I will bring them to readers via this column.

And as far as Australia Television is concerned a short list of buyers has been prepared and the sale is expected to go through later this year.

Sydney ATC

Sydney Air Traffic Control (ATC) comes in well on 8.867MHz in the early morning according to **Paul Waddington** from Cumbia. He currently uses a Yaesu FRG-100 and a Dressler ARA300 active antenna and likes listening to the amateur bands as well as h.f. aircraft communications.

Paul says that Sydney ATC sent a very nice QSL letter. He sends the QSL address for use by other interested readers: **Sydney Flight Service, Civil Aviation Authority, Sydney (Kingsford-**

Greg Baker
PO Box 208
Braidwood
NSW 2622. Australia
E-Mail:greg@pcug.org.au

Smith) Airport, PO Box 211, Mascot, New South Wales 2020, Australia.

Other Listeners

H. J. Scott-Douglas has monitored RA at SINPO 44435 on 11.660MHz on 27 February in the period 1430-1600. Programme content was Bookstall, News, Asia Focus and Australia Today. He uses a Lowe HF-225 fed by an 11m long wire antenna through a Howes CTU8 a.t.u.

Police HF Frequencies

T. Trenfield has asked for h.f. frequencies used by Australian police services. Australia's *Radio and Communications* (*R&C*) magazine gives a complete list of Queensland police force h.f. frequencies as: 2.2854, 2.5254, 2.632, 2.7815, 3.1975, 3.7535, 3.8495, 4.5585, 4.5615, 4.7815, 5.1815, 5.9195, 6.9065, 6.985, 7.6585, 10.2965, 10.5065, 14.5735 and 18.5435MHz.

The Queensland water police use 27.86, 27.88 and 27.98MHz. Transmissions on h.f. are used in Queensland because of the vast size of the state. v.h.f. and u.h.f. transmissions do not have the range needed to operate effectively over this area.

Also from *R&C* are Victorian police frequencies of: 2.2854, 2.4895, 2.5705, 2.5765, 2.6320, 2.7295, 3.7305, 3.7335, 3.7365, 3.7445, 3.7535, 3.8215, 4.5265, 4.5585, 4.5600, 4.5685, 4.5745, 4.7815, 4.8465, 4.8815, 5.1285, 5.6815, 5.9075, 5.9165, 5.9325, 7.6585, 7.6600, 8.0515, 10.5050, 11.0465, 14.5735, 14.7535 and 18.5435MHz.

The Victorian police do not seem to use these frequencies a lot except for checking that they still work. Victoria is of course a very small state in comparison with Queensland and is more densely populated. This makes it more practical to operate on the v.h.f. and u.h.f. bands.

Sale Of Frequency Spectrum

The Spectrum Management Agency has begun a series of auctions of frequency space in

Grassroots

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

AVON

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

RSGB City of Bristol Group: last Tuesdays, 7pm. New Friends Hall, Purdown, Bell Hill, Stapleton, Bristol BS16 1BG. June 24 - Half yearly meeting. Robin Thompson G3TKF on (01225) 420442.

South Bristol ARC: Wednesdays, 7.30pm. Whitchurch Folkhouse Assoc., Bridge Farm House, East Dundry Rd, Whitchurch. May 28 - VHF workshop for newcomers, June 4 - 80m activity evening, 11th - BBQ, 25th - Preparation for Longleat Rally. For more information ring (01275) 834282 on a Wednesday evening.

BUCKINGHAMSHIRE

Aylesbury Vale RS: Wednesday evenings, 8pm. Hardwick Village Hall, (Hardwick is situated off the A413 between Aylesbury and Buckingham). June 4 - Discussion evening. Gerry Somers G7VFV on (01296) 432234.

CHESHIRE

Mid-Cheshire ARS: Meetings held every Wednesday, 8pm, at Cotebrook Village Hall, North of Tarporley, Cheshire. May 28 - VHF on air/construction night. Ted Bannister G0RBA on (01606) 592207.

DERBYSHIRE

Derby & DARS. Wednesdays, 7.30pm. 119 Green Lane, Derby. May 26 - Direction finding evening in Markeaton Park, Derby, June 4 - Junk sale, 11th - Quiz night, 18th - BBQ in the club room garden, 25th - Direction finding in Allestree Park, Derby. Martin Shardlow G3SZJ on (01332) 556875.

DEVON

Appledore & DARC: 3rd Mondays, 7.30pm. Appledore Football Clubroom. June 16 - Talk by Dave G3YGJ on kit construction. Den Williams G0UMT on (01237) 471802 for more information.

Exmouth ARC: Alternate Wednesdays at the Scout Hut, Marlpool Hill, Exmouth. June 4 - ATV evening, 9th - Talk by Radiocommunications Agency at Exeter RC, 18th - Junk sale, 7.30pm, Scout Hut, Marlpool Hill. D. Fox G0NRR on (01395) 271880.

Torbay ARS: Fridays, 7.30pm. ECC Social Club, Highweek, Newton Abbot. June 20 - Scotland - The Pictures with Peter G4VFG. Peter G4UTO. (01803) 864528.

EAST SUSSEX

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

GREATER LONDON

Wimbledon & DARS: 2nd & last Fridays, 7.30pm. St Andrews Church Hall, Herbert Road SW19. June 13 - Desert Island Radio by G4ZXO. J. Gale G4WYJ on (01737) 356745.

HAMPSHIRE

Horndean & DARC: 1st & 4th Tuesdays, 7.30pm. Lovedean Village Hall, Lovedean Lane, Lovedean, Hants. May 27 - The radio interface in GSM and how it works by Nigel G7CAW, June 3 - Natter night, 24th - Slow scan TV, how to get started by Tom G4CMG and Bill G7PVZ. 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) 7377 5.

HEREFORD & WORCESTER

Malvern Hills RAC: 2nd Tuesdays. Red Lion, St. Annes Rd. June 10 - Evening on the air - Malvern Common. Dave Hobro G4IDF on (01905) 351568 evenings and weekends.

HERTFORDSHIRE

Hoddesdon RC: Alternate Thursdays, 8pm. Conservative Club, Rye Road, Hoddesdon. June 5 - Natter night, 19th - BBQ at Tolmers Scout Camp, Cuffley. Don G3JNJ on 0181-292 3678.

Verulam ARC: 2nd & 4th Tuesdays, 8pm, RAFA Club, New Kent Road, St Albans. New members and visitors welcome. June 10 - Informal meeting, 24th - Update on fire safety by Stan Adams G4OAV. Ian Forsyth G0PAU on (01923) 222284.

KENT

Bromley & DARS: 3rd Tuesdays, 7.30pm. The Victory Social Club, Kechill Gardens, Hayes. June 17 - Direction finding hunt. A. Messenger G0TLK. 0181-777 0420

Dover RC: Wednesdays, 8pm to 10pm during term time. Duke of York's Royal Military School, Dover. Morse classes and Novice Training Courses are also conducted between 7pm and 8pm on the same evenings. June 4 - Club operating and natter night, 11th - A talk by Ian Keyser G3ROO on aerials in small gardens, 18th - Club operating and natter night, 25th - Morse tests, club operating and natter night. Brian Hancock G4NPN on (01304) 821007.

Maidstone YMCA ARS: Fridays, 8pm. YMCA Sports Centre, Melrose Close, Maidstone, Kent, ME15 6BD. May 23 - Rally preparation, 25th - Mobile rally, June 6 - Construction competition, 13th - AGM. Mike Grainger on (01634) 856765.

NORFOLK

Norfolk ARC: Wednesdays, 7.30pm. Formal and informal meetings at The Norman Centre, Bignold Road, Off Drayton Road between 'Asda' and Three Mile Cross Roundabout, Norwich. May 28 - Night on the air, construction QRP and Morse practice, June 4 - Foxhunt briefing by David G0PFN/CW NFD final briefing, 7/8 - CW National Field Day, 11th - Night on the air/construction QRP and Morse practice, 18th - Foxhunt, 25th - Night on the air/construction QRP and Morse practice. Mike G4EOL. (01603) 789792.

West Norfolk Airband Monitoring Group: Regular informal meetings on Thursdays, 7.30pm. Dave on (01485) 578183 for details.

NORTH YORKSHIRE

Hambleton ARS: All meetings held at Allertonshire School, Northallerton, 7.30 to 9.30pm. May 22 - Operating night, June 5 - DF aerial construction, 19th - Fox hunt. More details from John G0VXH on (01845) 537547.

NOTTINGHAMSHIRE

Mansfield ARS: 2nd Mondays, 7.30pm. Novices particularly welcome. David Peat G0RDP on (01623) 631931.

South Notts ARC: Wednesdays, 7pm. Meetings held (in term time) at Fairham Community College, Farnborough Road, Clifton Estate, Nottingham. Julie Brown G0SOU. (01509) 672734.

SHROPSHIRE

Salop ARS: Thursdays, 8pm. The Telesports Club, Abbery Foregate, Shrewsbury. May 29 - Night on the air and natter night, June 5 - Open evening, all welcome, 12th - Night on the air and natter night, 19th - Second 2m Fox Hunt, 26th - Telford Rally discussion. Ian Davies G7SBD, QTHR or @ GB7PMB.

SOMERSET

Yeovil ARC: Thursdays, 7.30pm. The Red Cross Centre, 72 Grove Avenue, Yeovil. May 22 - Packet radio, a demonstration by G8WKK, 29th - Club station on the air, plus committee meeting. Malcolm Sadler on (01460) 54657

TAYSIDE

Dundee ARC: Tuesdays, 7pm. Dundee College, Graham Street, Dundee. May 27 - Club night, closing night for summer recess. Allan Martin GM7ONJ, 11 Langlee Place, Broughty Ferry, Dundee, Tayside DD5 3RP.

WARWICKSHIRE

Stratford-upon-Avon & DRS: 2nd & 4th Mondays, 7.30pm. Home Guard Club, Main Street, Tiddington, Stratford-upon-Avon. May 26 - Bank holiday, discussion night, June 9 - 2m direction finding competition, 23rd - Tecknow evening. The Society are again organising a course of instruction for the Radio Amateur Examination of the City & Guilds of London Institute and further details can be obtained by writing to the Chairman of the Society, Mr J. Harris G8HJS, enclosing a stamped addressed envelope. The address to write to is: 57 Evesham Road, Stratford upon Avon, Warks CV31 2PB.

WEST YORKSHIRE

Wakefield & DRS: Tuesdays, 8pm. The Ossett Community Centre, Prospect Road, Ossett. June 3 - Replacing the v.h.f. rotator, 10th - On the air, 17th - Pitch and putt, 24th - On the air. Bob 0113-282 5519 or G3WWF@GB7WRG.

WILTSHIRE

Salisbury ARC: 2nd and 4th Tuesdays, 8pm The Scout Hut, St Marks Avenue, Salisbury, Wiltshire. Prospective members and visitors are welcome. A club Net held daily at 6.30pm local time and additionally 2030pm Fridays S.16 (V32) 145.000. RAE tuition available. May 27 - CW operating evening G3FKF on the air, June 10 - 73kHz talk and play by Rod G4ZUP, 21st - St Josephs School Fete - Club display station, 24th - Rig Clinic - get that equipment checked plus 12.5kHz v 25kHz channel spacing by Frank G8PCB. Jamie G7WAA on (01772) 334935 (business hours).

Trowbridge & DARC: 1st & 3rd Wednesdays, 8pm. The Southwick Village Hall, Southwick, Trowbridge. June 4 - Foxhunt (G4YXS) 1930 start from Southwick, 18th - Natter night. Ian G0GRI on (01225) 864698.

Editorial

Reading through the letters this month I was interested to see that other people find the various antennas that spring up around the country, or even the world if you travel abroad a lot, interesting. Quite a high proportion of my holiday photographs are of antennas and satellite dishes - and trains of course!

Let me have your more intriguing antenna pictures and I will see what can be done with them in a future issue. Don't forget to tell us where they are and, if you know, what they are for.

By the time you get round to reading this you will have noticed that the cover price of your favourite magazine has gone up. It is now 18 months since we last had to increase the cover price and our production costs have risen in this time. We are constantly striving to keep our costs as low as possible while still giving you the best possible value for your money.

Of course, if you are a subscriber you are protected against price increases for the duration of your subscription - three-year subscribers are even better off! You can take advantage of Kathy's generosity and take out a subscription at the old rate - but she will only maintain the old price for three months.

Dick Ganderton G8VFH

Letters

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

Dear Sir

I am writing to enquire if there is any equipment and software available for the Amiga 500+ for use with the HF-225. I am new to s.w. listening and have a long wire in the back garden, made from heavy duty electrical wire.

I have just started getting *SWM* and I find it very good and helpful, but I don't think my HF-225 is performing because of the long wire and I have not got a very big back garden. I do hope that somebody can help me as I do not want to spend too much cash on this problem.

Ken Munns
Newcastle-Upon-Tyne

This is really two separate questions. Gerry Glenwright will probably be able to help with the Amiga 500+ part in his 'Shackware' column and I will pass it on to him to deal with. The second question is a little more difficult to answer as you haven't specified what the problem is. Perhaps, as a beginner you don't know what the problem is, but just think you have a problem. To expand on this statement, certain types of s.w. listening require a lot of patience as well as good equipment and an element of luck. Not all frequencies have signals on them all the while - some frequencies never have signals, others have signals for short periods often with long intervals of no signals. Have you tried fitting a pre-selector between the antenna and the HF-225? Lowe make a pre-selector for the HF-150 that will work with the HF-225, although the case design doesn't match. Alternatively try a simple a.t.u. (antenna tunning unit), such as the one described in More Out Of Thin Air, *available from the* SWM Book Store. ***Ed.***

Dear Sir

Would the person who contacted me when he saw my name in the May '96 issue of *SWM*, regarding my Collins 75A/2, please contact me again. I have written several letters but have heard nothing.

Keith Heselton
Swindon

If the person concerned has misplaced Keith's address they can reply via the Editorial Offices. ***Ed.***

Dear Sir

Whilst reading through the letters page in *SWM* April 97, I noticed Peter Linzey's plea to find several transistors or any information on equivalents, etc. Being in the electronics trade I set about searching through various equivalents books to see if anybody stocked any of them. I found plenty of equivalents, but being the old germanium transistors, none of the major component suppliers stocked them anymore.

Stumped, I asked several people - mostly the older ones! - if they knew of anywhere they might be available. One of the design engineers asked if I had tried ringing Cricklewood Electronics. This I did, with success as they either had all of the transistors or their equivalents in stock.

OC44 - £2.50
OC45 - £2.95
OC78 - £5.50
GET 114 none in stock (equivalent AC126, £1.75)
GET 874 - none in stock (equivalent OC44N, different from OC44, no price available).

Ian Fourmy
Dunstable

Cricklewood Electronics can be contacted on 0181-452 6662. ***Ed.***

Dear Sir

First, my thanks for some very interesting magazines. Although not active in scanning or airband listening, I read the whole of the magazine, a good habit I think!

My main interests are utilities and the data modes, to help the latter, I recently invested in a digital signal processor, the Timewave DSP 599ZX. Using the DSP has improved the reception of RTTY signals a great deal since it has filters suitable for the shift in use.

The shift can be changed only to those commonly used, but the bandwidth and the centre frequency can be adjusted over a wide range. The DSP also has a band-pass filter designed for METFAX. In addition, the DSP has a modem which sends the RTTY data to the RS-232 port at a user selectable speed to match that transmitted.

The icing on the cake is provided by some test faciltiies: a sine wave oscillator, an a.c. millivoltmeter and two types of teleprinter test signals. The DSP can also receive RS-232 data from the computer for those interested in the transmission side of radio.

Finally, a cautionary tale for Mr P Linzey of Renfrewshire. I was going through my stock of transistors a short time back and found a tin of old germanium transistors and guess what(!), I threw them away because nobody would want them now, sorry Peter! The moral is, don't throw anything away - but don't tell my wife!

Dr. F. Crossley
Congleton, Cheshire

Dear Sir

Re: Lafayette Communications Receiver Model HE30, 1.6-30MHz, manufactured in the USA.

As an old s.w.l. and a reader of *SWM* and *PW*, I would appreciate the help of your readers. My request is for the user's operating instructions for the above receiver and a technical sheet that is available, this would be a bonus. I shall of course be pleased to pay for any costs for photocopies and postage. Thanking you in advance.

D.C. Bishop
Bath

Dear Sir

I read with great interest the article 'Active Solution'. Both the TL loop and the AD370 antenna are in use in my very noisy QTH. Some 200 yards from my house runs a 360kV power line.

My main listening is done in the v.l.f./l.f. band. The TL loop is a very noise-free antenna for this bands and has a very sharp null. For 2MHz and up to 30MHz the AD370 in a horizontal position, outperforms the TL loop.

I replaced the three 'D' cell power supply of the TL loop by something more practical. A 12V battery (Stellar Industries, Brighton) and a 7805 5V regulator does the job. Between the shack and the loop in the garden, run two coaxial cables, one for the signal and one for the 5V power. These cables are placed underground for shielding.

To support the loop, a 3/4in flexible tube is used, well known for electrical house wiring. With

ADVERTISERS INDEX

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Manufactured by:
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Chesterfield Road,
Matlock, Derbyshire, DE4 5LE, UK

the loop 600mm above ground level, some nice l.w. loggings were obtained: 38kHz Rude Sweden; 120kHz Spata Attikis Greece; 511kHz Gdynia Poland, all in c.w. mode, and RAI Caltanissetta on 189kHz, all in September.

My congratulations to Mr E.C. Foster for designing such a fine antenna, my best since 1963, the start of my radio career.

W. Van Hullesbusch
Belgium

Dear Sir

I am writing to ask if you or your readers can solve a problem that has been bothering me. On a recent football away trip to see my beloved Southend United (men in white jackets have been alerted(?)) play at Wolverhampton, my father and I couldn't help but notice a large, complicated array of masts and aerials in the area surrounding the junction of the M1 and the M6. It was an impressive sight and certainly caught my eye.

I was planning to track down the aerial site on the way home but, because of a less than perfect performance by my team, I'm afraid to say I completely forgot about it. I'd be very grateful if you can give me some information about this site.

Keep up the good work with the mag.

Paul Clark
Rochford, Essex

PS. The site is on the left has you are going north on the M1!

Is this Rugby? How many of us have noticed unusual and impressive antennas as we travel around and wondered what they are for? About three miles outside St. Johns, Antigua is an enormous silver loop with a vertical bar across its diameter. The diameter was a bit difficult to estimate at that distance but is probably about 30m. Unless someone had been administering the metal polish regularly it was new. Any ideas on this one? ***Ed.***

Dear Sir

I entirely agree with Mr Denman (May) and Mr Jacobs (April) regarding the unreadable print, such as on page 39 in the May issue. John Wilson's articles are one of the reasons why I buy *SWM* and I was considering a subscription, but if we are going to have this interfering background to the printing, I shan't bother.

There is no room either, in what purports to be a serious radio magazine, for so called 'spoofs'. In any case the subject matter is not beyond the bounds of possibility!

Thank you for what is otherwise a very readable magazine.

John W. Redfern GW4RZU
Haverfordwest,
Pembrokeshire

Dear Sir

I'm a French reader of *SWM* from Japan and wish to thank you for making such a great and attractive magazine. The reason for my message is to ask you to give a much greater importance to Jerry Glenwright's 'Shackware' article. It's by far the most interesting and refreshing approach to s.w. equipment I've seen for years! It's a shame that he's only allowed one page every couple of months! There is so much to write about how to mate old silicon to high-tech, the article's ideas are great, but amputated by space limitations.

Now about another subject. I'm very amused about the dog-fight between John Wilson and the people of WinRadio....for the reader it's very beneficial to hear so many pros and contras coming from so many people. By doing so, the quality of content and message of a review is outstanding (*sic*) the traditional way of reviewing a piece of equipment. This is probably why I appreciate *SWM*, keep up the good work!

Frederic Collin

The mind boggles! A Frenchman reading an English magazine in Japan! The level of 'computer' content in SWM was aired very thoroughly some time ago. ***Ed.***

Dear Sir

As a prospective buyer and knowing nothing, I found the WinRadio review a refreshing change from the usual 'lovely rig, nothing wrong with it...' type of review. It was a shame, but predictably obvious that the manufacturer took umbrage at the review and, it seems to me, unsporting that constructive criticism was seen to rubbish the product. In my humble opinion, it did nothing of the sort, indeed it praised it where praise was due.

As an outsider, I do not wish to see write-up, reviews, call them what you will, that contain nothing but praise and illuminate none of the item's bad points. Nothing in this world is perfect and this must surely apply to an electrical contraption, no matter how many hundreds of pounds it costs.

A great many of us look to magazine reviews when making our choice. Perhaps none of our mates have the beasty and the man in the shop is bound to tell you it's the bee's knees, it's in his interest too. If the truth hurts, let it be said. The customer whose hard earned cash might be squandered on something that is unsuited to his needs will not respect you for ignoring shortcomings!

Keep up the good work, my continuing decade plus of 3-year subscription renewals, tells you all - my favourite radio magazine.

Bob Mersh G8JNZ

Dear Sir

While I will stand aside from the great 'radio-in-computer' debate - particularly since all professional receivers are now computers with an r.f. A to D converter in there somewhere! - I really must congratulate John Wilson on standing up to what must take the prize as the most outstanding example of pseudo-babble of recent days.

And, while I'm at it, a note for Bob Ellis (p 29, May 1997) and his rather snide comment about the old-school RAF voice on Volmet. Before that voice was chosen, a great deal of experimentation was done trying out various voices, including female ones. The old-school RAF voice won hands down for maximum intelligibility under the usual high-noise military cockpit environment. All those announcers one hears on radio and TV these days with slurred semi-articulated consonants, weird pitches and rhythmic accents, regional accents you can cut with a knife and so on, should take note - as should whoever is responsible for platform announcers on what used to be British Rail, where the maxim seems to be 'the louder the better'.

By the way Bob, 'VOLMET' is simply an inversion of the French *'Meteo en vol'*, or translated, 'weather in flight' - easily intelligible in both languages. Weather In Flight is what it is, so where's the problem?

Walter Blanchard G3JKV
Dorking, Surrey

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

SWM SERVICES

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Components for SWM Projects

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

The printed circuit boards for *SWM* projects are available from the *SWM* PCB Service, Badger Boards, 87 Blackberry Lane, Four Oaks, Sutton Coldfield B74 4JF. Tel: (0956) 374918 (Mon. - Fri. 9am - 5.30pm).

Photocopies and Back Issues

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

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Technical Help

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

Target HF3 Data

We offered Mike Richards the opportunity to shake down AKD's Target HF3M, the new data mode version of their excellent 'starter' receiver.

Now this is a chance I couldn't turn down. The Target HF3 receiver has caused quite a stir in the radio market since its introduction last year.

The key to its success being the very low prices combined with a communications receiver like spec and style. The latest release from Target is the HF3M that comes complete with software and modifications for the reception of h.f. FAX and RTTY. This makes the HF3M very attractive to any new listener with an interest in the data modes.

Computer Requirements

The FAX and RTTY software supplied with the HF3M is DOS based, which means that you can get away with a fairly basic PC. The minimum requirement is a PC with a 386 or faster processor plus at least 640Kb of RAM and a VGA monitor. If you don't already have a PC, you will find that 386 based PCs can be had quite cheaply on the second-hand market.

Installing the software was very straightforward as the supplied 3.5in disk featured its own installation program. Although this was very basic, I'm sure it will satisfy the vast majority of computer systems. This automated loading routine created a directory named 'WEATHER' on the 'C' drive and transferred to it all the program files. If you should want to put the files elsewhere, you will have to do this by manually copying the files to the required directory.

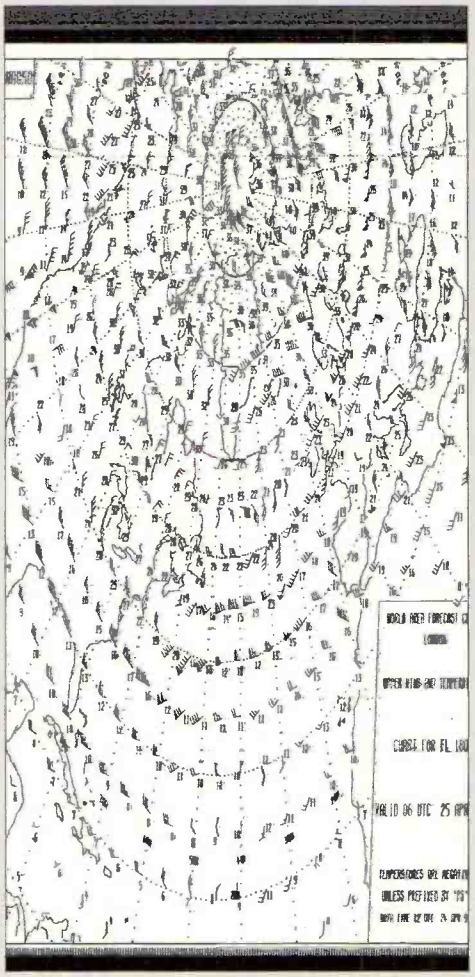

Fig. 1: Sample Weather Chart captured to file.

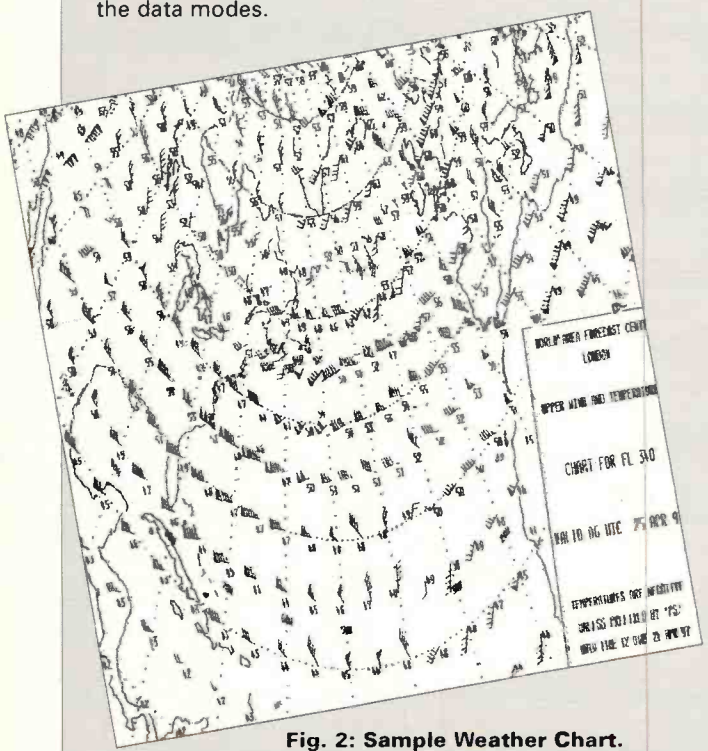

Fig. 2: Sample Weather Chart.

Neat Interface

With all computer based decoding systems there is a requirement for some form of interface between the computer and the receiver. This can range from sophisticated units with built-in processors, through to a simple audio lead to the sound card. In the case of the Target system, a special interface has been provided on the rear panel of the receiver.

There was no information supplied with the receiver, but a quick check of the p.c.b. shows, what appears to be, a fairly basic signal limiter circuit employing just one intergated circuit. This is similar to the systems used by many other FAX and RTTY programs. The main purpose of the interface is to

Reception

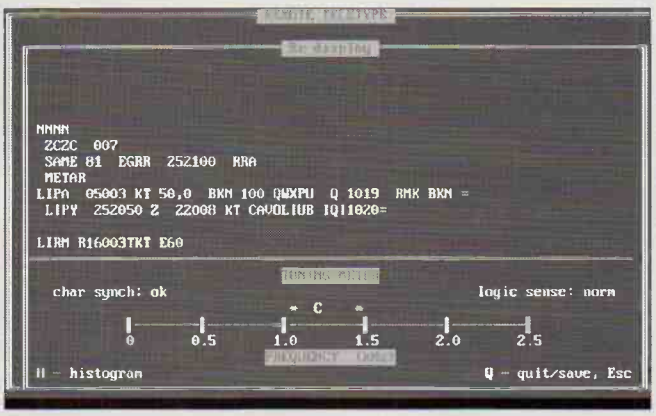

Fig. 3: Main RTTY Receive Screen.

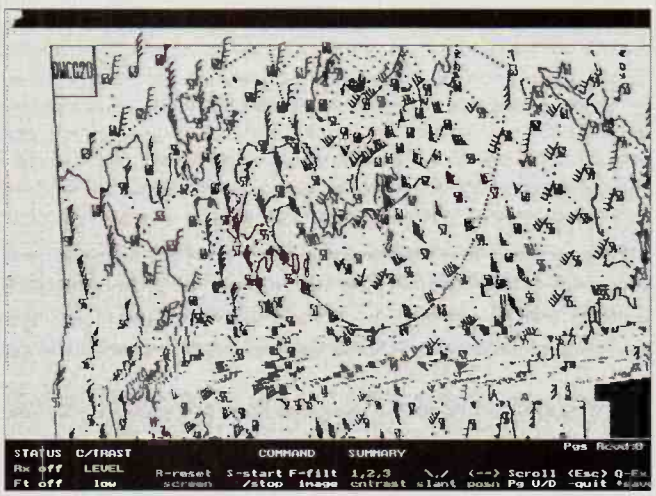

Fig. 4: Main FAX Receive Screen.

convert the audio signal from the receiver into a constant amplitude square wave that can be processed by the COM port in your PC.

This new decoding interface takes-over the HF3's 3.5mm headphone socket to provide a connection point with the outside world. This has been specially configured so that the decoder output is available regardless of the setting of the volume control. The only disadvantage being that you no longer have a headphone socket for other types of listening!

The connection to the PC is by a special lead (supplied) with a 3.5mm jack at one end and a 9-pin D-type connector at the other. If your computer has a 25-pin connector, don't worry, as adapters are readily available. Out of a perverse interest, I did try using the HF3's decoder interface with the popular JVFAX and HAMCOMM programs. Both worked perfectly, thus providing a useful route to add extra modes at a later date.

Menu Driven

With all the connections made, receiver and PC powered-up, you just have to select the C:\WEATHER directory and type 'TARFAX' to get started. It's important to make sure that you start the program in DOS not Windows as the decoding programs won't operate in a Windows environment. This is because the programs need exclusive access to the PC's timing systems and this is not possible under Windows.

Once you've started the program you are presented with a simple menu where you can choose FAX or RTTY. The RTTY system was supplied as a free extra because it's still at the experimental stage. However, it was a useful addition. To start the RTTY option, you just hit 'S' and the program starts trying to make sense of the incoming signal.

To help with the tuning the main receive screen featured a bar tuning display at the bottom of the screen. This showed where the respective mark and space were appearing so that you could adjust the receiver to get the mark and space indicators to straddle the centre point. This basic tuning aid was supplemented by a more sophisticated histogram display that shows the audio frequency spectrum. When using this feature, tuning was completed by using the arrow keys to move the vertical red line to the centre point of the mark and space peaks.

There is also a facility to invert the data to compensate for the varying polarities used by some stations. There also appeared to be a built-in unshift-on-space facility which can be very useful for automatically correcting the errors that follow when a shift character is corrupted.

However, those interested in receiving coded weather stations will curse the fact that unshift-on-space cannot be disabled. This means that all the five figure groups are converted into five letter groups!

First FAX

Now for that first FAX picture! Once the FAX option has been selected from the main menu you're presented with a sub-menu where you can choose 'Configure', 'Start a FAX' or 'Retrieve a picture from disk'. The configuration option needs to be used when you first start the program to make sure it is set for the correct COM port.

Lowe Elec

JRC NRD345

JRC need no introduction to most SWL's but their new receiver does! An all-mode receiver, the NRD345 includes synchronous detection as standard, offering low signal distortion and clear sound. Direct Digital Synthesis is employed in a phase locked loop circuit to enhance the carrier to sideband noise ratio. The RF amplifier and the first mixer in the front end stage incorporate 4 low-noise junction-type FETs with excellent cross modulation characteristics respectively to ensure high sensitivity with wide dynamic range. Other features include a variable level noise blanker, clock and timer functions and a built-in RS232 interface for computer control. We'll be writing a driver for our RCON control software just as soon as we have our first European spec samples! This will enhance the NRD345's 100 memory channels and scanning capabilities. The new receiver offers great value for money at just £899.00 (subject to exchange rates etc.).

Be aware of "grey import" NRD345s being offered for sale at a lower price. These a have not been purchased through official channels in the UK via JRC and therefore have no factory warranty. Lowe Electronics have been official JRC distributors for the UK for many, many years and we deliberately held back on the announcement of this new receiver to the press as the European model was not yet available for review or sale. It should become available from the middle to end of May and we are sure you will be impressed with what it has to offer when it finally arrives.

The real price by the way is £899.00 from Lowe Electronics or other authorised dealer - give us a call and we'll let you know your who your local dealer is so you can make your purchase with confidence.

Specifications

- Frequency range 0.1 to 30MHz
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- Receiving system Double superhet
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- Antenna input attenuator 20dB
- AGC characteristics AF output varies with 10dB or less for the antenna input of 3 microvolts to 100 millivolts
- AF output 1W or more with 8Ω load at 10% distortion
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NRD345 £899.00

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ICOM IC-8500

ICOM "next generation" technology brings you super wide band, all mode coverage from HF to 2GHz, including short wave and VHF/UHF, while maintaining a constant sensitivity. The IC R8500 is not simply a scanner - it's a professional quality communications receiver with versatile features from high speed scanning to computer control.

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- 1000 memory channels storing frequency, mode (including passband width) and tuning step and alphanumeric tag, etc., divided into 20 banks of 40 channels each plus an auto memory write area of 100 channels and skip area of 100 channels
- 20 scan edge memory channels to store 10 sets of frequencies for programmed scan plus 1 priority channel for priority scan. The number of channles in each bank is user-assignable
- RS-232 interface for computer control
- Memory, priority and program scans are available, plus skip, auto write, and mode select scans
- Scan speed is continuously adjustable up to 40 channels per second plus VSC (Voice Scan Control)
- Voice synthesiser (optional UT-102 required) announces the frequency setting
- REC and REC remote terminals are provided for tape recorder control and for recording received signals (received frequencies can also be recorded when the optional UT-102 is installed)

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BIONIC EAR

More and more hobbyists are finding good uses for our commercial products so here's an interesting new item recently added to our security division. The Bionic Ear consists of a high quality micro-phone, parabolic reflector, high gain amplifier and headphones matched to give in excess of 800% increase in sound level!

You can hear a pin drop - and from 50 feet away!

Regular visitors to our Matlock showroom will probably know the corner shop just across the road from our showroom that students from the local school usually invade at lunchtimes. Well, from our doorway you can here quite clearly the shopkeeper discussing the price of Jelly Babies with his customers and we reckon that's a good 60 yards away! Now that's despite traffic noise from the main road just feet away!

The microphone is an omni-directional type ideal for some applications but coupled to the parabolic reflector it becomes extremely directional and this also helps to mask background noises and boost the sounds that you do want to hear. The gain is variable via a control on the microphone and special AGC circuits ensure that sudden loud noises are quickly attenuated, preventing possible harm to your hearing.

Our commercial customers see the obvious security uses of the Bionic Ear but we get a lot of nature watchers in these days, some of whom are using the Bionic Ear for recording birdsong and other animal activity and there must be dozens of other applications!

For total portability, the Bionic Ear is powered from batteries and is complete with all cables between microphone and headset. Just add your own tape recorder for a total portable listening post!

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

With that complete, you can press 'S' to move to FAX reception. Pressing 'S' once more will start the receive process. One important point to note about this FAX system is that it doesn't include any automated reception features.

If you are unfamiliar with h.f. FAX you ought to be aware that most FAX transmissions start with a tone followed by 30 seconds of synchronisation pulses. At the end of the picture transmission another tone is sent to indicate the end. These tones and pulses are used by many decoding systems to facilitate automatic reception of FAX pictures. As the Target system doesn't include this facility, you will have to manually start and stop reception for each image. Fortunately, the reality of this is not quite as bad as it might seem, thanks to some well thought-out controls.

Let's just take you through the reception of an image to show you what it's like. You begin by pressing 'S' when you hear the FAX station send the start tone. The signal then changes to synchronisation pulses for 30 seconds. These show up on the screen as a narrow white bar that represents the edge of the picture. You then have to press the left or right arrow keys to place this bar at the edge of the screen. Once this is done you press 'R' to refresh the screen ready for the start of the image proper. Whilst the image is being received you can use the '1', '2' and '3' keys to optimise the contrast of the received image. You can also use the 'Zoom' controls to zoom in and out of the image. However, these controls only alter the image that follows and have no effect on the image already displayed on the screen.

As a result, this needs to be used with some thought. Just a minor gripe here, the manual says you have to press 'Alt I' and 'Alt O' to zoom in and out whereas in fact you just pressed I or O!

Now all this manual reception might sound a bit complicated, but it wasn't really and I soon found myself quite comfortable with the controls. I would though, much rather have seen automatic reception included. Once you've received your image you can use the 'pg-up' and 'pg-dn' keys to scroll through it or save it to disk in bitmap (bmp) format. This latter option was very useful as you could then use one of the powerful graphics packages (i.e. Paintshop Pro) to tidy-up and generally enhance the image.

The final option from the FAX menu was the facility to view previously saved images.

HF3 - Data Receiver

This receiver has already been reviewed thoroughly in *SWM* - see November 1996 (*back copies available - **Ed.***) - and I've also covered its performance from a data point-of-view in my 'Decode' column. In view of this, I'll just stick to the main points here. In order to function as an effective receiver for data modes a number of important criteria have to be satisfied. First and foremost is the ability to tune in fine increments. The exact requirement depends very much on the type of listening you do, but there is certainly a need to be for the listening frequency to be able to be set with a resolution of ±50Hz or better.

The HF3 meets this criteria through its use of the main tuning plus clarifier to interpose between the 1kHz main tuning steps. This provides continuous tuning, albeit, via two controls.

The second requirement is good frequency stability. This is particularly important for FAX reception where each image can take up to 15 or 20 minutes to receive. I've used the HF3 over extended periods for all types of FAX reception and have found the stability to be well up to the job. A good frequency display is also very important and the HF3's resolution to 1kHz is generally adequate. The lack of user programmable memories can be an inconvenience, but this is minimised by the very effective rapid tuning facility. Although many people get hooked-up about sensitivity, the generally high noise floor on h.f. means that high sensitivity is rarely essential. Overall the HF3 is pretty well specified, especially when you consider the price. ■

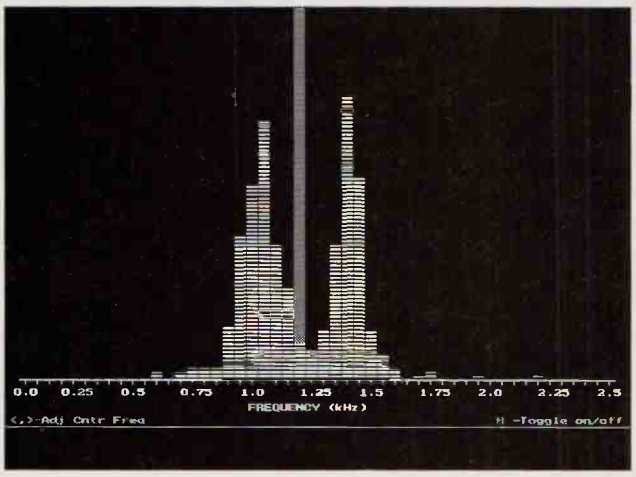


Fig. 5: RTTY Histogram Display.

Summary

So is this package a success? Well, the receiver's fine, but the software's a bit crude. It does all it claims and it is very easy to use but lacks the sophistication of many shareware and commercial offerings.

I'm also not sure whether or not building the interface into the receiver is really wise as you lose the headphone socket. On the plus side, the built-in interface does appear to be fully compatible with JVFAX and HAMCOMM so you have the flexibility to change the decoding software as more advanced systems become available. The HF3M costs **£209.95** and is available from **AKD, Unit 5, Parsons Green Estate, Boulton Road, Stevenage, Herts SG1 4QG, Tel: (01438) 351710, FAX: (01438) 357591**, and their distributors. My thanks to **AKD** for the loan of the review model.

a simple Windspeed indicator

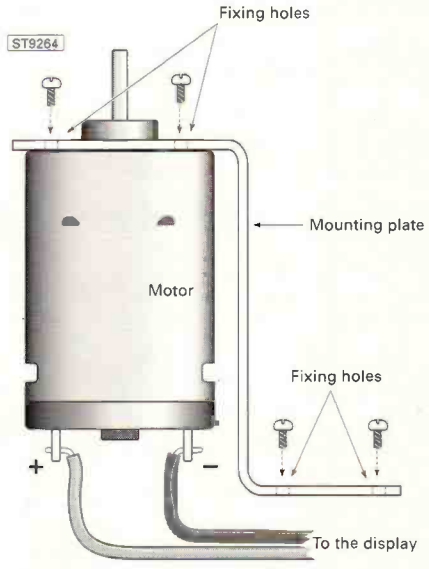
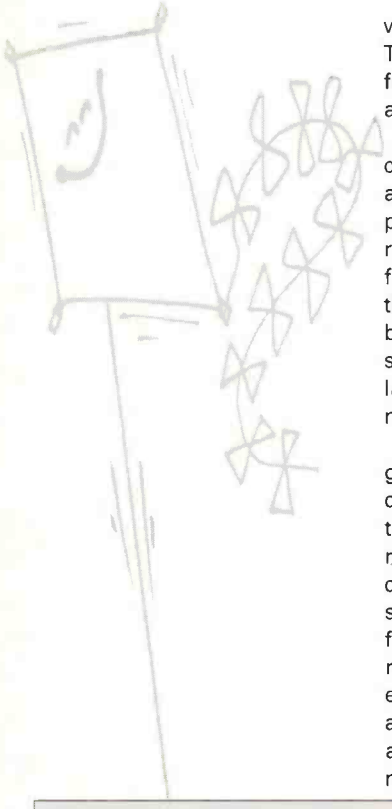


Fig. 1: The motor assembly.

How many times have you looked at and admired the professionally built weather stations that are advertised? Then you see the price and shudder. D. Bedford G4ABS had always fancied a windspeed indicator, so he decided to make his own.



My various junk boxes gave me the essential parts for what is, after all, a very simple circuit. Just a little ingenuity and some careful crafting and the required article took shape.

You will need the following items: A working 6 - 12V drive-motor from an old audio or computer cassette recorder. Test this for output with meter **before** doing any work on it! A fairly large, easy-to-read meter with an f.s.d. of about 250mA.

A length of low-resistance wire for the meter shunt. Three table-tennis balls and a few other odds and ends such as screws, silicone, etc.

When dismantling the old cassette unit, save the screws and the motor mounting plate. It will be necessary to remove the small vee-pulley from the motor shaft. Most of these pulleys are a shrink-fit, but can be persuaded to separate with the aid of a large screwdriver, taking care not to damage the motor.

A little heat from a small gas torch will help in stubborn cases. The large flywheel on the capstan drive is also required, and this, in most cases, has the same diameter shaft as the motor. The flywheel shaft has to be removed from the flywheel, either pressing it out with the aid of a vice, or tapping it out, again with the aid of heat if necessary.

Windmill

Once the flywheel shaft is removed, the flywheel is ready for modification into the 'windmill' generator. This is achieved by drilling and tapping three holes laterally in the side of the flywheel (**Fig. 2**). These holes should be 120° apart for even balance. Use whatever material you have for the windmill arms, but something like a 100mm long piece of dural rod, about 4mm diameter should suffice. The threads in the flywheel holes must be the same as the thread on the dural rod, but you can use either metric or imperial dies and taps. Screw the rods tightly into the holes, using a small spot of Superglue on the last thread in. This will prevent the arms from coming adrift. When complete, check the arms for length to check that they are all the same.

Table-tennis balls have a re-inforcing ring inside - holding the ball up to the light will reveal this - and it is necessary to cut the balls along this ring. Use a **sharp** Stanley knife or Junior hacksaw for this purpose. Discard the smaller piece of ball. The ball halves are then drilled for a tight fit on the arms, drilling on the opposite side of the ring to the cut. (**Fig. 3**). Push the balls on to the arms, taking care to align them all in the same manner, although the direction of rotation is immaterial. Set them in place with a small blob of silicone sealant and set aside to dry, making sure all three balls are upright and facing the same way.

Mounting Plate

Depending on where you intend to mount the generator, the mounting plate for the motor may need to be modified, or a new, larger mounting plate made, using the original as a template for the motor shaft and screw holes. Bear in mind that the windmill arms must have sufficient clearance to turn freely, and should ideally be mounted in the clear above any obstructions. When you attach the motor to the mounting plate, use a spot of Superglue as you tighten the screws to prevent vibrating loose.

When the flywheel is ready, carefully press or gently tap it on to the motor shaft, taking care not to disturb the balls. The shaft should rotate freely when you blow on the balls.

Calibrating the Meter

As a general guide, a windmill turning at one revolution per

Table 1: Volmet Frequencies

RAF Volmet	4.715, 11.200MHz, u.s.b., updated every hour.
Shannon Volmet	5.505MHz, u.s.b., updated every hour.
London Volmet South	128.600MHz, a.m., updated every hour.

a simple Windspeed indicator

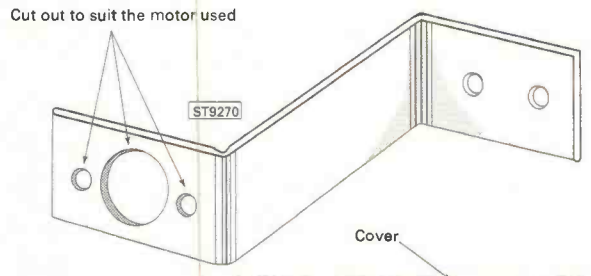


Fig. 1a: The bracket details.

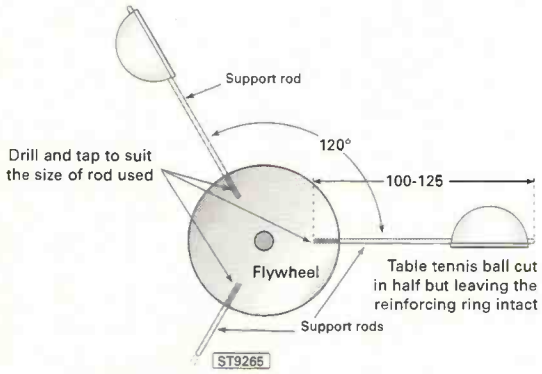


Fig. 2: Modifying the flywheel to accept the windmill arms.

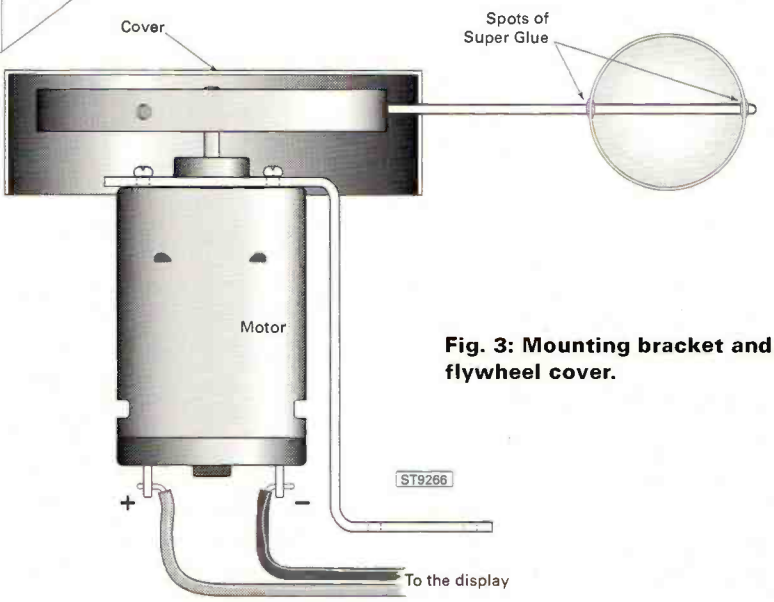


Fig. 3: Mounting bracket and flywheel cover.

Fig. 5: The meter scale should be calibrated to about 60 knots.

Fig. 4: Circuit diagram of the windspeed system.

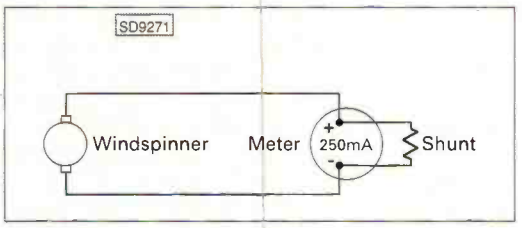


Table 2: Beaufort Wind Scale

Force	Speed (knots)	Description
0	less than 1	Calm
1	1 - 3	Light Breeze
2	4 - 6	Light Breeze
3	7 - 10	Gentle Breeze
4	11 - 1	Moderate Breeze
5	17 - 2	Fresh Breeze
6	22 - 27	Strong Breeze
7	28 - 33	Near Gale
8	34 - 40	Gale
9	41 - 47	Severe Gale
10	48 - 55	Storm
11	56 - 63	Tempest
12	64 + +	Hurricane

second should equate to a windspeed of about 3knots. A knot is 1 nautical mile per hour = 1.143 statute miles per hour. Two revs/second should equate to about 6 knots, etc. The scale on the meter needs to read up to about 60 knots, and if necessary, you can make a new scale. On my meter, which is a large, 122mm diameter ammeter (without the original shunt) the scale is calibrated in amperes at 10 - 20 - 30 - 40 - 50 - 60, which is very convenient. I picked it up at a rally for £2. I use a piece of Eureka resistance wire as a shunt, with a resistance of 3Ω. This is placed directly across the meter terminals, and the twin cable from the motor is attached directly to the terminals, remembering positive to positive, etc.

I adjusted the shunt to agree with the wind speed indicated.

Getting an accurate indication is fairly easy.

The approximation method, which gets you very close, involves you tuning to the various Volmet frequencies and listening for the report on the nearest airfield to you. (Frequencies are given in **Table 1**) You can telephone your local airfield and ask the tower for a wind speed reading. They are usually quite happy to oblige.

A check over several volmet reports will enable you to average the readings, and that will be close enough.

Or you can get a friend to drive you in a car, and with the generator held out of the car window, check the meter reading against the speed of the car. The friend should be involved **only in the driving**! Different motors will give different outputs, so the final calibration is arbitrary.

Weather Protection

Before mounting in the final position, put plenty of grease or Vaseline around the motor, especially the upper side. Although the flywheel covers the motor bearings, the wind will blow moisture and water under the flywheel to the detriment of the motor. You may have ideas of your own for waterproofing the unit.

I used a plastics pill bottle with three slots to match the arms cut along the sides of the bottle, which I then placed upside down over the flywheel but clear of the mounting plate. With Vaseline smeared on the motor ends, this method has lasted over five years. ■

HAYDON COM

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The AR-5000 advances the frontiers of performance providing excellent strong signal handling, high sensitivity and wide frequency coverage with microprocessor facilities to match including five independent VFOs, 1000 memory channels, 20 search banks, "Cyber Scan" fast scan and search rates, alpha-tag memory and search banks, frequency offset, step adjust and auto-mode tuning to name just a few. AOR have been synonymous with pioneering receiver design for many years and this tradition continues with the all new AR-5000 "Cyber Scan" 10kHz-2600MHz. RRP ~~£1749~~.

SALE PRICE **£1325.00**

AOR AR-3000A

This highly acclaimed receiver has set its own place in today's demanding market. Your listening horizons are truly extended by its Rx range of 100kHz to over 2GHz, and high level performance is achieved by its electronically switched 15 band pass filter system. RRP ~~£950~~.

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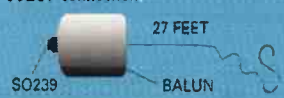

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This is a superb self contained antenna system for inside the house/flat. (built in preselector). P&P £4

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HF-225	Incl. FM an new	£349.95	IC-PRO 80	As new	£169.95	IC-R7000	VGC £699.95
NRD-525	VGC	£599.95	VT-125	VGC	£129.95	OPTO SCOUT	As new £299.95

KENWOOD

Transceiver

John Wilson Reviews The Kenwood TS-570DM

And I heard a voice crying unto me "I want you to review the TS-570DM": and I replied, saying, "But Lord, the TS-570DM is a transceiver, and not worthy to enter the Kingdom of *Short Wave Magazine*." And the Lord replied, saying, "But this TS-570DM has been transfigured by the blessed St. Martin, and has seen the error of its ways and wishes to become a receiver." And thus it came to pass that I placed my hands upon the transfigured TS-570DM and marvelled, saying, "Truly, this is a miracle; blessings be unto St. Martin."

It has been true for many years that Kenwood have been advancing the design of the receiver sections of their transceivers, because there are few more demanding roles for an h.f. receiver than winkling weak signals out of an overpopulated amateur band, particularly when there is a DX pile-up shouting to contact some chap sitting on a remote rock running about ten watts of power. However, because of the cost savings inherent in making a transceiver rather than a separate transmitter and receiver, the last time Kenwood actually made a companion receiver to a transmitter or transceiver was some 15 years ago when the R-820 appeared as a partner for the astonishingly successful TS-820, (unless you also count the R-5000 as a partner for the TS-440?), and I recall with pleasure being asked to go to Tokyo and discuss the design with the team leader Mr. Nomura, JA1CB. Of course, the R-820 was an amateur bands receiver, but now that almost all amateur transceivers contain a general coverage receiver, it was only a matter of time before someone seriously looked at the costs and benefits of buying a transceiver just to obtain the performance of its receiver section. I am pleased to find that Martin Lynch has been imaginative enough to recognise that in the TS-570DM was a very good receiver which would still be value for money even if one ignored the transmitter section. How good is it?

Neat And Attractive

I am impressed by how neat and attractive the TS-570DM is, compared to previous generations of h.f. transceivers, and apart from the slight extra weight imparted by the transmitter heat sink, there is little external evidence that it contains a transmitter at all. The front panel layout is very much to my personal taste because it has the tuning knob sitting in the middle, with the main display centred above and the other controls disposed symmetrically on each side. It's a classic layout, and not only looks right but feels right when used in anger. Colour? Very dark grey: Weight? About 6.8kg: Size? 270 x 96 x 270mm, and that's all I need say about the physical characteristics because it's more important to talk about how the receiver performed - the rest you can get from looking at a colour brochure. Let's go on tour.

Dominated

As I said, the panel is dominated by the tuning knob and the main display, and both are excellent. The 'feel' of the tuning control is just right, aided by its size and mass, whilst the display is one of the now familiar bright orange/yellow backlit panels with the figures and characters standing out vividly in black. Comparing this type of display with the faint almost unreadable early attempts of five years ago makes me realise just how hard designers have improved matters for the user. Frequency readout is to 10Hz, and this is the default setting for the tuning rate on s.s.b., c.w. and f.s.k., with 100Hz for a.m. and f.m. However, poking the button labelled 'Fine' reduces these steps to 1Hz and 10Hz respectively, although the frequency readout remains at 10Hz. Tuning at these rates and then going back to the dear old R-820 makes me marvel once again at the advances which have taken place.

TX or RX Receiver

For fast frequency shifts, a pair of UP/DOWN buttons are provided just a finger width away from the tuning knob, and these can be user programmed to move frequency in 1MHz, 500kHz or 100kHz steps - or for the radio amateur you can move up and down the current amateur bands (but not the broadcast bands, unlike the carefully thought out NRD-345 and AR3030). Lurking down to the right of the tuning knob is a smaller control providing multi-function facilities, mainly for transmitter use, but in receive this control twiddles nicely along in 10kHz tuning steps, and it was this which I used most of the time for shifting rapidly around within a band. Incidentally, on medium wave this control can be programmed to step in 9kHz increments, so someone remembered the European band plan. On top of all this there is direct keypad entry which is easy to use, but one thing I did note is that it is not quite so clever as some dedicated h.f. receiver keypads in that you have to remember to enter MHz as two digits - all right for 11MHz or 22MHz but not so good for 6MHz which has to be keyed as '06'.

Display

The display panel also indicated very clearly all the functions of the receiver, such as r.f. preamplifier, r.f. attenuator, mode, v.f.o. A/B, memory channel, a.g.c. time constant, two intriguing legends 'NR' and 'Beat Cancel' of which more later, and of course the signal strength meter. This is not my favourite moving coil type, but I have to say that I found the analogue representation of a moving coil meter very well executed, and I particularly liked the peak hold reading, where the last two dots at the leading edge of the meter reading stayed in place for a second or so before dropping back if the meter reading had fallen. On rapidly fading or intermittent signals, this feature makes it much easier to estimate signal strength and proved both useful and informative. There are of course other scales on the meter which relate solely to transmitter use, but this does not detract in any way from the legibility of the signal meter.

Mode Selection

Modes available on the TS-570DM are u.s.b., l.s.b., a.m., f.m., c.w. and f.s.k., with mode selection carried out by three soft touch buttons arranged on the left hand side of the tuning knob. The first button alternates between u.s.b. and l.s.b., and such is the frequency accuracy of the receiver that there is no change in audio characteristics when selecting sidebands on an a.m. signal. This is perhaps as well, because there is no provision for synchronous a.m. detection, but used in conjunction with the very smooth i.f. shift, or passband tune control, the selectable sideband reception of a.m. is very impressive. The second button alternates between c.w. and f.s.k., and the third between a.m. and f.m.

A curious little software anomaly in the mode selection is that for a.m., f.m., c.w. and f.s.k., once a mode has been selected, the mode remains whatever the receiver frequency. However, if you select l.s.b., go to another mode and listen above 10MHz then return to s.s.b., you find that the receiver reverts to u.s.b. Similarly, if you select u.s.b. then use another mode below 10MHz and return, the receiver will come back on l.s.b. Someone has presumably been told that all transmissions below 10MHz are l.s.b., and all above are u.s.b. Whilst this is true for the amateur radio frequencies, it is clearly not the case with utility or h.f. communications frequencies, and the effect can cause momentary head scratching when you find yourself trying to listen to aircraft on 8.854MHz on l.s.b., just because the receiver says so... However, it has to be said that if you select either s.s.b. mode and remain on s.s.b., the automatic change over does not occur, so it's not overly important, just curious. 26 ▶

Short Wave Column: Whatever Happened to Radio Moscow?

There was a time when you really did not need a receiver to hear Radio Moscow. Hi-fi fans found that the inductance of the pick-up coil and the capacitance of the cable to it produced a resonance around 7MHz causing it to come out of the record player. Such was the power radiated in our direction.

The size of the Russian land mass meant transmitter sites could be placed to get the best signal almost anywhere. When the USSR became the CIS, most of these sites were lost as the new countries did not want to carry the voice of an old regime. The economics in the new regime can hardly support the powerhouse transmitters and a recent name change to The Voice of Russia adds to the confusion when looking for the old war-horse.

Try AOR's big-signal capability on 7,400kHz late in the evening and our sensitivity circa 17,780 and 15,560 around 1300GMT.

Some of the sites are still fed by a sideband link. Test our self-seeking filter symmetry on 12,175 USB, daytime and the selectivity on 4,860 via Tver as night falls bringing in all the European mobile comms co-channel.

And, of course, listen to Media Network from Radio Netherlands buying air-time on 1386, The Voice of Russia via Kaliningrad, Thursdays around 2152GMT.

We get our radio news and views and Moscow gets badly needed revenue. Funny how things change...

©Bob Ellis 1997

AR5000 high performance and versatile programmability... Cyber Scan®

The AR5000 advances the frontiers of performance providing excellent strong signal handling, high sensitivity and wide frequency coverage with microprocessor facilities to match. Features include automatic electronic preselection between 500kHz - 999.999999MHz. 'True receive' throughout it's range, not an up-converter above 1GHz. 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. The new soon to be released **AR5000+3** offers even more: Noise blanker, Automatic Frequency Control and AM Synchronous detector.

AR5000 £1495 AR5000+3 £1749

AR8000UK wide band hand held receiver

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

£349

AR3000A Evolution at its very best

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

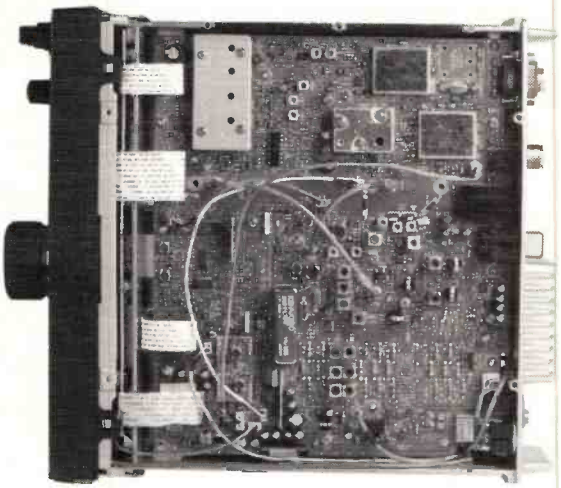
Now is YOUR chance to own an amazing AR3000A receiver at the extremely attractive price of £799

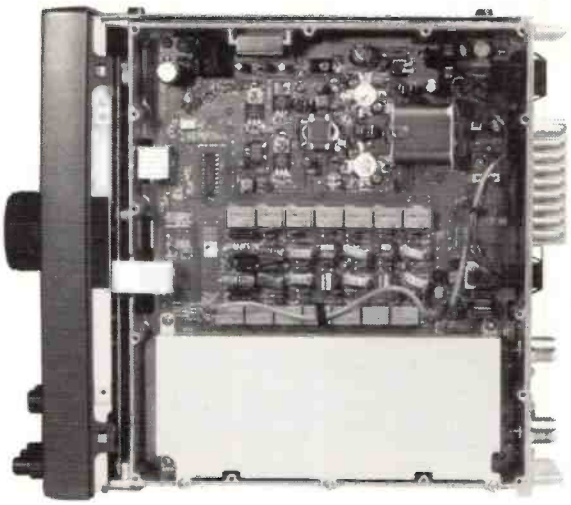
SDU5000 Spectrum Display

The **SDU5000** is a spectrum display unit designed with the AOR AR5000, AR3000A, ICOM R7000, R7100 & R9000 in mind. Locating brief transmissions has never been so easy, by using the MAX facility any transmission within ± 5 MHz may be identified and signal strength measured in dBm. A small modification is required to the standard AR3000A to provide compatibility but the **AR3000A'PLUS'** is ready to go.

£799

HAWK-5000 is a PC control package for the SDU5000 spectrum display unit. HAWK-5000 will work in conjunction with the AR5000, AR3000A plus ICOM R7000, R7100 & R9000 receivers. Video frames may be stored to disk for replay at a later date and SONOGRAM makes identification of signal changes very easy. Spectrum data can processed by HAWK-5000 to produce channel occupancy for export into formats suitable for other AOR packages so providing automatic loading of memory channels. The computer must be a minimum of 486DX66 IBM compatible with fast graphics and running Windows 3.xx or Windows/95 (also requires a serial lead). A necessity for the professional listener. *£99*





I mentioned the i.f. shift control, so this leads me on to the various methods of selecting the receive bandwidth. The standard TS-570DM comes fitted with a 2.2kHz filter for s.s.b., c.w. and f.s.k. which has en excellent shape factor of 2:1. For a.m., the standard filter is 4kHz and for f.m. 12kHz. However, a wide range of optional i.f. filters is available, including 1.8kHz, 600Hz and 270Hz, the last one being for the really dedicated c.w. or data enthusiast.

Digital Signal Processing

But - and it's a big **but**, the TS-570DM also includes an array of other selectivity assisting features based around an audio DSP (Digital Signal Processing) system which are quite remarkable in operation. You must remember that these are operating at audio, and cannot therefore provide the same adjacent channel rejection as a crystal filter in the i.f. system, but nevertheless, the effectiveness is quite marked.

The first DSP feature is a filter in which you can adjust the low frequency and/or the high frequency cut-off points. This is operated by a pair of dual concentric knobs located above the r.f./a.f. gain control - yes, the TS-570DM has a 'proper' r.f. gain control to soothe your aching ears. In s.s.b., a.m. or f.m. modes the low frequency cut-off can be adjusted from 10Hz to 1kHz, and the high frequency from 5 to 1kHz, so it is possible to select an a.f. bandwidth which exactly suits the signal to which you are listening. Being DSP, there is none of the 'ponging' noise which characterises earlier high *Q* audio filters, so the effect is pleasant at all bandwidths. In c.w. and f.s.k. mode, the filters have a range of pre-set values, these being 50, 100, 200, 300, 400, 600Hz, 1 and 2kHz for c.w., and 250, 500Hz, 1kHz and 1.5kHz for f.s.k. (Data). If you can't find a filter to suit from that lot, you must be a very pernickety person. The filter selection for c.w. and f.s.k. is made by twiddling that multi-function knob I previously mentioned.

Seek And Destroy

On with the motley: the next frill bestowed by the DSP system is brought in by a button marked 'B.C.' standing for Beat Cancel which is not a method of drowning out the noise of the Glastonbury 'heavy metal rave', nor indeed the transfer of your local bobby from foot patrol to car riding, but an automatic 'seek and destroy' filter designed to take out not one, but several heterodyne whistles which might intrude on your listening. Let me describe it in use: I tuned the TS-570DM to the BBC World Service on 9.410MHz at a signal strength of S0 to S2 - weak but perfectly clear. I then introduced a signal 1kHz away at S9 level, which caused the BBC to vanish. Pushing the 'Beat Cancel' button completely wiped out the offending S9 whistle within a few milliseconds, and what is more tracked it and wiped it out as I moved the interfering signal across the BBC signal. It has to be tried to be believed. To reiterate what I said about the difference between i.f. filtering and audio filtering, whilst the Beat Cancel removes the audio whistles, it can't remove the interfering signal from the i.f., and consequently the strong unwanted signal will still operate the a.g.c. system and reduce the receiver gain.

Frequency Adaptive Filter

Once more unto the breach, dear friends, once more. There is another modest button labelled 'N.R.' which stands for 'Noise Reduction', and sets in motion a frequency adaptive filter system. If, when listening to a noisy signal you press the 'N.R.' button, the effect is rather like having the noise at the edges of a cinema screen, which then rolls inwards from left and right, folding the noise behind it. It's strange but impressive, and although it works better on an s.s.b. signal than a.m., and on speech rather than music, it nevertheless helps considerably when the listening gets difficult. A second press on the 'N.R.' button takes you to a harsher filter setting which is designed to help with c.w. signals, and it is in this position that you begin to hear the 'urgly-gurgly' noises in the background caused by aliasing in the filter. Now it's true that this technology has been available for some time in add-on accessory units such as the JPS NIR filters, but they are relatively expensive bricks whereas in the TS-570DM it's a built-in facility and easy to use.

The rest of the receiver operating features work well, and include selectable a.g.c. time constants, a noise blanker (non-adjustable threshold), and a useful antenna selector which allows you to select either of two antennas connected on the rear panel. These are, however, low impedance inputs and there is no provision for connection of a high impedance long wire. Since many listeners own one of the wideband matching units, such as the Shenzi balun, this should not present any difficulty, although it does demonstrate the amateur radio origins of the TS-570DM. There are 100 memory channels storing frequency and mode, but not a.g.c. or other settings. All the memories are tunable after recall, so you have in effect 100 tunable v.f.o.s, and by programming a set of memories with the starting frequencies of bands of interest, it is equivalent to calling up each band as you need it. A further feature is that ten channels can be programmed with start and

end frequencies so these can be used as band stores.

Scanning Facilities

Having memories in a receiver means that you usually have scanning facilities as well, and in the TS-570DM these are quite interesting. As you might expect, you can scan the memory channels for occupancy, aided by an all mode squelch control which means that the scan continues in silence - well, that's not entirely true because on h.f. it's quite difficult to get the squelch setting right for all frequencies - but it's done as well in the TS-570DM as any other similar system I've seen. When the receiver stops on an occupied frequency, it will resume either after a set time delay, or stay until the signal disappears. These functions are user selectable. If you don't want to scan all 100 memories you can scan groups of ten, and there is a further useful scan facility which tunes the receiver across the frequency range specified by the start and end frequencies of the ten band store memories. I often use the general channel scan for monitoring signal strengths of several frequencies containing the same station, such as BBC World Service or VOA.

Summary

Martin Lynch is to be congratulated on taking the initiative in bringing the TS-570DM to the notice of the dedicated listener. This is a receiver which will appeal to the enthusiastic 'driver' who wants to extract the best out of the utility and h.f. communications signals which abound, and the RTTY or data user will find the features ideal. The l.f. listener will however note that the lower frequency limit is 500kHz, thus ignoring the existence of long wave stations. For the number of operating facilities provided, I found the TS-570DM easy to use, and the DSP functions in particular were a delight because of the 'single button press' approach. I liked the provision of switching between two antennas from the front panel, even though there was no high impedance input to the receiver, and all the right 'communications' knobs were available, such as a 'pedestal' type r.f. gain control; i.f. shift; noise blanker and so on.

Its position in the market place is unique, because its price is clearly above the fiercely competitive £800 group, but considerably below the NRD-535 which used to be such an attractive proposition, so I would place it as an attractive alternative to the '535, but with a useful saving in cost. Finally, because the TS-570DM has had its transmit functions disabled prior to sale as a receiver, the disabling has been devised by Martin Lynch so as to be totally effective. So you don't need to worry about accidentally blasting 100W of r.f. into your long wire balun.

Any concerns about modifications affecting either the warranty or the 'CE' marking have been dispelled by a letter which I have from Kenwood UK confirming that they are happy to endorse the Martin Lynch modification with no effect on any warranty and no change to the 'CE' status. The lad's done it properly, you see.

The TS-570DM is supplied by **Martyn Lynch & Son, 140-142 Northfield Avenue, Ealing, London W13 9SB. Tel: 0181-566 1120. Fax: 0181-566 1207, E-mail: sales@martyn-lynch.co.uk** with a suitable power supply for £1329. If at a later date you pass your RAE and want to have the transmit side activated, Martin Lynch will do this for you at a cost of £38 plus carriage.

■

RF Performance

So - the TS-570DM is a comprehensively equipped receiver which is easy to use and pleasant to handle. How about the r.f. performance?

I carried out my usual batch of performance checks on the TS-570DM and found it to be excellent, as one might expect from an experienced manufacturer like Kenwood.

Table 1: Sensitivity for 12dB SINAD

Pre-amp in	Pre-amp out (dBm)	(dBm)
SSB	-122	-115
CW (using DSP/IF Shift)	-133	-121
AM @ 60% mod.	-114	-106

Table 2: Intermodulation.

Noise floor	-126dBm
Dynamic range	100dB
3rd order I.P.	+24dBm

Measurements taken at 14.1MHz, using standard s.s.b. filter and no DSP.
Pre-amp switched out. 20kHz tone spacing.

Table 3: Reciprocal mixing effects
3dB reduction in 12dB SINAD wanted signal

Reciprocal mixing ratio	Signal spacing (kHz)	(dB)
	+5	78
	+10	91
	+20	98
	+50	107
	+100	115

What does this all mean? The TS-570DM is an excellent receiver. The sensitivity is just right without the preamplifier, although this can be switched in for listening on quieter high frequencies, and there is an additional 20dB attenuator which can be switched in as well (although I would have preferred two 10dB steps). The dynamic range is also excellent, even at the price of the TS-570DM, and it shows when using the receiver on crowded frequencies. The reciprocal mixing performance can still be bettered by receivers using crystal oscillators for the first conversion, and this is evident in the close-in measurements although it is clear that the noise performance at wider frequency separations is very good. All the measurements confirm or exceed those given by the manufacturer, and the receiver had no apparent vices whatsoever.

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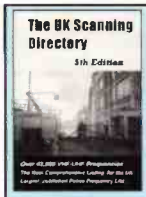

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Build A Bandpas

Beam antennas have several attractions for the short wave listener. In this article Joe Carr, K4IPV explains the reasoning behind beams and how to work out the optimium dimensions.

Various types of beam antennas are used for short wave reception. The attractions of these antennas is that they provide gain and directivity. These two interrelated attributes of beam antennas are used for different purposes. The gain attribute means that a signal of any given strength arriving at the antenna will be stronger in the same signal picked up by some reference antenna, usually either a theoretical construct called the isotropic source or a dipole. An antenna gain of 3dB (which is modest) represents a doubling of the signal strength. To put this in perspective, many receivers use a scaling factor of 6dB/S-unit, so a modest 3dB gain provides about half an S-unit difference.

The other attribute, directivity, is often of more use to receiver operators than the gain. The directivity can be seen in the pattern of the antenna. All antennas are actually three dimensional devices, i.e. the pattern has both elevation and azimuthal extent. In this article we will take a look at the azimuthal pattern, which is the pattern as seen from above.

A Fly In The Ointment

The omnidirectional pattern is shown in **Fig. 1**. This azimuthal pattern is that of vertical antennas. It receives signals from all directions equally well. This seems like an advantage, especially to someone who doesn't have the space or money to erect a directional beam antenna. But there is a 'fly in the ointment', as they say: if the signals are on the same or adjacent channels, then interference results.

Good radio reception is largely a matter of signal-to-noise ratio. Indeed, all good books on radio receivers or communications systems deal with the matter of detection in the presence of noise and other signals. In crowded bands, like most of the high frequency (h.f.) short wave spectrum, undesired signals fall into the category of 'noise' for reception purposes. An omnidirectional antenna does not discriminate directionally, so will gladly supply these 'noise' signals (QRM) to the antenna input of your receiver...to your detriment.

'Figure-of-8' Patterns

Many forms of antenna have so-called 'figure-of-8' patterns. Half wavelength ($\lambda/2$) dipoles have this type of pattern, with their maxima being perpendicular to the antenna wire, and their minima (or 'nulls') off-the-ends. The large loop antennas have a square shape and are made with total wire lengths of $\lambda/2$ to 2λ, with the one wavelength size (e.g. $\lambda/4$ per side of the square) being the most common. These antennas also exhibit the 'figure-of-8' pattern with their maxima broadside to the plane of the loop wire. Small loop antennas (e.g. < 0.2λ) also have a 'figure-of-8' pattern, but their maxima are off-the-ends and their minima are broadside to the loop plane.

Antennas with a 'figure-of-8' azimuthal pattern are better at rejecting unwanted signals than the omnidirectional antenna. In **Fig. 2** we have three cases, A, B and C (assume that all signals are on the same frequency and are of equal strength). The signals arriving from directions 'A' and 'B' are well within the maxima lobes, so will be picked up with essentially full strength. The signal from direction 'C' is positioned in the null, however, and is thus considerably attenuated. If 'A' or 'B' is the desired signal, and 'C' is the undesired signal, then the overal signal-to-noise ratio between the desired and undesired signals is improved. Reception is certainly made more comfortable in any event, and in some cases the difference may make an unhearable signal audible.

But there is still a problem with the 'figure-of-8' pattern. If signal 'A' is desired, and signal 'B' is undesired (or *vice versa*), then one will interfere with the other because the antenna welcomes them equally. An amusing incident (although it was deadly serious at the time) where bidirectional antennas came to ill was during the Battle of Britain. According to the account by David E. Fisher in *A Race on the Edge of Time*, a friendly aircraft from the Continent was sighted by the Chain Home radar stations.

s Beam Antenna

Hurricane fighters scrambled to meet the threat. Because either Chain Home used bidirectional antennas at the time, or the rearward screening didn't work well, the rising fighters were seen as new 'blips' on the screen. With the A-scan method of oscilloscope display in use early in the radar era, it was impossible to get good directional information. According to Fisher, aircraft both east and west of the antenna would look the same to the radar operator. The 'Battle of Barking Creek,' as the incident was called, wasn't a good start for radar electronic warfare, I'm afraid.

Unidirectional

The pattern for a beam antenna is shown in **Fig. 3**. It is called unidirectional because the main lobe (in the direction of the large arrow) is much larger than the sidelobes or the back lobe. As a result, signal 'A' is received at or near full strength (and increased by the gain of the antenna), while signals 'B' and 'C' are attenuated because the gain of the antenna in their direction is much smaller.

The beamwidth of the antenna is a measure of the width of the main lobe, and is usually measured at the points where the gain drops off -3dB from the peak (which is labelled 0dB here). The angle between these points is known as the beamwidth of the antenna (angle α in **Fig. 4**).

Narrow Band

One of the problems seen with beam antennas is that they are rather narrow band compared with dipoles and verticals. Get more than 40 or 50kHz from the design frequency, and v.s.w.r.rises remarkably and gain falls off. This can be more than a nuisance, but there is a way to broaden the frequency bandwidth somewhat: use the Bandpass Beam Antenna (BBA), also known as the LPY array (Log Periodic Yagi), shown in **Fig. 5**. The design of truly optimum log periodics is beyond the scope of this article, and indeed has taken several books. But there are rules of thumb guidelines that produce workable and even exciting results, especially as long as one doesn't become too ambitious as to bandpass. According to Orr (1983), the gain of this antenna can vary from 9dB to 20dB over the 500kHz bandpass, while the front-to-back ratio was on the order of 30dB, with a v.s.w.r. of less than 1.2:1. A small 10m amateur band version that I built several years ago showed gain figures (as near as one can measure gain —

Fig. 1.

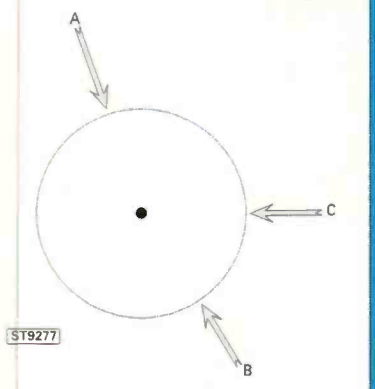
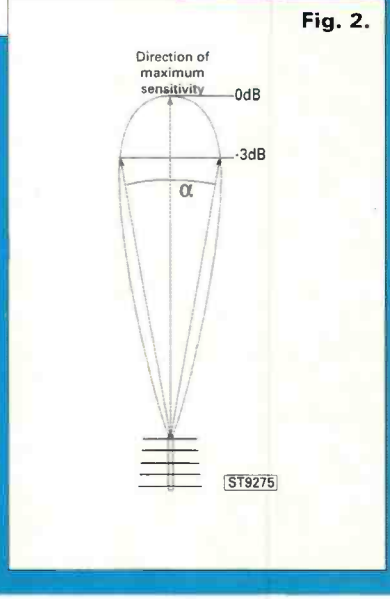


Fig. 2.



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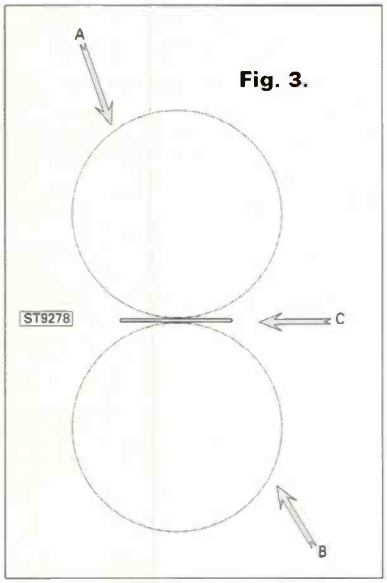

Fig. 3.

▶31 tricky business outside of an anechoic chamber) close to these, but a little on the short side. The front-to-back ratio on my beam was on the order of 25dB according to my notebook, and the v.s.w.r. was less modest than claimed in Orr, rising to about 2:1 at the high end of the band.

The Bandpass Beam

The BBA antenna consists of five elements: a reflector, two drivers and two directors (yes, that's right, **two** driven elements). The drivers are cross-connected with a twisted piece of transmission line in the manner of the ZL-Special beam antenna. The transmission line harness can be made of 300Ω ribbon feeder of the sort used as the v.h.f. f.m. antenna supplied with hi-fi tuners - and television downleads in the USA. With the configuration shown, the feedpoint impedance is about 200Ω, which is close enough to 300Ω to allow the use of ribbon feeder to the receiver if a moderate v.s.w.r. can be tolerated. Or, alternatively, a 4:1 BALUN can be connected to the feedpoint, allowing 50Ω coaxial cable to be used for the feeder run to the receiver. Personally, I prefer the latter approach.

The element lengths are shown in some of the literature in a vague manner. The reflector length is said to be about half a wavelength at the lowest frequency of operation, while the length of Director 2 is supposedly about half a wavelength at the highest frequency of operation. This language is fine for larger, very wideband LPY antennas, but falls down a bit for smaller and narrower band arrays of the sort depicted in **Fig. 5**.

If the required bandwidth is kept to about 500kHz on h.f., and a couple megahertz in the mid-v.h.f. region, then certain approximations can be made and these are shown in **Table 1**.

Table 1.

Element	Length (m)	Length (ft)
Reflector	160.0/f	525/f
Driver 1	139.6/f	458/f
Driver 2	126.5/f	415/f
Director 1	140.2/f	460/f
Director 2	138.1/f	453/f
Spacing	**(m)**	**(ft)**
A	22.3/f	73/f
B	30.2/f	99/f
C	53.6/f	176/f
D	74.1/f	243/f

Where f is the frequency, in megahertz (MHz), at the mid-point of the desired 500kHz band segment on h.f., or 2MHz band segment on mid-v.h.f. bands.

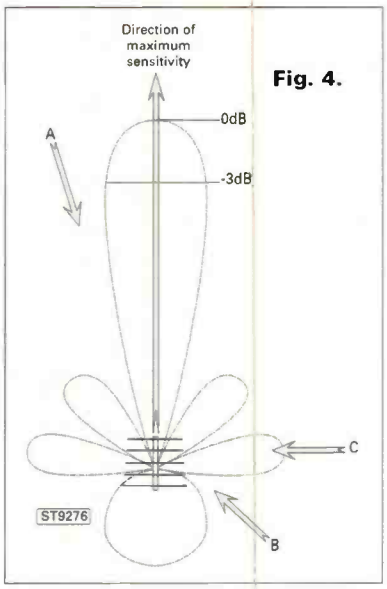

Fig. 4.

These approximations don't result in the highest performance possible with this design, but are accessible to large numbers of readers and work reasonably well up to about 300MHz, although for the 450MHz band one might have to do some fiddling with the dimensions for best performance.

On the h.f. bands, the BBA antenna can be built of either wire or aluminum tubing, depending on circumstance. For h.f. beams the length to diameter ratio of the elements is not as critical as for v.h.f. beams. For v.h.f. versions, you might want to stick with 6mm (0.25in) tubing. Tips and techniques on building beam antennas can be found in various books on antennas.

References

1. ***ARRL Antenna Handbook for Radio Amateurs.*** **(American Radio Relay League, Newington, CT, USA). Any recent annual edition.**

2. **Joseph J. Carr, *Practical Antenna Handbook - 2nd Edition* (TAB/McGraw-Hill, 1994, Blue Ridge Summit, PA, USA). *Joe Carr's Receiving Antenna Handbook* - (HighText, Solana Beach, CA, USA. 1994).**

3. **William Orr, W6SAI, *Beam Antenna Handbook* (Radio Publications, Inc. Wilton, CT, USA. 1993).**

4. ***RSGB Radio Communication Handbook.*** **(Radio Society of Great Britain, Potters Bar, Herts. 1994).**

All the books mentioned are available from the *SWM* Book Store.

■

LPY Calculator Software

The calculations for the BBA/LPY antenna, over the range 3 to 300MHz, can be made using a piece of Windows software called *LPY Calculator*.

If you would like a copy of *LPY Calculator* send two £1 coins, taped to a piece of card, to *Short Wave Magazine*, *LPY Calculator* Software, 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.

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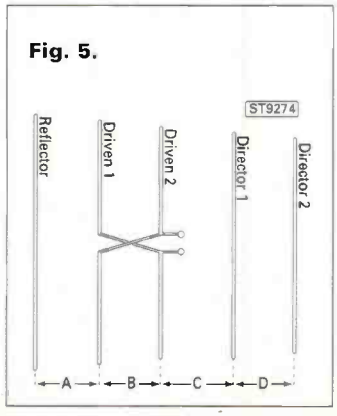

Fig. 5.

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Ben Nock G4BXD takes a look at another of the elderly (classic) valved receivers with a reputation far greater than their capabilities.

One of a long line of fine communications receivers produced by the Eddystone company is the S770R, a 19 to 165MHz set providing reception capabilities for a.m., n.b.f.m., f.m., c.w. and s.s.b modes.

Ruggedly constructed, the single conversion superhet of the 1950s featured 'advanced' design, for its time, and a set that can operate in a wide range of climatic conditions. As well as being a fine communications receiver, the S770R could also be used as a piece of test equipment, its wide continuous frequency coverage and 'S meter' making it ideal in this role.

The frequency coverage of the set is 19 to 165MHz in six bands, 19-27, 27-39, 39-54, 54-78, 78-114 and 114 to 165MHz. A single i.f of 5.2MHz is employed, with variable selectivity being provided. The b.f.o. is non adjustable.

In all, 19 valves and three germanium diodes are used. The supply requirements are 110 to 230V a.c., antenna input of 75Ω unbalanced and an a.f. output of 3W into a 2.5Ω speaker.

The styling of the set is in common with other '700 series' sets, the 730/4 for instance. It features the large rectangular tuning scale, flutes in the die cast case sides, large chrome grab handles, an opening top lid, and the usual weighty finish. The visually matching S770U receiver, follows on in frequency coverage, tuning continuously from150 to 500MHz.

The circuit design is also classic Eddystone. A tuned r.f. amplifier feeds a mixer, the local oscillator being a free running type, operating on the high side of the received signal, at v.h.f. frequencies. Four stages of i.f. amplification are used to feed the a.m. detector. A further stage of i.f. limiting precedes the f.m. discriminator stage, two stages of a.f. amplification precede the a.f. output stage. The full block diagram of the S770R is shown in **Fig. 1**. The front, underside and rear views are shown in **Fig. 2**, **Fig. 3** and **Fig. 4** respectively. The specifications for the S770R are detailed in **Table 2**.

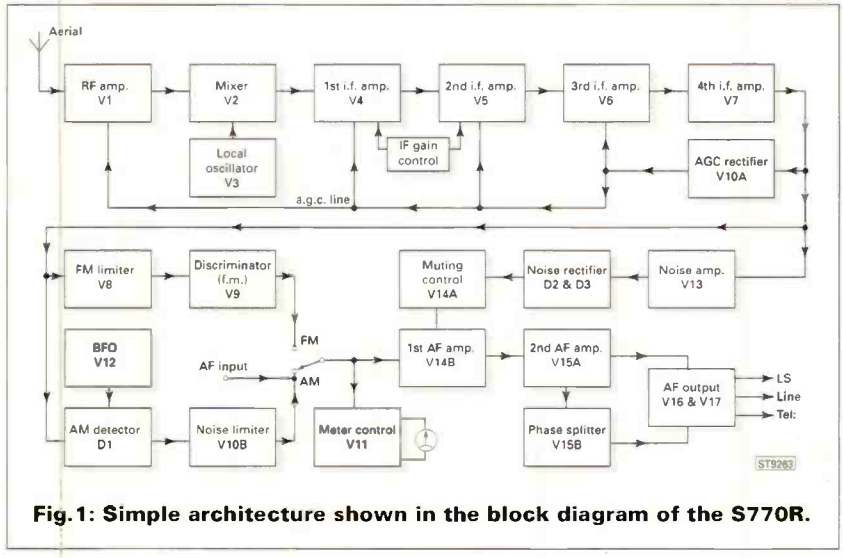


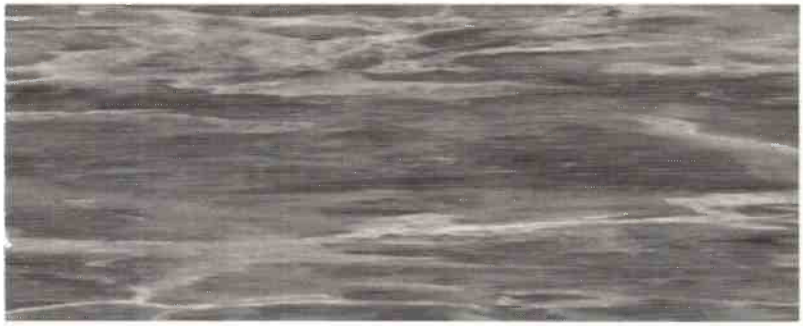
Fig.1: Simple architecture shown in the block diagram of the S770R.

Circuit Description

The r.f. section of the '770R uses a miniature, 3-gang, split-stator tuning capacitor along with a rotary turret wavechange assembly which switches the six banks of associated coils. A 6AK5 is used as the r.f. amplifier, lead lengths around this stage being kept to a minimum in the interests of stability.

The a.g.c. is applied to the r.f. amplifier in all modes except c.w. Manual gain controls are only available for the i.f. and a.f. stages. The local oscillator also uses a 6AK5 strapped to operate in triode configuration. The entire r.f. section is housed in its own die cast box, the h.t. feed to the section being regulated by a VR150/30 thermionic voltage stabiliser.

The four stages of i.f. amplification use the 'variable μ' 6BA6 pentodes. Variable selectivity is provided by switched tertiary windings on the i.f. transformers, the switch being ganged with the mode switch. The three bandwidths, dependent upon mode selected, are 15kHz at 8dB down (more normally expressed at 3 or 6dB down these days) on c.w. and a.m., 40kHz at 8db down on n.b.f.m. and 150kHz at 8db



down on f.m. mode. Careful attention to layout and effective screening ensures symetrical i.f. response in all positions of the mode switch.

The final i.f. amplifier feeds the a.m. detector and the f.m. limiter circuit. The diode a.m. detector also being used, with the b.f.o., when switched to c.w. mode. Included in the detector circuit is a 'series type' noise limiter, this is effective in reducing pulse type noise interference. The noise limiter can be switched in or out as required.

The f.m. limiter circuit feeds a Foster Seeley type discriminator, using a further two germanium diodes. A meter on the front panel acts as an 'S meter' on a.m. and c.w., or as a centre zero tuning meter with f.m. mode selected.

Muting, or squelch in today's parlance, is provided by rectifying the noise above 15kHz which is present in the absence of a signal. The rectified voltage is used to provide a biasing voltage which is then used to switch off the first stage of a.f. amplification. When a signal appears, the bias voltage is reduced re-enabling and the a.f. stage, allowing the signal to be heard.

An internal preset allows adjustment of the muting threshold, a front panel toggle switch selects muting as required.

As already stated, three stages of a.f. amplification are used, two drivers and a push-pull output stage, delivering a nominal 3W to a 2.5Ω load. A 'PU', or pick up, socket on the rear panel of the set allows an external a.f. signal to be fed to the receiver which then acts an an audio amplifier. Further outputs for 600Ω line and high impedance headphones are provided.

The power supply is a conventional design, transformer, h.t. rectifier valve and voltage stabiliser. The stabilised h.t. is fed to the r.f., mixer and local oscillator stages, it also feeds the b.f.o and 'S meter' circuits.

A Case In Point

The mechanical aspects of the receiver are equally well attended to. A rugged die cast front panel mates with a rustproofed steel chassis and outer case. A sub-chassis system is used throughout, all the units being made from rustproofed steel or brass material. Handy chromium plated handles at each end of the case being useful, for not only lifting the set but, when placed face down, protecting the control knobs from damage.

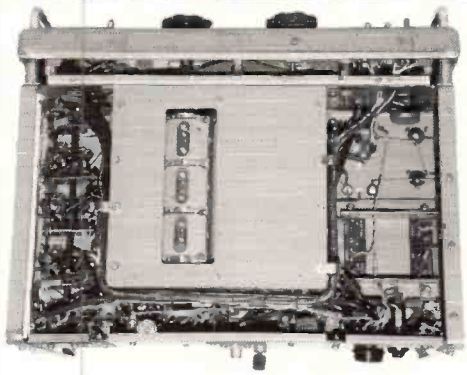
The main chassis is removed from the cabinet by the removal of four large screws at the corners of the rear panel. Steel protecting rails allow the set to placed in any position for servicing without damage to the internal assemblies.

The all up weight of the 770R is some 27kg, its dimensions being some 432mm in width, 220mm high and 367mm deep.

The large rectangular tuning dial, the trade mark of Eddystone sets, is calibrated to within 1% on ranges one and two, and to within 0.5% on the others. The geared reduction drive provides a 140:1 ratio with freedom from backlash and good resetting accuracy. In conjunction with the logging scale on the

Table 1: Valve Line-up.

V1	6AK5 or EF95	r.f. amplifier
V2	6AK5 or EF95	mixer
V3	6AK5 or EF95	oscillator
V4	6BA6	1st i.f. amplifier
V5	6BA6	2nd i.f. amp
V6	6BA6	3rd i.f. amp
V7	6BA6	4th i.f. amp
V8	6AU6	f.m. limiter
V9	6AL5	f.m. discriminator
V10A	6AL5	a.g.c. rectifier
V10B		noise limiter
V11	6AU6	meter control
V12	6BA6	b.f.o.
V13	6AU6	noise amplifier
V14A	12AU7	muting control
V14B		1st a.f. amplifier
V15A	12AU7	2nd a.f. amp
V15B		phase splitter
V16	6AM5	a.f. output
V17	6AM5	a.f. output
V18	VR150/30	stabiliser
V19	5Z4G	rectifier
D1	GEX34	a.m. detector
D2/3	GEX34	noise rectifiers



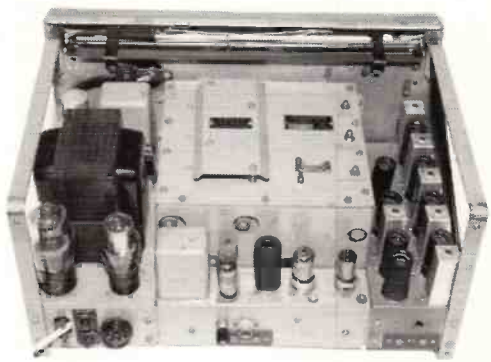


Table 2: Specifications.

Sensitivity:	5µV for an o/p of 50mW at a S/N of 15dB
Image Rejection:	Better than 20dB down at 165MHz rising to better than 50dB down at 25 MHz
Selectivity:	c.w./a.m. 15kHz at -8dB n.b.f.m. 40kHz at -8dB f.m. 150kHz at -8dB
Noise Factor:	Range One 14dB, Range Two 10dB Range Three 8dB Range Four 6dB Range Five 5dB Range Six 5dB
IF Breakthrough:	80dB on Range Six -100dB on Range One
AGC Range:	a.f. o/p change of <12dB for 70dB input change over 5µV.
Muting Level:	signal of 5µV will release muting.
AF Output:	3W into 2.5Ω, ±2dB from 100Hz-10kHz.
PU Input:	15mV at PU gives o/p of 50mW.

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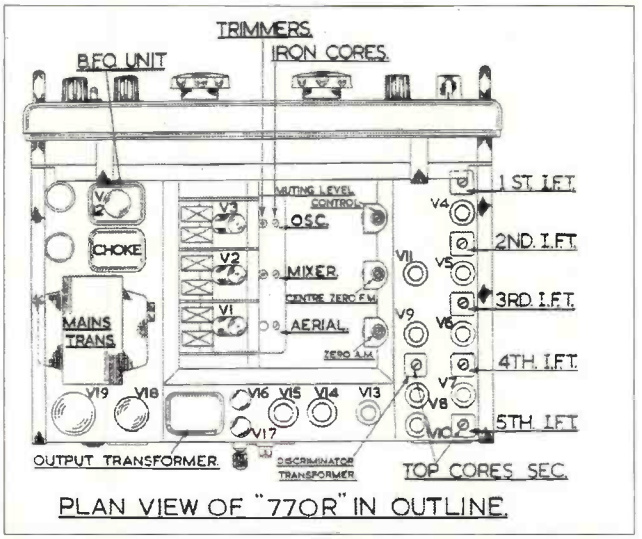


Fig.2: From the Eddystone handbook, the internals in plan view.

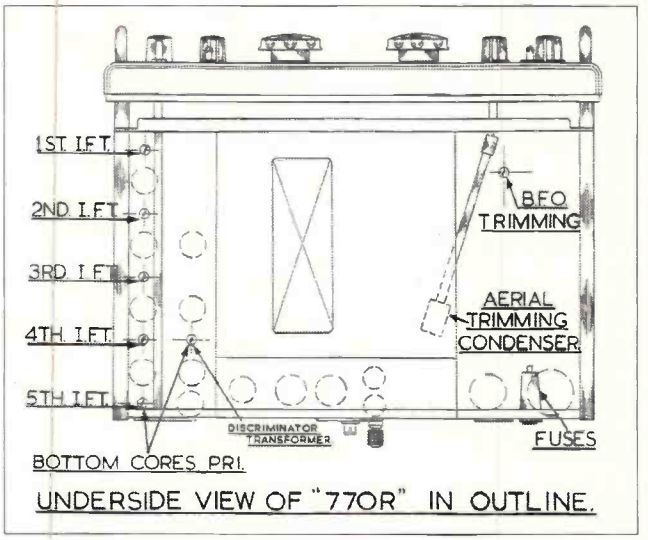


Fig.3: What's what underside.

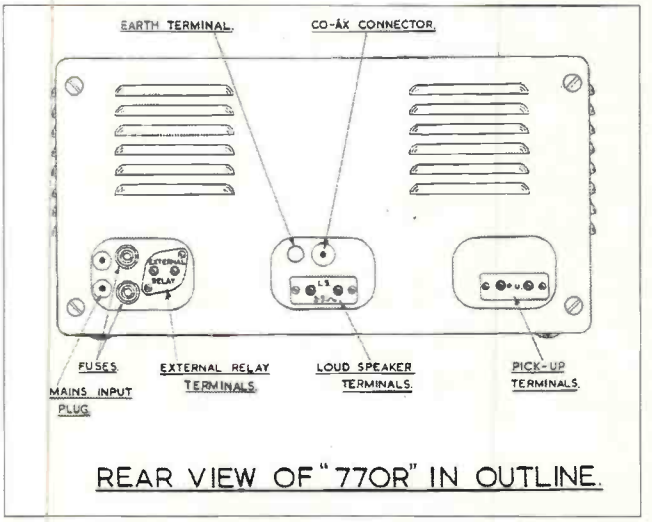


Fig.4: A handful of connections.

vernier bandspread a total dial length of some 10.3m is achieved.

The set is normally used as a desk top model, there were, available fixing brackets, part No 5344P, to secure it to a table top. Alternatively, brackets could be ordered from Eddystone to mount the set in a standard 19inch rack. If used on the table top there were further brackets available, Catalogue number 774, that raised the set off the surface slightly, thus allowing easier operation of the controls.

The layout of the set is such that with the front of the set towards you, the power supply section is along the right, the r.f. section, the r.f. amplifier, mixer and local oscillator, is located in the centre of the set, the i.f. stages down the left and the audio section along the rear.

On top of the r.f. section are the presets for muting adjustment, meter centre zero adjust on f.m. and meter zero adjust for a.m. reception.

Re-Aligning The Set

This is a rather complicated task, not one to break your teeth on in the servicing side of the hobby. For instance, the i.f. alignment requires the removal of the r.f. amplifier, the local oscillator and b.f.o. valves.

The i.f. stages are then aligned, then the b.f.o., the discriminator then the r.f. section. Rather than confuse the reader with an abridged version of the instructions I would be happy to provide a copy of alignment instructions upon request. I can be contacted (QTHR), direct or via the Editorial Offices.

Antennas

As the set covers the upper portion of the h.f. band and the v.h.f. bands it is unlikely that one antenna will suffice. Long wires with an a.t.u. or h.f. dipoles will work for 15, 12 and 10m amateur bands, then the more usual amateur band antennas, whips, Slim Jims, dipoles or beams for the 6, 4 and 2m bands.

A useful antenna with this kind of set is the wide band discone. Using a discone at my location brought in signals across the spectrum. Obviously not as good as a tuned antenna, the discone offers wide frequency coverage from a single feeder.

An alternative is to cut dipoles for the different frequencies of interest, say airband, 6, 4 and 2m, then connect them to a single feeder to join to the set. I have just such a multi-band dipole in the loft and the results are quite acceptable.

When not listening to amateur stations, I use the '770R v.h.f. broadcast band DXing between 88 to 108MHz. It is amazinging to see just how many local radio stations can be heard with a decent antenna. Leaving the set tuned to a distant broadcast station will give an indication of band conditions, allowing the capture of that 2m DX.

And Finally

Whilst the set is robust and a bit heavy, it is mechanically sound, not prone to the howling and frequency shifting so common on lesser sets. The tuning is very smooth, easy to reset to a particular frequency and the wide range of modes available mean that all types of signals can be resolved.

The S770R is a very nice set to play with, a worthwhile item of test equipment and certainly a talking point in any shack. I suggest you keep your eyes open at the next rally and see if you can pick yourself up a nice example. Have fun and good listening.

■

RADIO SECRETS

THE MONSTER IN THE FIELD

David White takes another trip back in time to discover yet more wartime radio secrets.

In the mid 1970s, a farmer at Wymondham near Norwich in Norfolk, became fed-up with having what looked like a metal manhole cover in the middle of one of his fields. It had to be carefully avoided in order to prevent damage to his farm machinery.

After a considerable time, he decided he would have to remove it. And what appeared at first sight to be a simple task, soon turned out to be anything but.

The manhole cover appeared immovable, so some concentrated digging was called for. A whole day at this seemed to reveal the top of what at first sight appeared to be a rusty buried submarine.

The more they dug, the bigger the object appeared to get. Getting somewhat alarmed now and wondering what the purpose of the object might be, the farmer decided to contact the authorities to see if they could throw any light on the matter.

None of them knew anything about it and it seemed that it would remain a mystery until a local man remembered seeing what looked like wireless aerials in that field during the war and wondered if that might be something to do with the large metal object.

Eventually, the enquiries reached the Radio Society of Great Britain and specifically the ears of radio amateur, Pat Hawker G3VA who thought he might know what the strange metal object could be. Pat, in turn, contacted another amateur radio enthusiast, a Mr Gerry Openshaw G2BTO of Bolton in Lancashire, who was pretty sure he knew what the mystery object was likely to be.

Excavation Time

In the meantime, the farmer had decided that the nuisance in the field must be removed and with much heavy excavating equipment our metal mystery was finally brought out of the ground (see **Fig. 3**). The object when finally unearthed turned out to be about the size of a very small bungalow and made of galvanised metal.

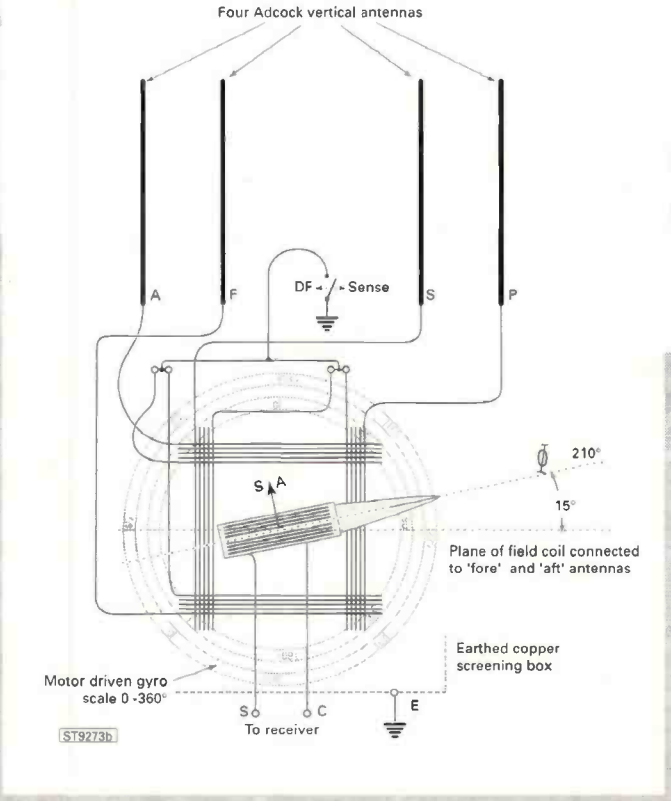
When the hatch was finally prised off, it revealed an iron ladder on the inside wall. Gerry Openshaw and a colleague, George Edwards G2UX decided to make the long journey to Wymondham to confirm their suspicions for themselves.

Upon their arrival, another ladder was placed against the outside to gain access to the top. Gerry and George entered and both men recognised the chamber immediately as part of a very secret World War Two, enemy radio signals location unit.

Back In Time

Now, we take a step back in time to reveal just why the huge metal tank had been buried in the ground in the first place. The year is early 1939 and war clouds were gathering fast. Officials in the internal security department (MI5) had created an organisation to detect illicit radio transmissions in the United Kingdom.

This was called the Radio Security Service with its headquarters located in, of all places, Wormwood Scrubbs prison, London. It was, apparently, difficult at the time, to find suitable secret accommodation. In September 1939, James



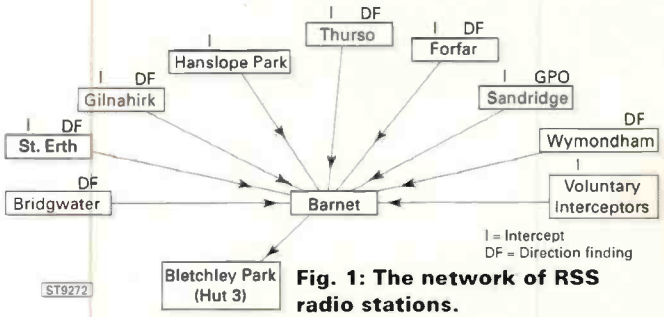


Fig. 1: The network of RSS radio stations.

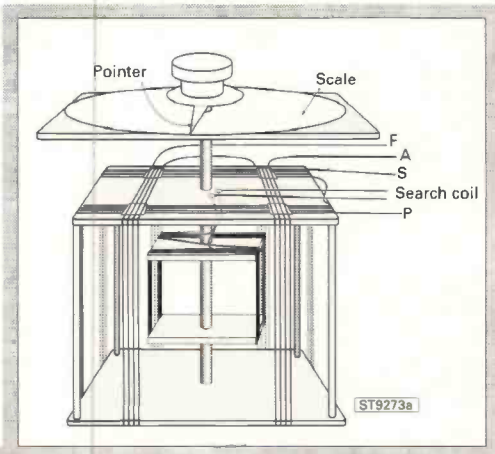


Fig. 2: The d.f. antenna and goniometer details.

Sandhurst, who was the manager of a wine merchants, was commissioned into the RSS and given the rank of Major.

Because his full title in the RSS was Major Lord Sandhurst he was also entitled to sit in the House of Lords since 1933. With much experience of signals attained during the First World War the Major made contact with Arthur Watts, who was then the President of the Radio Society of Great Britain, and also a licensed radio amateur with the callsign G6UN.

Arthur was requested to attend an extraordinary meeting with Lord Sandhurst at Wormwood Scrubbs prison and he was amazed to find that he was actually being interviewed in one of the prison cells. The result of this interview was that eventually several hundred radio amateurs who were RSGB members volunteered to search for enemy radio beacons, which might be used to guide enemy bombers to targets in Britain and also to listen for enemy agents in this country that would be trying to contact Germany by radio.

Although they listened diligently they never detected any spies or radio beacons in this country.

Mystery Signals

However, they had accidentally stumbled on many mysterious wireless signals, the number of which was increasing all the time as Germany invaded most of Europe. What they had accidentally discovered was a huge European radio network of enemy agents which made the RSS realise that they could not hope to monitor all of these signals on a 24hr basis, just by using the Voluntary Interceptors who were only listening in their spare time.

Even so, the traffic that they were intercepting was considered to be extremely important, with the listening reports pouring into the RSS headquarters daily. In October 1940, the RSS moved out of the prison and into new headquarters, which had been specially requisitioned and these were at Arkely near Barnet in Hertfordshire.

This new headquarters was needed to handle the large numbers of VI logs. Also constructed was a 20 position wireless intercept station at Ravenscroft which was a large house next to Arkely View, this was able to give 24hr coverage of the enemy radio signals. The HQ was given a special cryptic address, which became famous as PO Box 25, Barnet.

The number of secret enemy transmissions that were now being intercepted became so huge that it became increasingly difficult to cope. Realising the vital importance of what was being intercepted, the authorities decided to militarise the system and expand enormously. The autumn of 1941 saw a massive re-organisation with MI6 taking over the responsibility for the expansion and most of it now came under the umbrella of the Secret Intelligence Service, and this now became known as Special Communications Unit Number Three, ostensibly under the Royal Corps of Signals.

Immediately, plans were

43 ▶

Fig. 3: The Wymondham underground steel d.f. station following rediscovery and excavation in the mid 1970s.

Fig. 4: Gerry Openshaw G2BTO, operating the d.f. station goniometer in 1943 showing the Marconi equipment. Three similar underground stations were at Wymondham in Norfolk, St. Erth in Cornwall and Thurso, Scotland.

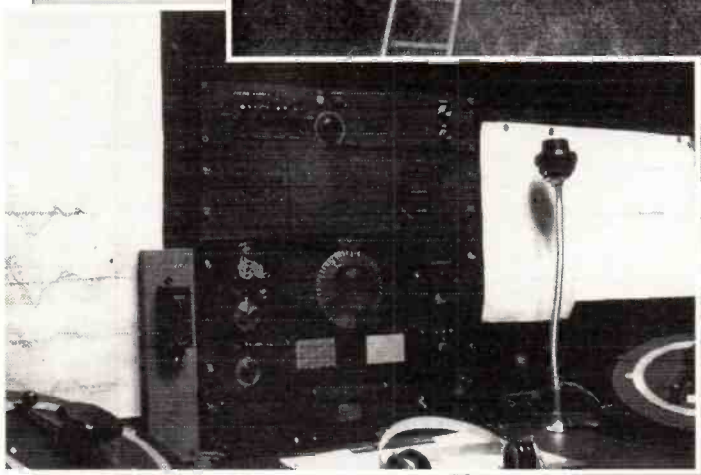


Fig. 5: Inside the underground d.f. station at St. Erth showing the HRO receiver, microphone on stalk, headphones and two goniometers one of which was a spare.

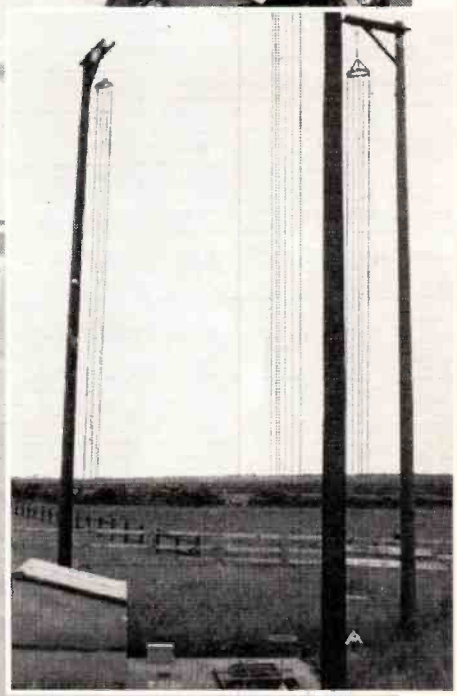


Fig. 6: St. Erth underground d.f. station 1943 showing the entrance hatch and three of four Adcock antenna support masts.

All the photographs used in this article were kindly supplied by Gerry Openshaw G2BTO. The originals are currently on display in the Bletchley Park Radio Museum. The photos were taken by Gerry between 1943-44.

41 ▶

put into operation to build a huge intercept station at Hanslope Park in Buckinghamshire and another one at Forfar in Scotland. Three of the GPO civilian intercept stations were taken over along with their radio direction finding stations and these were located at St Erth in Cornwall, Gilnakirk near Belfast and Thurso in the far north of Scotland.

Additional Stations

Additional direction finding stations were built at Bridgewater in Somerset. At the Forfar station and finally at Wymondham in Norfolk (see **Fig. 1**), every intercept d.f. station was connected to the Central Control at Barnet and all would be linked together on an open landline so that they could contact each other using a Morse key and an audio oscillator.

The system would work as follows: An intercept operator at Ravenscroft would detect an unknown signal on his HRO communications receiver, he would immediately alert central control, who would switch the received signal direct onto the d.f. landline, Control could then call any d.f. station in Morse code using the following procedure 'CQ CQ DE RSS BTO 6998' and this was immediately followed by the unknown signal which would be received via the landline and heard in the right-hand earpiece of the d.f. operators headphones.

The d.f. operator would then tune his Marconi RG42 receiver until he matched the landline signal with the one on his own receiver, which could be heard in the left-hand earpiece. As soon as he had discovered this signal, the d.f. operator would then rotate a search coil in a device called a 'Goniometer' (see **Fig. 2**).

In order to find the point where the signal was at a minimum, each d.f. station would then report in turn to d.f. Control at Barnet using Morse code giving the compass bearing of the unidentified wireless transmission. All of these bearings were combined which gave accurately the location of the enemy transmitter and they were plotted on a large map at Arkely by a contingent of ATS girls.

Redundant Turret

When Gerry Openshaw was sent to Wymondham to go into the large metal underground tank he was told it was a redundant gun turret off a large navy warship, and it was buried in the ground for the purpose of keeping out all unwanted radio waves. The received radio waves consist of two elements the direct ground wave and the reflected sky wave.

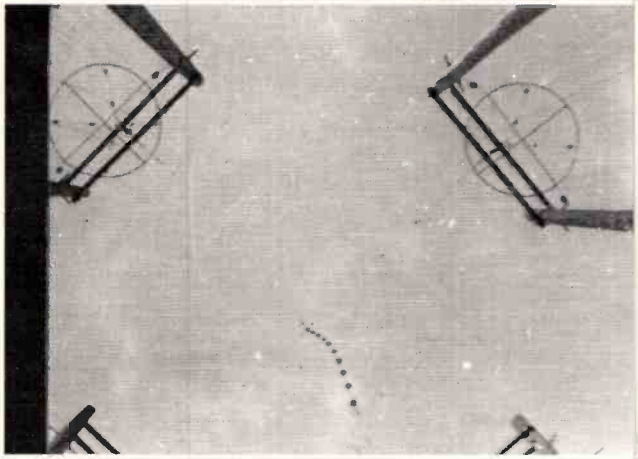


Fig. 7: Close-up view of the Adcock d.f. antenna looking upwards from the doorway of the d.f. hut at Thurso 'A' Station showing the short sense antenna hanging down from the cross wires.

Fig. 9: A special meeting of RSS d.f. operators outside the Hanslope Park d.f. station in 1944 where they had been examining the experimental spaced loop system. The picture include both Gerry Openshaw G2BTO (4th from the right) and Lou Varney G5RV wearing the captain's hat in the centre.

Fig. 8: RSS d.f. station 'A' at Thurso in 1943 with Adcock antennas alongside the bullet proof hut which contained an HRO receiver. Shown in the foreground is a signal generator being used to check compass bearing errors. In the distance, the antennas of the 'B' d.f. station can be seen.

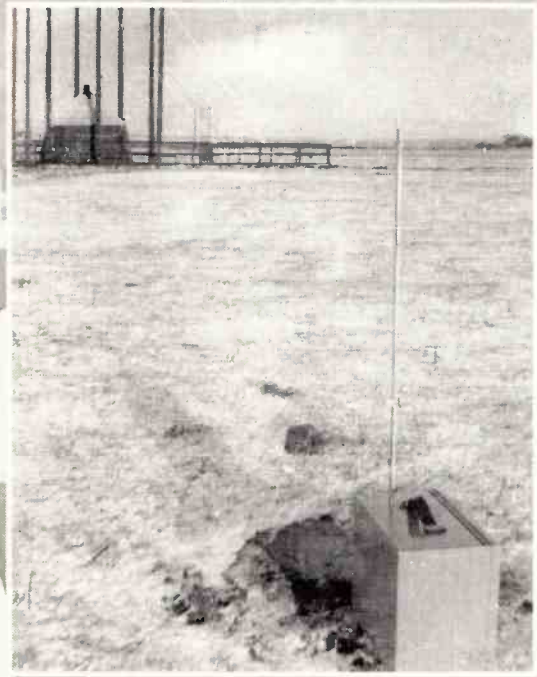


Fig. 10: Thurso d.f. station in the winter of 1943 showing the deep snow that had to be trudged through every winter as the station was a long way from the road. Shown are - (left to right) - G. Openshaw, G. Milton and E Houndsworth.

If the ground wave only is received by the vertical part of the d.f. antennas then an accurate null (minimum signal) on the signal can be obtained. If the ground wave and the reflected sky wave are received together then out of phase signals result which makes it difficult to obtain a null.

If only a reflected sky wave is being received, then due to the angle of the radio wave, part of it will be detected by the vertical element of the d.f. antenna and part of it by the horizontal element, resulting in phase problems, which again make a null difficult to obtain.

In 1916 during the First World War, a Lieutenant Adcock had suggested screening the horizontal part of the d.f. antenna to prevent these phase problems and this is precisely why, during World War Two, a refined system was brought into use by the RSS. The massive galvanised iron tanks were sunk into the ground at Thurso, Wymondham and St Erth, they were completely immune from receiving any unwanted radio waves or magnetic fields as they acted as a huge Faraday shield.

Above the tank at Wymondham, four wooden telegraph poles were erected at each corner of it and were spaced about 30 feet apart. A horizontal wooden bar was placed on the top of each pole and this supported a vertical antenna, which was made up of many wires in the form of a cage in order to form a broadband array, as seen in **Fig. 6.**

The bottom of the vertical antenna was fed by a screened feeder, which was also buried in the ground and led directly into the tank. These fed straight into a crossed coil unit which is a Marconi DFG12 Goniometer. The rotating search coil had a pointer and dial marked with 360° points of the compass and this coil was connected directly into a Marconi RG42 communications receiver as can be seen in **Fig. 5.**

The underground tank at Leedstown near St Erth used an HRO receiver and manual goniometer. All the above ground d.f. stations were built into bullet proof huts with a conical roof, very fortunately, this was never put to the test.

Our farmer at the beginning this story had not realised what a historic piece of equipment that he had discovered on his farm. Unaware of what a vital part it had played in locating the enemy intelligence network and the despised Gestapo who were all over Europe, nor how so many licensed amateur radio operators had helped to assist in eavesdropping on these secret enemy signals so that the contents of these signals could be de-ciphered. ■

What's the Time?

There are many time stations operating throughout the world, transmitting time and weather information. Dick Moon explains how they work and what they do.

Time is something we never seem to have enough of these days. Our whole life is governed by clocks which tell us when our day must begin, when our next appointment is, when it's lunch time, right through until it is time to go to bed!

In earlier days, we had to rely on mechanical clocks for our time keeping, which required winding, and even then were not too reliable. Today, digital clocks are in universal use, and keep very accurate time, but even these devices are not foolproof.

How often, after a power failure, do you have to run around resetting all these little red lights, probably from your wristwatch, which in any case is probably not too accurate. The keen radio listeners have a much more accurate method.

They switch on their receivers and tune to either 10MHz or 5MHz and listen. Within a few seconds, a voice informs you that 'At the tone X hours Y minutes Co-ordinated Universal Time (UTICA) Beeeeep', and all the clocks can be set with the knowledge that they are accurate to a micro second.

These time signals are derived the atomic resonance of the element Cesium and are more accurate than mother earth. In fact, every few years a 'leap second' has to be added to compensate for fluctuations in the earth's rotation.

Time Stations

There are many time stations operating throughout the world, but the easiest ones to hear are operated by the National Institute of Standards and Technology in the USA. Three stations are in operation, namely WWV/WWH and WWB. WWV is on a 390 acre site situated close to Fort Collins, Colorado, and operates 24 hours a day, transmitting time and weather information on frequencies of 2.5, 5, 10, 15 and 20MHz.

The time station WWH is sited in Hawaii, on the island of Kauai, and transmits similar information, but on fewer frequencies, and as a means of distinction, has a female announcer. WWB is also sited in Colorado and transmits a binary coded decimal time code, but is unlikely to be heard as it uses a frequency of only 60kHz.

Most time signal stations provide only basic information, usually just the time, but WWV/H provides additional useful information to the short wave listener to enable him to predict future listening conditions, such as Maritime storm warnings and Geophysical alerts. These 45 second alerts are produced by the National Oceanic and Atmospheric Administration's Space Environment Services Centre (SESC), which operates a world-wide network of sensors.

The sensors continuously monitor conditions between the earth and the sun, and are updated every three hours. The alerts are divided into three segments, 1) the current activity, 2) a summary of the conditions during the past 24 hours and 3) a forecast for the next 24 hours.

A sample format of the broadcasts is as follows: *At the tone 15 hours 18 minutes Co-ordinated Universal Time "Solar terrestrial conditions for 10 May follow: Solar flux 150 and estimated A index 45, repeat Solar flux 150 and estimated A index 45. The Boulder K index at 1400UT on 11 May was 5, repeat 5. Solar terrestrial conditions for the last 24 hours follow: Solar activity was low, the Geomagnetic field was at minor storm. The forecast for the next 24 hours follows: Solar activity will be low to moderate, the geomagnetic field will be mostly active".*

Solar Radiation

The Solar flux is at the intensity of solar radiation at a frequency of 2.8GHz, measured by the use of a radio telescope situated in Ottawa, and is proportional to the sunspot activity. The figure broadcast is in solar flux units and can range from approximately 65 to maximum of over 300, the lower figures predominating during the lower portion of the 11 year solar cycle.

The A index is an average of the geomagnetic activity taking place. It is a 24 hour estimate based on four measurements made at three hour intervals at a site in Fredericksburg, Virginia. The scientists at the SESC then check present trends to project the A index, thus it is known as an 'estimated Fredericksburg A index'.

The A index varies between 0 to 400 and propagation conditions are evaluated from these indicesas shown in **Table 1**.

The K index is the result of a three hourly magnetometer measurements which are made at Table Mountain Observatory near Boulder in Colorado. The K index values may range from 0-9 and are related to the A index in **Table 2**.

For reception purposes, the lower the K index, the better conditions will be. A figure higher than four means trouble for the short wave listener and another return to the TV.

Third Portion

In the third portion of the broadcast, the terms relating to solar activity relate to the amount of energy released into the atmosphere and are self-descriptive. The higher the solar activity figure, the greater effect on the ionosphere.

Large solar X-ray bursts cause extensive ionization of the lower regions of the ionosphere causing considerable absorption of s.w. radio waves. The term isolated storm is associated with a solar flare.

These storms are very common during the higher solar activity years. A 27-day recurrent storm can last as long as a year, and as its name implies, the associated disturbances follow a regular 27-day cycle.

This type of storm often occurs after a sunspot maximum during the seven year period of solar activity decline. During periods of high solar activity, conditions on bands higher than 15MHz are improved.

The term Geomagnetic activity relates, as the name implies, to variations in the geomagnetic field and is related to the A Index.

For short wave listeners a category above Active means a degradation of the D-layer of the ionosphere with increased absorption of radio waves and poor reception. Forecasting of radio propagation conditions is a complex operation and the results are still by no means accurate.

As a rule of thumb, however, for good listening conditions, particularly in the medium wave bands, the A index should be under 12 and the solar activity low to moderate. Should the A index remain below seven for several days, excellent reception should be experienced. ■

Table 1

Range of A Index	Category
0-7	Quiet
8-15	Unsettled
16-29	Active
30-49	Minor Storm
50-99	Major Storm
100-400	Severe Storm

Table 2

K	0	1	2	3	4	5	6	7	8	9
A	0	3	7	15	27	48	80	140-	240	400

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- *SSB CW AM FM Data*
- *AM Synchronous*
- *100 Memories*
- *4 filters fitted*
- *Switched Pre-amp*
- *Passband tuning*
- *Enhanced AGC*
- *Noise spike compression*
- *Six level attenuator*
- *Bar S-meter*
- *AC adaptor included*

NB-7030 unit adds 400 memories, text, multiple timers, notch filter, noise blanker and enhanced CPU £179.00

Roberts R-861

Price Match

W&S £169

- *153kHz to 30MHz*
- *FM Broadcast*
- *SSB CW AM*
- *306 Memories*
- *Alphanumeric storage*
- *1kHz dial readout*
- *RDS Built-in*
- *Pre-set BC stations*
- *Built-in whip*
- *Ext. Antenna socket*
- *Inc. case, ant. & Freq. list*
- *Powered from AA cells*

AKD HF-3

W&S £158

- *30kHz to 30MHz*
- *SSB & AM*
- *1kHz steps*
- *Clarifier*
- *3.8kHz filter*
- *1kHz readout*
- *Lovely display*
- *S-meter included*
- *Memory channel*
- *Very nice tuning dial*
- *SO-239 ant. socket*
- *Built-in speaker*
- *Very easy to use*

New HF-3M in stock £199

KENWOOD R-5000

W&S £885

- *100kHz - 30MHz*
- *SSB CW AM FM*
- *100 Memories*
- *10Hz steps*
- *3 IF Filters*
- *Analogue S-meter*
- *Dual AGC*
- *Dual Noise Blanker*
- *Wide dynamic range*
- *Notch filter*
- *IF shift control*
- *Built-in timer*
- *Built-in AC supply*
- *Ext. 12v DC operation*

Icom ICR-8500

W&S £1449

- *100kHz - 2GHz*
- *SSB CW FM WFM AM*
- *1000 Memories*
- *4 IF Bandwidths*
- *Alphanumeric*
- *Analogue S-meter*
- *RS-232 interface*
- *IF shift & Audio filter*
- *Keypad entry option*
- *Min tuning step 10Hz*
- *Sleep timer & record*
- *12v DC supply*

Icom IC-R10

W&S £349

Special

Price Match

- *500kHz - 1300MHz*
- *SSB CW AM FM WFM*
- *Real-time bandscope*
- *1000 Memories*
- *Alphanumeric display*
- *Improved front-end design*
- *Voice scan function*
- *Large clear LCD*
- *Memory edit and copy*
- *100Hz resolution*
- *Noise blanker*

Sony SW-55

Genuine SONY UK Stock*

W&S £249

Full short wave coverage plus FM broadcast. SSB, AM, FM.
FREE carry case

Not all dealers sell genine UK models! Be careful!

AOR AR-5000

SAVE £400

W&S £1349

PRICE DOWN

- *10kHz - 2.6GHz*
- *SSB CW FM AM*
- *1000 Memories*
- *2100 Pass channels*
- *5 Independent VFOs*
- *Alphanumeric*
- *6 IF bandwidths*
- *45 ch. per sec. scan*
- *Duplex monitor mode*
- *RS-232 Port*

AS-5000	Auto 4-way ant. switch	£82.95
CT-5000	CTCSS decoder for AR-5000	£72.95
DS-8000	Speech inverter (also for AR-8000)	£64.95

Yupiteru MVT-9000

W&S £399

Star Scanner

Price Match

- *530kHz to 2039MHz*
- *1000 Alphanumeric Memories*
- *Duplex monitoring & tracking*
- *USB LSB CW AM FM*
- *Channel spectrum scope*
- *Blistering scanning speed*
- *Good performer on the SW bands*
- *Totally programmable*
- *Multiple tuning steps*
- *Extremely sensitive front-end*
- *Good strong sugnal performance*
- *Includes AC charger and Ni-cads*

Sony SW-100E

Genuine SONY UK Stock*

W&S £179

Palmtop SSB & AM receiver plus FM broadcast. Superb performer.
FREE carry case and frequency guide.

Open Day, Sunday 1st June 10am Hockley

Welz WS-1000 Scanner

June Special ~~£299~~ **£229.95**

* World's smallest scanner
* FM, WFM, & AM
* 500kHz - 1300MHz
* Fast scanning speed
* Clear LCD readout
* 400 Memories
* Super sensitivity
* Good strong signal handling
* Runs from just 2 x AA cells
* Battery saving mode

Ham Radio Today Review says *"Lovely little set - very sensitive receiver"*

OFFER ENDS 30th JUNE

Accessories:

CNB-401	Ni-cad pack	£11.95
CSA-401	AC charger	£36.95
WSC-1000	Soft case	£14.95

AOR AR-8000 Scanner

Special W&S £299

Price Match

* 500kHz - 1900MHz
* WFM, NFM, SSB, AM
* 1000 Memory Channels
* 20 Search Banks
* 30 ch. per second search
* Band Scope Display
* Password Protect
* Computer control outlet
* Signal Strength meter
* Illuminated Display
* Programmable Steps
* Ni-cads and AC charger.

Yupiteru MVT-7000 Scanner

Special W&S £249

Price Match

* 100kHz - 1300MHz
* WFM, NFM, AM
* 200 Memories in 10 banks
* 20 channels per second speed
* Programmable Steps
* Illuminated Display
* Audio and Carrier Search
* Signal Strength meter
* RF atenuator switch
* Ni-cads and AC charger

Yupiteru MVT-7100 Scanner

Great Value W&S £269

Price Match

* 100kHz - 1650MHz
* NFM, WFM, SSB, AM
* 1000 Memories
* Signal Strength Meter
* Illuminated keypad - display
* 500 Ch. pass memories
* 30 Ch. per second speed
* Unique mode scan
* Ni-cads & AC Charger

Yupiteru MVT-7200

Special W&S £359

Price Match

* 100kHz - 1650MHz
* WFM, NFM, SSB, AM
* 1000 Memories
* Illuminated kepad - display
* Signal Strength Meter
* Built-in ferrite AM aerial
* Narrow band SSB filters
* Improved SW reception
* Improved selectivity & batt drain
* 30 ch. steps per second
* Ni-cads & AC Charger

AT-2000 Listener ATU

W&S £99.95

* Handles Coax, balanced feed and, long wire
* Covers 500kHz to 30MHz
* Includes unique "Q" switch for best selectivity
* Gets maximum signal into your receiver
* Improves front-end selectivity
* Reduces intermodulation and cross modulation

MFJ-784B DSP filter

W&S £239

* Works with any receiver or transceiver
* This filter is fully programmable with memories
* 16 factory pre-set positions for easy use
* Plugs directly into the headphone socket
* Drives speaker or headset to good volume
* Requires 12v DC at approx. 500mA.

OptoElectronics Scout

Free Freq. Guide

W&S £348

* 10MHz - 1.4GHz
* 400 Memories
* 255 hits record
* Auto store and recall
* Interfaces with AR-8000
* Ni-cads and charger

OptoElectronics Xplorer

PRICE DOWN

25-1300MHz
Nearfield Monitor

W&S £798

* Complete FM Receiver
* Spectrum scan in 1 second!
* Reads out exact frequency
* Records "hits" and multiples
* Shows tones and deviation
* Computer interface option
* Ni-cads & AC charger

WATSON FC-128 Counter

W&S £79.95

1MHz - 2.8GHz

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

WATSON QS-400

NEW W&S £9.95

* Mounts handy or GPS on dash grill
* The safe way to go mobile
* Quick release feature.
* Doesn't use nasty adhesive!

WATSON QS-300 Desk Stand

Super W&S £19.95

* Handheld Desk Stand
* Firmly holds handheld
* Adjustable angle
* BNC plug to SO-239 socket
* Superbly made unit.

Portable Antenna

W&S £14.95

1.8 - 30MHz

Unwinds to 28ft, supplied with 3.5mm plug and whip clip adaptor. Winds back in seconds. Great for portable use, indoors etc. Connects to any receiver

WATSON WSM-1900 Antenna

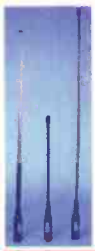
Mini -Magnetic Scanner Mobile Antennas

W&S £29.95

Airband Civil & Military model WSM-225

* 25MHz to 1.9GHz Car Antenna
* 29cm super magnet that really sticks!
* Low profile 400mm long black whip
* 2.75m of coax fitted BNC plug
* Out-performs all others
* Scanning whilst on the move

Portable Scanning Whips



* 25MHz to 1900MHz
* Fully flexible with BNC fittings
* Out-perform factory supplied models.

Tele-Gainer 41cm long rigid telescopic whip with knuckle joint £14.95

Regular-gainer 21cm flexible whip that is ideal as replacement whip £12.95

Super-Galner 40cm flexible model for the ultimate in gain £19.95

WATSON WEP-400 Earpiece

W&S £14.95

* Improved
* Soft pad
* Left/right fit
* 8 Ohm driver
* Extremely comfortable
* Fitted with 3.5mm plug

WATSON WSC-2 Belt Case

NEW

W&S £14.95

Combined quick release spring clip and belt loop. Self adjusting, fits all handys.

WATSON WMM-1 Modem

Lowest Price Ever!
Money Back Warranty

W&S £69.95

The best value in data decoders!

* Packet, AMTOR, CW
* SSTV, Fax, RTTY
* NAVTEX, SYNOP
* Transmit and receive
* Needs PC 286 or better
* Includes software
* No external power required
* Connects to RS-232

USED GEAR

Lots in stock. **R-7000** £699, **NRD-525** £569, **R-2000** £319, **R-5000** £699, **HF-250** £449, **HF-235** £650, **HF-225** £349, **FRG-7700** £299, **R-861** £139, **ICF-7600** £99, **ICF-7600G** £129, **ICF-2001D** £159, **AR-3000** £499, **AR-2001** £129, **FRG-9600** £269, **PRO-236** £219, **PRO-239** £129, **PRO-2006** £159, **MVT-8000** £249, **AR-8000** £229, **IC-R1** £159, **PRO-26** £199, **WIN-108** £109, **VT-125** £129, **VT-225** £159, **MVT-5000** £169, **MVT-7000** £169, **MVT-7100** £199, **GPS-45** £169, **GPS-90** £279, plus lots more.

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REMEMBER at W & S

* We PRICE MATCH
* No Credit Card Surcharge
* Give you 10 days approval
* Have 4 Service Engineers
* Still offer help after the sale!

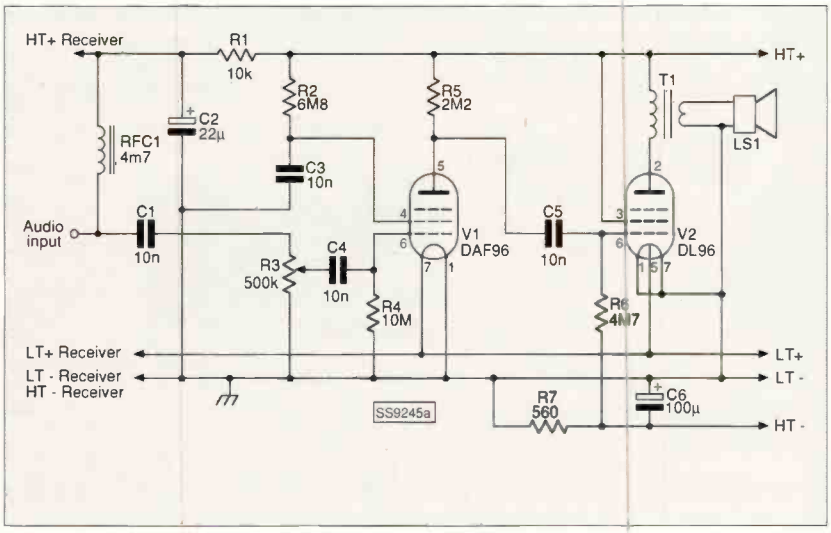
Add-on Audio Amplifier & Supply for the Denco On

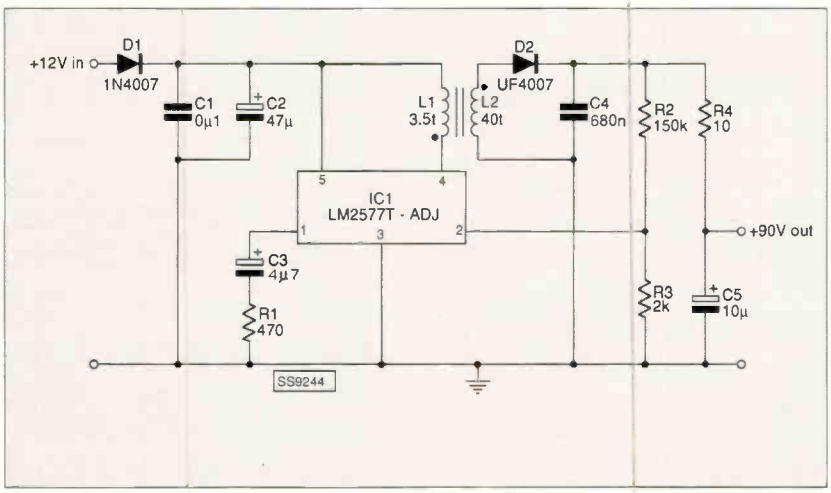
David Allen has been busy designing an add-on audio amplifier and a power supply to go with the Denco Beginner's Simple Short Wave Receiver described in the December '96 SWM.

The audio amplifier uses two low-consumption valves. The first, a DAF96, is a directly heated (no cathode as such) audio amplifying pentode plus a diode. The diode was originally used for detection purposes and is ignored in this application. The second valve, a DL96, is a directly heated output pentode. This valve has a 2.8V centre-tapped filament, so the two halves of the filament are wired in parallel to allow it to run on the same 1.4V as the other valves.

The circuit of the audio amplifier is conventional and uses all those nice high value resistors that most of us have forgotten about. I made some small modifications to the original 'Denco' circuit involving adding a small radio frequency choke in place of the headphones, an additional coupling capacitor and a minor change to the h.t. feed point. The radio frequency choke and coupling capacitor are shown in **Fig. 1** as part of the amplifier input circuit, so that no modifications to the One-valver are needed.

The 4.7mH radio frequency choke (RFC1) replaces the headphones, the high impedance of the choke at r.f. retaining the d.c. on the anode of the IT4 valve, while keeping the r.f. out of the power supply. This means that R2 (in the receiver) now becomes the anode load at audio frequencies.





The 'HT-' Feed

The power connections to the additional amplifier are the same as to the receiver, except for the 'HT-' feed, which now goes to the junction of R6/R7 on the amplifier. The resistor R6 keeps the input grid of the output valve tied down to 'HT-' and is quaintly known as the 'grid leak'.

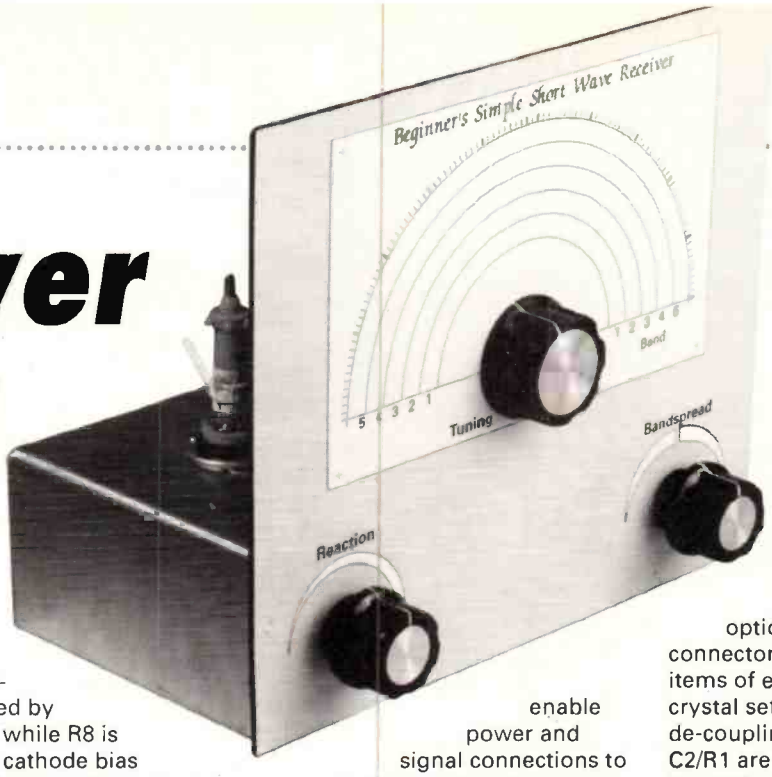
What is loosely called 'cathode bias', if it can be called that when the valve hasn't got a separate cathode, is provided by R8. If you look at the circuit diagram, **Fig. 1**, you will see that the resistor goes from the 'HT-' point to the filament of the valve in a roundabout way, so when the valve is passing h.t. current, a voltage is developed across this resistor, thus providing bias for the output stage.

Output Transformer

The output transformer is a Maplin 250mA miniature range mains transformer with a 240V primary winding and a 6-0-6V secondary winding. The 240V primary on this transformer is connected between 'HT+' and the anode of the output valve, thus providing a load. The loudspeaker is now connected to the low voltage side of the transformer - there is room for experiment here with regard to loudspeaker impedance and whether you use the full secondary or just one half of it.

After further experiment a 100V line matching transformer was pressed into service - Maplin DH49D or similar - with the highest resistance winding connected between the anode of the output valve and 'HT+' to form its load. The other winding of the transformer now becomes the loudspeaker winding. The loudspeaker winding of the transformer has various tappings so try them out with your particular loudspeaker. The speaker I am using at the moment is an ancient 'Elac' 8in diameter twin-cone unit with an 8Ω speech coil in a nice wooden box, giving surprisingly good results. The output of the amplifier also looks good on the 'scope' when fed with 1kHz sine wave.

and Power e-valver



The Circuit

The circuit is a two stage R-C coupled amplifier of conventional design using a DAF96 pentode in the first stage to provide most of the voltage gain. The output valve is a DL96, used once again in conventional mode. This valve provides power to the loudspeaker via the output transformer.

The 'HT+' feed to the Denco one-valver is de-coupled by C2 and R2. Resistor R3 is the screen grid biasing resistor, which is decoupled by its associated capacitor (C3). The audio coupling capacitor, C4, isolates the volume control, as far as d.c. is concerned, from the input grid of the first stage. Resistor R5 is the grid bias/leak resistor and R6 is the anode load for the first stage, the signal from here being fed via C5 to the output stage. The essential grid leak for the output stage is provided by R7, while R8 is the cathode bias resistor for the output stage, decoupled by C6. Without this decoupling capacitor, negative feedback would occur in the output stage and so reduce the gain. The output transformer, T1, converts the high impedance of the anode circuit to the low impedance of the loudspeaker.

Construction

Construction is left open to individual choice. I built the prototype in and around a Maplin MB2 ABS plastics box with little trouble. A 5-pin DIN plug/socket combination was fitted to the short side of the box to enable power and signal connections to be made to the Denco One-valver in an elegant manner. On the rear of the box I mounted four 4mm binding posts for connecting the l.t. and h.t. from your particular power supplies. The binding posts and DIN socket are wired together internally in the amplifier box and the audio from the receiver is also connected to the amplifier via this arrangement. The two valve holders were mounted on the lid of the box, along with the output transformer.

The volume control is mounted centrally on one of the long sides of the box. The resistors, capacitors and internal wiring are all connected directly to the pins of the valve holders and sockets with little trouble. An extra input socket is fitted to the box and wired across the volume control. This socket is an optional input connector and allows other items of equipment, e.g. a crystal set, to be used. The de-coupling components C2/R1 are wired to the rear of the DIN socket.

To test the amplifier, connect the loudspeaker and power, advance the gain control of the amplifier and with a wet finger touch the signal input of the amplifier - a hum should be produced. Connect a lead from the headphone socket of the Denco One-valver to the amplifier input and apply power via the amplifier. Hopefully signals at loudspeaker strength should be audible. I have found this amplifier to be both reliable and stable in use.

An Afterthought

For those who have built the original Denco one-valver and do not have a pair of high resistance headphones, here are a couple of ideas to get you working.

Crystal Earpiece Option: Instead of the high resistance headphones, connect a 2.7kΩ 0.6W 5% resistor in its place. Solder two 0.1µF 63V disc ceramic capacitors across it and connect the leads of the earpiece to the remaining ends of the capacitor.

Low Impedance Headphones Option: Instead of connecting high resistance headphones, try using an old valve type output transformer with the high resistance winding connected to the points where the high resistance phones should be. Connect a pair of low impedance hi-fi style headphones to the low resistance winding. The

53 ▶

You Will Need

Resistors
Carbon 0.6W 5% (Maplin)

2.2kΩ	1	R1
10kΩ	1	R2
6.8MΩ	1	R3
10MΩ	1	R5
2.2MΩ	1	R6
4.7MΩ	1	R7
560Ω	1	R8

Potentiometers

500kΩ *log*	1	R4

Capacitors
Disc ceramic 100V min.

10nF	4	C1, C3, C4, C5

Electrolytic

22µF 100V	1	C2
100µF 25V	1	C6

Wound Components

Radio frequency choke

4.7mH	1	RFC1 (Maplin)

Transformer
T1 output transformer (see text)

Valves

DAF96	1	V1 (or equivalent e.g. 1AH5, 1FD1, ZD25)
DL96	1	V2 (or equivalent e.g. 1P1, 3C4, N25)

Miscellaneous

Valveholders B7G (2); MB2 ABS plastics box (Maplin); 6BA nuts and bolts; hook-up wire, etc.

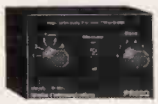
BUY NOW BEFORE INTEREST

....NEW PRODUCTS....

Calling all HAND HELD & BASE SCANNER USERS!!!

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

MyDEL ML-2Q Passive Preselector



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

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

MyDEL ML-AT2

Everyone knows how important it is to use an Antenna Tuning Unit in between your long wire and receiver/scanner. That random piece of wire may only be resonant on one frequency - you're trying to use it on hundreds!

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

£59.95
Now includes scanner/receiver lead.

MyDEL Long Wire Balun

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

£22.95 p&p £3.50

MyDEL Shortwave Antenna

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

£39.95 p&p £3.50

NOISE REDUCTION

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

RRP £195 incl. p&p.

NEW Icom ICR-8500

The new IC-R8500 has proved itself to be the professional choice for all band monitoring. Covering 100kHz to 2GHz with no gaps and all mode fitted as standard.

- 100kHz to 2000MHz
- Incredible 10Hz resolution
- All mode including USB/LSB, CW, AM, FM & WBFM
- Built in TCXO for unrivalled frequency stability
- IF Shift & Audio Peak Filter
- Noise blanker, RF Attenuator & selectable AGC
- Digital AFC
- 1000 memories including Alpha Numeric tagging
- RS-232C serial Port
- Versatile Scanning functions
- 13 different tuning steps
- Optional Voice Announcement

RRP £1695
ML Price: 1429

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

- New Icom IC-R8500 with two years RTB warranty
- Matching Icom SP-21 deluxe speaker
- Icom AD-55 Mains PSU
- Icom FL-52A 500Hz CW & Data Filter

Total value £1900, ***ML Price £1615***

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

ICOM ICR-10E

When Icom introduce a new scanner, the competition take a deep breath. The amazing ICR-1E introduced over 5 years ago stopped all other scanner sales in their tracks. With the introduction of the new ICR-10E, looks like Icom are about to continue a tradition. Just look at these features:

- All mode FM, WFM, SSB, CW, AM
- 500KHz-1300MHz
- Real Time Bandscope
- 1000 memories
- Alphanumeric tag to each memory
- Tunable bandpass filters employed for excellent RX performance
- Multi function dot matrix display
- Full Computer access capability.

Now available from stock

RRP £379.
ML Price £329 From only £6.14 per week

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

AR-3030

If you've been looking for the bargain of the year then you've come to the right spot. The AR3030 was one of the first receivers to be offered with Collins filters as an accessory. Classically styled, the compact receiver from AOR is a DDS receiver with A TCXO fitted as standard and tuning rate of only 5Hz.

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

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

ML Price: 499

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

KENWOOD TS-570D/M

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

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

Supplied with Mains PSU for receiver operation.

ML Price: £1329
Available on finance, £229 deposit and 36 payments of only £39.96, cost of loan £338.66

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

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THE AMATEUR RADIO EXCHANGE CENTRE

- Martin Lynch can also offer finance terms upto 36 months. Deposits from a minimum of 10%. We welcome your part exchange against any new (or used!!) product, provided its clean and in good working order. Call the Sales Desk today. APR: 19.9% Payment protection is also available.
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The widest frequency coverage offered by any Base scanner available - 10kHz to 2600MHz. All mode and ideal for either base or mobile use. Introduced during April, the new AR5000+3 is a standard version of the original with 3 enhancements (hence the +3):

■ Synchronous AM ■ AFC ■ Noise Blanker

AR-5000 "Original" £1399, (RRP £1495), deposit £159, 24 payments of £62.12 Cost of loan £250.97, or 36 payments of £45.04 Cost of loan £381.77

AR5000+3 £1595, (RRP £1749), deposit £189, 24 payments of £70.44, Cost of loan £284.57, or 36 payments of £51.07 Cost of loan £432.87

NEW MVT-9000

"A thoroughbred amongst scanners"

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

RRP £489

ML Price £409

Deposit £49 and 12 payments of £33.06, cost of loan £36.74.

Welz WS-1000

NEW

SPECIAL OFFER ONLY

Incl. VAT & FREE postage

299

NOW AVAILABLE FROM STOCK

FREE NICADS THIS MONTH ONLY!

specification

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

NEW...Opto Xplorer...

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▶49

small mains transformer wired backwards 'trick' could also work here.

Switched Mode HT Supply

The circuit of the switched mode power supply, **Fig. 2**, has been designed around a National Semiconductor LM2577T-ADJ switching regulator, which is used in flyback mode. The original resistor and capacitor values were taken from the National Semiconductor computer program 'Simple Switchers' and then later calculated properly using the application notes.

An additional filter has been added, consisting of R4/C5, which has a cut off frequency of approximately 10kHz and helps to reduce any switching noise that may be present on the output - although none was found on the prototype.

As this is meant to be a practical project, I will not dwell on the rather cumbersome mathematics. The diode D1 provides input polarity protection. The capacitors C1 and C2 provide power supply input decoupling - with C1 decoupling the high frequencies and C2 the low ones.

A compensation network is formed by C3/R1, which is also part of the soft start circuit incorporated in the LM2577T-ADJ regulator. The step-up transformer is provided by L1 and L2.

A fast switching diode was chosen for D2 due to the high switching frequency of the regulator. Smoothing is provided by C4, which has a low impedance value due to the high switching frequency (52kHz) involved. Resistors R2 and R3 provide feedback to the LM2577T-ADJ and have a major part in defining the output voltage. Additional filtering is provided by R4/C5, the filter, which has proved to be effective in operation, cutting off at about 10kHz - well below the switching frequency.

The Transformer

The transformer windings were found by experiment and consist of a primary winding of 3.5 turns of 0.91mm (20s.w.g.) enamelled copper wire wound on the lower half of an RM10/1 pot core bobbin. The secondary winding consists of 40 turns of 0.32mm (30s.w.g.) enamelled copper wire wound on the upper half of the RM10/1 pot core bobbin. It is important to achieve correct phasing on the transformer, so make sure that the two windings are wound in the same direction and that the start of L1 goes to pin 4 of the regulator (switch) and that the start of L2 goes to the anode of the rectifier diode.

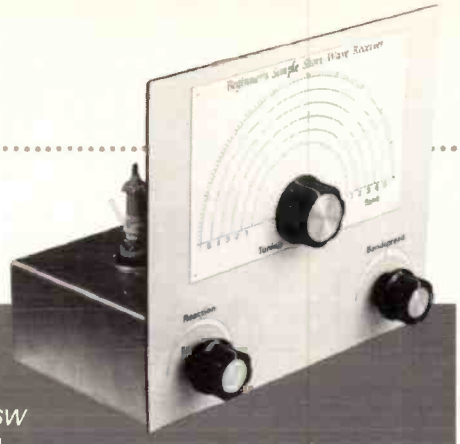
Construction

Construction is very much up to the individual as the layout is not critical. A die-cast box is highly recommended to aid screening and provide a good earth for the component board and input/output sockets.

There are holes to be drilled in the lid of the die-cast box, four for the mounting board and others who size and shape depends on the choice of input/output connectors. The prototype was built on Veroboard as this is easy to use and there are so few components. The board is fitted onto the lid of the die-cast box using 3mm nuts, bolts and spacers.

In Use

Connect 9-12V d.c. via short leads to the input of the converter and 90V should be present on the output to connect to your receiver. Always run the converter with a load to ensure correct operation of the regulator. As a whole, this converter has proved to be reliable.



You Will Need

Resistors

Carbon film 5% 0.6W

10Ω	1	R4
470Ω	1	R1
2kΩ	1	R3
150kΩ	1	R2

Capacitors

Disc ceramic 50V

0.1µF	1	C1

Mylar 100V

680nF	1	C4

Electrolytic

4.7µF 63V	1	C3
10µF 100V	1	C5
47µF 25V	1	C2

Semiconductors

Diodes

1N4007	1	D1
UF4007	1	D2 (fast rectifier diode)

Integrated circuits

LM2577T-ADJ	1	IC1 (adjustable switching regulator)

Wound components

Inductors

L1	3.5 turns 0.91mm (20 s.w.g.) enamelled copper wire wound on lower half of RM10/I ferrite pot core bobbin
L2	40 turns 0.32mm (30 s.w.g.) enamelled copper wire wound on upper half of RM10/I ferrite pot core bobbin (both windings to be wound on same direction - see Fig. 2.

Miscellaneous

Veroboard; Veropins (for board connections); die cast or metal box (Maplin LH73Q); DC input connector - this depends on the output connector of existing d.c. power supply: a standard 2.1mm d.c. plug/socket combination was used in the prototype.; One plain uninsulated 4mm binding post (output earth); One red insulated 4mm binding post (output positive); Four 3mm nuts, bolts and spacers, etc. for mounting board onto lid of die cast box; Two RM10/I pot core halves (L1-2); Two RM10/I pot core clips (L1-2); RM10/I split bobbin (L1-2); TO220 clip on heatsink; 20s.w.g. enamelled copper wire (L1); 30s.w.g. enamelled copper wire (L2); connecting wire.

Modifications to the Denco One-valver continue on page 54

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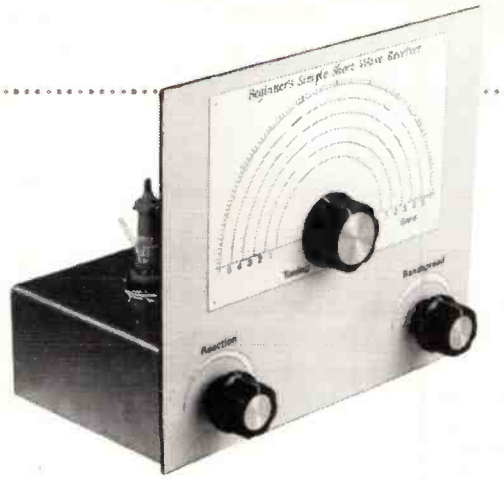
Modifications to the Denco One-valver



One of the ideas behind re-publishing the Denco One-valve receiver was to try to encourage a bit of home construction and experimentation. The following notes by Dick Ganderton outline some suggested modifications to overcome problems encountered by one reader.

Wally Bell of Scunthorpe built the Denco One-valver from the article in the December '96 issue of *SWM*. He encountered a few problems, particularly when using the Denco 'Range 3 Green' coil. The tuning on his receiver was very sharp, making it difficult to tune. His solution to the problem was to move the 'aerial coupling' coil 6mm up the former, away from the other windings as shown in **Fig. 1**. This improved the spread of the tuning around the dial and made the position of the slug les critical. Wally's method of moving the coil up the former was to **carefully and quickly** unsolder the lead from pin 9 of the coil base, unwind the coil and wind it in its new position. This way you only have to unsolder one end of the wire, but you will loose a turn. However, this makes no appreciable difference to the performance. It would seem that only the 'Range 3 Green' coil is afflicted by this problem.

He also found that, if he connected the 'aerial' lead to the 'Earth' socket, instead of the 'Aerial' socket and then wound the lead three or four times loosely around the coil former, he could achieve a similar result to moving the 'aerial coupling' coil.

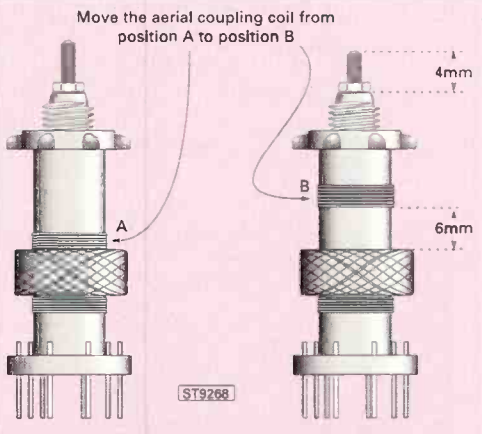


Fig. 1: Modifications to the Denco Range 3 Green coil suggested by Mr. W. Bell.

Screen Grid

The medium wave coil also posed some problems, needing its slug removed before it was useable. By feeding the screen grid from the wiper of a potentiometer, rather than through a fixed resistor, as in **Fig. 2**, allows the gain to be backed off. This, Wally claims, also helps greatly with resolving s.s.b. signals on the amateur bands.

Bandspread

Finally, his original bandspread capacitor (C2) proved to be too large, giving sharp tuning. He removed vanes from the bandspread capacitor until he achieved the results he wanted. The capacitor ended up with only one moving and two fixed vanes and would now have a maximum capacitance of around 5pF with the vanes fully meshed and a minimum of about 2.5pF with them unmeshed.

Editor's Notes

One-valve receivers can offer a lot of opportunities for fun and experiment. No one builds a one-valver just to listen to radio stations. You build them because you want to find out more about radio and to try out various ideas - just as Wally has. Above all, you need a lot of patience - but it really is worth it when you dig out that weak DX station from the crowd of strong ones. Tex Swann, from *Practical Wireless*, has just spent an enjoyable evening with the Denco One-valver I built for the project. This is unmodified and Tex found, as I did, that the reaction is savage. However, with patience and care, Tex managed to pull in a dozen or so stations over about an hour between 2000 and 2100. The next step will be to modify the 'Range 3 Green' coil as Wally did.

As an aside, does anyone out there have any recollection of how the circuit performed forty or fifty years ago? What about the same circuit using other manufacturers coils, such as Osmor - did they have similar problems?

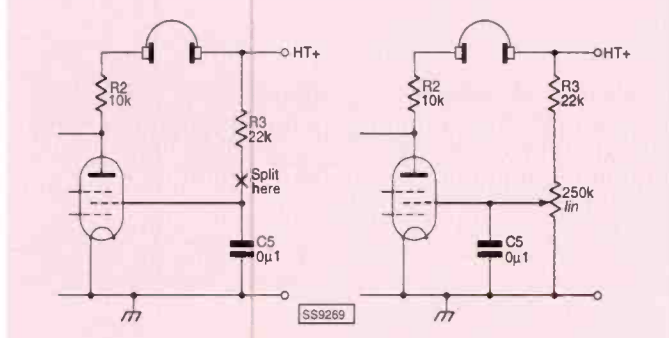


Fig. 2: Modifications to the screen grid circuit to enable the gain to be backed off.

Further Ideas To Try

How about adding a 'bandspread plus' control. Put another small variable capacicitor in parallel with the existing bandspread capacitor - it could be a 5pF Jackson C804. You can then use 'bandspread plus' at the high frequency end of the coil's tuning range where the main tuning capacitor is at minimum capacitance and the normal 'bandspread' at the opposite end when the main capacitor is at maximum.

If you are using the add-on amplifier try swapping the positions of the headphone socket and R2. This will entail adding some extra solder tags to support the components.

Fit a slow-motion drive to the main tuning capacitor to provide finer tuning.

Whatever you try, don't forget to let me know what you did and how you got on.

■

A Day In The Life Of A Radio Inspector

The Butter Conditioner

Young Golly, the trainee radio inspector said, puzzled, "The complainant is a citizen band operator, I thought we didn't investigate complaints from CBers."

Kilocycle Ken, the senior radio inspector said, "We don't normally, they take their chances, but he's also got a TV and it's effecting his viewing. There is goes again! Louder. Go to the next pole."

"So what do you think it is?"

Kilocycle Ken was almost smiling. "I reckon it's a butter conditioner."

"That makes you happy?"

"I haven't heard one for a long time. The butter conditioner, or butter warmer some call them, a device which caused so much trouble throughout New Zealand. They were fitted in a door compartment of a Frigidaire refrigerator, just big enough for a pound of butter, that was before we went metric. In that compartment, a metal shelf, and under it a heating element and a thermostat, its setting controlled by a flat white knob."

Young Golly said, "Strange, to have a refrigerator keeping food cold, and then contrary like, install a heating element inside it to keep butter warm?"

"The idea is to have the butter just soft enough for spreading on bread to make sandwiches for lunches, for the kids and the husband, everybody seemed to take their lunch from home then."

"When was then?"

"It was in the late 1950s, the start of everybody having fridges. Frigidaire was almost synonymous for refrigerator, like Hoover in England for a vacuum cleaner. Tens of thousands were sold to replace the old meat safe which most houses had, although some rich people had ice boxes and the ice man would call. Don't see the ice man anymore," Kilocycle Ken said reminiscently.

Heat Control

"No other brand of refrigerator?"

"That's the only one which fitted the thermostat heat control. It was a marketing idea, I don't know whether it was used overseas. I think it was dreamed up in New Zealand. But the thermostat problem didn't really show up until the 1960s when television became widespread and so had Frigidaires. Later, the thermostat was replaced by a switch for different heats, but it took years before that was done.

"The easiest way to cure the problem was to chop the element and the thermostat. But if the owner insisted, then it could be suppressed. At one time the manufacturer provided suppressers free of charge, must have cost them a lot of money. Then they gave up, suppressers had to be bought.

"We used a Ducon brand PN471, a large tubular capacitor, the usual delta configuration, a 0.1µF and two 0.001µF, made here in New Zealand, before they took the factory back to Australia. That was when we had an electronics industry, now disappeared, when we built all our radios and TVs, but it's all changed, TVs are all Japanese now, made in Malaysia or Singapore or Taiwan. We used to press our own records, we had coil winding and transformer factories."

...Ask if they've got a Frigidaire...

Highest Frequency

Young Golly yawned.

"There is goes again, not too bad, but some of the thermostats are violent. This one is every 29 minutes."

"Only lasts eight seconds."

"But it drives people mad, like the old water torture."

"I could do with a drink," Young Golly said.

"It's tedious, chasing thermostats with long times between actions, but once we are right on top of it then we can knock on doors, ask if they've got a Frigidaire."

"Use the direction finder to locate the source," Young Golly said.

"DF only shows it's coming from the line, and the duration is too short, intensity is the best way. On medium wave broadcast, QRM can travel for miles, but at 200MHz, it's range is much less. So we'll go higher in frequency, use the highest frequency we can hear the noise on."

Interference Receivers

The car was fitted with two Sprague interference receivers, the 610 model and the older 500. "Keep the 500 on 27MHz and take the 610 up to 200MHz, see if we can hear it there, if we can, we are fairly close.

"Watch the output meter, there it goes again, stronger, switch in another 10dB of attenuation and

J. Edward Brown brings us more tales of

Kilocycle Ken & Young Golly investigating some more interference complaints.

drive to the next pole. Most of these poles are hardwood, from Australia, used to be a big trade in hardwood poles, but now power supply companies use NZ grown treated pine, or concrete, 11kV on the top, 400V underneath. New housing areas have underground supply which makes it difficult to find QRM, although QRM attenuates quicker in cable.

Outdated Shape

"This model of Frigidaire is now an outdated shape, like an old car, but they go forever, well made, never break down. Still seen in auction rooms, second-hand shops, and still heard in suburbia, blurting away as regular as clockwork around every 30 minutes, day and night, week in week out, for years, a puzzling phenomena to the uninitiated.

"The woman would be completely floored when we demonstrated that the interference was coming from her own fridge. To undo the self-tapping screw and slide out the metal shelf which conceals the heating element, would be to surprise the housewife, show her ancient butter, a deep dark brown and ponging to high heaven."

"Housewife is not politically correct," Young Golly said.

"That's what they were called, in the heyday of this trouble. That's the complainant's place up ahead, with the groundplane. I think we'll cut this short, let's call on him."

"Might not be anybody home in the middle of the day."

"Knock and we'll find out."

Kilocycle Cops

The guy who came to the door had a pot belly, a cigarette dangled from his lip, he looked at them, looked at the grey car with the d.f. loop on the roof. "Ah, the kilocycle cops."

"About your complaint," Kilocycle Ken said.

"Glad to know you're on the job."

"Have you got a Frigidaire refrigerator?" Kilocycle Ken asked.

The complainant looked suspicious. "I've got a couple of refrigerators."

"Could we have a look at them?"

"Why?"

"Could be the trouble."

Belligerently, "Doesn't sound like a refrigerator to me."

In the kitchen was a large white Kelvinator. Kilocycle Ken only glanced at it. "And the other?"

"I just acquired a refrigerator, at an auction, it's old."

"A Frigidaire?" Kilocycle Ken asked.

"I don't know, I don't think its got a brand name plate on it."

In the basement was a TV on the Trackside running channel, an old rotary dial telephone for betting with the TAB, a Dick Smith CB on the table. A Toshiba multi-band transistor radio was tuned to the rugby game from Eden Park. A yellow plastics fizz boat sat on a trailer and alongside it a Frigidaire, the once white cabinet now yellowed.

Warming Butter

Kilocycle Ken opened the fridge flipped the butter compartment flap, felt the metal plate. "Warm. This hasn't been amputated."

"What's that for?" the complainant asked.

"Warming the butter. An arcing thermostat is the source of your QRM."

"I'll be damned, in my own house, it's been going for three months, upsetting the neighbours. They reckoned it was by CB causing them interference, that's why I called in you guys."

He rolled a cigarette from a Park Drive packet. "Wait until the world hears about this."

Kilocycle Ken took sidecutters from his pocket. "May I operate? Whenever I see one of these refrigerators my hand twitches, wanting to chop it out, Amputation is better, quick, clean, neat, better than suppression. Suppression doesn't mean elimination, just a reduction in level."

"Be my guest, I don't want to hear it again. I got no reason to have warm butter."

"I love this operation," Kilocycle Ken said.

Brewing Beer

"Have a beer," the complainant said.

He had all the equipment for brewing his own beer, a large round washing machine bowl from an old wringer type machine, brown quart beer bottles, a crown top hand capping machine.

"Not a bad drop," Young Golly said.

Kilocycle Ken gagged. "Been on CB long?"

"No, just found out about it, and it's great. All those people to talk to. Got a CB in the boat so I can tell the wife to put the frying pan on for the fish. Hang on a minute, a race from Avondale, the two-fifteen." He cocked his head. "Race three results confirmed, good, enough in that bet to buy more hops."

They left.

"The quintessential New Zealander," Kilocycle Ken said. "Rugby racing and beer."

"And CB," Young Golly said. ■

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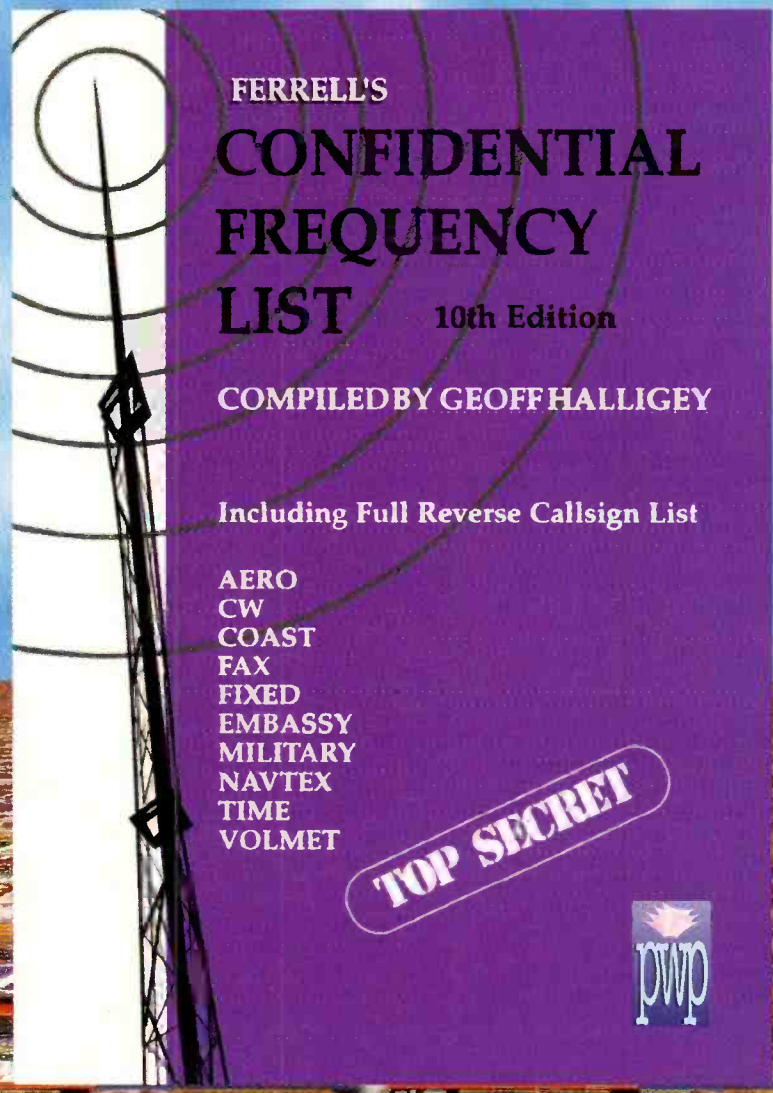

THE DEFINITIVE HF UTILITY GUIDE

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

Amateur Bands Round-up

Listening to the Amateurs

At the time of last writing I was having equipment troubles - both the TS-440S and the ancient TS-520S went QRT almost at the same moment. The first-mentioned had to go away, but the old 'un I put on the bench for a spot of my personal attention.

It was while there was nothing to listen with that the next gale came on, at the end of which the tilt-over had acquired a 'set' of something like fifteen degrees between top and foot, enough to make it decidedly tricky to lower. However, once everything was shipshape and Bristol-fashion again, the 'set' seems to have gradually untwisted itself. To find oneself doing antenna work knowing there is nothing at the bottom of the feeder is a wee bit frustrating!

Input

The first envelope opened was the March edition of *Just Listening*, the magazine of the **International Listeners Association** and this time they have notice of a couple of listener contests on the amateur bands, a bit on slow-scan TV, an amateur-bands review, as well as the usual columns for the special interests outside our bands. The address is **c/o GW4OXB, 1 Jersey Street, Hafod, Swansea SA1 2HF**. If you write expecting a reply, a stamped addressed envelope would be no more than courteous.

Your Letters

Let's open the scoring with **Ted Hearn** in Chesterton, Newcastle Staffs. On Top Band, FS5OI, G3PQA, G4IME, and LY2BMX were noted, and on 3.5MHz Ted offers CY1FG, EA8RR, HD2RG, JX7DFA for Jan Mayen Island, LA6WEA, LX1UUN, LZ3ZZ, NH1U, ON4NA, SP7IIT, OK2RZ, VY2MC, YL2DZ, YU1ANO, and 4X1FV. Up again and 7MHz came up with CP6DA, CT2GLO, J25HW, LA5FJA, LX9AI, OK2SMS, S53M, SP9HWN, SP9LAB, SU1GS, SU1SK, T00XL who said his home call was F5XL, UA1MU, UR7UL, US4IL, UT5VOC, UR4PWK, VY2RU, Z32MB, 3E1DX, 4X4MRC and 9A2TR. Up again to 14MHz where AA1KS was on Moose Island, plus AB5VA, CT1EHZ, GB2NLO, HG5M, IT9OSF, IT9STX, KD2JR who was operating mobile from a camper-van somewhere near New York., OX3SA, P43A, VA3BEG, VA3DCA, VE9AO, YO3APJ, Z31FK, UT2LF, S52HA, SV3NN, 4L1BW, 4X1MD, 9A3KQ, 9K2MU who was calling for QSLs via WA4JTK.

We move on now to **Colin Dean** in Barnsley, where on 3.5MHz, sideband was copied from A92FZ, EK6GB, EY8MM, FG5HR, FM5DP, FS5PL, HC1XL, JA1, JA5, JX7DFA, J39JS, J77FT, TA6C, KF4AME/TI5, UK8MF, UN7GG, VK2-3-5, VP2EUC, VP2MR, VP9KK, XT2DP, YK1AO, YS1RRD, ZF1PM, 4L5O, K4ZLE/6Y5, 8P9JA and 8R1AK. His other favoured band is 7MHz where AP2AR, AP2AMR, AP2KSD, A41LD, A71EM, ET3BT, FR/IK2GNW, HL3ERJ, HS9AL, HZ1CCA, JA2-4-5-7-8-9, JY5HN, OD5PI, PZ1EM, RA0FA, TA1/RU9WW, TZ6VV, VK1-2, VU2PAI, XE1REM, YC8TZR, YK1AO, ZA1MH, ZL2BMW, ZL1PB, ZL4BO, 3B8/IK2GNW, 3V8BB, 4S7BRG, 5A1A, 5X1D, 9G1MR, and 9K2IC were all logged.

Nice to hear again from **Karl Drage** of Woodford, Kettering, who has learned the hard way all about what happens if you don't back up the data on your computer; when his hard drive defected he lost the lot. A new 1.2Gb hard drive has now replaced the sick 420MB one, and the process of picking up the pieces has started. However, SL activity continues, with Top Band yielding K3UL, N3AKH, and VE1ZZ. On 3.5MHz the list shows 7X0AD, 8P9JA, 8R1Z, C6ANI, CO2KK, CY1FG, DU9RG, FG5LY, KP4RS, LU1IV, PJ9G, PY2YP, TI5WCP, TP9CE(Council of Europe), TZ6VV, VP2ENP, VP2EUC, YB5QZ, YB6MF, YV5BXS, YV5LIX, ZL4BO, ZL4KF plus a great pile of assorted W/K/N/A from the East Coast to the Land of the Fives, VE, VO, VY, and smaller fry. Turning to 7MHz, this is where the pay-dirt has been, with 3A2HB, 3B8/IK2GNW, 4S7BRG, 5N8NDP/9, 5N9KWO, 5N9NJM, 9G1MR, 9J2TF, 9L1IS, A41LZ, A45ZN, A71EM, AP2AR, AP2ARM, AP2KSD, BD7YA/7, C6AGP, C6AGR, CE8ABF, CM8PJ, CO3CL, CP6DA, CP6UU, CP6XE, CX8BR, DS5RNM, EM1HO (an Antarctic Base), ER2DX, ET3BT, EY8MM, FR/IK2GNW, HC1JQ, HJ6PPN, HK0NZY, HK3BZO, HK4LP, HK4SAN, HL5PVN, HZ1CCA, IC8/IZ8BFY, IC8QEF, J52IM, JD1BLP(Ogasawara), LU2NI, LU5FYV, OD5NH, OD5NJ, OD5PI, PP5UA, PP5WG(IOTA SA-026), PR8MG, PT7BR, PT7FM, RA0FA, SU1GS, SU2MT, TA2DS, TI2CC, TI4CF, TI5RLI, VK5ISL(OC-220 St Peter Is), VK6LK, VP9/G4JTQ, VU2LAC, XT2DP, YB2MQ, YB5QZ, YC0FEO, YC8EBW, YC8TZR, YN1JFB, YV1EPD, YV5EPY, YV5NCK, ZL1PB, ZL4BO, ZP5FAH, ZP5SBE, ZP5SBR, ZP5XF, ZP6SC, and finally ZS5BH - plus of course the smaller fry such as assorted Ws, VEs, VO, JAs and so forth. Heading upward in frequency again we come to 14MHz, where the tally of scalps included 3B8GF, 4F1JUX, 4F3CV, 4S7BRG, 4S7RF, 4S7SW, several 4X4s, 5B4AFB, 5N9NJM, 5Z4FZ, 7X2FK, 7X2WEK, 7X2YL, 7Z1IS, 9K2AI, 9M2AA, 9M2CW, 9V1AG, A71BY, AP2JZB, BV7GA, C21TT, CE4RPM, DU1KT, DU1SAN, EK4JJ, FS5PL, FS/JA4DND, HS1AFN, IJ7/IK7FPX, J43CRN, J52DW, a hatful of JAs, JW8AV, another hatful of W6-W7-W0, KH0AC, KH0I, KH6FKG, KL7AC, KL7AH, KL7J on SSTV, OD5FE, OD5NJ, PP8BV, RM9RX, SU1ER, T77M, TA2LM, UA0FDX, UA0SJ, UN0P, VE5UA, VE6EO, VE6JJV, VE6JY, VE6QX, many VE7s, VE8RCS, VK2CM, VK6ACY, VK6NZ, VQ7DW, VQ9ZX, VS97LC, VU2RAK, YB1XUR, YB2BRW, YB8ZY/P for ITA OC-209, YI1AK, YI1HK, YI1RD, ZB2AZ, ZL1BLF, ZS1HL, ZS6BBO, and ZS6SOA. Next, we turn to 18MHz and 4S7BRG, 9K2NG, A41LZ, A61AN, HL3VQ, JAs, East Coast Ws, KP4ERJ, PT7BZ, SU3AM, YS1RRD, YV5EUX, and ZS5WFD. Finally on 21MHz Karl mentions 5X4F, 9U5CW, LU6DPG, VO1SA, YC9VX, and ZP6CC.

Question

This one came from a correspondent who wants to remain nameless. He's in his mid-seventies, and not in the best of health - he believes the illness has affected his memory somewhat. It's now five times he has taken the RAE, and all he has to show for it is a pass in Part 1. I have written directly, with my own thoughts on how to get over the problem, but I ask all you readers out there who have cracked it despite many difficulties to write to me at the column address and I will collate your various answers and ship out to my correspondent. I sense that he is getting a mite distressed by all these non-passes, and needing all the help we can give; but I can recall a certain person in my own class who was with me for a decade but finally made it.

Ted Trowell on the Isle of Sheppey was feeling the need for an 'election-free area' when he wrote. Again reading between the lines, I guess Ted had been torn away from some juicy DX by one of these electioneering clowns. And, just to make things worse, first the Omni-V had to have a fault repaired, then the HF6 antenna developed a fault, coaxial feeder went dead short, and finally The Boss required repairs to the microwave oven. In between times, Ted tried his c.w. on 7MHz for TI2WKN, 7X2CR, VK3BG, VK3MR, 3W5RS, ZB2EO, VU2RAK, 9M2TO, VU2PAI, FG5XJ, VP2EJT, ZD860CC, VK6DX and C56/DK3FW. On 10MHz EA6ZY and EA6NB were worked, while at 14MHz VU2BK, VQ9VK, KL7XX, 3B8DB, W7OF, JX7DFA, VE7FLC, 9K2MU, 9M6TPR, 8P9JA, 9Q5BQ, ZS2LM, PY4AR, N7RO, 6W1AE, 9G5VJ, 7X2FK, ZP8YA, 8P6FK and PY2OW. 18MHz yielded K9AV/KH2, VQ9VK, VP2EUC, KN4UG/VP5, PY1VPY, VP5/KB4IRS, VQ9QM, FG5XJ, 5X1P(G3MRC out and about again), and 9J2DR; just for a change Ted also used sideband for ZS3C and XT2DP who was using a TS-50 on a battery recharged by solar power and a dipole to produce an S6 signal. Finally, to 21MHz c.w. where ZP5KO, PU1KDR, LU9AUY, 5N2KST, 7Q7LA, and CX3SN were all booked in.

Snippets

In an attempt to avoid confusion, stations in Kure, which is OC-020 for IOTA by the way, are allocated calls where the first letter of the *suffix* is a K, for example AH7KM, NH7KL. Stations having any of the other letters of the alphabet are operating from Hawaii. A stations going portable on Kure will use own call/KH7K.

The famous 'Flying Horse' Callbook - one volume for North America and one for the rest of the world - has been discontinued as a book. In future it will only be available on CD-ROM.

Of the 37000 contacts from 3V8BB made by Hrane YT1AD, he has answered 12700 direct and 1500 bureau cards. By the time this reaches you he may well have shifted a lot more.

QSL addresses

Some more from Ted Trowell: XT2DP via WB2YQH, ZD7BGX via Box 157 St Helena; 9M6TPR via KQ1F; 9J2DR via Box 30062 Lusaka; 5X1P via G3MRC; and VQ9VK via AA1OJ.

Finale

That's the lot for this month. As usual, please send your letters and comments to me to arrive by the beginning of the month at PO Box 4, Newtown, Powys SY16 1RA - and the more letters the merrier!

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73 from Dave G4KQH, Technical Manager.

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FREQUENCY EXCHANGE

Kevin Nice G7TZC

MHz	Mode	Time	Call	Location	Monitor	Notes
3.88292	UNID	2027	???	Russian PTT, ???	mc	1280bps OQPSK UNID System.
4.04300	UNID	1802	???	???, ???	mc	150bd/850 FSK UNID System, sync, cont, ACF=0.
4.08832	PacTOR	1712	???	???, ???	mc	200bd/200, no sync.
4.09000	SITOR-A	1819	HCHZ***	UNHCR, Zagreb	mc	100bd/170/E, NX in EE signed "(unhcr) zagreb".
4.11300	36-50	2136	???	Russian Mil, ???	mc	100bd/200 , double speed version.
4.11921	MS5	2257	???	Russian Mil, ???	mc	12-tone vocoder (3300Hz pilot), tfc.
4.22700	Baudot	2212	IGJ41	Italian Navy, Augusta	mc	100bd/850 , CARB "igj41 /igj42 /igj43 /idr2 /idr3 /idr8".
4.51221	MS5	1821	???	Russian Mil, ???	mc	12-tone vocoder (3300Hz pilot), tfc.
4.55300	ARTRAC	1740	HGX..	Hungarian Diplo, ???	mc	125bd/170, MSGs ending.
4.56400	36-50	2111	???	Russian Navy, ???	mc	50bd/250, crypto.
4.62830	RS-ARQ	1621	???	???, ???	mc	228.7bd/150, ALIS bursts.
4.63034	RS-ARQ	1818	???	???, ???	mc	240bd 8-tone, idle in beta.
4.68404	RS-ARQ	1706	???	Turkish Diplo, ???	mc	240bd/E 8-tone, crypto tfc ends "DAHIL SERDIM".
4.81337	FEC-100	1652	???	German Mil, ???	mc	VFT: 3ch of 192bd/140/I, crypto ends "%%%%%".
4.81800	36-50	1801	???	Russian Navy, ???	mc	50bd/250, tfc.
5.08280	Baudot	1705	IPR..	Italian Police, ???	mc	50bd/170, MSG in II about stolen firearms ending "bt #0056".
5.12660	UNID	1823	???	???, ???	mc	250bd/170 FSK UND Fast ARQ System.
7.52574	4+4	1606	???	Chinese Diplo, ???	mc	idle.
7.54604	RS-ARQ	1720	???	???, ???	mc	240bd 8-tone .
7.70151	PICC-6	0753	MKD	Royal Air Force, Akrotiri	mc	VFT: 2ch of Piccolo-6, eng ch "muh 45 de mkd" Rls RBQPZ, RBQPY.
7.70191	PICC-6	0756	MKD	Royal Air Force, Akrotiri	mc	VFT: 2ch of Piccolo-6, crypto tfc for exercise net.
7.72870	SITOR-A	1819	???	Egyptian MFA, Cairo	mc	100bd/170/E, idle in IRS mode.
7.82400	81-81	1537	???	????, ???	mc	81bd/500, tfc.
7.85700	c.w.	1919	4XZ	Israeli Navy, Haifa	mc	"vvv de 4xz 4xz BT BT" marker.
7.87800	c.w.	2023	4XZ	Israeli Navy, Haifa	mc	"vvv de 4xz 4xz BT BT" marker.
7.90800	PacTOR	1939	???	???, ???	mc	100bd/200, No sync.
7.91900	FEC-100	0801	DGG91L2	PIAB, Bonn	mc	96bd/400/E, NX in GG (new QRG?).
9.19051	PICC-6	1858	MUH 45	British Forces, ???	mc	VFT: 2ch of Piccolo-6, eng ch "mkd de muh 45 have sync now pal".
9.19131	PICC-6	2021	MUH 45	British Forces, ???	mc	VFT: 2ch of Piccolo-6, crypto tfc.
9.19300	UNID	1531	???	???, ???	mc	300bd/280 FSK UNID System, sync, cont, ACF=0.
9.36300	Baudot	1638	???	SOUD Station, ???	mc	75bd/500, 5LGs.
9.91951	PICC-12	1604	???	???, ???	mc	Piccolo-12, crypto.
10.12521	MS5	0822	???	Russian Mil, ???	mc	12-tone vocoder (3300Hz pilot), tfc.
10.16621	MS5	0904	???	Russian Mil, ???	mc	12-tone vocoder (3300Hz pilot), tfc.
10.22552	PICC-6	0826	GYU	Royal Navy, Gibraltar	mc	VFT: 4ch of Piccolo-6, eng ch "de gyu gyu gyu lolololo cip cip cip".
10.22592	PICC-6	0825	GYU	Royal Navy, Gibraltar	mc	VFT: 4ch of Piccolo-6, tfc ch idle.
10.22632	PICC-6	0824	GYU	Royal Navy, Gibraltar	mc	VFT: 4ch of Piccolo-6, tfc ch idle.
10.22672	PICC-6	0825	GYU	Royal Navy, Gibraltar	mc	VFT: 4ch of Piccolo-6, tfc ch idle.
13.22021	MS5	0857	???	Russian Mil, ???	mc	12-tone vocoder (3300Hz pilot), idle.
13.22588	81-81	0859	???	???, ???	mc	81bd/500, tfc.
13.30321	MS5	0900	???	Russian Mil, ???	mc	12-tone vocoder (3300Hz pilot), tfc.
13.31221	UNID	1026	???	???, ???	mc	VFT: 7ch of 75bd/170 FSK UNID System (BR6028).
13.31800	UNID	0902	???	???, ???	mc	75bd/250 FSK UNID System, sync, cont, ACF=0.
13.33667	SITOR-A	1020	???	Egyptian MFA, Cairo	mc	100bd/170/E, Calling selcal TVVK (Rabat).
13.36200	81-81	1003	???	???, ???	mc	81bd/200, tfc.
13.36204	RS-ARQ	1149	TAD..	Turkish Embassy, Baku	mc	241bd 8-tone, File transfer to Ankara.
13.37650	SITOR-A	1215	RETZCT***	Guardia Civil, Tenerife	mc	100bd/400/I, MSGs in SS "fm 'ecor tenerife" to MOI Madrid.
13.39500	Baudot	1236	OFZG***	Serbian MFA, Belgrade	mc	75bd/400, crypto after "xyxyxyxyxyxyxy".
13.41450	TWINPLEX-1w	0830	EAE220	Spanish MFA, Madrid	mc	100bd/140, 5LGs to Embassy Moscow.
13.42950	SITOR-A	1521	???	???, ???	mc	100bd/170/I, ATU-80 Passport details.
13.43052	PICC-6	1151	MKD	Royal Air Force, Akrotiri	mc	VFT: 3ch of Piccolo-6, eng ch "muh de mkd zub 1312z lolololo".
13.43092	PICC-6	1152	MKO	Royal Air Force, Akrotiri	mc	VFT: 3ch of Piccolo-6, crypto tfc.
13.43132	PICC-6	1152	MKO	ROyal Air Force, Akrotirimc	mc	VFT: 3ch of Piccolo-6, crypto tfc.
13.44900	81-81	1355	???	Russian Navy, ???	mc	81bd/500, tfc.
13.48244	ROU-FEC	1032	V5G***	Romanian MFA, Bucharest	mc	164.5bd/800, crypto with bitmask=0, unusual shift!.
13.48670	SITOR-A	1233	???	Egyptian MFA, Cairo	mc	100bd/170/E, ATU-80 MSGs to Athens, Paris and Bonn.
13.49490	c.w.	0913	S***	SLHFB	mc	"S" continuously.
13.49590	SITOR-A	0916	LJA30	Norwegian MFA, Oslo	mc	100bd/400/E, crypto to Baltic embassies.
13.49590	TWINPLEX-1w	0915	LJA30	Norwegian MFA, Oslo	mc	100bd/400, crypto after "kckcssswwwssswww" to EU embassies.
13.51060	RS-ARQ	1241	???	German Embassy, Amman	mc	228.7bd/150, MSG to MFA Bonn.
13.51060	RS-ARQ	1242	OMK	German MFA, Bonn	mc	228.7bd/150, MSGs to Embassy Amman.
13.52790	c.w.	1524	S***	SLHFB	mc	"S" continuously.
13.52800	c.w.	1524	C***	SLHFB	mc	"C" continuously.
13.55404	RS-ARQ	0806	TAD	Turkish MFA, Ankara	mc	241bd 8-tone, Sending file "TA-11-01.ZIP".
13.55404	RS-ARQ	0936	TAD..	Turkish Embassy, Baku	mc	241bd 8-tone, Zipfiles to MFA Ankara.
13.55404	RS-ARQ	1840	TAD..	Turkish Embassy, Sarajevo	mc	241bd 8-tone, Sending ZIPfile traffic to MFA Ankara.
13.55804	RS-ARQ	0913	TAD	Turkish MFA, Ankara	mc	240.1bd 8-tone, Message file transfers "MUSTdddd.001" etc.
13.55804	RS-ARQ	0932	TAD..	Turkish Embassy, Teheran	mc	241bd 8-tone, Opchat to MFA Ankara after zipped MSGs.
13.79821	MS5	1144	???	Russian Mil, ???	mc	12-tone vocoder (3300Hz pilot), tfc.
13.83800	ASCII	1347	COY851***	Russian Intel, ???	mc	300.5bd/500, 5LGs to YFC QSX 14417kHz.
13.87902	ROU-FEC	1555	V5G***	Romanian MFA, Bucharest	mc	164.5bd/400, Circulars in RR (bitmask=24).
13.9264	ARQ/342//96/E/340	0627-0718	MKO	RAF AKROTIRI	dw	13.926445 Ch. 4 in VFT. 4CRC. 2 channels. Both betas. Ch: B met traffic SACY LCRA (RAF Akrotiri).
14.4870	ARQ/S//96/-/170	0807-23	OEC64	AUSTRIAN EMB LAGOS ()	dw	5CRC (ACF70). After spell on betas "hello Wien hier OEC64" Changes to 6CRC (ACF84). Traffic in German.
14.4870	ARQ/S//96/-/170	0824-36	OEC	MFA VIENNA	dw	Traffic in off-line encryption to Lagos.
14.6190	ARQ/E//96/E/170	1220-27		GERMAN EMB BRASILIA	dw	8CRC. Betas. Traffic in p/1 German to Bonn.
14.6700	ARQ/342//200/E/400	1233-1316	RFFVAT	FF INCIRLIK?	dw	4CRC. 2 channels. Betas in ch: A, alphas in ch: B. Traffic in ch: A badly corrupt but off-line encrypted.
14.7540	ARQ/E/72/E/400	1446-1626	RFFXS	FF MOGADISHU?	dw	4CRC. Alphas.
14.75530	Baudot	1055	DOR***A	Bulgarian MFA, Sofia	mc	150bd/500, 5FGs and NX in BB ends "dor dor dor znn gb sk".

FREQUENCY EXCHANGE

FREQUENCY EXCHANGE FREQUENCY EXCHANGE

MHz	Mode	Time	Call	Location	Monitor	Notes
14.80600	CROWD-36	1007	???	Russian Diplo, ???	mc	crypto.
14.84081	ARTRAC	1538	???	Hungarian Diplo, ???	mc	125bd/170, in IRS mode.
14.84122	ARTRAC	0859	HGX45	Hungarian E, Islamabad	mc	125bd/170, NX in HH signed "hgx21 de hgx45".
14.91200	CROWD-36	1205	???	SOUD Station, ???	mc	5LGs with opchat in EE.
14.91351	TT2300b	1224	???	???, ???	mc	100bd, idle on tone seq 40657321.
14.9267	ARQ/E3//192/E/400	1630-1752	RFTJ	FF DAKAR	dw	8CRC. Cct [TJD] to RFTJD. Controle de voie RFTJ de RFTJ. Daily forces press message from MARINE SIRPA Brest/RFFKC.
14.9597	ARQ/E3//192/E/400	1331-1443	RFTJ	FF DAKAR	dw	8CRC. Betas. Poor sync but cct [TJI] identified.
14.96470	UNID	1143	???	Italian Diplo/Mil, ???	mc	1200bps FSK UNID System.
15.7619	ARQ/342//96/E/340	1439-1515	GYU	RN GIBRALTAR	dw	15.761955. Chan in VFT. 4CRC 2 channels. Ch: A and Ch: B betas.Occ met tfc on Ch: A.
15.77521	MS5	1012	???	Russian Mil, ???	mc	12-tone vocoder (3300Hz pilot), tfc.
15.81350	TT2300b	0905	???	???, ???	mc	100bd, tfc and idles on tone seq 40657231.
15.8450	ARABIC//75/N/500	1340-42	SUA289	MENA CAIRO	dw	Arabic press. 170Hz high.
15.85550	RS-ARQ	1100	???	German Emb, Dar Es Salaam	mc	228.7bd/150/E, Tfc to Bonn.
15.85550	RS-ARQ	1100	DMK	German MFA, Bonn	mc	228.7bd/150/E, Crypto after "vvvv" to Dar Es Salaam.
15.9617	ARQ/E3//196/E/400	1037-1332	RFLI	FF FT DE FRANCE	dw	8CRC. Betas. Cct [BFL]. Controle de voie RFLI de RFLI.
16.0138	FEC/A//96/E/400	0748-59	DGQ21L5	PIAB BONN	dw	German press to Middle East.
16.0877	ARQ/E3//100/E/400	0630-0719	RFVI	FF LE PORT?	dw	8CRC. Controle de voie Paris de Paris at 0706z cct ID corrupt.
16.1252	ARQ/342//200/E/400	1620-23	RFQP	FF DJIBOUTI	dw	4CRC. 2 channels. Betas in both channels. Ch: A Controle de voie RFQP de RFQP. Cct [QPB].
16.1932	ARQ/342//200/E/400	1627-1745	RFQP	FF DJIBOUTI	dw	4CRC. 2 channels. Both betas. Chan:A RFQP de RFQP cct [QRG] Ch: B cct [QPF] RFQP de RFQP controle de voie.
16.3124	ARQ/E//288/E/350	1837-1900	-	UNID.	dw	Idling var patterns 8CRC. 1845 idling on space with acc burst data in ITA2//100/R/350 giving "pls qsy 61 zbz2 qsa1" "zbz1 qsa1 plsdown 3" "zbz0 qsa0 try 60" (note Eng verb). 1858z ARQ
16.3247	ARQ/E3//192/E/400	1930-40	RFTJD	FF LIBREVILLE	dw	8CRC. Betas. Controle de voie svc. Cct [JDJ].
16.3344	FEC/ROU//164.5/R/400	1041-53	-	MFA BUCHAREST?	dw	On-line encrypted traffic.
16.4530	ARTRAC//VFT	0614-16	-	MFA BUDAPEST?	dw	5 channel available on u.s.b.
16.4534	ARTRAC//125/N/170	0616-19	-	MFA BUDAPEST?	dw	Ch: 1 in IRS mode.
16.7995	3SC//50/R/170	1957-2000	EOSJ	SHIP "GRANITNYJ BEREG"	dw	Calls "UIW de EOSJ" then tfc in 3SC via Kaliningrad.
16.8030	3SC//50/R/170	1623-26	?	SHIP "7566/4E4ERSK"	dw	3SC traffic.
17.4290	ARQ/SWE//100/1/400	0836-40	?	MFA STOCKHOLM	dw	Mostly idling on betas and fig shifts. CHB22. Also "so long ..." then off air.
17.5509	ARQ/E3//192/E/400	1404-23	RFTJ	FF OAKAR	dw	8CRC. Betas.
18.0350	ITA2//75/N/850	1221-30	ZRH	SAN CAPETOWN	dw	Marker "qbf figs de ZRH and RY's". Then qso with unknown station but poor copy. Signal fading.
18.0400	ARTRAC//VFT	0840-0900	HGX21	MFA BUDAPEST	dw	Periodic testing of 5 channels in u.s.b.
18.0408	ARTRAC//125/N/170	0625-35	?	MFA BUOAPEST	dw	VFT ch. 2 (+800Hz). IRS mode.
18.0640	ARQ/POL//100/-/250	0910-13	-	POLISH EMB ROME	dw	Traffic in Polish p/1/
18.0641	ARQ/POL//100/E/250	0656-0713	-	MFA WARSAW	dw	Traffic in English and Polish.
18.1110	ARQ/E//96/E/170	0738-48	-	UNID.	dw	8CRC. Off-line encrypted tfc but fading badly.
18.1500	FEC/A//VFT	0936-45	9AZX	UNID.	dw	VFT with three channels (each 192bd 170Hz FEC/A carrying off-line encrypted tfc) at +1190 +1870 and +2550Hz offset. Ends "rpt rpt rpt rpt" then off air.
18.1740	ARQ/N//100/E/300	0726-40	-	UNID.	dw	4CRC. Betas. At 0744 changed to steady mark.
18.1806	COQ/8//	0830-39	-	MFA ALGIERS	dw	18180.65. On-line encrypted traffic.
18.1806	COQ/8//	1405-48	-	MFA ALGIERS	dw	18180.650. Algerian diplo African net.
18.1908	ARQ/N//96/E/170	0924-31	-	UNID.	dw	Poor sync. Giving qsa 1/2 to his contact then tfc with off-line encrypted groups.
18.2750	ARQ/E//288/E/200	1143-50	-	UNID.	dw	8CRC. On-line encrypted.
18.2750	ARQ/E//288/I/200	1010-17	-	UNID.	dw	8CRC. On-line encrypted traffic.
18.3802	ARQ/E3//100/E/400	0752-0809	RFFI	FF PARIS?	dw	8CRC. Msg "RFVICS de RFI--- then off-line encryption. Cct probably Paris to Reunion. Controle de V but other cct IDs poor.
18.3993	FEC/HNG//100.1/R/425	0720-1712	-	MFA BUOAPEST?	dw	ACF90. Off-line encrptd using figs. Tfc addressd (or source?) Bejrut. Dated "Maajus 12". Ends "tks ob hr qsl nr. 58-ig all ok=" and off air 0729z. All day monitor to disc but no further tfc.
18.4900	TORG/11//100/E/500	1031-58	-	AAMC MOSCOW	dw	Idling on "ppppp".
18.4961	ARABIC//50/N/400	1600-03	CNM80X11	MAP RABAT	dw	Arabic press.
18.5498	FEC/ROU//164.5/R/400	1102-08	V5G	MFA BUCHAREST	dw	On-line encrypted traffic broadcast.
18.5521	FEC/ROU//164.5/R/400	1109-1118	V5G	MFA BUCHAREST	dw	On-line encrypted tfc broadcast then (1114) in CW "=V5G nw hr qspmsg" followed by further FEC/ROU mode on-line tfc then "=V5G gruall".
18.7620	FEC/ROU//164.5/R/400	1018-21	-	MFA BUCHAREST	dw	On-line encrypted traffic.
19.0487	ARQ/E3//192/E/400	2022-40	RFFI	FF PROVENCE?	dw	Cct [LFA]. Controle de voie RFTJ de RFTJ. Tfc RFTJZA de RFFIC.Traffic in French.
19.2047	ARQ/E3//192/E/400	0922-1021	RFLI	FF FT DE FRANCE	dw	8CRC. Occ controle de voie and svc referring to "hors format".
19.2360	ARQ/E//72/E/400	1122-1221	RFFEDT	FF "TURQUOISE"	dw	4CRC. Off-line encrypted tfc. Cct [EDT]?. Originator RFFEDT.
19.2360	ARQ/E//72/E/400	1258-43	RFFEDT	FF UNID	dw	3CRC. Controle de voie RFFEDT . Cct ID [EDT].
19.3512	ARQ/E//72/E/400	1224-1545	RFFEDT	FF "TURQUOISE"	dw	4CRC. Cct [EDT]. (Refer 19236 - diversity frequency?) Goma? Tfc to RFTJD/RFFXI fm RFFEDT/b-t~~~st Turquoise.
19.4187	ARQ/E3//192/E/400	1920-33	-	FF UNID.	dw	8CRC. Off-line encrypted tfc. Signal fading rapidly poor sync.
19.8100	ARTRAC//VFT	0708-09	-	MFA BUDAPEST	dw	Traffic on Ch. 1. Testing on all channels.
19.8104	ARTRAC//125/N/170	0710-30	-	MFA BUOAPEST	dw	Ch. 1. Tfc in p/1 Hungarian. Msg headed "phj/062/gr 0117 Budapest 652. '5.1994. 05. 18. then off-line encryption.
20.0170	TWINPLEX//100/E/-	1200-20	-	PAKISTAN EMB NIAMEY	dw	-400/-85/85/400. Tfc addressed Foreign Karachi (instruction "FGNISLD pls poss").
20.2865	SITOR/B//100/N/170	1435-38	SOV228	WARSAW RADIO	dw	Polish ship press.
20.4985	FEC/A//96/E/400	0728-40	DGU50L2	PIAB BONN	dw	Startup and schedule (corrupted) 20498.5/DGU50L2 and 13570.9/DGN57L1.
20.7167	ARQ/E//192/N/400	1545-1855	RFTPA	FF NJDAMENA?	dw	8CRC. Cct [IAH]. Tfc "RFTJD de RFTP-~ (RFPTA?).
20.8820	ARQ/E//96/E/170	1047-53	-	UNID.	dw	8CRC. Betas then opr chat in Italian "allora hai mandato anche il137 oltre" ending "ciao ci sentiamo kk" and off air.

Graham Tanner, 64 Attlee Road, Hayes, Middlesex UB4 9JE. Internet: gmt@delphi.com

SSB Utility Listening

This month we take a look at some marine frequencies in use around the UK and the Irish Republic. This has all but exhausted my stock of marine information, so I look forward to seeing some more information and questions in my letterbox.

UK & Eire

From **P Doherty** comes some marine information covering the UK and the Irish Republic. The information on the UK frequencies comes from a British Telecom chart, but I have never seen the Irish information before, so I thought that it was all worth repeating.

In the Irish Republic, the 'Distress & Calling' frequency is the same as the rest of the world - 2.182MHz. There are a number of 'ship to shore' frequencies, which are: 2.020, 2.023, 2.049, 2.056, 2.531 and 2.534MHz. Some of these are also international allocations, so don't be surprised to hear different nationalities of some of these frequencies. There is no indication if these frequencies are assigned any channel letters or numbers, so I can only suggest that you keep a good watch on them for activity. There is also an single 'inter-ship' frequency assigned - 2.211MHz - has anyone heard any traffic on this frequency?

Two Irish coastal stations have pairs of ship/shore frequencies. These are used in a similar fashion to the UK Marine m.f. channels (see below), except that they are not allocated channel letters. I have listed these frequencies elsewhere on this page.

The UK marine frequencies are arranged into an alphabetic list, with each shore station using one or more frequencies. In fact, each 'channel' is actually a pair of frequencies - one for the ship to transmit upon (and the shore station to listen), and the other for the shore station to transmit (and the ship to listen).

The best time to hear these frequencies in use is just after the three-minute quiet period at the top of each hour and at 30 minutes past each hour. After this period, shore stations announce the callsigns of ships that they have traffic for, and take calls from ships with traffic for shore stations. This all happens on 2.182MHz. Once contact has been established between the ship and shore station, the shore station will ask the ship to QSY to a particular channel (for example, vessel *Shortwave*, QSY to channel Alpha). The ship and the shore station then change to the relevant frequencies and conduct their business.

I have listed all the channels and assigned frequencies on this page, along with the names of the shore stations which use them.

RAF

Over the past year I have received one or two letters from readers containing logs with entries for 'CWL' callsigns in the aeronautical bands. Usually, there is a request at the bottom of the letter asking for 'more information'; I have mentioned these 'CWL' callsigns several times in the past, but I recently found a very good source of information which I can recommend.

As mentioned in the past, the RAF trains various aircrew members how to operate h.f. radios, and how to pass information from an aircraft to a ground station and vice-versa. This is done with a number of aircraft based at RAF Cranwell in Lincolnshire using the callsign 'CWL' followed by a two-digit number. Their transmissions appear only during the week, and one of the most active frequencies is 5.685MHz. Other 'often quoted' frequencies are 4.718, 4.745, 6.715 and 6.748MHz, but I am sure there are others

This years *Royal Air Force Year Book* has a very interesting account of how navigators, air engineers and other aircrew are trained, and includes a few paragraphs about their radio communications training. The messages heard by readers are in fact training messages (if you hadn't already guessed) being sent to the radio room back at RAF Cranwell. The messages are used to train aircrew how to send, receive and pass-on messages over h.f. radio.

Diary Dates

Here is another selection of news items and information which will generate some h.f. signals for you to listen out for. As ever, I do not know what frequencies will be used, and the dates are 'approximate', so should only be taken as a rough guide.

American president Bill Clinton has asked all European leaders, including Russian president Boris Yeltsin, to attend a super-power meeting, to commemorate the 50th anniversary of the 'Marshall Plan'. This will be held at the end of May in The Hague and Rotterdam in the Netherlands. The event will take place from 26 - 28 May. Boris and Bill will first meet in Paris on 27 May before flying-on to the Netherlands. Obviously, there will be a lot of 'Mystic Star' signals to listen for, including 'Air Force 1' and (probably) 'Air Force 2'. Once the meeting is finished, I presume that President Clinton will return to the USA, and that means that he will fly directly over the UK (so you could hear his flight on v.h.f. and h.f.).

For those of you who monitor the USAF GHFS frequencies, exercise 'Bright Star 97', will be taking place from 18 October - 4 November in Egypt. This exercise involves a massive airlift of troops, supplies and aircraft from the USA to Egypt; in the past, these flights have used the suffix 'BS' to their callsigns. Also, flights can be heard about one week either side of these dates.

Irish Marine channels (frequency in MHz, all u.s.b.)

Coast Station	Shore	Ship
Malin Head	1.644	2.069
	1.677	2.102
	2.045	1.677
Valentia	1.746	2.090
	1.752	2.096
	2.045	1.752

UK Marine m.f. channels (frequency in MHz, all u.s.b.)

Coast Station	Channel	Shore	Ship
Shetland	Alpha	2.715	2.006
(Wick)	Bravo	2.8406	2.277
	Charlie	3.538	3.335
	Delta	2.084	3.328
Wick	Echo	2.705	2.524
	Foxtrot	1.827	2.548
	Golf	2.604	2.013
	Hotel	2.625	2.381
Stonehaven	India	1.856	2.555
	Juliet	1.715	2.552
	Kilo	1.946	2.566
	Lima	2.779	2.146
	Mike	3.617	3.249
Cullercoats	November	1.838	2.527
	Oscar	2.828	1.953
	Papa	3.750	2.559
Humber	Quebec	1.925	2.569
	Romeo	2.684	2.111
	Sierra	2.810	2.562
North Foreland	Tango	2.698	2.016
Niton	Uniform	2.628	2.009
Lands End	Whisky	2.728	2.002
	X-Ray	3.610	2.120
Portpatrick	Yankee	1.883	2.104
Hebrides	Zulu	1.866	2.534

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Scanning

Only a few letters this month and one on computer hash and how to beat it. Must be the holiday season! I'll go in with some news which is of interest to all of us.

Much coverage has been given recently to the subject of illegal eavesdropping in the cordless 'phone portion of the spectrum. If you're unaware of the coverage around it - where have you been?!

In brief, if you have a cordless 'phone then the chances of your conversation being picked up by a scanner able to pick up the two frequency areas occupied by the cordless unit are more than good. However, we have a problem here. The 'phone is in two sections, the handset and the base unit.

The handset is linked in to the base via radio waves and is therefore (surprise, surprise) not a part of the public telephone system. The base unit, strangely enough, is.

What this means is that various folk have freedom to eavesdrop on you anytime they feel like it. Oh, and in the case of bodies like the police, without a warrant!

To back this up, I cite a case from 1990 where a drug baron, Godwin Eno Effik, was given a nine year sentence after police had recorded his conversations on his cordless 'phone.

It eventually involved the Law Lords, who decided that, and I quote: "....Accordingly, the interception by police of telephone conversations on a cordless telephone is not subject to the Interception of Communications Act 1985 and evidence at a criminal trial of such conversations is not rendered inadmissible....by reason of the fact that the interception has taken place without a warrant." Source Law Lords Ruling on Regina v Effik.

Labour have promised to close this loophole, stating that the interception of such calls by anyone, the authorities or otherwise, without a proper warrant (an intercept warrant), will be classed as illegal.

Liberty, the Human Rights Organisation, want it to go further and are asking for a new Privacy Law to be introduced. Why? Because current technology allows the police, and other members of the security services, to fire a laser at your window and listen in to your conversations....and a lot more!

Darker Interest In Radio

So, what has this to do with scanning? A lot, actually.

Currently, the average scanner can patch in to cordless 'phones. This allows those with a darker interest in radio to know where you are, where you will be and for how long.

You don't have to be Sherlock Holmes to work out what this means. Whilst you may, rightly, throw your arms up in horror at this news, let's look at it from another slant. It's not just the criminal fraternity who can do this.

The police, the security forces, such as MI5 and so forth, have a *carte blanche* self-interest in eavesdropping on Mr & Mrs Public. In short, you could be the possible victim of privacy invasion and have no legal remedy to that.

In short, your private life isn't private any longer. It might well be public, and very public indeed. Consider this: Britain, in 1995, recorded 2147 'phone taps and bugging operations carried out by the police.

In the US, in the same year, 1100 'taps' were authorised. Am I the only one worried here? I shouldn't be.

So, what's my point? My point is, quite simply, that those figures are official. How many unofficial 'taps' were made?

Record Conversations

Back to scanning. What's this got to do with us? Simple. Your average high-street bit of kit has the ability to record conversations on cordless 'phones. That makes you and me, as scanner owners, instruments, willing or not, of our own demise.

Although some move towards scrambling your cordless 'phone was made, this was defeated by the DTI on the grounds that it would '....have to be controlled in order not to hamper the work of the intelligence and law enforcement agencies.' Yeah. Right. What it's saying is that we're no longer private citizens.

I predict a backlash over this as major manufacturers working on intelligence and police projects display the ease at which the average scanner can break in to your cordless 'phone, hearing aid or baby alarm.

Show the 'evil, busy-body' scanner anorak as someone with a disgusting interest in listening in to what you have to say, add to it the criminal element - 'They know when you're out, when you're in - and it costs them under £100 to find out' and show a black-masked man listening to a scanner with a jemmy and a swag bag....and the message 'Scanners - Together We Can Ban Them.'

What an awareness raising bit of propogandist psychology. You think I'm joking? I wish I was.

What's The Point?

So, what's the point of this? Easy. The point is that scanners may shortly become high-profile in a very negative sense, with the underpinning message being that such devices are tahtamount to being as useful to a criminal as a jemmy, while the government can do what they like, when they like and to who they like.

Okay, so it's illegal in many areas to listen in unless your licensed but, apart from the few idiots who go open on scanning and flout the law, we are mainly responsible users. Which is why I don't publish certain frequencies. Which is why I have no mercy for those who get caught operating illegal scanning and, lastly, which is why I believe we are, in the main, interested enough to keep it private. However, for how much longer?

Low Profile

You can assist in this by staying low profile, staying within the law as much as you can and, in general, behaving sensibly. If we don't, we're leaving ourselves wide open to attack.

So, don't travel with your scanner on display and, as I've said before, if you want to program sensitive frequencies in then by all means do so, but in the memory bank between your ears. Until the Psycho—cops come along, that's not public domain.

Let's try and raise the profile of the hobby by being responsible. After all, we're only shooting ourselves in the foot if we don't.

Computer Interference

A letter from **Miles Millar** of Launceston, in Cornwall, struck the column at the right time. Miles asks about reducing computer interference, hash, and what can be done?

The next day I had a computer session at college where the Tech advised me on the subject - after much arm bending on my part, by the way. Thanks Greg! So, what does he suggest?

If you have a PC which has a plastics case, treat it as if it is letting hash out. You need to buy some conductive nickel spray (try people like Electromail, Maplin, etc.). It has a matt finish, grey, and sticks well to plastics.

Using something called a conductive wrist strap, as PCs don't like static electricity, dismantle same and then mask off all of the holes in the case and spray. Be aware to ensure that no electrical parts are sprayed. Doing so may faff up the computer.

At re-assembly, make sure good contact is made on all joins to ensure a 'leak free' case. If you get any on the outside of the PC then you may not be able to remove it, so do take great care.

Also be aware that you may still get interference. A possibility is the mains lead and Greg advises fitting a mains filter in the lead before it enters the PC power socket.

Normally, a 6A type, do make sure it includes chokes in both live and neutral circuits. Apparently, using the type which run with suppression circuits is a waste of time.

The don'ts can be summarised as follows:

1) It's a big **no** to spraying exposed live wires and near to mains switches. If you do, then the case may become live - and so may you. It's not good for either you or the PC.

2) Aluminium foil is said to be a good suppresser. Fine, but if it touches a live bit in the gizzards of the PC, there may be a short, and the Tesco £1.95 roll of foil will certainly terminate your mega-buck all singin', all dancin' PC quicker and more efficiently than a lightning strike. If you are on the keys at the time, then....!

3) Don't spray inside monitor or peripheral equipment cases and lastly

4) Cans of spray cost around

£20, but do remember, you may invalidate your warranty by opening the case.

Finally, Greg says that unless you know what you're doing inside the gubbins of the PC, you'd be advised to look for an amateur radio supplier who may do the job for you. He also says that, if you are under warranty, consider just living with the noise and operating the scanner/radio elsewhere.

The reason being that an invalidated warranty for your mess up will prove expensive to you as well as ensuring you end up paying for the subsequent putting right yourself. If, however, you are out of it, then any reputable dealer offering such a service may be pricey, but the results are worth it if you use a PC with your set up.

Greg, by the way, is an internet freak who I've just interested in scanning! Another convert to the cause?

By the way, no responsibility can be accepted by either myself or the magazine for your modifications. You're on your own!

Your Letters

Frequencies from **SH** of Warwick on Warwick Castle 456.875 is a base with 462.375 mobile. This is channel 1 with 453.025 being channel 2. Previously mentioned frequencies are still in use.

International letter from **Chan Fuh Han** asks about an antenna able to scan above 800MHz. I've sent the reply in a pre-paid envelope, Chan - and no I'm not on the 'Net. Yet. Not for a long time to come, I think! Chan Fuh Han lives in Singapore, that proves the piece is read quite a distance from the UK!

Short range business radio frequencies, as requested, and sent in by **Mr. CCH** of South Wales: Ch1 - 461.2665. Ch2 - 461.4750. Ch3 - 461.4875 - all simplex, 461.300 is on-site paging.

He also informs me that surveillance cameras use a standard TV u.h.f. channel, channel 52, and can also use ch36. They receive the pictures on 439.250. Should suit someone out there, I guess. Thanks for the response to the SRBR question, Mr. CCH!

Until Next Time

Lastly, if you want to send stuff in on disk, be advised that I can read ASCII in .TXT file but do limit the files to around 30Kb. I'm on a word processor and not a PC and no, it doesn't generate as much hash as a computer!

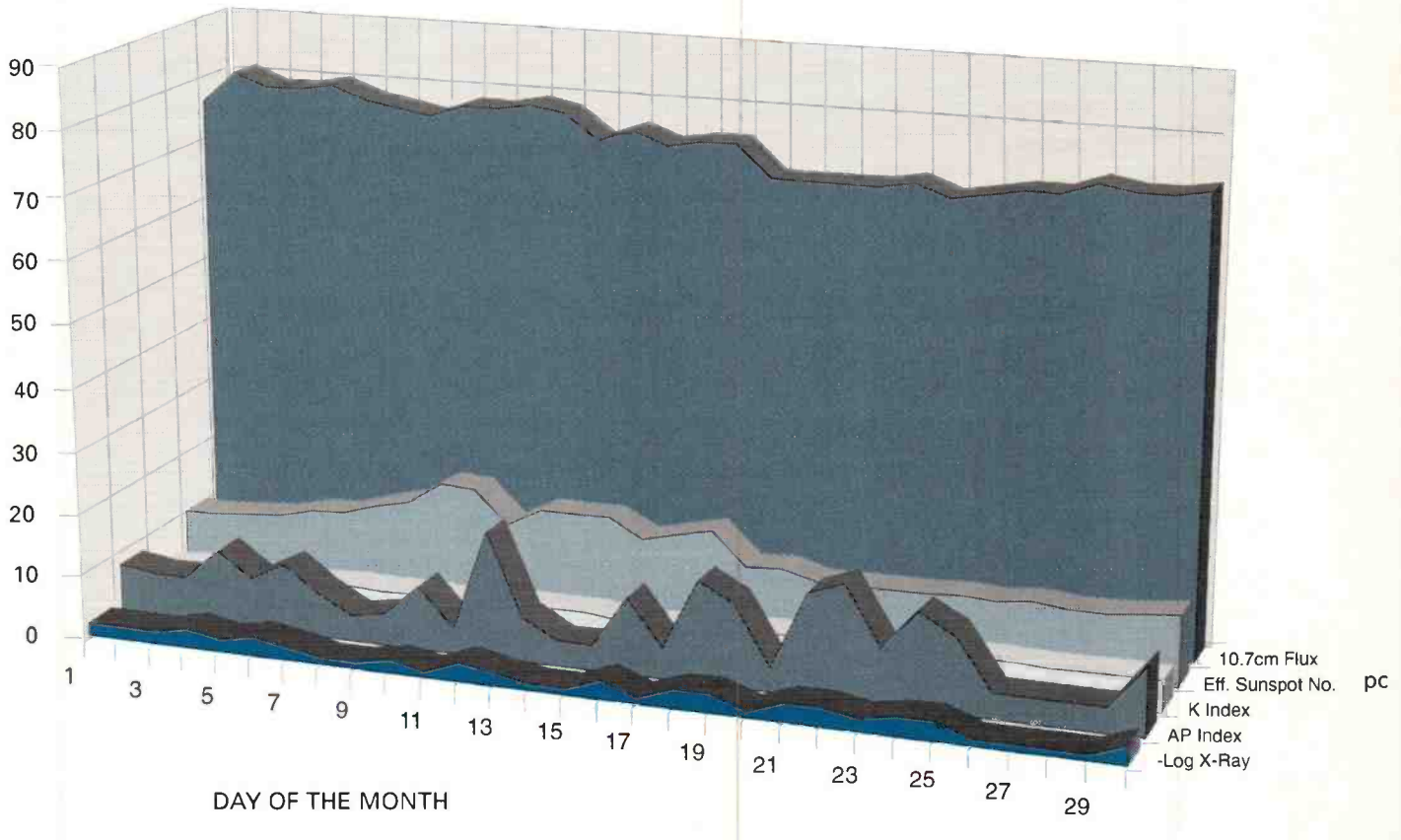
That's it for now. Do write with news and views, any 'unusual traffic' heard - with frequencies , news clippings and so on, and, of course, anything to do with UFOs and air-miss incidents is welcomed. Until next time, keep it safe!

Propagation Extra Compiled by Kevin Nice G7TZC

Propagation Extra

Guide to the Chart

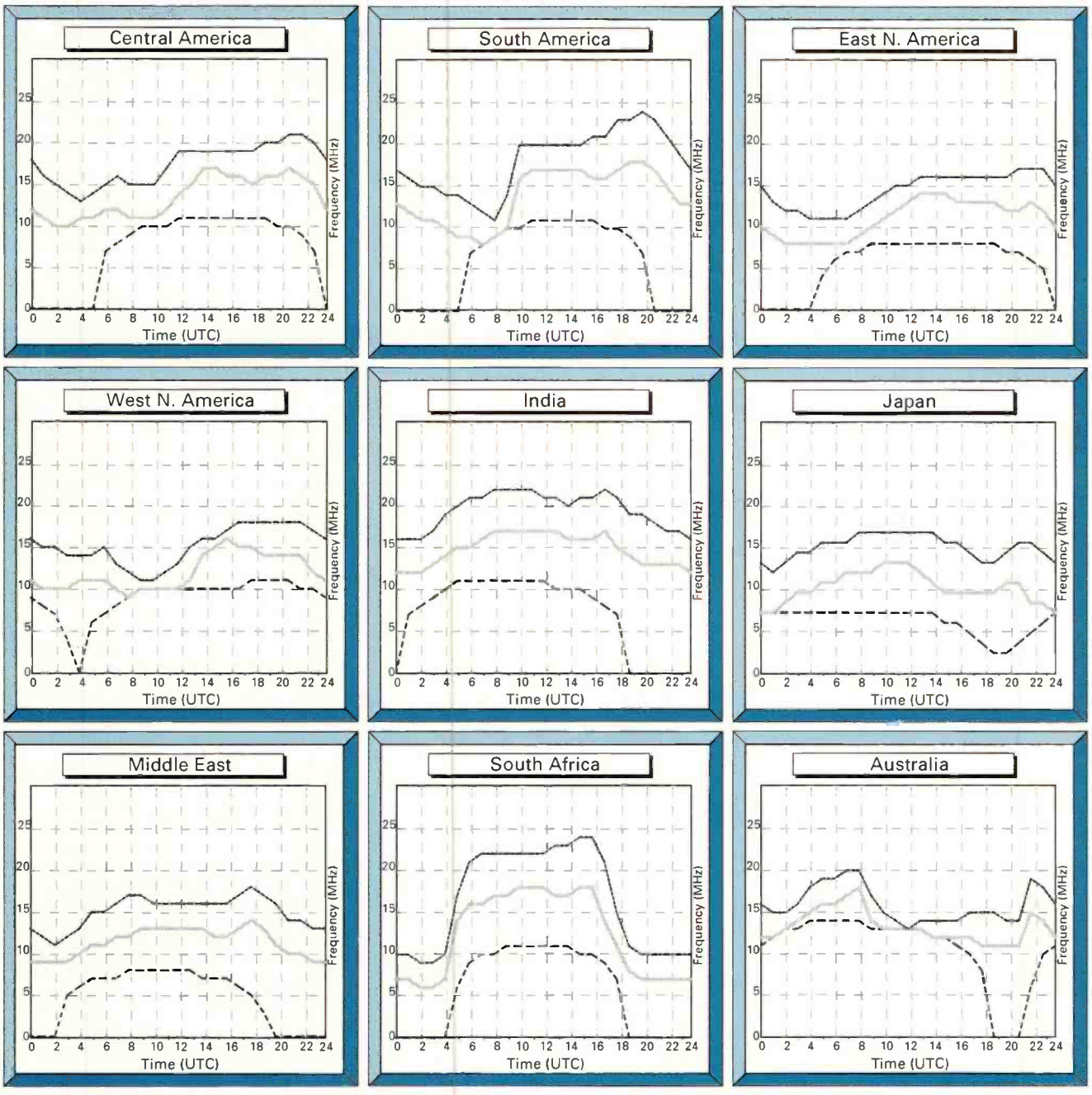
The 10.7cm solar radio flux is used as an indicator of the general level of solar activity.
The K and AP indices are measures of geomagnetic activity.
The K index ranges from zero (very quiet) to nine (severely disturbed).
K values of five or greater correspond to geomagnetic storm conditions that can relate to poor propagation conditions.
The AP index ranges from 0 to 400. An AP of 30 is the threshold for geomagnetic storm conditions.



Jacques d'Avignon VE3VIA

World Propagation Forecasts June

Circuits to London



How to use the Propagation Charts.

The charts contain three plots. The lower dashed line represents the lowest usable frequency (LUF), or ALF (Absorption Limiting Frequency). The chances of success below this frequency are very slim.

The middle line indicates the optimum working frequency (OWF) with a 90% probability of success for the particular path and time.

Lastly, the upper dashed line, represents the maximum usable frequency (MUF) a 50% probability of success for the path and time.

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

Good luck and happy listening.

Roger Bunney, 35 Grayling Mead, Fishlake, Romsey, Hants SO51 7RU

Satellite TV News

Heavenly Sightings.....

At last my new satellite dish with support (vertical) post has arrived. A recent Sunday morning was spent digging a 1 metre deep hole and covering the bottom with a thin layer of concrete prior to the forthcoming major task of pouring concrete into and filling the hole with the support post held completely vertical. The new 1.2m prime focus dish will be atop the 1.5m post and tracked across the Clarke Belt with a modified (silenced) horizon to horizon motor. Weather and time permitting I hope to be operational within the next few weeks.

April, and the traditional 'Cable and Satellite' show at Earls Court, all that's new in the expanding satellite field is on show. This year many exhibitors were showing off their latest MPEG DVB creations with delivery dates of under seven weeks in one instance. None seemed to offer complete flexibility being designed for use within a defined region or a specific channel package though Bentley Walker (Hayling Island) were selling modified Nokia boxes. Interesting to find two Far Eastern companies selling manually tuned receivers though all three types were new designs, in conversation with their sales manager they sell mainly in South America (a rapidly developing market) and oddly Germany.

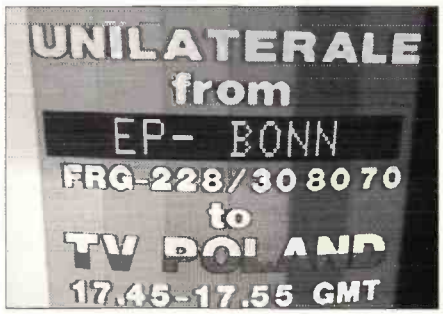
From the post received it seems more signals have gone digital and several queries have arisen asking the best receiver to buy. At this time I would advise **not** to outlay monies since the technology is still advancing at a tremendous speed. Many receivers are tied to a specific standard (and geographical region) and are therefore non DVB (digital video broadcast compatible) across the Clarke Belt. The lack of flexibility in many receivers means that the more interesting news feeds cannot be resolved though already several companies in Europe - and at least one in the UK - are offering variable parameter operation and until these become more attractive price-wise it would be sensible to wait a little longer. Apart from conventional broadcasts we need the ability to lock up news and outside broadcast feeds. As soon as user friendly equipment is available I'll pass on information though initially it's likely that any receiver will cost upwards of £350. Long live analogue!

A few months ago I included a news feed ident 'BSKYB DORAL' which we suggested could have been an item concerning Stephen Dorrel the Health Secretary. **Gerard Nicholson, EI887** (County Cork) feels that the identification may have originated from the Doral Ryder Open, an American golfing tour event intended for Sky Sports. The plot unfolds as DO RAL - comprising parts of a husband/wife partnership names,Al it seems had the idea for the tournament some years ago. Tracking now to the UK Midlands and **Bob French** tells a tale of woe, the Jaeger Horizon to Horizon motor mount (H to H) intended to track his new 3.1m IRTE dish across the heavens snapped dropping the dish onto the ground resulting in extreme damage. Fortunately the manufacturers have agreed to cover replacement costs. Though the Spacenet-2 NASA space feeds have now ceased, Bob found that signal levels from Intelsat 06 @ 53° W have increased and that Morocco's C-Band 2M service is more powerful - and in the clear (3.990GHz RH circular). The new Arabsat 2B bird at 31°E is also providing very strong downlink signals, another C-Band offering.

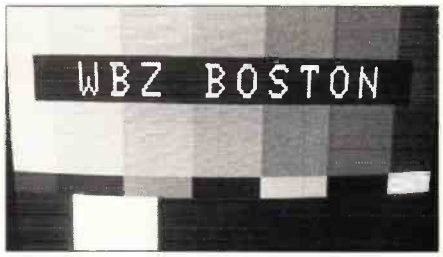
At the time of writing broadcasters are preparing for the general election which promises to be a mega event now with so many more SNG trucks operational. Though our results will be diluted with the increasing numbers now opting for digital and the advantages of smaller uplink dishes, lower power and reduced transponder rental.

Roy Carman (Sandown, IoW) is one satellite enthusiast looking forward to the election and reckons to spend much of the day and night tracking and tuning! Backtracking into March and many reports were carried from Starbird and other SNG operators concerning the events in Albania, the escape of the refugees across the Adriatic and general naval/maritime activity in the region. Numerous feeds were logged carried by Intelsat 705 @ 18°W, the Italian 'ITA 41' being very active out of Port Brindisi with other occassional news offerings uplinked via Eutelsats II F2 @ 10°E and II F4 @ 7°E. An interesting comment from Roy that in recent times PanAmSat 3R (43°W) has been the busiest since its launch! On one particular day when a story broke over the new European currency at least four different transponders were fired up carrying interviews with various European financial experts. At the same time Intelsat K (21°W) was also carrying news commentaries again over the European monetary union negotiations and ironically one transponder featured a German rally against unemployment.

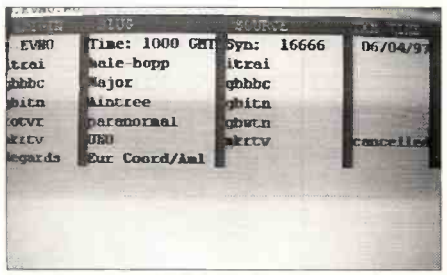
Grand National time and this year the race was postponed a couple of days due to bomb alerts. Near-Aintree neighbour **John Locker** (Wirral) was active viewing the several outside broadcast feeds that were seen carrying the lack of race, together with shots of the rapidly emptying course from the BBC 'eye in the sky' helicoptor pictures linked to the ground at S-Band. And **Frank Lumen** (Ayr) suggests that another colour bar identification seen on Eutelsat II F4 @



A sound in syncs (SIS) stabilised feed via Eutelsat II F4 @ 7°East.



Traditional test card via Intelsat K @ 21°West.



European news distribution menu via 7°East, April 6, '97, note the Aintree, GB, ITN slot which was cancelled later that day.

PAS-3R at 43°West carries a test card prior to a news feed.

Keith Hamer & Garry Smith, 17 Collingham Gardens, Derby DE22 4FS.

DX Television

Reception conditions for March remained firmly in the doldrums with almost zero Band I activity. Tropospheric reception was only marginally better. There were reports of Continental signals in Band III and u.h.f. on the 10th, 11th and 12th. On a brighter note, the Sporadic-E season should now be firmly established so if you want to take advantage of reception then now is the time to get into the hobby. The publication *DX-TV For Beginners* - available from the SWM Bookstore - will prime you with the basics and should whet your appetite.

Middle East Band I Stations

Spring is the time of the year when experienced enthusiasts become extremely optimistic about what the new season will have in store. Not content with routine reception from Europe, imaginations tend to stray further afield.

The Middle East has several Band I stations operating and new ones seem to come on-air every season. Channel E2 is the best channel to concentrate on with the antenna beamed eastwards. Many Arabic signals appear on this channel when Channel R1 is active but a reduced vision IF bandwidth is desirable to ensure that R1 signals do not override weaker Arabic transmissions on E2.

It can be difficult to identify some of the reception, unless Arabic is understood. The Syrian 2nd network from the new Channel E2 outlet should be easy to identify if last year's reception was anything to go by. The name 'SYRIA' in large letters was part of the logo in the lower left-hand corner of the picture and it could hardly be missed. Middle East countries to look for include:-

Channel E2: Iran, Syria, Dubai, Lebanon, Egypt;

Channel E3: Jordan, Syria, Saudi Arabia ('Channel 3 TV'), Iran, UAE, Lebanon;

Channel E4: Syria, Lebanon, Iran, Bahrain, Egypt.

For some elusive European catches look for the Portuguese RTP-2 outlet on E2 (35W e.r.p.) or those low-power Albanian outlets which are supposed to exist. Don't forget to check Band III, especially if the f.m. band is bursting with foreign activity. It is the only way to log some of the north African countries such as Algeria and Libya.

Fig. 1: The Albanian PM5534 test card. Sporadic-E reception is possible from the Tirana outlet on Channel IC (82.25MHz vision).

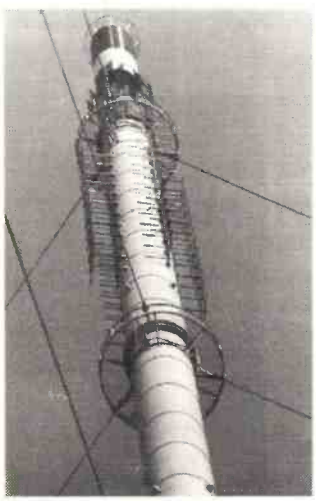


Fig. 2: The Smilde TV tower in the Netherlands

Reception Reports

Stephen Michie (Bristol) and **Peter Barber** (Coventry) logged various Dutch, French and Belgian transmitters on March 10th and 11th. Shortly after midnight on the 11th, **Tom Crane** (Hawkwell) received the Dutch Goes transmitter on Channel E35 (now this one will definitely cause havoc once Channel 5 start using this frequency!), Canal Plus Belgique on E58 and BRT-1 (Belgium) on E43.

The following German services were noted on the 12th: ARD-1 on E32 (Münster), WDR-3 on E60 and ZDF on E22, E25, E31. Many French and Dutch signals were available on other u.h.f. channels causing the inevitable co-channel interference to services in the UK.

Costa del Sol TV

Tim Bucknall (Congleton) has just returned from Torremolinos in southern Spain. In addition to TVE-1 and TVE-2 there is also Canal Sur which is broadcast throughout the whole of Andalucia. Local stations covering Torremolinos and Benalmadena Costa include 'Telecosta' and 'RTV340 Mijas' which uses the PM5534 test card. Incidentally, the '340' derives its name from the N-340 motorway which runs down to Cadiz.

During the flight, Tim was given permission to use his scanner to check out AFRTS (American Forces TV) stations which are listed in the WRTH on Channels A2 and A4 but have never been received in Europe. Unfortunately, there was no sign of them so we can only conclude that these channels are not operational. However, Tim did discover one of several Spanish TV relays operating on unusual frequencies. The signal was on 452.75MHz which is the equivalent of channel E19!

Channel 5 Begins

After months of retuning hassle, the British public finally witnessed the launch of the UK's fifth national TV network at 1800 on Sunday March 31st.

The usual tired-looking mock colour-bar pattern was shown right up to the start of the service but with the addition of a digital countdown clock for the last remaining minutes before the station burst into life hosted by the Spice Girls. Channel 5 were cock-a-hoop that Sunday viewing figures outstripped Channel Four's. However, within hours viewers were voting with their tuning knobs and watching their favourite programmes on the other four channels.

Nick Potter (Derby) comments that official Channel 5 technical information has been seriously lacking. We also discovered this when trying to find out details about the proposed Channel 35 transmitters which are due to come on-air later this year. There is no e.r.p. information about at the moment or what the proposed transmitter coverage will be.

There should be several Channel 35 transmitters all within a stone's throw of each other dotted around the Midlands. We can only conclude that e.r.p.s will only be a fraction of the other four services in order to avoid co-channel interference.

Valuable frequencies have been totally wasted in the creation of the Channel 5 network. The channels should have been put to better use providing regional TV services.

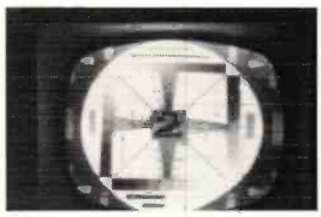


Fig. 3: Sixties-style DXing when there were few UK stations using u.h.f. This is the RMA 1946 Test Chart which was used by the NTS-2 service (Dutch 2nd network) in 1965.

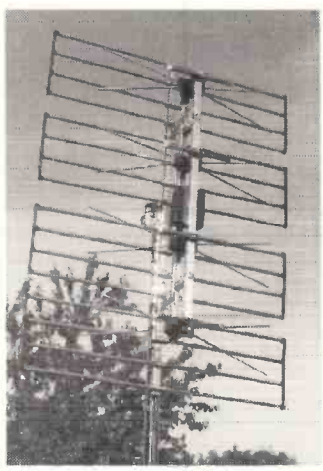


Fig. 4: A wideband u.h.f. grid antenna, a popular choice of many DXTV enthusiasts.

Profile Of A DXer

Simon Hockenhull (Bristol) became interested in DXTV in a way familiar to many of us. Simon had encountered Sporadic-E and tropospheric openings when watching his local TV as a schoolboy in the Sixties. During the summer month the local BBC1 reception from North Hessary Tor on Channel B2 would frequently be wiped out by 'Continental Interference' with strange patterns affecting the picture and a rasping buzz which obliterated the sound channel. This was caused by the phenomenon known as 'Sporadic E'.

The technical differences between the Continental 625-line broadcasts and our own 405-line transmissions meant that picture and sound could not be resolved without drastic modifications to the TV set.

During the Eighties, Simon owned a Murphey 19in dual -

DXTV continued from page 75

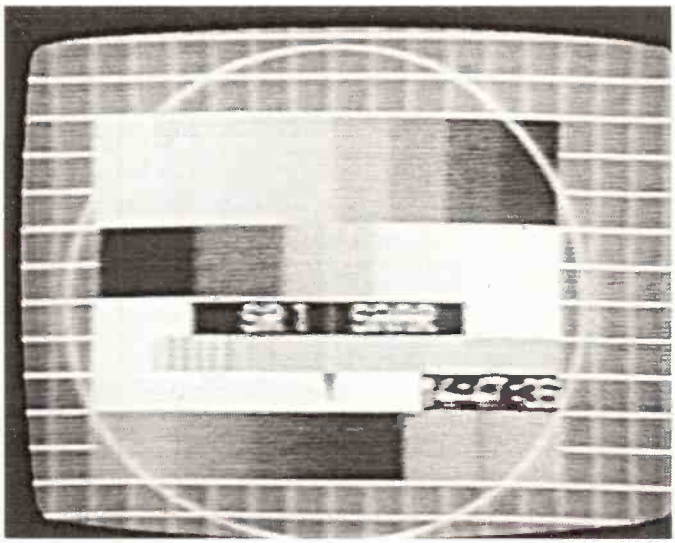


Fig. 5: Short-skip Sporadic-E reception from the German Saarlpndischer Rundfunk network (the Gsttelborner Hshe outlet on Channel E2).

standard monochrome TV. Using special keyplates which slotted into the mechanical push-button tuner, the TV could be made to operate at 625 lines in Band I. Pictures were frequently received at great strength from all over Europe even using 1.5m of wire as an antenna!

Other Matters

Adrian O'Leary (Co. Cork, Eire) confirms that Telefis na Gaeilge, the new Irisholanguge TV service, is using a logo based on the letter 'G' an d this sound very much like the logo **Andrew Burfield** saw on channel 59 towards the end of last year - see March issue of *SWM*.

Stephen Aungier (Dagenham) asks where he should point his fixed u.h.f. and Band III antennas for best results. Aligning then towards central Germany may be a good idea since there is quite a concentration of transmitters in that direction. These include transmitters in Belgium and some in the Netherlands plus French outlets in the north-east such as Lille.

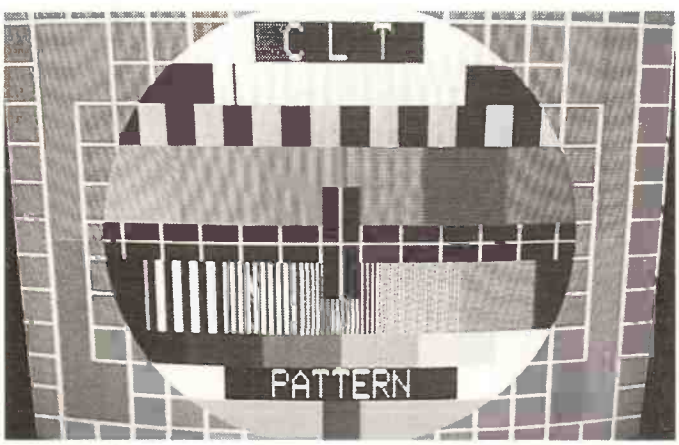
Peter Barber (Coventry) has recently acquired a Roadstar multi-band portable from the *Argos Superstore catalogue*. It is model TVM-7002 PV and retails for £59.99. There is also an Alba PTV70 TV and radio advertised at £79.99 with coverage of Bands I, III and u.h.f. However, Peter comments that neither of these receivers has provisions for connecting an external antenna.

Keep On Writing!

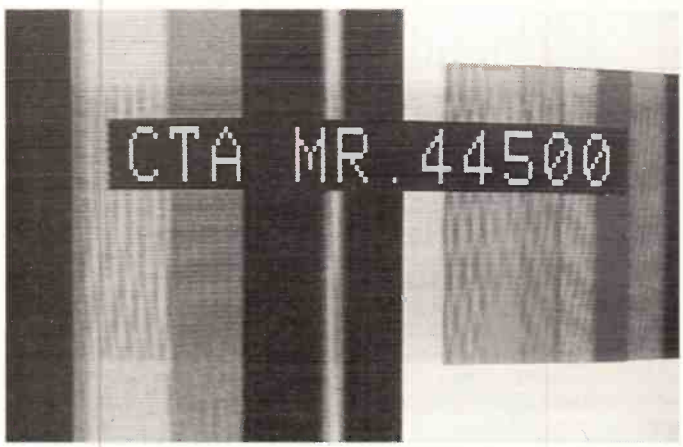
Please send DX-TV reception reports, equipment news, off-screen photographs and general information to arrive by the 3rd of the month to:- **Garry Smith, 17 Collingham Gardens, Derby DE22 4FS, England.**

Fig. 6: This month's rummage through the archives. The BBC Clock caption used from December 1949.

Satellite TV News continued from page 73



CLT Luxembourg, a rare test card catch on satellite.



An unknown test pattern via Eutelsat II F4, though suspected from BBC International Control Room, London.

7°E with 'FUCHSST TV' could possibly be a German news feed for 'FOX TV' - 'fuchs' being German for fox !

New Zealand 'SatFACTS' magazine and a horror story. Viewer with dish on the AFRTS digital package on 177°E notes caption appears on the menu 'Boot loader, waiting for information'. Advice - get the hell off that satellite fast - the downlink will reprogram your digital receiver into another MPEG parameter mode and lock out any previously loaded data - permanently!

Satellite News

Backtracking to January 17 and the sad story of AT and T's TELSTAR-401 satellite @ 97°W which ceased to work at 0615EST taking down all transponders, telemetry and control. The bird had only been launched three years earlier and represents a serious loss. Main network TV users were re-allocated though occassional users (educational TV etc) were left to sort out alternative transponder facilities. Telstar 302 was moved as a temporary measure into 97°W though the long term aim is to locate soon to launch Telstar 5 at the vacated 97°W slot.

The Orion-3 contract to build and launch has been signed for slotting at 139°E Pacific and covering that general area/SE Asia and into Australia with 10 C- and 33 Ku-band transponders. JCSat-6 will launch May 1998 for Japan and nearby Asian coverage via 32 x Ku-band transponders. And Eutelsat, Paris announce that their 3rd generation satellites will launch as follows, W2 Autumn '98 and W3 Spring '99. Hot Bird (HB) 3 will launch mid '97, HB4 Autumn '97 and HB5 Spring '98.

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

Airband

Bristol 170 Freighter 31m, sadly crashed a few weeks after the photo. *Christine Mlynek*

Are we getting a new item on the airshow circuit this year? A pair of Extras has been seen practising formation aerobatics over Aylesbury (air-to-air 129.925MHz). They come from, then depart to, the south. Own up - who are you? Or does anyone else know more? Pity it appears that the local show, RAF Halton, will never take place again.

If you'd like a helicopter flight on July 12 then act quickly. Rufus de F. Foster (**Cabair Helicopters, Elstree Aerodrome, Borehamwood, Hertfordshire WD6 3AW**) is organising the positioning of a Puma from Aberdeen to Yardley Gobion (Northampton) in preparation for flights in support of the Silverstone Grand Prix.

Now, there is no charge for the flight itself but you will be 'required,' they say, to pay for rail and minibus transfers at each end of the trip and overnight accommodation might also be needed. Closing date is about the time this Magazine comes out. If you go, write to me with your experiences!

Follow-Ups & Foul-Ups

Sorry about two small misprints in April. 'Airband Meteorology' page 42, Temperatures & Pressures section: "Temperature plus air" should read "Temperature plus ait" because the outside air temperature is eight degrees Celsius and eight is pronounced "ait" phonetically. 'Airband' page 70, photo caption, the aerodrome on the Isle of Wight is of course Bembridge.

I wondered about the difficulty with Gloucester (Staverton) aerodrome's navigational aid, as reported by Andy Cadier in 'Off the Record' (April page 79). The GST n.d.b. is on 398kHz, close to the 396kHz second harmonic of 198kHz BBC Radio 4 transmissions. No UK broadcaster has a fundamental output near the n.d.b. frequency (according to the Radio Listener's Guide). Well, it's an informed guess.

A.H. Harrison (Chester-le-Street) wasn't sure about the further use of Pole Hill 131.05MHz (near the end of the April 'Airband'). A.H.H. now confirms that this frequency is still active and **W. Sutcliffe** (Bradford) agrees.

In The Air

Mrs. B. (Isle of Man) is now so well-known at Ronaldsway that Manx are thinking of offering her a job! Hope the celebration went well on May 10, Manx Air Charters having been formed 50 years previously. The Red Arrows were expected to kick off their display season at this event.

As his Warwick home is on Birmingham's 33 extended centreline, **Stephen Hill** is treated to arrivals 4000ft overhead (300ft per mile for a 3° glideslope, work it out). Some of them cheat and call the Tower when set up for a visual approach, not bothering with i.l.s. if the weather is clear.

Various new systems are in contention to replace i.l.s. The Microwave Landing System would be the same but more accurate, also allowing for curved approaches. This was forecast to be the obvious successor. Few installations have been made and no-one seems certain any more as to which of the more recent systems will win. Perhaps GPS with local correction? Meanwhile, Birmingham retains its i.l.s.

Stephen has tabulated d.m.e. frequencies in some detail, too much for me to check in its entirety. He correctly states the following examples of transmitter frequencies: channel 46Y ground 1.133, air 1.070; channel 109X ground 1196, air 1.133; channel 109Y ground 1.070, air 1.133GHz. I couldn't check your entire table, Stephen, but sampled the entries for channels 17X and 17Y through to 59X and 59Y, finding all to be correct. I'm confident you've got the right idea.

When I studied for the Radio Amateur's Exam my 1972 *RAE Manual* listed 11 spot frequencies between 144.0 and 144.9MHz inclusive that were forbidden in the 2m band; Stephen also remembers these. Later, 144.0, 144.54 and 144.9MHz were retained but the rest cancelled. Now there is no such restriction. I believe these were military allocations as no civil transceivers would have covered them. There have certainly been other military frequencies close to this region in more recent times.

During his researches Stephen consulted some scanner directories, only to find information that he could not confirm. Such 'third party' publications have their place, often listing military matters in more detail than official sources. Others are just easier to read than official *Supplements*. However, if you want the same accuracy that pilots trust then I recommend the official offerings, and I shall now tell you how to order them.

Information Sources

First send to the Broadstone Editorial Offices for an *Airband Factsheet*, supplying a self-addressed pre-paid envelope to hold two A4 sheets (don't send to me!). Then, when you receive the *Factsheet*, you'll find it lists the suppliers who sell to the public by mail order. Beginners would consider Aerad's *Europe and Middle East Supplement* as well as the *RAF British Isles and North Atlantic Supplement*.

The latest *Airport Timetables* are available from **Airtime Publishing, 13 The Hollows, Long Eaton, Nottinghamshire NG10 2ES**. The Summer '97 UK edition costs £12.50 or you could have the Heathrow/Gatwick only version at £5.75. Seven European terminals are covered in the Europa edition at £7.40. Overseas orders should include an extra £1 per item postage.

The Heathrow/Gatwick edition is updated three times a year and to subscribe to all three costs £15.65 for the year. The other two editions come out twice a year and the costs of the Winter issues have yet to be announced.

These books should end all that confusion over callsigns and what's flying where. My only disappointment is that the format was changed a while ago. The current layout does not show where an aircraft arrives, turns round and departs. For example, if you're waiting to catch a flight, you can't use these books to find the number of the flight that the incoming aircraft is operating. So, you can't tell if it's arrived by reference to the airport display screens! This removes a useful indicator of any possible delay to the inbound aircraft.

Chartwork

The RAF charts (such as *UK(H)2*) are favoured by **John Richards** (Glastonbury). I can see the differences between the RAF and civil Aerad charts that John points out. For example, airway UW501 is labelled UW501(2) by the RAF and they've printed this (as well as a couple of other selected routes) in maroon. Why? What does the RAF know about this apparently ordinary airway that the civil chart publishers haven't told us?

A short distance away, John sees airliners northbound. I think this would be the new route UN862.

At what point would John find the divide between lower and upper airspace? Over most of the UK it's FL245. All upper airspace is radar controlled but only some lower airspace. Logically, the cruise section of a jet flight will probably be in upper airspace and few changes of level are likely. Some change is required, though, as heavily-laden aircraft might be aerodynamically restricted to lower levels until some fuel is burnt off. In general, pilots request the highest levels to maximise fuel efficiency; this can cause congestion, with delay in being cleared to the ideal level.

Low level is everything else including aircraft cruising below FL245 (many turboprops); also, flights departing from, or arriving at, terminal airspace.

Finally, the military presence in John's part of the world provides some low-level sorties. Little use is made of radio by these as they are too low to be in range of a ground station. Anyway, they're supposed to be training to operate independently, keeping radio silence, as if over enemy territory! Some air-to-air frequencies do exist but there's no set pattern, so local research could be indicated.

There aren't even set low-level routes. However, John already has the *Factsheet* and so knows the address of the CAA Chart Room in Kingsway and that general low-level flows are indicated on chart *RAC 5-0-1.1*, available free! Do send a pre-paid, self-addressed envelope though - at least A4, chart weighs 125g.

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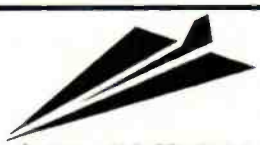

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Peter Bond, c/o Editorial Offices, Broadstone

MilAir

Antennas

Whilst I realise that the subject of antennas is covered regularly in other sections of *Short Wave Magazine*, three readers though have kindly written in with similar questions, I thought I would devote some space to this subject in this month's column. The questions effectively ask what type of base station antennas I use or would recommend for airband listening. Also, is there any benefit to be gained from antennas designed specifically for the airband?

Over the past 15 years I have tried a wide variety of antennas, sometimes out of personal interest and others as a result of the weather conditions. The increasing number of winter storms over the last decade has meant that the antenna manufacturers have been kept very much in business by myself and I am sure by many others. It has even got to the point where I now keep an old discone operational in the loft during the Winter as I get fed up with being off the air each time another big storm wrecks the rooftop arrays.

Firstly, I will assume that the reader is using a good quality low loss co-axial cable, with the antenna placed as high as is reasonably possible. Also, using an antenna with the low loss 'N-type' connector does seem to improve performance slightly. I currently use a mix of three antennas.

(a) A wide band discone for general listening I have found that the double discone design works well over a wide range of frequencies, including good results on both the air bands. If possible buy one made of stainless steel rather than aluminium as I have found that they survive long term exposure to the elements more effectively. The aluminium oxidises and becomes brittle after a while and therefore becomes more likely to snap in strong winds.

(b) I use a dedicated airband antenna. My experience shows that the results over a good quality discone are not as dramatic as some people might expect but if your main interest is aviation then the expenditure is well worthwhile to help pull in those weak signals. (My guess is that there is at least a 5dB gain by using this type of dedicated antenna).

(c) I have been using a log periodic on a rotator, this is an excellent antenna if you want to target signals from a specific direction. Unfortunately, since I bought it seven months ago I have had quite a lot of problems. Despite the fact that it is a heavy duty mounting, etc., it has been unserviceable for three of those seven months and I am currently attempting to get my money back. When it worked the results were superb, unfortunately it packed up every almost time the wind rose to over 20knots.

Siren Hold

Richard from Swindon writes with information regarding the use of the Siren Hold at Lyneham. Because of the location of the airfield almost directly under airway Golf 1 / Upper Golf 1, C-130s departing Lyneham make a climb out using a Standard Instrument Departure (SID) - usually Approach frequencies **118.425/359.5** - and then if required they take up an orbit in the Siren Hold where they wait until a slot is available for them to be fed into or cross the jet traffic on the airway. (Richard also asks some questions about the Bermuda Triangle, which whilst interesting I feel that that is beyond the scope of this column).

Refuelling Areas

In reply to query from a reader from Flintshire in North Wales, information has come to light regarding a new permanent Danger Area. A new military in-flight refuelling area has been established between the Isle of Man and the UK mainland. The area AARA 13, is one of the smaller UK areas and runs slightly off of North-South axis for about 80km from just south of the Scottish mainland. If anyone has identified the frequencies in use please let us know. There also seems to have been a realignment of the North Sea air refuelling areas with AARA 4 being split into two adjoining areas and AARA 8 being rotated slightly.

Frequency Focus

A request from **Bill** in the Wirral, he asks if I have any information on the frequencies used in the UK low flying areas. A check with a few people produced the following list, as usual if you can update it please let us know: Area A **337.85** - Area B **306.65** - Area C **300.55** - Area D **277.2** and **369.05** - Area E **364.975** - Area F **279.25**.

Lastly, thanks to an eagle eyed reader the 111 Squadron Tornados mentioned in the Jan 97 'MilAir' are of course based at Leuchars not Lossiemouth. Also thanks for the list **Mike**, I have passed it on as requested. See you next month.

Airband continued from page 78

Hawker Demon. *Christine Mlynek*

Abbreviations

CAA	Civil Aviation Authority
d.m.e.	distance measuring equipment
FL	flight level
ft	feet
g	grams
GHz	gigahertz
GPS	Global Positioning System
i.l.s.	instrument landing system
kHz	kilohertz
MHz	megahertz
n.d.b.	non-directional beacon
PFA	Popular Flying Association
TMA	Terminal Manoeuvring Area

Frequency & Operational News

A couple of changes sent by **Martin Sutton** (CAA). Aerodromes: Shawbury's 01/19 runway becomes 18/36 as magnetic north moves. Airways (see also last month): W3D and W911D are now controlled by Forth Low 124.5MHz, which same frequency operates the Northern Radar Advisory Service north of W911D. Beacons: Enniskillen is the proud owner of d.m.e. with callsign ENN.

Helicopter routes: the Northolt reporting point on H9/H10 is actually just south of the airfield of the same name. Reporting when over the airfield means you've gone too far, without clearance! To avoid confusion, the point has been renamed 'Gutteridge.'

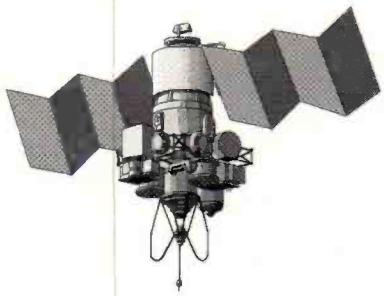
Martin, I see you're in the Safety Regulation Group. Will you be participating in the CAA presence at the Cranfield PFA Rally this year? And anyone else who's going there, drop me a line with your evening 'phone number if you'd like to arrange to meet.

John H. Fenton (West Rainton) won't have had the May issue when he wrote, but correctly lists the new Scottish Airways frequencies. As elaborated in May, 126.3 is in fact TMA Inbound whereas 124.825MHz is TMA Outbound. Hope this clears up any confusion. Or, is this famous last words? A good way to end this month's column!

The next three deadlines (for topical information) are June 16, July 24 (slight alteration there) and August 18. Replies always appear in this column and it is regretted that **no** direct correspondence is possible.

Lawrence Harris, 5 Burnham Park Road, Peverell, Plymouth, Devon PL3 5QB E-mail: lawrenceh@ndirect.co.uk

Info In Orbit



National Oceanic and Atmospheric Administration

Space Monitoring Information Support

The extended spell of sunny weather in April apparently broke records going back 200 years. It provided me with several opportunities to obtain images of comet Hale-Bopp, which remained at naked eye visibility for several weeks. Nearer at home, infra-red images from both METEOSAT and NOAA satellites showed large areas of clear skies over most of Britain for days at a time.

GOES-K (now called GOES-10) was successfully launched on Friday 25 April. After tests it will stored 'sleeping' at 105°W. This will avoid on-earth storage costs, post-storage re-testing, and the 12-month delay between NOAA's call-up and launch.

Current WXSATs

With no METEORS in operation until 21 April (due to the temporary solar illumination constraints of their orbits), we heard only METEOSAT, GOES-E (on the western side of Britain), NOAAS-12

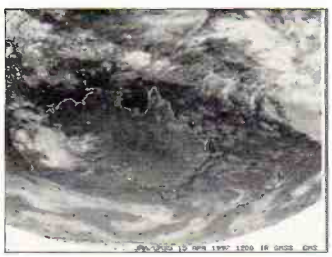


Fig. 2: GMSS infra-red WEFAX image from METEOSAT on 15 April.

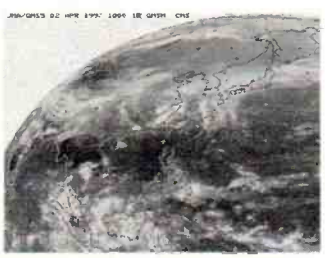


Fig. 3: GMSN infra-red WEFAX image from METEOSAT on 2

and 14. The CIS oceanographic satellite OKEAN-4 (also known as 1-7) did an occasional data dump (on 137.40MHz). On 7 April I caught a transmission near the end of a south-bound pass at 0748UTC.

If you manage to 'catch' an OKEAN or SICH pass, you can expect to see a combination of images from one or more of the sensors. Beginners should be aware that neither OKEAN or SICH transmit continuously. A short schedule of planned transmissions is published on the Internet each week by Alex Ivanov.

METEOSAT Schedule

EUMETSAT issued a second transmissions schedule - S9704M02 - to replace that issued earlier in the month. April saw the introduction of the new GMS (Japanese) formats. METEOSAT transmits two new GMS WEFAX formats - GMSS (south) and GMSN (north). The GMSS format now includes the whole of Australia (previously split between two formats). GMSN shows the eastern edge of the Asian continent. WEFAX images from the CIS (Russian) GOMS WXSAT are scheduled to be routinely re-transmitted from about mid-May.

METEOSAT-7 is currently scheduled for launch in July; subject to successful commissioning of the spacecraft, it will become the operational satellite during autumn.

Letters

Increasing numbers of images are arriving as disk files and this has allowed me to make small enhancements to image contrast where this is needed for inclusion in the column. This was not the case with **Frank Slater's** GOES-E image of 1 April which shows a depression off the coast of Florida. Frank constructed a yagi antenna for the 1.691GHz METEOSAT signal, and this feeds a Dartcom downconverter. The resulting signal (137.500MHz) feeds the WXSAT receiver. The output was computer processed and enhanced using image processing software on his 386SX computer.

Anthony Turton lives in London and, after reading his letter, I have to express admiration for his achievements in constructing a working system. Like me, Anthony has an extremely limited budget. He started with a Cirkit receiver, which is supplied in kit form. He has just one crystal fitted - that for NOAA-14 (137.62MHz) - though there is room for five more. Anthony bought the unit in the form of a built and aligned PCB, so he fitted the additional casing, sockets, knobs and wiring.

To construct a WXSAT antenna, Anthony used the cable from a CB antenna for making a crossed-dipole. I believe he has installed this in the loft, but plans to have it roof-mounted at some time.

The a.p.t. output signal from the Cirkit receiver feeds an A&A Engineering demodulator interface which his sister brought back from America. The interface came with good software which Anthony explains can run on his (relatively) low performance PC - a Compaq 286 with 640K RAM! Anthony asks whether there is any satellite tracking software "for such non-Windows dinosaurs?" I have had a look at the minimum specifications given in the documentation provided with several DOS programs - InstantTrack, Traksat, STS-Plus, and PC-Track. The nearest minimum specification program is Traksat, but this still appears to require 2Mb RAM, though it runs in 250Kb RAM. If any reader knows of any lower specification program I shall be happy to mention it.

Anthony continued his low-cost acquisition program by servicing a car in exchange for a second-hand b/w monitor! Using an old VCR and camera, he has recorded passes by filming the PC screen. The video could also record the a.p.t. signal itself, and could therefore be programmed to record future passes. I recall other experimenters perfecting this technique some time ago. Anthony suggests that those hemmed in by tower blocks, as he is, could take folded crossed-dipoles and a receiver and travel to an open space to record passes. I tried this myself some years ago, taking just an antenna, receiver and small portable cassette recorder (optimised for recording a.p.t.) in the car. The results - recorded on Dartmoor - were extremely good, but I no longer have a car. Anthony's WXSAT software includes basic image processing options and can save images in PCX format. Having an American bias, the program can build a GOES whole disc image using the four quadrants. Anthony sent some NOAA-14 images of which **Fig. 5** shows Britain.

Jim Smith of Welwyn Garden City jogged my memory with his letter about PDP-8 and PDP-11 computers. He has apparently been reading 'Info' since I took over the column back in the 80s, following Pat Gowen's decision to concentrate on the amateur satellite scene and his environmental work. Jim was an electronics engineer for nine years and then made redundant in 1982. He entered computing, working for a small maintenance company servicing DEC PDP systems. They were minicomputers and, as Jim says, "Those were the days!" Jim was aware that I was also using these PDP computers at the same time - hence his comment.

His interest in WXSATs began on a beach while reading a copy of *Practical Wireless*, in which there was an article about receiving transmissions on v.h.f. Jim commented that he wished he had known this 10 years earlier when he had all the v.h.f. test equipment and components needed to build and align a 137MHz receiver. On his return from holiday, he 'cannibalised' an old v.h.f. stereo receiver. Bending the coils around and using the London Volmet (a.m.) signal on about 135MHz, he realigned the receiver to work in the 135 to 140MHz band.

Jim then made a dipole from a piece of copper pipe. For beginners who might be uncertain of the nature of WXSAT antennas, remember that for test purposes, almost any antenna will suffice. The signal from a typical WXSAT is significantly smaller in amplitude (at about 5W) than any terrestrial broadcast station, but they are passing across our sky with minimal attenuation. Consequently, you can connect almost any wire or cable to the receiver input and - when a WXSAT rises above your horizon - receive a signal. In my loft I have a discone; outside I have two mounted crossed-dipoles, and an h.f. random length wire. All of these can hear the WXSATs. The only caution is that with a very basic receiver, you may also hear paging signals in the band. These powerful transmitters were allocated frequencies in and near the 137MHz band in Britain, so special filtering is required if you wish to produce a WXSAT image from the signal.

Continuing with Jim's story - he had no access to prediction software or orbital information so he spent many evenings "twiddling the tuning", waiting for his first WXSAT. Eventually, after about a week "I heard that (now familiar) 'clip clop' sound! It worked!" Soon after that he built a proper crossed dipole and then set about making a decoder for his Sinclair QL. I had also bought a QL (Sinclair's abbreviation for

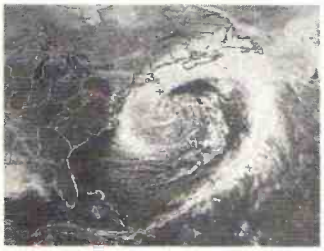


Fig. 4: GOES from Frank Szlater.

Fig. 5: 7 April NOAA-14 from Anthony Turton.

'Quantum Leap', if I remember correctly), and was teaching myself 68000 chip programming! There were no books on the subject, and my son Tim was just going to primary school (this is relevant because after I taught him BASIC, he was able to help me identify the codes used by the 68000 chip). He is now doing a degree in computing at Cambridge University - so something must have rubbed off!

Jim's QL decoder took about 18 months to perfect, "but by then it was obvious that my home-brew receiver wasn't really suitable for WXSAT reception". Jim bought a Maplin receiver and Cirkit decoder kit. The dreaded pagers began and completely blotted the 137MHz band.

Jim recently took up the hobby again and rebuilt the decoder. He wrote some simple software ("we called simple code 'noddies' in the PDP days!", he said). He bought a Martelec receiver and has been impressed - "no pager interference at all". He also comments on the WXSAT V2.3 package which works under Windows and uses the 'line-in' of a standard sound card to produce pictures in real-time. In fact I have this installed but for certain reasons (!) April has been the busiest month for me in many years. I plan to review this software as soon as I can. Meanwhile, my thanks to Jim for an interesting story about his WXSAT endeavours.

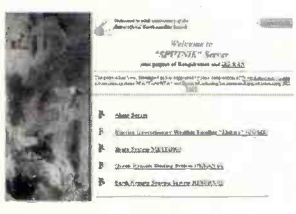


Fig. 6: Russian 'Sputnik' site.

Beginners - Kepler Elements

This forms part three of my notes on Kepler elements, requested by many readers. Keplers are the data sets issued (mainly) by NASA at regular intervals. Each set details the position and movement of a satellite at a specific time - called the Epoch (covered in part one). Last month I gave a brief outline of the two-line element format used by NASA; this is the type normally used by people using computer programs for automatic updating.

Kepler elements define an ellipse, they orient it around the earth and place the satellite on the ellipse at the Epoch time. They assume that the ellipse is of constant shape and orientation. In practice, effects such as the solar wind, gravitational anomalies and the variability of the upper atmosphere cause changes which accumulate as errors. This is why Kepler elements 'age'.

The term eccentricity defines the actual shape of the ellipse. Many satellites have near-circular orbits - an ellipse with an eccentricity of zero (0) is a circle. Eccentricities near one (1) imply a satellite orbit which is highly 'squashed'. Both types of WXSATs have orbits of near zero eccentricity. If the orbit is non-circular then the satellite's orbital speed will not remain constant; at its nearest point to earth (perigee) it will move at its fastest. At its furthest distance (apogee) its orbital speed will be slower; this is a consequence of Kepler's Laws of planetary motion. One application of the 'moves slower when further away' effect is that some types of communication satellite can be put into highly elliptical orbits. While near their apogee they can be used for long communications sessions between the two sites for which the orbit was carefully planned.

As an example of a satellite in a highly eccentric orbit look at CRRES (catalogue number 20712) which has an eccentricity of 0.718. Together with its other orbital parameters, this results in the satellite having a perigee of 338km and an apogee of 34582km.

Russian Internet Site Update

It is always good to receive early news of new Russian Internet satellite information sites, and an E-mail arrived - just before the press deadline - from **Dr. Alexei Mazurov** announcing a new one.

There has been a Russian presence on the Internet for some time and their primary WXSAT site has been at: **http://smis.iki.rssi.ru** and continues to provide current information, including specialist newsworthy images. A recent innovation is the schedule of the planned reception of NOAA passes; the latest image from each pass is available for viewing.

The Russian Space Forces site at: **http://www.rssi.ru/SFCSIC/SFCSIC_main.html** is the Coordinational Scientific Information Centre of the Russian Space Forces. This presents new technologies and equipment for civil GLONASS users. The Russian Space Agency (RKA) site is at: **http://liftoff.msfc.nasa.gov/rsa/rsa.html** and provides links to pages on MIR and the International Space Station. "The Russian Space Agency (RKA) was formed after the break-up of the former Soviet Union and the dissolution of the Soviet space program. The RKA uses the technology and launch sites that belonged to the former Soviet space program. Currently, the RKA has centralised control of Russia's civilian space program, including all manned and unmanned non-military space flights". RPA Planeta has a site providing information on the GOMS WXSAT at: **http://smis.iki.rssi.ru/goms/goms_2.htm** The Russian MIR space station has a site address: **http://www.maximov.com/Mir/mir2.html** The PRIRODA international earth remote sensing project (part of the MIR complex): **http://www.ire.rssi.ru/priroda/prir_br.htm** The new Russian WXSAT site announced on 16 April has the site address: **http://sputnik.infospace.ru** It is dedicated to the 40th anniversary of the launch of the first artificial Earth satellite.

"The SPUTNIK Server is a joint project of Russian Commitee for Hydrometeorology and Space Research Institute (IKI RAN). It has been launched and is supported by Division of ground microprocessor information systems of RPA 'Planeta' and Space Monitoring Information Support (SMIS) laboratory of Space Research Institute (IKI RAN)."

"The main task of this server is to provide information about Russian weather satellites. You will find here information about the following satellites: Russian geostationary weather satellite "Elektro" (GOMS); Space System Meteor-3; Space Ocean Sensing System Okean-01; Space Remote Sensing System Resurs-01; "The server shows the operation schedule for these satellites; they will be updated on regular basis. Requests for data acquisition and processing are planned to be accepted in near future."

The information presented here is published by kind permission of **Dr. Michael Zakharov** of the Space Monitoring Information Support Lab, Space Research Institute RAS, Moscow.

Shuttle Launch Schedule

The failure of STS-83 to complete its mission has resulted in NASA re-scheduling it as STS-83R for launch around 1 July.

Currently STS-84 (the sixth MIR mission) is scheduled for mid-May. It will carry the Spacehab double-module into the MIR orbit of 51° inclination.

STS-85 is scheduled for a 17 July launch.

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

Kepler Elements - MIR and Shuttle

1. For a print-out of the latest WXSAT elements, MIR, and the Shuttle (when in orbit), send a stamped addressed envelope and secured 20p coin or separate, extra stamp. Transmission frequencies are given for operating satellites. This data originates from NASA.
2. I maintain a list of people who receive a monthly print-out of Kepler elements. To join the list please send a 'subscription' of £1 (secured, plus four self-addressed, stamped envelopes) for four editions.
3. You can have the data as a computer disk file containing recent elements for the WXSATs, and a large file holding elements for thousands of satellites. A print-out is included, identifying NASA catalogue numbers, ideal for automatic updating of tracking software. Please enclose 50p with your PC-formatted disk and stamped envelope.

Frequencies

NOAA-14 transmits a.p.t. on 137.62MHz
NOAA-12 transmits a.p.t. on 137.50MHz
NOAAs transmit beacon data on 137.77 or 136.77MHz
METEOR 3-5 (or 2-21) use 137.85MHz
OKEAN-4 and SICH-1 use 137.40MHz
METEOSAT-5 (geostationary) uses 1.691 and 1.694.5GHz for WEFAX
GOES-8 (western horizon) uses 1.691GHz for WEFAX
MIR uses 145.80 and 143.625MHz.
Progress (supply vehicle to MIR) transmissions may be heard on 166.0MHz

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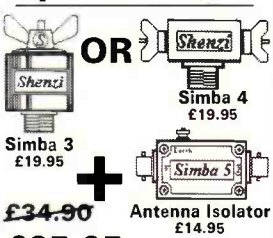

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Decode

All the Data Modes

Help!

A number of readers have written to me this month asking for help on a wide range of subjects. The first query comes from **Bill Wellington** who's son has developed an interest in short wave listening and would like to move on to start decoding some of the data modes. He currently has a Lowe HF-225 receiver and a BBC Master 128 computer in very good condition. Bill would very much like to use the BBC Master to handle the decoding but has yet to find a source of suitable software.

Whilst there have been many such programs available over the years, I'm not sure whether or not any are currently on sale. If you know of any suitable sources please let me know, you could also drop an E-mail to Bill who can be reached at **bill@bootsie.demon.co.uk**

Now the next request is a little easier to handle. **Eric Rutter** of Fleetwood has been using a Commodore C-64 computer with the old Technical Software RX4 program on tape. Unfortunately, this program has now failed as the tape won't load anymore - a good reason for keeping a back-up of your favourite software! As with the BBC Master there have been many programs sold for these computers so you may find some at Radio rallies. An alternative is to contact **BMK Communications** who still sell RTTY and c.w. programs for the C-64 and Dragon on disk and tape. The contact details are: **BMK Communications, 2 Beacon Close, Seaford, East Sussex BN25 2JZ.**

Basic Start-up

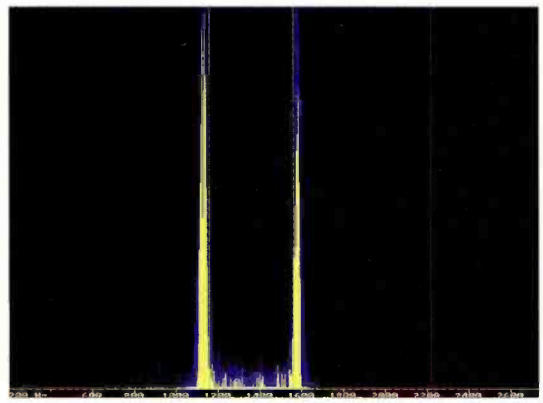
Jorma Metso is a Swedish based 'Decode' reader who used to enjoy RTTY decoding, first back in the sixties and then using an old Swedish micro ABC-80 that employed the classic Z-80 processor and home-made software. Jorma's new interest is fuelled by a rather more powerful Pentium PC running Windows 95. He has ordered-up an interface from Pervisell and has already received my set of five disks from PDSL. The question is - where to start? This is a very sensible question as it's all too easy to bob about from one program to another and never really get to grips with this decoding game. The choice really is between JVFAX and HAMCOMM as they are the main decoding programs, though MSCAN is also in the running. Although the FAX programs offer a perhaps more impressive result HAMCOMM is much easier to get going as it requires far less setting-up and has a good range of tuning indicators.

So, let's just run through some of the key points required to get you started. The first thing of course is to install the software. If you're using Hamcomm from my disk set you must start by creating a new directory on your hard drive. You can call this anything you like, but 'Hamcomm' is quite a good choice. Once you've done this, copy the file 'hamcom31.exe' from the hamcomm directory on the floppy disk. Next you need to run 'hamcom31.exe' which will unpack all the program files into this new directory. Once this has finished you can delete the file 'hamcom31.exe' as it's served its purpose. That's really all you have to do to get the software installed onto you disk. Now, whilst you can do all I've described so far using Microsoft Windows, the actual HAMCOMM program must be run from DOS. This is because HAMCOMM requires exclusive access to the PC's programmable timers and Windows doesn't allow this.

Before you can start decoding you have to connect your receiver interface and make sure HAMCOMM can find it. As far as interfaces go there are lots of variants on the market. If you want to try your hand at a some home construction it might be worth trying one of the kits that can be found advertised in these pages. However, if you really are new to this game it might be more advisable to start with a ready made interface. There are lots of people selling these, but Pervisell have been supplying 'Decode' readers with excellent service for many years now and so remain my personal recommendation. Not only is their service top notch, but the build quality of their interface is of the highest standard - all for just £16.99. They can be contacted at **Pervisell Ltd., 8 Temple End, High Wycombe, Bucks HP13 5DR. Tel: (01494) 443033.**

When you have your interface to hand you need to connect it to one of your computer's serial ports. Which one you choose doesn't really matter, so long as it's not already in use! If you have a suitable free serial port just plug-in your interface. At this point you may well find that the interface uses a 9-pin plug but the PC has a 25-pin plug or vice versa. Don't panic, the solution is easy. Just pop down to your local computer or component shop and ask for an adapter. The assistant will probably ask if you want male:male male:female, null modem, etc., etc. Again, don't panic just make sure you take your interface unit with you.

Fig. 1.



If, like me, you find all the available serial ports are in use then you need to invest in a simple data switch. These are available from most computer and component shops and come in all manner of formats. The data switch is really just a multi-way switch box that lets you connect lots of different devices to the same serial port. You choose which one to use by turning a rotary switch on the front panel. Assuming you've solved this little problem, you now need to sort out the audio connection.

The very best place to make the connection is to use your receiver's 'line' or 'Aux' output socket - if it has one. This is because this point offers a relatively constant output level that's not effected by the setting of the volume control. This means that you have the convenience of being able to adjust the volume without effecting the decoding system. If your receiver doesn't have a suitable output, then you will have to revert to using the external speaker socket. The snag with this is that whenever you plug-in your decoder it will cut-off the internal speaker so you can no longer hear what's going-on! The solution is to use what's known as a 'Y' connector. This is so called because it looks just like a Y with the bottom of the Y comprising a 3.5mm jack plug and the two top branches featuring 3.5mm sockets. All you do is plug the 3.5mm jack into the external speaker socket, then plug the decoder into one of the spare sockets and an external speaker into the other. It's very simple but effective. When using this system you do need to be careful with the volume setting. If you want to run the external speaker at a lower volume than your decoder demands it's worth getting a speaker with a built-in volume control. These are often used for car speakers so your local car accessory shop may be worth a visit.

The final part of the set-up is to tell the program which serial port you've decided to use. However, to do this you need to start the Hamcomm program by first making sure you are at the DOS prompt i.e. something similar to C:> then change to your new directory - type cd\hamcomm. Now all you need to do is type HC and the program will start and present you with the main screen. This comprises a range of menu options along the top of the screen with the words 'Ham Comm' in the centre. To tell the program which port to use you need to open the 'Port' menu. This is done by pressing 'Alt' and 'P' together where you will be presented with a list of COM ports from 1 through to 4. The currently selected port is indicated by a square block to the left of the port name and the default setting is COM 2. If you need to change this to another port simply move the highlighted cursor down to cover the required port and press enter to select it.

You are now ready to receive amateur RTTY but I suspect most of you would rather get stuck into a commercial station or two. In order to do this you need to change the speed and shift settings. This is because most commercial stations use 50 or 75baud and a shift of around 400Hz.

Thankfully changing these parameters is really very easy and can be done using the menus. To change the shift press 'Alt' and 'K' together and move the highlight down to cover 425Hz and press enter. If you want you can get a bit smart at this point and use the 'Set Var' option and enter '400' to set the shift the 400Hz. Finally you need to set the speed by pressing 'Alt' and 'S' keys together and moving the highlight to 50.

Now we're ready to fly - all you need is to find a suitable RTTY signal. A good one to start with is Hamburg Meteo on 7.646MHz. Set your receiver to upper sideband and tune to this frequency listening for a strong warbling sound. Once you've found this press 'Alt' and 'm' keys together followed by 'p'. This will start Hamcomm's spectrum display which is a really great tuning aid. Now all you have to do is experiment with the receiver's tuning so that the two signal peaks align with the vertical alignment marks shown in **Fig. 1.** Now just press 'Alt' and 'M' followed by 'B' to start receiving. If everything is okay you should find your screen filling with five digit groups of numbers or the station ident transmission.

What you have here is a coded weather transmission from Hamburg Met. Not very exciting in its unprocessed form, so let's use the SYNOP decoding features of Hamcomm to turn this into something more useful. All you have to do is press 'Alt' plus 'T' followed by 'X' to enable the SYNOP decoder.

Day Watson Complex List extract follows:

Freq	Mode	Station	Time	Observations
0.1291	ITA5//200.4/N/300	BMPT BONN (DCF49)	1845-58	Frequent ID "DCF49 TEST". Further characters before/after. Constant mark between bursts. No system to detect fully reported 11bit(1srt/8data/ep/1stp)frame cfmd Code30 analysis. HAMC
1.1105	ARQ/E3//192/E/400	FF FT DE FRANCE (RFLI)	1027-45	8CRC. Betas then off air.
2.2330	ARQ/E//VFT	LKA VARIOUS	2212-13	8 channel VFT structure on u.s.b. 3 channels visible on spectrum analyser.
2.2338	ARQ/E//72/E/85	LKA BONN	2213-22	2.233820. Ch. 1 in VFT. 4 CRC. Betas. Cct [SHVHF] to Kiel.
2.2345	ARQ/E//72/E/85	LKA BONN	2222-27	Channel 3 in VFT. Betas. Cct [GNVHF] to B. Bemstad.
2.2355	ARQ/E//96/E/85	LKA BONN	2228-32	2.235520. Ch. 6 in VFT. 8 CRC. Betas. Cct [HHVHF] to Hamburg.
2.2930	ARQ/E//VFT	LKA VARIOUS	2246-47	8 channel VFTstructure on u.s.b. 4 channels visible on spectrum analyser.
2.2938	ARQ/E//96/E/85	LKA BONN	2247-52	2.293820. Channel 1 in VFT. 8CRC. Betas. Cct [GWVHF].
2.2945	ARQ/E//96/E/85	LKA BONN	2252-55	Channel 3 in VFT. 4CRC. Betas. Cct [GMVHF] to Kassel.
2.2955	ARQ/E//96/E/85	LKA BONN	2255-2302	2.295520. Ch. 6 in VFT. 8CRC. Betas. Cct [NWVHF] to Dusseldorf.
2.2958	ARQ/E//96/E/100	LKA BERLIN	2302-06	2.295.860. Channel 7 in VFT. 8CRC. Betas. Cct [HFVBR] to Bonn.
2.5525	ARQ/E//46.2/E/170	UNID.	2056-2117	2.552550. Upper channel in VFT. Idling betas. Short msg starting "zczc ata900" (cct/serial?).
2.5525	ARQ/E//46.2/E/170	UNID.	2200-0400	2.552550. Upper channel in VFT. Overnight monitor. Periodic svc. Starts "zczc ata700 (also ata600, ata500) then typically "1191099. 19066 bwxoszm nnnn"
3.2546	PACT//100/-/200	UNID	2254-59	Standard. Poor sync in noise. One brief section showing English.
3.5960	ARQ/E3//100/E/400	UNID.	2030-2110	8CRC. Idle on betas.
3.6144	AUTOSPEC//68.5/E/85	STONEHAVEN RADIO (GND)	2114-31	3614.425. Chan 1 in VFT. Idling on code32's.
4.0146	ARQ/E3//48/E/400	ANTANANARIVO AIR (5ST)	2034-46	4CRC. Betas. Poor sync.
4.4875	ARQ/342//96/I/400	BRAZZAVILLE AIR (TNL)	2223-44	4CRC. 2 channel. Ch: a cct [FOA air traffic. Ch:b met traffic.
5.0550	ARABIC//50/5/400	PETRA AMMAN (JYF)	1711-55	20Hz low. Arabic (ATU7) press followed by press in English.
5.2890	SITOR/A//100/I/400	MOI SPAIN	2053-59	Traffic with on-line encryption. Then selcals TXXX, TWLS.
5.4755	ARQ/E//VFT	LKA VARIOUS	0831-36	8 channel VFT structure on u.s.b.
5.4763	ARQ/E//96/E/85	LKA BONN	0846-48	5476.32. 8CRC. Ch. 1 in vft structure. Cct [BRVHF]. Idle on betas.
5.4780	ARQ/E//96/E/85	LKA BONN	0855-57	5478.02. 8CRC. Ch. 6 in vft structure. Cct [THVHF]. Idle betas.
5.4787	ARQ/E//72/E/85	LKA BONN	0859-1041	4CRC. Ch: 8 in VFTstructure. Cct [GOVHF]. Idle on betas. Tfc at 1142(0942z) and 1218(1018z) on-line encrypted.
5.6970	COQ/13	UNID.	1835-1955	5.697052. Tones placed but too weak to sync tfc. Brief "r as as2" and "qsl 1851z k" fm second station on same net. Callsigns in use "LAL de JK". Brief tfc recognised in French.
5.6970	COQ/13	UNID.	1910-18	5697.052. Traffic but s/n level poor and little copy.
5.6970	COQ/13	UNID.	1930-50	5697.052. Very weak little sync. Nr of RY strings also " tde (' [de KN ?] int zb nt qtv". INT indicates military useage.
6.9185	FAX//120/576/N/800	MADRID MET (ECA7)	1255-57	Upper air chart.
6.9619	TWINPLEX//100/E/-	MFA OSLO	0740-45	-400/-200/200/400. Loss of qso - selcal KFPD used.
6.9760	ARQ/E//72/E/170	FF AJACCIO (RFFHCA) ?	1307-1457	4CRC. Idling betas.
7.4410	ARQ/E3//100/E/400	MOI MARSEILLES (FIT13) ?	1909-11	8CRC. Betas.
7.9020	ARQ/E3//100/I/400	MOI PARIS (FIT75) ?	2000-2107	8CRC. Betas.
7.9160	FEC/A//96/E/400	PIAB BONN (DGG91L2)	2154-56	Start up marker. RY's otherwise only vri occ word.
7.9830	ARQ/E3//48/E/400	FF DAKAR (RFTJ) ?	0633-54	Little sync. Betas. Weak and fading.
8.1535	ARQ/E//72/E/400	FF UNID. (RFFEDT)	2152-0525	4CRC. Betas. Controle de voie's. Cct [EDT]. RFFEDT de RFFEDT and tfc with off line encrypt. Tfc addressees RFXXI RFFEBCT RRRUGN RFFBDU RFFUED RFFABCT.
8.4015	3SC//50/R/170	SHIP "4APAEW" (URHE)	2148-53	Traffic in 3SC. Calls to UUI. Traffic via Odessa.
8.4025	3SC//50/R/170	SHIP "OREL"	2046-49	Traffic in 3SC via Kaliningrad Radio
9.0797	ARQ/E3//100/E/400	FF DJIBOUTI (RFQP)	1700-1825	8CRC. Cct [DJI] betas and Controle de v's.
9.1267	ARQ/E3//192/E/400	FF LIBREVILLE (RFTJD) ?	0517-45	8CRC. Betas.
9.1360	ARQ/E//48/E/170	NDJAMENA AIR (TTL)	1906-37	4CRC. Show all indicates idling or a mixture of betas and alphas in each block of 4 chars, 130Hz low.
9.1959	ARQ/342//96/I/400	BRAZZAVILLE AIR (TNL)	1804-25	4CRC. 2ch. Ch: A air tfc cct [FOA] to Bangui ch: B met traffic.Some of the air traffic on ch: A hours old (circa 0945)?
9.3631	FEC/A//96/E/400	PIAB BONN (DGJ36H1)	2157-2203	Startup marker for DGG91I2/7.916MHz and DGJ36H1/9.3631MHz for "mittel amerika" (Central America) then German press.
9.9077	ARQ/342//200/E/400	FF PARIS (RFFTA)	1010-1138	4CRC. 2 channels. Betas. Ch: A tfc to RFFVAY (Sarejevo) cct [FDXA] svc msg.
9.9077	ARQ/342//200/E/400	FF UNID ?	2123-30	4CRC. 2 channels. Little sync.
10.1037	ARQ/E3//192/E/400	FF UNID.	0656-1018	Weak and little sync. Occ controle de voie (Paris de Paris) and off-line encrypted traffic (originator RFFKC) recognised.
10.2250	ARQ/E//48/E/850	FF PORT BOUET (RFTJF)	1847-52	4CRC. Betas.
10.2813	ARQ/E//96/I/400	FF CAYENNE (RFLIG)	1903-2020	8CRC. Betas. Cct [RTI] to Ft de France. Controle de voie RFLIde RFLI.
10.3347	SITOR/A//100/E/170	MFA CAIRO	2038-48	Selcals TVVQ (Khartoum) in Sitor A. Calls in Sitor B. Constant mark between bursts and when idle. No response to calls.
10.3479	ARQ/E//96/E/340	RN GIBRALTAR (GYU)	2054-2110	10.347995. 4CRC. 2 ch. Betas in both chanels.
10.4800	FEC/ROU//164.5/R/400	MFA BUCHAREST	0606-07	End of transmission and off air.
10.5217	ARQ/E3//192/E/400	FF FT DE FRANCE (RFLI)	0617-23	8CRC. Betas. Controle de voie RFLI de RFLI cct [LIJ].
10.6805	ARQ/E//72/E/400	FF BANGUI (RFFXI) ?	2115-0605	4CRC. Betas. Only part tfc (controle de voie?) copied "r faviersde faviers".
10.7983	ARQ/E3//96/I/400	FF FT DE FRANCE (RFLI)	0640-41	8CRC. Betas. Controle de voie RFLI de RFLI. Cct [IRT].
10.9177	ARQ/E3//48/E/400	FF DAKAR (RFTJ)	0807-0950	8CRC. Betas. Controle de v RFTJ de RFTJ cct ID [TJF]. Tfc in off-line encrypt RFTJF (Port Bouet) de RFFABCT.
11.0964	ARQ/342//96/E/400	RAF AKROTIRI (MKD)	1009-15	11.096445. Chan 4 in VFT. 4CRC. 2 channels. Both on-line encrypted.
11.1120	FEC/A//96/E/400	PIAB SINGAPORE (9VE)	1600-16	New schedules (partially corrupt) and German press.
11.1235	FEC/A//96/E/400	PIAB BONN (DGL26L2)	0538-52	Start up for Europe. Gives dual callsign DCF42and DGL26L2 but only frequency is for 11.1235 (also 0.1237 not hrd). June schedule partially corrupt. German press.
11.1235	FEC/A//96/E/400	PIAB BONN (DGL26L2)	0541-49	Startup sequence and German press.
11.1256	FEC/A//96/E/400	PIAB BONN (DGL26H1)	1959-2004	Startup for DGL26H1/11.1256MHz for South America south and DGN43H1/13.4386MHz for South America North. Then German press.
11.4630	ARQ/E//96/E/170	ITALIAN EMB WARSAW	0800-15	8CRC. Starts with idle alphas (which causes report of ARQ/E3 not ARQ/E).Traffic fm AMBVARS in Italian p/l to MAEROMA. Transmitter dropping offair frequently 0815z.
11.4630	ARQ/E3//96/N/170]	UNID.	0757-0800	Idling on non-beta characters in 8CRC pattern.
12.5815	SITOR/A//100/E/170	MOBILE RADIO (WLO)	2048-51	Traffic to 3EMF. Tfc to "Sea Beach".
12.6035	SITOR/B//100/E/170	ATHENS RADIO (SVS)	2100-24	Greek ship press then marker "de SVS" and long tuning dash.
12.7140	SITOR/A//100/E/170	ARKHANGELSK RADIO (UXN)	0928-37	Traffic in 3SC to UPPB/Pioner Onegi.
13.3744	ARQ/E//96/E/170	GERMAN EMB ? LOC	0535-59	8CRC. On-line encrypted traffic ending "kkkkkkk" then betas.
13.3790	ARTRAC//VFT	UNID.	0635-50	Signals in Ch. 5 (+2000Hz) but too weak to sync.
13.3794	ARTRAC//125/N/170	MFA BUDAPEST ?	1750-1804	Ch:1. Off-line encrypted traffic.
13.4017	SITOR/A//100/N/170	MFA CAIRO	1725-45	Constant mark or space between bursts. Tfc in p/l ATU80.
13.4307	ARQ/342//200/E/400	FF SAREJEVO ?	1753-1805	4CRC. 2 ch. Ch: A betas. Ch: B alphas.
13.4386	FEC/A//96/E/400	PIAB BONN (DGN43H1)	1956-59	Startup for DGL26H1/11.1256MHz for S. America South and DGN43H1/13.4386MHz for S. America North.
13.5437	ARQ/E3//192/E/400	UNID.	0742-0800	8CRC. Betas.
13.5709	FEC/A//96/E/400	PIAB BONN (DGN57L1)	0800-12	German press to West Africa.
13.8750	ARTRAC//VFT	MFA BUDAPEST	0558-0600	Traffic on channel 4.
13.8750	ARTRAC//VFT	MFA BUDAPEST	0628-30	Traffic on ch.1 acknowledgement of ch. 4
13.8754	ARTRAC//125/N/170	MFA BUDAPEST	0555-0633	Traffic in ch. 1 in Hungarian p/l (press summary) returning to receive mode.
13.8760	ARTRAC//125/N/170	MFA BUDAPEST	0615-18	VFT ch. 5 (+2000Hz) end of IRS mode and ends with "tks next 73 88 sk szioka".
13.8766	ARTRAC//125/N/170	MFA BUDAPEST	0600-08	Channel 4. Traffic in off-line encryption.
13.8766	ARTRAC//125/N/170	MFA BUDAPEST	0621-35	Channel 4. In receive mode.

If you now leave the system running for a while it will start to produce plain text which is a lot more interesting. If none of this works out you may need to reverse the signal polarity. This is dead easy and done by pressing 'Alt' and 'K' together then selecting either Normal or Reverse keying. Once you've got the hang of this, you can also use the tuning indicator at the lower left-hand side of the main display to speed-up the tuning process.

WXSat - Windows FAX

Yes, there's another new FAX program around that's looks to be worth a look. WXSat v3.2 can be found on the Internet under the file name INST230.exe. As the name implies, the program has been primarily designed primarily for weather satellite reception but it does include facilities to receive conventional f.m. based h.f. FAX signals. The big difference with this FAX program is that it has been designed to work under a Windows environment using a standard sound card. The penalty is that you do need a reasonably fast PC and a 16-bit sound card. If you want to be able to record incoming FAX signals as WAV files this spec. needs to be increased to a 486 processor running at 40MHz plus. If you can match these demands then WXSat is certainly worth a try, particularly if you also have an interest in weather satellites. WXSat can be set to operate and lock-on to all the standard automatic picture transmission tones used on h.f. If you use WXSat to record FAX images as WAV files you will need to make sure you have lots of hard disk space available as a typical h.f. FAX chart will occupy around 3.5Mb. If you'd like to try a copy, either use an Archie client to look for INST230.EXE, or try **ftp.funet.fi/pub/ham/**

Complex Stuff

As I've spent a lot of this column dealing with basic issues I've included an extract from Day Watson's Complex Frequency Logging - see **Table 1**. My thanks to Day for supplying the data. The format used for mode column of the list is as follows: mode/speed/polarity/shift.

Readers Special Offers

If you'd like a copy of Hamcomm/JVFAX, etc. I've arranged a very special offer with the Public Domain and Shareware Library (PDSL).

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

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

LM&S

Long, Medium and Short Waves

Quite a few of the international broadcasters altered their short wave transmission schedules at the end of March. Some of their changes are reflected in the data herein, which is based upon reports of actual reception by listeners in the UK and overseas.

Reception reports are always welcome here for LM&S - please post them to me at the above address.

Long Wave Reports

Note: l.w. & m.w. frequencies in kHz; s.w. in MHz; Time in UTC (=GMT). Unless otherwise stated, all logs were compiled during March.

The broadcasts from Belarus via Sasnovy on 171kHz were heard for the first time on March 11 by **Tony Stickells** in Thornton Heath. He logged the 1000/500kW transmission as SINPO 31332 at 1823UTC. On several occasions, after Saarlouis (2MW) on 183kHz had closed down, he heard the Turkish TRT-2 service via Polatli (1.2MW) on 180kHz. The conditions were good on the 19th and at 0120 it was peaking 34244.

At 2305 on the 19th **Sheila Hughes** (Morden) picked up a broadcast under DLF via Donebach (500kW) on 153. The light opera type songs and the announcements which she heard were not in Arabic, so it was unlikely they were coming from the co-channel 1MW outlet at Bechar, Algeria. R.Romania also broadcasts on this frequency via Bod (1.2MW), which seemed a more likely source. By 2315 the signal was 22212.

The sky waves from the Radiotelevisione Italiana (RAI) 10kW outlet at Caltanisseta, Italy, on 189kHz reached the UK during several evenings. The clearest reception of them ever for Tony Stickells was on the 26th, when they rated 44254.

Medium Wave Reports

The listeners who searched for m.w. broadcasts over transatlantic paths at night during March sometimes found the conditions favourable. Most of the entries in the report from **David Edwardson** (Wallsend) were logged during the first half of the month, mainly around 0130 or dawn (0530). At 0130 on the 8th he heard R.Dos Mil, Venezuela on 1500, which rated 25552. The nights of the 8th, 9th & 16th proved to be rewarding for **Robert Connolly** in Kilkeel. On each of them he heard CKVO in Clarenville, NF on 710, but the best reception (33333 at 0110) was on the 16th.

During the early hours of the 17th **Harry Richards** (Barton-upon-Humber) logged WLPZ on 1440 as 23232 at 0230, WNRB on 1510 as 24333 at 0250 & WTOP on 1500 as 23222 at 0300. Despite repeated checks he could find no trace of CJYQ on 930 (often used by DXers as a pointer to conditions) until 0030 on March 22, when it peaked 24232. He then heard WBBR on 1130 at 0055, but reception was poor - 22222.

Up in Shetland, **John Slater** (Scalloway) found the conditions good on the 22nd, but most of the entries in his list were received after 0530. WBBR was the last to fade out at 0700 - well after sunrise! The nights of the 19th, 22nd & 23rd were the best for Tony Stickells. In common with most DXers he had difficulty in identifying the stations and found it very frustrating at times. Nevertheless, he compiled an interesting list - see chart.

The broadcasts from some of the m.w. stations in the Middle East and N.Africa also reached the UK after dark. Quite extensive logs were compiled by some listeners - see chart. The 10kW outlet at Las Palmas, Canary Is on 1008 was heard for the first time since January '96 by **George Millmore** (Wootton, IoW) but the sky waves were weak - SIO211. He also logged quite a few of the low power outlets in Spain.

In January '95 the ORF 600kW transmitter at Wien-Bisamberg, Austria on 1476 was taken out of service, but **Eddie McKeown** (Newry) has informed me that R.Austria International is now broadcasting on 1476 during the evening. He logged their transmission as 22411 at 2047, but he has received it more clearly later. Tony Stickells says "It was very strong on the 21st and was heard well above County Sound on most nights there after". On the 25th Sheila Hughes logged it as 43443 at 2245.

Some remarkably distant local radio stations were logged during the day - see chart. The highlight of the month for **Ross Lockley** (Galashiels) was hearing ILR Plymouth Sound AM on 1152 late one night. He says "The channel is usually dominated by Clyde 2, Great North Radio or Amber Radio depending upon the time of day, so for anything else to get through was quite unusual". ILR Plymouth Sound AM was also heard for the first time by **Brian Keyte** in Bookham - he logged their transmission as 32422 at 0706.

Whilst searching the band Ross noticed that changes had been made to the names of some local radio stations. On 999kHz he heard Red Rose Gold announced as 'Red Rose 9-99' (nine ninetynine). On 1161 Great Yorkshire Gold had become 'The Big Easy Magic 1161' but on 1305 Great Yorkshire Gold was referred to as 'The Big Easy Magic AM'. Last month Ross reported that Great Yorkshire Gold had become '1278 & 1530 AM West Yorkshire' but that name has since been replaced by 'Classic Gold'.

Another change was reported by **Chris Ridley** in Co.Sligo, S.Ireland. He informed me that ILR R.City 1548 AM altered their ident to 'Magic 1548' on March 17. Amongst the many entries in his interesting log was the new Classic Gold 1kW outlet near Newbury on 1485, which he heard at 1825 on March 6. No doubt they will be surprised to get his reception report!

Short Wave Reports

As expected, the **25MHz (11m)** band remained very silent here during March. However, some broadcasters may well be keeping an eye on the propagation conditions therein because the upward slope of solar sunspot cycle 23 now lies ahead!

Propagation in the **21MHz (13m)** band is often poor but a number of broadcasters can usually be received here during the hours of daylight. Before noon, Slovak R.Int via Rimavska Sobota **21.705** (Eng to Australia 0830-0857) rated 33333 at 0837 in Scalloway; RFI via Issoudun 21.620 (Fr to E.Africa 0800-1500) 45554 at 0908 by **John Parry** in Larnaca, Cyprus; RFI via Allouis? **21.580** (Fr to Africa 0900-1600) 14421 at 0951 by **Rhoderick Illman** in Oxted; R.Australia via Darwin on **21.725** (Eng to Asia 0630-1100) 32232 at 1000 by **Vic Prier** in Colyton; UAER, Dubai **21.605** (Eng to Eur 1030-1055) 35443 at 1030 in Galashiels; BSKSA Saudi Arabia **21.495** (Ar [Holy Quran] to S.E.Asia 0900-1200) 35333 at 1059 by **Darren Beasley** in Bridgwater; R.Portugal Int via Sines **21.655** (Port to Brazil ?-2000?) 23122 at 1200 by **Norman Thompson** in Oadby.

After mid-day, the BBC via Cyprus? **21.470** (Eng to E.Africa 1300-1600?) was 34222 at 1310 in Newry & 45554 at 1310 in Cyprus; BBC via Cyprus **21.490** (Eng to E.Africa 1400-1500 & via Ascension Is 1500-1645) 24332 at 1404 & 34333 at 1505 by **Fred Pallant** in Storrington; R.Portugal Int via Sines **21.515** (Eng to M.East, India 1400-1500) 24212 at 1406 in Thornton Heath; BBC via Ascension Is **21.660** (Eng to Africa 1100-1700) SIO322 at 1554 by **Philip Rambaut** in Macclesfield; REE via Noblejas **21.570** (Sp to S.America 1200-1800) 25332 at 1643 in Storrington; WYFR via Okeechobee, USA **21.525** (Eng to Eur, Africa 1600-2000?) 24432 at 1820 in Storrington.

The conditions in the **17MHz (16m)** band vary from day to day but broadcasts from several continents can usually be heard here during daylight. In the morning they include R.Japan via Yamata **17.810** (Eng to S.E.Asia), rated 35454 at 0605 in Cyprus; BBC via Mayhe, Seychelles **17.885** (?, Eng to E.Africa 0500-1400) 35553 at 0645 in Wallsend; R.Japan via Ascension Is 17.815 (Eng, Jap to S.Africa 0700-0900, 0930-1000) 44444 at 0740 by **Stan Evans** in Herstmonceux; SRI via Schwarzenburg? **17.515** (It, Eng, Fr, Ger, Port to Australia, S.Pacific 0830-1100) 34233 at 0924 in Newry; Voice of Russia **17.610** (Eng [WS]) 33333 at 0830 by **Bernard Curtis** in Stalbridge; AIR via Bangalore **17.387** (Eng to Pacific areas 1000-1100) 44444 at 1015 in Morden; BBC via Masirah **17.785** (Eng to Asia 1000-1130) 23332 at 1114 in Oxted; R.Cairo, Egypt **17.800** (Ar to C/S.Africa 1100-1130) 44343 at 1115 in Oadby; R.Pakistan, Islamabad **17.900** (Eng to Eur 1100-1120) 54444 at 1115 by **Chris Shorten** in Norwich; Israel R, Jerusalem **17.545** (Heb [Home Scerly] to W.Eur, N.America 0800-1425) 55435 at 1120 in Thornton Heath.

After mid-day they include Africa No.1, Gabon **17.630** (Fr to W.Africa 0700-1600), rated SIO322 at 1350 by **Phil Townsend** in E.London; RFI via Moyabi, Gabon **17.560** (Eng to M.East 1400-1500) 34443 at 1405 in Kilkeel; WYFR via Okeechobee, USA

Long Wave Chart

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

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

Listeners:-
(A) Sheila Hughes, Morden.
(B) Eddie McKeown, Newry.
(C) George Millmore, Wootton, IoW.
(D) Fred Pallant, Storrington.
(E) Tom Smyth, Co.Fermanagh.
(F) Tony Stickells, Thornton Heath.
(G) Norman Thompson, Oadby.
(H) Phil Townsend, E.London.

Medium Wave Chart

Freq (kHz)	Station	Country	Power (kW)	Listener
520	Hof/Hurzburg (BR)	Germany	0.2	E*,L*
531	Ain Beida	Algeria	600/300	A*,L*
531	Torshavn	Faeroe Is.	100	N*
531	Leipzig	Germany	100	C*,E*,F
531	RNE5 via ?	Spain	?	E*,F,L*
531	Beromunster	Switzerland	500	C*,F,L*,M*,N
540	Wavre	Belgium	150/50	C*,E*,F,L,N
540	Solt	Hungary	2000	C*,L*
540	Sidi Bennour	Morocco	600	E*,F*,L*
540	Vitoria(EI)	Spain	10	A,L*
549	Les Trembles	Algeria	600	C*,F*,K*,L*,N*
549	Thumau (DLF)	Germany	200	C*,E*,F,L*,N
558	Espoo	Finland	100	E*
558	Rostock(NDR)	Germany	20	E*
558	Tirgu Jiu	Romania	200	F*
558	RNE5 via ?	Spain	?	E*
558	Cima di Dentro	Switzerland	300	A
567	Berlin	Germany	100	L*
567	Tullamore(RTE1)	Ireland (S)	500	C,D,F,L*,N
567	RNE5 via ?	Spain	?	L*
576	Muhlacker(SDR)	Germany	500	F,L*,N*
576	Braga	Portugal	10	L*
576	Barcelona(RNE5)	Spain	50	E*,F*,L*
585	Paris(FIP)	France	8	F,L,N
585	Madrid(RNE1)	Spain	200	E*,F*,L,N*
585	Gafsa	Tunisia	350	M*
585	Dumfries(BBCScot)	UK	2	D,E*,L*
594	Zagreb	Croatia	20	L
594	Frankfurt(HR)	Germany	1000/400	C*,E*,F,K,L*,N
594	Oujda-1	Morocco	100	C*,F*,L*,M*
594	Muge	Portugal	100	E*,F*,L*
603	Lyon	France	300	L
603	Sevilla(RNE5)	Spain	50	E*,F*,K,L*,M*
603	Newcastle(BBC)	UK	2	D,E*
612	Athlone(RTE2)	Ireland (S)	100	D,F,L*,M*,N*
612	Sebaa Aioun	Morocco	300	E*,L*
621	Wavre	Belgium	80	E*,F,L,N
621	Batra	Egypt	2000	L*
621	RNE1 via ?	Spain	10	L*
621	Barcelona(OCR)	Spain	50	E*,F*
630	Vigra	Norway	100	E*,F*,L*
630	Tunis-Djedeida	Tunisia	600	E*,F*,L*
639	Praha(Liblice)	Czech	1500	E*,F,L*,N
639	RNE1 via ?	Spain	?	E*,F,L*
648	RNE1 via ?	Spain	10	E*,L*
648	Orfordness(BBC)	UK	500	F,L,N
657	Neubrandenburg(NDR)	Germany	250	L*
657	Napoli	Italy	120	F*,L*
657	Madrid(RNE5)	Spain	20	E*,F*,L*
657	Wrexham(BBCWales)	UK	2	D,E*,L
666	MesskirchRohrd(SWF)	Germany	150	E*,L*,N*
666	Sitkunai(R.Vilnius)	Lithuania	500	E*,L*,M*,N
666	Lisboa	Portugal	135	E*,F*
666	Barcelona(COPE)	Spain	10	L*
675	Lopic(R10 Gold)	Holland	120	E*,F,L,M*,N
684	Sevilla(RNE1)	Spain	500	E*,F*,L*
684	Avala(Beograd-1)	Yugoslavia	2000	E*,F*,L*,M*,N
693	Tortosa(RNE1)	Spain	2	E*,L*
693	Droitwich(BBC5)	UK	150	F,L,M,N
702	Flensburg(NDR)	Germany	5	L*
702	Monte Carlo	Monaco	40	E*,F*,L
702	Sebaa-Aioun	Morocco	740	M*
702	Slovensko 1 via ?	Slovak Rep.	?	L*,N
711	Rennes 1	France	300	E*,F,L,N
711	Heidelberg	Germany	5	L*
711	Laayoune	Morocco	600	F*,L*
711	Murcia(COPE)	Spain	5	L*
720	Langenberg	Germany	200	F
720	Lisnagarvey(BBC4)	Ireland (N)	10	F*,K
720	Norte	Portugal	100	E*,F*
720	Sfax	Tunisia	200	M*
720	Lots Rd,Ldn(BBC4)	UK	0.5	F,L
729	Cork(RTE1)	Ireland (S)	10	D,E*,F*,K*,L*
729	RNE1 via ?	Spain	?	E*,F*,L,N*
738	Paris	France	4	F,L
738	Poznan	Poland	300	E*,F*,L,N
738	Barcelona(RNE1)	Spain	500	E*,F*,L*,N*
747	Las Palmas	Gran Canaria	20	L
747	Flevo(Hilv2)	Holland	400	E*,F,L,M*,N
747	Cadiz(RNE5)	Spain	10	E*
756	Braunschweig(DLF)	Germany	800/200	E*,F*,K,L,M*,N
756	Bilbao(EI)	Spain	5	E*,L*
756	Redruth(BBC)	UK	2	D,E*,F
765	Sottens	Switzerland	500	E*,F,L*,M*
774	Sofia	Bulgaria	50	F*
774	Hrvatski R.	Croatia	50/10	L*
774	Bonn(WDR2)	Germany	5	M*
774	Enniskillen(BBC)	Ireland (N)	1	K
774	RNE1 via ?	Spain	?	A*,E*,F*,L*
783	Leipzig(MDR)	Germany	100	E*,L,N
783	Miramar(R.Porto)	Portugal	100	F*,L*
792	Limoges	France	300	F,L*,M*,N
792	Lingen(NDR)	Germany	5	E*,L*
792	Sevilla(SER)	Spain	20	E*,F*,L*
792	Londonderry(BBC)	UK	1	K
801	Munchen-Ismaning	Germany	300	L*,N
801	Ajlun	Jordan	2000	F*,L*,M*
801	RNE1 via ?	Spain	?	E*,L*
810	Madrid(SER)	Spain	20	E*,L*
810	Westerglen(BBCScot)	UK	100	D,F,K,L*,M*,N
819	Sud-Radio, Toulouse	France	20	L
819	Batra	Egypt	450	C*,L*
819	Toulouse	France	50	E*,F
819	Trieste	Italy	25	L*
819	Warsaw	Poland	300	C*,F*,L*,M*,N
819	S.Sebastian(EI)	Spain	5	L*
828	Hannover(NDR)	Germany	100/5	L*
828	Rotterdam	Holland	20	L,N
837	Nancy	France	200	F,L*,N
837	COPE via ?	Spain	?	E*,F*,L*
846	Rome	Italy	540	F*,L*,M*
855	Berlin	Germany	100	F*
855	RNE1 via ?	Spain	?	E*,F*,K,L*,N
864	Strakonice	Czech Rep	7	L*
864	Santah	Egypt	500	F*,L*
864	Paris	France	300	F,L,M*,N
864	Socuellamos(RNE1)	Spain	2	L*
873	Frankfurt(AFN)	Germany	150	D,E*,F*,L*,M*
873	Zaragoza(SER)	Spain	20	E*,F*,L*
873	Enniskillen(R.UI)	UK	1	K
882	COPE via ?	Spain	?	E*,K,L*
882	Washford(BBCWales)	UK	100	A,D,F,J,L,N
891	Algiers	Algeria	600/300	E*,F*,L*,M*
891	Huisberg	Netherlands	20	E*,F,L*
900	Brno(CRo2)	Czech Rep	25	E*
900	Milan	Italy	600	E*,F*,L*,M*,N*
900	COPE via ?	Spain	?	L*
909	B'mans Pk(BBC5)	UK	140	F,K,L,M*
918	Plesivec(Sloven'nR)	Slovenia	600/100	E*,F*,L*,M*
918	Madrid(R.Int)	Spain	20	F*,L*
927	Wolvertem	Belgium	300	E*,F,L,M*,N
927	Evora(RRE)	Portugal	1	L*
936	Bremen	Germany	100	E*,F*,L*,M*,N
936	Venezia	Italy	20	E*,L*,N*
936	RNE5 via ?	Spain	?	F*,L*
945	Toulouse	France	300	E*,L*,M*
954	Brno (CRo2)	Czech Rep.	200	F*,L*,M*
954	Madrid(CI)	Spain	20	E*,F*,L*
963	Pori	Finland	600	E*,F*,L*,M*
963	Tir Chonaill	Ireland (S)	10	F*,K*
972	Hamburg(NDR)	Germany	300	E*,L*,M*
972	RNE1 via ?	Spain	?	F*,L*
981	Alger	Algeria	600/300	F*,L*
981	Coimbra	Portugal	10	L*
990	Berlin	Germany	300	C*,E*,L*,M*,N*
990	R.Bilbao(SER)	Spain	10	C*,E*,F*,L*
990	Redmoss(BBC)	UK	1	E*
990	Tywyn(BBC)	UK	1	D,L*
999	Schwerin (RIAS)	Germany	20	E*
999	Torino	Italy	20	L*
999	Madrid(COPE)	Spain	50	L*,M*,N*
1008	SER via ?	Canaries/Spain	?	E*,F*,L*
1008	Flevo(Hilv-5)	Holland	400	E*,F,L,M*,N
1017	Rheinsender(SWF)	Germany	600	E*,F*,L*,M*,N*
1017	RNE5 via ?	Spain	?	E*,L*
1026	SER via ?	Spain	?	L*
1035	Lisbon(Prog3)	Portugal	120	E*,F*
1044	Dresden(MDR)	Germany	250	E*,L*
1044	Sebaa-Aioun	Morocco	300	L*
1044	SER via ?	Spain	?	E*,F*,L*
1053	Zarogoza(COPE)	Spain	10	E*,L*
1053	Talk R.UK via ?	UK	?	F,K,L
1062	Kalundborg	Denmark	250	E*,F*,L*,N*,O*
1062	R.Uno via ?	Italy	?	F*,L*
1071	R.France via ?	France	?	L
1071	Brest	France	20	F
1071	Riga	Latvia	50	E*
1071	Bilbao(EI)	Spain	5	L*
1071	Talk Radio UK via ?	UK	?	L
1080	Katowice	Poland	1500	E*,F*,L*,M*
1080	Toledo(OCR	Spain	5	L*
1080	SER via ?	Spain	?	F*,L*
1089	Talk Radio UK via ?	UK	?	F,L,M*
1098	Nitra(Jarok)	Slovakia	1500	E*,F*,L*,M*
1098	RNE5 via ?	Spain	?	E*,F*,L*
1107	AFN via ?	Germany	10	D,E*,L*
1107	RNE5 via ?	Spain	?	E*,L*
1107	Talk R.UK via ?	UK	?	F,K,L,N
1116	Bari	Italy	150	F*,L*
1116	Pontevedra(SER)	Spain	5	L*
1125	La Louviere	Belgium	20	E*,F*,L
1125	Deanovec	Croatia	100	L*
1125	RNE5 via ?	Spain	?	E*,F*,L*
1125	Llandrindod Wells	UK	1	D
1134	COPE via ?	Spain	2	F*,L*
1134	Zadar(Croatian R)	Yugoslavia	600/1200	E*,F*,L*,M*,N*
1143	AFN via ?	Germany	1	D,E*,F*,L*
1143	Bolshakovo(Mayak)	Russia	150	L*
1143	COPE via ?	Spain	2	E*,F*,L*
1152	RNE5 via ?	Spain	10	F*,L*
1161	Strasbourg(Flnt)	France	200	F
1161	S.Sebastian(EI)	Spain	50	L*
1179	Bacau	Romania	200	N
1179	SER via ?	Spain	?	E*,F*,L*
1179	Solvesborg	Sweden	600	A,E*,F*,M*,O*
1188	Kuurne	Belgium	5	E*,F,L
1188	Reichenbach(MDR)	Germany	5	L*
1188	Szolnok	Hungary	135	F*,L*
1197	Munich(VOA)	Germany	300	E*,L*
1197	Vitoria(EI)	Spain	5	L*
1197	Virgin via ?	UK	?	F,L,N
1206	Bordeaux	France	100	F,L
1206	Wroclaw	Poland	200	E*,F*,L*
1215	Virgin via ?	UK	?	F,K,L
1224	Vidin	Bulgaria	500	F*
1224	Lelystad	Holland	50	E*,L
1224	COPE via ?	Spain	?	L
1233	Liege	Belgium	5	E*,F*,L*
1233	Tanger	Morocco	200	M*
1233	Virgin via ?	UK	?	L
1242	Marseille	France	150	E*,K,L*
1242	Virgin via ?	UK	?	L*
1251	Marcali	Hungary	500	E*,L
1251	Huisberg	Netherlands	10	E*
1251	Porto	Portugal	10	L*
1260	SER via ?	Spain	?	E*,L*
1260	Guildford (V)	UK	0.5	F,L,N
1269	Neumunster(DLF)	Germany	600	E*,F*,L,N*
1269	COPE via ?	Spain	?	E*,L*
1278	Strasbourg	France	300	L
1278	Dublin/Cork(RTE2)	Ireland (S)	10	C,D,F*,K*,L
1287	RFE via ?	Czech Rep.	400	E*,F*,L,N*
1287	Lerida(SER)	Spain	10	F*,L*
1296	Valencia(COPE)	Spain	10	F*,L*,N
1296	Orfordness(BBC)	UK	500	D,K,L*
1305	Rzeszow	Poland	100	E*,F*
1305	RNE5 via ?	Spain	?	L*
1314	R.Due via ?	Italy	?	L*
1314	Kvitsoy	Norway	1200	A,E*,F*,K,L,N*,O*
1323	W'brunn (V.Russia)	Germany	1000/150	C,E*,L,N*
1332	Rome	Italy	300	E*,F*,L*,N*
1341	Lakihegy	Hungary	300	L
1341	Lisnagarvey(BBC)	Ireland (N)	100	D,F,L
1341	Almeria(OCR)	Spain	2	L*
1341	Tarrasa(SER)	Spain	2	L*
1350	Nancy/Nice	France	100	N
1350	Pecs	Hungary	10	L*
1350	Cesvaine/Kuldiga	Latvia	50	E*,L*
1359	Arganda (RNE-FS)	Spain	600	E*,F*,K,L*
1368	Foxdale(Manx R)	I.O.M.	20	B*,C,D*,E*,F*,J,K,L*
1377	Zardar	Croatia	10	E*
1377	Lille	France	300	F,L
1386	Ahwaz	Iran	400	L*
1386	Bolshakovo	Russia	2500	C*,E*,F*,L,N
1395	Lushnje(Tirana)	Albania	1000	L*
1395	Lushnje(TWR)	Albania	500	E*,L*
1395	Lopic	Netherlands	120/40	F,G,L,N
1404	Brest	France	20	F,L,N*
1404	Sighet	Romania	50	E*
1413	RNE5 via ?	Spain	?	E*,F*,L*
1422	Heusweiler(DLF)	Germany	1200/600	E*,F*,L,N
1422	Valmiera	Latvia	50	E*,L*
1431	Kopani	Ukraine	500	E*
1440	Marnach(RTL)	Luxembourg	1200	E*,F,L,N*,P*
1440	Moscow via ?	Russia	?	L*
1440	Damman	Saudi Arabia	1600	L*
1449	RAI via ?	Italy	?	F*,L
1449	Redmoss(BBC)	UK	2	L
1458	Fllake	Albania	500	L*
1467	Monte Carlo(TWR)	Monaco	1000/400	E*,F*,L*
1467	Volvograd	Russia	25	E*
1476	Wien-Bisamberg	Austria	600	C*,E*,L*
1485	AFN via ?	Germany	1	L*
1485	SER via ?	Spain	?	L
1494	Clermont-Ferrand	France	20	F,L
1494	St.Petersburg	Russia	1000	E*,F*,H*,L*,N*
1503	Rome	Italy	2	L*
1503	Stargard	Poland	300	C*,F*
1503	RNE5 via ?	Spain	?	L*
1512	Wolvertem	Belgium	600	C*,E*,F*,H*,L,N,O*
1512	Jeddah	Saudi Arabia	1000	A,L*
1521	Kosice(Cizatice)	Slovakia	600	F*
1521	Duba	Saudi Arabia	2000	F*,L*
1530	Vatican R	Italy	150/450	E*,F*,L,N*
1539	Mainflingen(ERF)	Germany	350(700)	E*,F*
1539	SER via ?	Spain	?	L*
1557	Nice	France	300	L,N*
1566	Sarnen	Switzerland	300	E*,F*,L,N*
1575	Genova	Italy	50	L
1575	SER via ?	Spain	5	F*,L
1584	SER via ?	Spain	2	F*,L*
1593	Holzkirchen(VOA)	Germany	150	A,D,E*,F*,I*,L,N*
1602	SER via ?	Spain	?	L*
1602	Vitoria(EI)	Spain	10	F*,L,N*
1611	Vatican R	Italy	15	L,N*

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

Listeners:-
(A) John Eaton, Woking.
(B) Francis Hearne, N.Bristol.
(C) Sheila Hughes, Morden.
(D) Brian Keyte, Bookham.
(E) Eddie McKeown, Newry.
(F) George Millmore, Wootton IoW.
(G) Roy Patrick, Derby.
(H) Clare Pinder, while in Appleby.
(I) Harry Richards, Barton-on-Humber.
(J) Chris Ridley, Cranmore, Co.Sligo, Eire.
(K) Tom Smyth, Co.Fermanagh
(L) Tony Stickells, Thornton Heath.
(M) Norman Thompson, Oadby.
(N) Phil Townsend, E.London.
(O) Thomas Williams, Truro.
(P) Tom Winzor, Plymouth.

17.555 (Eng to Eur 1600-2200?) 54444 at 1606 by **Tom Winzor** in Plymouth; BBC via Antigua, W.Indies **17.840** (Eng to N/C.America 1400-1700) 44434 at 1638 by **John Eaton** in Woking; RFI via Fr.Guiana? **17.630** (Fr to America 1600-2200?) 45444 at 1715 by **Tony Hall** in Freshwater Bay; R.Nederlands via Bonaire **17.605** (Eng to S/E/W.Africa 1830-2025) SIO323 at 1830 by **Tom Smyth** in Co.Fermanagh; BBC via Ascension Is **17.885** (Fr, Eng, Hau to W.Africa 1800-1845, 1915-1945) 35544 at 1903 in Storrington; BBC via Ascension Is **17.830** (Eng to C.Africa 0730-2100) 43354 at 1930 in Colyton.

Reception in the **15MHz (19m)** band tends to be more reliable than in the higher frequencies. Some

Transatlantic DX Chart

Freq (kHz)	Station	Location	Time (UTC)	DXer
		USA		
710	WOR	New York, NY	0259	F
770	WABC	New York, NY	0554	B
840	WHAS	Louisville, KY	0310	F
850	WEEI	Boston, MA	0538	B,E,F
880	WCBS	New York, NY	0545	B,E,F
1010	WINS	New York, NY	0030	C,F
1050	WEVD	New York, NY	0110	F
1120	KMOX	St.Louis, MO	0119	F
1130	WBBR	New York	0055	C,D,E,F
1190	WOWO	Ft.Waine, IN	0050	F
1390	WDCW	Syracuse, NY	0058	F
1440	WLPZ	Portland, MA	0230	D,F
1500	WTOP	Washington, D.C.	0300	A,B,D,F
1510	WNRB	Boston, MA	0215	B,D,F
1560	WQEW	New York	0145	B
		CANADA		
580	CFRA	Ottawa, ON	0140	A
580	CJFX	Antigonish, NS	0600	E
590	VOCM	St.John's, NF	0615	E
620	CKCM	Grand Falls, NF	0120	B,F
650	CKGA	Gander,NF	0126	B
680	CKXG	Grand Falls, NF	0555	E
710	CKVO	Clarenville, NF	0150	A
740	CBL	Toronto, ON	0144	F
820	CHAM	Hamilton, ON	0148	A,F
920	CJCH	Halifax, NS	0135	B,E
930	CJYQ	St.John's, NF	0030	A,B,C,D,E,F
940	CBM	Montreal, PQ	0035	F
950	CHER	Sydney, NS	0105	F
950	CKNB	Cambellton, NB	0630	E
980	CBV	Quebec, PQ	0130	B
990	CBY	Corner Brook, NF	0200	A
1375	RFO	St.Pierre/Miquelon	0140	B
1400	CBG	Gander,NF	0026	F
		SOUTH AMERICA		
1500	R.Dos Mil (2000)	Cumana, Venezuela	0130	B

DXers:-
(A) Robert Connolly, Kilkeel.
(B) David Edwardson, Wallsend.
(C) Roy Patrick, Derby.
(D) Harry Richards, Barton upon Humber.
(E) John Slater, Scalloway.
(F) Tony Stickells, Thornton Heath.

long distance transmissions may be received during the morning. Those noted came from R.Japan via Moyabi, Gabon **15.165** (Eng to ? 0700-0800), rated 43333 at 0700 by **Clare Pinder** in Appleby; KTWR Agana, Guam **15.200** (Eng to F.East 0755-0915) 32222 at 0805 in Morden; R.Japan via Ascension Is **15.220** (Jap to W.Africa, Eur? 0800-0900) 35553 at 0820 in Wallsend; Monitor R.Int via KHBI Agingan Pt, N.Mariana Is **15.665** (Eng to E.Eur? 0800-0900) 44444 at 0821 by **Bill Griffith** while in Valencia, Spain; R.Pyongyang, Korea **15.180** (Eng to S.E.Asia 0800-0850) 34333 at 0840 in Scalloway; BBC via Kranji, Singapore **15.360** (Eng to Asia 0500-1030) 43333 at 0845 in Stalbridge; Voice of Armenia, Yerevan **15.270** (Fr, Eng to Eur, M.East 0800-0900 Sun only) 54544 in Herstmonceux; BBC via Cyprus **15.565** (Eng to M.East 0900-1500) SIO211 at 1025 in Macclesfield; UAER, Dubai **15.395** (Eng to Eur 1030-1055) 33543 at 1039 in Bridgwater.

During the afternoon WWCR Nashville, USA **15.685** (Eng to N.America, Eur 1100-2200) was 33333 at 1405 in Kilkeel; RCI via Sines, Portugal **15.325** (Eng, Fr to Eur, M.East, Africa 1330-1500) 44444 at 1430 by **Gerald Guest** in Dudley; R.Nederlands via Tashkent **15.585** (Eng to S.Asia 1330-1525) 34232 at 1431 in Newry; VOA via Kavala? **15.205** (Eng to M.East 1500-1800?) 55555 at 1500 in Oadby; WYFR via Okeechobee **15.695** (Eng to Europe, Africa 1600-1900) 34343 at 1646 in Woking; KTBN Salt Lake City, USA **15.590** (Eng to N.America 1500?-0000?) 44434 at 1640 by **Vera Brindley** in Woodhall Spa; BBC via Rampisham & Skelton, UK **15.575** (Eng to Eur, M.East, W.Asia 0600-2100) 45234 at 1710 in Woking; BBC via Ascension Is **15.400** (Eng to Africa 1500-1930) 22222 at 1755 by **Thomas Williams** in Truro.

Later, the Voice of Vietnam, Hanoi **15.010** (Eng, Fr to Eur 1900-2000) was 34443 at 1900 in Galashiels; R.Nederlands via Bonaire **15.315** (Eng to S/E/W.Africa 1830-2025) 34343 at 1933 in Oxted; VOA via Morocco **15.410** (Eng to Africa 1900-2200) SIO444 at 1900 in Co.Fermanagh; RNB Brazil 15.265 (Port, Eng, Ger to Eur 1630-2020) 44444 at 1908 in Norwich; R.Nederlands via Bonaire **15.315** (Eng to S/E/W.Africa 1830-2025) 43232 at 1930 in Colyton; RAE Buenos Aires, Argentina **15.345** (Eng, Fr, Ger, It, Sp to Eur, N.Africa 1900-2300) 34322 at 1959 by **Ron Damp** in E.Worthing; RCI via Sackville **15.325** (Eng to Eur, M.East, Africa 2000-2129) 44444 at 2008 in Storrington.

Some improvement in reception has been noted recently in the **13MHz (22m)** band. During the morning R.Austria Int via Moosbrunn **13.730** (Ger, Eng, Fr, Sp to Eur 0400-1800) was SIO444 at 0830 in Co.Fermanagh; Croatian R, Zargreb **13.830** (Cr, Eng) 33333 at 0850 in Stalbridge; SRI via Sottens? **13.685** (It, Eng, Fr, Ger, Port to Australasia 0830-1100) 44343 at 0920 in Oxted; R.Norway Int **13.800** (Norw [Eng Sun] to Asia? 0900-0930) 55444 at 0900 in Truro; Monitor R, via KHBI Saipan, N.Mariana Is **13.840** (Eng to Asia, Pacific 0900-1058) 34223 at 0940 in Morden; UAER, Dubai **13.675** (Eng to Eur 1030-1055) 43433 at 1055 in Herstmonceux; SRI via Sottens? **13.635** (Eng, Fr, Ger, It to Far East 1100-1245) 35322 at 1100 in Newry.

After mid-day, UAER, Dubai **13.675** (Eng to Eur 1300-1357) was 44444 at 1345 in Norwich; R.Prague, Czech Rep **13.580** (Eng to Eur, E.Africa, N.America 1300-1327) 24233 at 1310 in Freshwater Bay; WHRI South Bend, USA **13.760** (Eng to E.USA, Eur 1500?-2057) 44444 at 1545 in Plymouth; R.Marti via Greenville, USA **13.820** (Sp to Cuba 1400-0000) 34333 at 1445 in Scalloway and SIO211 at 1615 in Macclesfield; WWCR Nashville, USA **13.845** (Eng to E.USA 1300-0100?) 32443 at 1830 in Colyton; Monitor R.Int via WSHB 13.770 (Eng to E.Eur 1800?-1955?) 35444 at 1858 in Storrington; SRI via Sottens? **13.635** (Fr, Eng to N.Africa 1845-2030) 32222 at 2000 in Appleby; RCI via Sackville **13.650** (Fr, Eng to Eur, M.East, Africa 1900?-2200) 53343 at 2120 in Norwich; WEWN Birmingham, USA **13.615** (Eng to N.America 1600-0000?) 25342 at 2130 in Bridgwater.

The occupants of the **11MHz (25m)** band include Georgia R. via Dusheti **11.910** (Eng, Ger to Eur 0800-0900), logged as 34333 at 0830 in Scalloway; FEBC Bocaue, Philippines **11.635** (Eng to Asia 0930-1100) 23222 at 1030 in Morden; Vatican R, Italy **11.625** (Eng to Asia, Pacific 1345-1403) SIO444 at 1345 in E.London; RCI via Skelton, UK **11.935** (Eng, Fr to Eur, M.East, Africa 1330-1700) 44444 at 1345 in Storrington & 34554 at 1445 in Cyprus; Family R. [WYFR] via VOFC Taiwan **11.550** (Eng to Asia 1302-1502)

Local Radio Chart

Freq (kHz)	Station	ILR BBC	e.m.r.p (kW)	Listener
558	Spectrum, London	I	0.80	A,D,F,J
585	R.Solway	B	2.00	D,E
603	Cheltenham R.	I	0.10	A,D,F,J
603	InvictaSG,Litt'brne	I	0.10	A,C,D,F,J,K
630	R.Bedfordshire(3CR)	B	0.20	A,B,C,D,F,J,K
630	R.Cornwall	B	2.00	A,D,F
657	R.Clwyd	B	2.00	A,D,F,I,K
657	R.Cornwall	B	0.50	A,D,F
666	Gemini AM, Exeter	I	0.34	A,D,F,J
666	R.York	B	0.80	D,E,J,K
729	BBC Essex	B	0.20	A,D,F,J,K
738	Hereford/Worcester	B	0.037	A,D,F,J,K
756	R.Cumbria	B	1.00	D,E
756	R.Maldwyn, Powys	I	0.63	A,D,F,J
765	BBC Essex	B	0.50	A,C,D,F,J
774	R.Kent	B	0.70	A,C,D,F,J,K
774	R.Leeds	B	0.50	D,E
774	3 Counties SG, Glos	I	0.14	A,F
792	Cl.G 792, Bedford	I	0.27	A,D,F,J,K
792	R.Foyle	B	1.00	H,I
801	R.Devon & Dorset	B	2.00	A,D,F,J*K*
828	Cl.G 828,Bournem'th	I	0.27	A,F
828	Cl.G 828, Dunstable	I	0.20	A,D,J*,K
828	Townland R. Ulster	I	0.80	H
837	R.Cumbria/Furness	B	1.50	E
837	Asian Netwk Leics	B	0.45	A,D,F,J,K
855	R.Devon & Dorset	B	1.00	A,D,F
855	R.Lancashire	B	1.50	E
855	R.Norfolk	B	1.50	D,J,K
855	Sunshine 855,Ludlow	I	0.15	D,J
873	R.Norfolk	B	0.30	D,E,F,J,K
936	Brunel Cl.G,W.Wilts	I	0.18	A,B,D,F,J
945	S.Coast R. Bexhill	I	0.75	A,D,E*,F,J
945	Gem AM, Derby	I	0.20	D,E*
954	Gemini AM, Torquay	I	0.32	A,D,F,J
954	Wyvern AM, Hereford	I	0.16	A,D,J
963	Asian Sd,Manchester	I	0.80	E
963	963 Liberty (Viva)	I	1.00	A,D,E*,F,J
990	R.Aberdeen	B	1.00	D
990	R.Devon & Dorset	B	1.00	A,D,F,J
990	WABC, Wolverhampton	I	0.09	D,J
999	Gem AM, Nottingham	I	0.25	D
999	Red Rose G, Preston	I	0.80	E*,H
999	R.Solent	B	1.00	A,D,F,J,K*
1017	WABC, Shrewsbury	I	0.70	A,D,F,K
1026	R.Cambridgeshire	B	0.50	D,J,K
1026	Downtown, Belfast	I	1.70	E,H,I
1026	R.Jersey	B	1.00	A,F,J
1035	RTL Country 1035	I	1.00	A,D,E*,F,H,J
1035	N.Sound, Aberdeen	I	0.78	D*,E,H,I
1107	Moray Fth,Inverness	I	1.50	E,H
1116	R.Derby	B	1.20	D,E,H,J,K
1116	R.Guernsey	B	0.50	A,D,F,J
1116	Valleys R.	I	?	A,E
1152	Amber, Norwich	I	0.83	D,E*,H
1152	Clyde 2, Glasgow	I	3.06	E,H
1152	GNR, Newcastle	I	1.80	E
1152	LBC 1152	I	23.50	A,D,F,J
1152	PlymSnd AM,Plymouth	I	0.32	D,E*
1152	Xtra-AM, Birmingham	I	3.00	A
1161	R.Bedfordshire(3CR)	B	0.10	J,D,K
1161	Brunel Cl.G,Swindon	I	0.16	A,D,J
1161	Big Easy Magic 1161	I	0.35	E*,H
1161	Southern Counties R	B	1.00	D,F,J
1161	Tay AM, Dundee	I	1.40	D*,E,H
1170	Amber SGR, Ipswich	I	0.28	E*,J
1170	GNR, Stockton	I	0.32	E
1170	SCR, Portsmouth	I	0.50	D,F,J
1170	Signal G,Stoke-on-T	I	0.20	H
1170	Swansea Snd,Swansea	I	0.58	A,E*
1170	1170AM,High Wycombe	I	0.25	D,J,K*
1242	InvictaSG,Maidstone	I	0.32	C,D,J,K
1242	IoW Radio, Wootton	I	0.50	A,F
1251	Amber SGR,Bury StEd	I	0.76	D,E*,H,I,J,K
1260	Brunel Cl.G,Bristol	I	1.60	A,D,E,H
1260	Marcher G, Wrexham	I	0.64	E,H
1260	R.York	B	0.50	E
1278	Cl.G 1278, W.Yorks	I	0.43	E
1296	Radio XL,Birmingham	I	5.00	A,D,E,F,H,J
1305	Big Easy Magic AM	I	0.15	E
1305	Premier via ?	I	0.50	A,D,E*,F,J
1305	Touch AM, Newport	I	0.20	F
1323	S.Coast R,Southwick	I	0.50	D,E*,F,J,K
1323	SomersetSnd,Bristol	B	0.63	A,D,E
1332	Premier, Battersea	I	1.00	D,E*,F,H,J
1332	Cl.G 1332,Peterbo	I	0.60	E
1332	Wiltshire Sound	B	0.30	A,D,F
1359	BreezeAM,Chelmsford	I	0.28	D,J
1359	Cl.G 1359,Coventry	I	0.27	D
1359	R.Solent	B	0.85	A,D,F
1359	Touch AM, Cardiff	I	0.20	A,E
1368	R.Lincolnshire	B	2.00	D
1368	Southern Counties R	B	0.50	A,C,D,F,J,K
1368	Wiltshire Sound	B	0.10	A,F
1377	Asian Sd,Manchester	I	?	J*
1413	Premier via ?	I	0.50	A,D,E*,F,H,I,J
1431	Breeze AM, Southend	I	0.35	D,E,F,H,I,J,K
1431	Cl.Gid, Reading	I	0.14	A,D,F,H,J
1449	R.Peterboro/Cambs	B	0.15	A,D,J
1458	R.Devon & Dorset	B	2.00	A,E,F
1458	1458 Lite AM Manch'	I	5.00	E,H,I
1458	R.Newcastle	B	2.00	D*,E
1458	Sunrise, London	I	50.00	A,D,E*,F,H,J
1458	Asian Netwk Langley	B	5.00	A,D,L*
1476	CountySnd,Guildford	I	0.50	A,C*,D,E,F,I,J,K,L*
1485	Cl.G, Newbury	I	1.00	D,H
1485	R.Humberside (Hull)	B	1.00	C*,D,E
1485	R.Merseyside	B	1.20	C*,E,H
1485	Southern Counties R	B	1.00	A,C,D,F,J,K
1503	R.Stoke-on-Trent	B	1.00	A,C*,D,E,H
1521	R.1521 Craigavon,NI	I	0.50	E,H,I
1521	Fame 1521, Reigate	I	0.64	A,D,F,H,J,K
1530	R.Essex	B	0.15	A,C,D,F,J,K
1530	Cl.G 1530, W.Yorks	I	0.74	D,E,H
1530	Wyvern, Worcester	I	0.52	A,D,E,F,H,J
1548	R.Bristol	B	5.00	A,D,F,H
1548	Capital G, London	I	97.50	A,D,E,F,H,J
1548	Magic 1548,Liv'pool	I	4.40	G,H
1548	Forth AM, Edinburgh	I	2.20	D*,E
1557	R.Lancashire	B	0.25	E,H
1557	Mellow, Clacton	I	0.125	D,E*,J,K*
1557	Cl.G 1557,N'hampton	I	0.76	A,D,E,H,I
1557	S.Coast R, So'ton	I	0.50	A,D,E*,F,J
1584	KCBC, Kettering	I	0.04	D
1584	London Turkish R	I	0.20	A,D,E*,F,J
1584	R.Nottingham	B	1.00	A,C*,D,E,H
1584	R.Shropshire	B	0.50	A,D,H
1584	Tay, Perth	I	0.21	E,H,I
1602	R.Kent	B	0.25	A,C,D,F,J,K

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

Listeners:-
(A) Darren Beasley, Bridgwater.
(B) Francis Hearne, N.Bristol.
(C) Sheila Hughes, Morden.
(D) Brian Keyte, Bookham.
(E) Ross Lockley, Galashiels.
(F) George Millmore, Wootton, IoW.
(G) Roy Patrick, Derby.
(H) Chris Ridley, Co.Sligo, Eire.
(I) Tom Smyth, Co.Fermanagh.
(J) Tony Stickells, Thornton Heath.
(K) Phil Townsend, E.London.
(L) Thomas Williams, Truro.

Tropical Bands Chart

Freq (MHz)	Station	Country	UTC	DXer
2.310	ABC Alice Springs	Australia	2109	D,G
2.325	ABC Tennant Creek	Australia	2111	D,G
2.390	Voz de Atitlan	Guatemala	0110	A
2.415	Wenzhou PBS,Zhejiang	China	0145	A
2.460	R.Alvorada	Brazil	0115	A
2.485	ABC Katherine	Australia	1830	D
2.560	Xinjiang BS, Urumqi	China	0120	A
3.215	RRI Manado	Indonesia	2323	C
3.220	CPBS 1, Beijing	China	2113	G
3.220	R.HCJB Quito	Ecuador	0140	A
3.220	Channel Africa	S.Africa	0300	L
3.230	SABC Meyerton	S.Africa	0125	A
3.240	TWR Shona	Swaziland	0300	F,L
3.245	AIR Lucknow	India	1718	C
3.250	RRI Banjamarsin	Indonesia	2135	Q
3.255	BBC via Meyerton	S.Africa	2117	A,F,J,G,L,N
3.270	SWABC 1, Namibia	S.W.Africa	2117	A,G,L,N
3.290	Namibian BC,Windhoek	S.W.Africa	1829	A,F,G,L,Q
3.300	R.Cultural	Guatemala	0305	A,F
3.306	ZBC Prog 2	Zimbabwe	2134	A,G,J,L
3.315	AIR Bhopal	India	0030	A,C,L
3.316	SLBS Goderich	Sierra Leone	2104	A,C,G,L,N
3.320	SABC (RSG) Meyerton	S.Africa	2109	A,F,G,L,N,Q
3.325	FRCN Lagos	Nigeria	2107	G,L,N
3.330	Christian Voice	Zambia	1835	L
3.335	CBS Taipei	Taiwan	2110	G,L,N
3.345	AIR Jaipur	India	0027	A,L
3.345	RRI Ternate	Indonesia	2140	Q
3.365	GBC R-2	Ghana	2120	A,B,C,D,F,G,J,L
3.365	AIR Delhi	India	1826	C,G,L,N,P
3.370	R.Beira	Mozambique	0213	Q
3.375	R.Nacional S.Gabriel	Brazil	2219	A,C,J
3.377	R.Nacional, Mulenvos	Angola	1828	G
3.380	R.Chortis	Guatemala	0130	A
3.385	RFO Cayenne	Guiana	1935	A
3.905	RRI Merauke	Indonesia	1947	Q
3.915	BBC via Kranji	Singapore	2121	C,E,F,G,N,O,P,R
3.920	KCBS Shinuju	N.Korea	1805	L
3.945	AIR Gorakhpur	India	0135	A
3.950	Qinghai PBS, Xining	China	2300	L,Q
3.955	BBC via Skelton	England	2121	A,C,F,M,N,O,P,R
3.955	R.Budapest	Hungary	2000	I
3.960	Xinjiang PBS, Urumqi	China	0050	J,L
3.960	RRI Padang	Indonesia	2000	Q
3.965	RFI Paris	France	1830	A,C,F,N,O,P
3.970	R.Korea via Skelton	England	2000	I,Q
3.975	R.Budapest	Hungary	2200	E,F,N,O,P,R
3.980	Nexus, Milan	Italy	2225	C,O
3.985	Nexus, Milan	Italy	1905	F,P
3.985	China R via SRI	Switzerland	2200	I,R
3.985	SRI Beromunster	Switzerland	1945	A,N
3.995	DW via Julich	Germany	2230	A,C,F,N,O,P,Q,R
4.003	RRI Padang	Indonesia	2329	Q
4.005	Vatican R.	Italy	2100	A,J,N,P
4.035	Xizang PBS, Lhasa	Tibet	0052	L,Q
4.330	Xinjiang BS, Urumqi	China	0055	A,L
4.460	CPBS 1, Beijing	China	2124	N
4.500	Xinjiang BS, Urumqi	China	0007	A,C,F,J,L,Q
4.735	Xinjiang, Urumqi	China	0008	A,F,L
4.754	R.Maranhao	Brazil	0210	Q
4.755	R.Educ CP Grande	Brazil	0030	L
4.760	Yunnan PBS,Kunming	China	2355	C
4.760	TWR Manzini	Swaziland	0258	F,L
4.765	R.Rural, Santarem	Brazil	0240	A
4.770	FRCN Kaduna	Nigeria	2124	A,B,F,G,J,L,N,O,P
4.775	AIR Imphal	India	0035	A,L,D
4.777	R.Gabon, Libreville	Gabon	2125	A,C,F,G,J,L,N,P
4.783	RTM Bamako	Mali	2159	A,C,G,J,L,N
4.785	R.Tanzania	Tanzania	2132	N
4.790	Azad Kashmir R.	Pakistan	1807	A,C,L
4.790	R.Atlantida	Peru	2250	A,L
4.800	CPBS 2 Beijing	China	2300	C,L
4.800	AIR Hyderabad	India	1732	C,L
4.800	LNBS Maseru	Lesotho	2126	F,G,N
4.805	R.Nac.Amazonas	Brazil	2312	C,L,O
4.815	R.Difusora, Londrina	Brazil	0120	A,C,Q
4.815	R.diff TV Burkina	Ouagadougou	2133	J,L,N
4.820	La Voz Evangelica	Honduras	0115	A
4.820	AIR Calcutta	India	1800	C,L,Q
4.820	Xizang, Lhasa	China	2315	J,L,Q
4.825	R.Mam, Cabrican	Guatemala	2237	Q
4.828	ZBC R-4	Zimbabwe	2116	G,L,N
4.830	R.Bangkok	Thailand	1655	L,Q
4.830	R.Tachira	Venezuela	0105	A,C,J,L
4.832	R.Reloj	Costa Rica	0500	L
4.835	ABC-Alice Springs	Australia	2131	G,Q
4.835	R.Tezulutlan, Coban	Guatemala	2345	A,C
4.835	RTM Bamako	Mali	2158	A,C,F,G,J,L,N,P
4.840	Heilongjiang, Harbin	China	2158	G
4.840	AIR Bombay	India	1704	A,C,L,Q
4.845	R.Fides, La Paz	Bolivia	0235	A
4.845	RTM Kuala Lumpur	Malaysia	1645	L,Q
4.845	ORTM Nouakchott	Mauritania	0505	A,L
4.850	R.Yaounde	Cameroon	2114	C,F,L,N,P
4.850	AIR Kohima	India	0040	C,L
4.860	AIR Delhi	India	1825	A,C,G,L,Q
4.865	PBS Lanzhou	China	2155	C,D,G,J,L
4.870	R.Cotonou	Benin	2127	F,G,J,L,N
4.875	R.Roraima, Boa Vista	Brazil	0022	A,L
4.879	R.Bangladesh	Bangladesh	0150	A,Q
4.880	AIR Lucknow	India	0037	L,Q
4.885	R.Clube do Para	Brazil	0334	A,F,G
4.885	KBC East Sce Nairobi	Kenya	1810	F,L,N
4.890	RFI Paris	via Gabon	0356	F,L
4.890	R.Port Moresby	New Guinea	1807	L
4.895	Voz del Rio Arauca	Colombia	0255	A
4.895	AIR Kurseong	India	0107	L
4.895	Pakistan BC	Pakistan	1742	C
4.900	Haixia 2	China	1502	L
4.900	SLBC Colombo	Sri Lanka	2317	L,Q
4.905	R.Nat.N'djamena	Chad	2152	A,E,F,G,L,N,P
4.905	R. La Oroya	Peru	0150	A
4.910	Tennant Creek	Australia	2132	G
4.910	R.Zambia, Lusaka	Zambia	2110	A,E,G,L,N
4.915	R.Anhanguera	Brazil	0015	A,L
4.915	R.Difusora, Macapa	Brazil	0140	Q
4.915	GBC-1, Accra	Ghana	2000	A,C,E,G,L,Q
4.915	KBC Cent Sce Nairobi	Kenya	1819	G
4.920	R.Quito, Quito	Ecuador	0445	A,C,D,L
4.920	AIR Madras	India	0110	L,Q
4.925	R.S.Miguel,Riberalta	Bolivia	2335	C
4.927	RRI Jambi	Indonesia	0005	Q
4.935	R.Capixaba, Vitoria	Brazil	2245	L
4.935	KBC Gen Sce Nairobi	Kenya	2107	G,L,Q
4.940	AIR Guwahati	India	0035	L
4.945	R.Illimani, La Paz	Bolivia	0150	A
4.945	R.Difusora	Brazil	1731	C
4.945	R.Progresso	Brazil	2245	L
4.950	R.Nacional, Mulvenos	Angola	0315	L,Q
4.950	AIR Srinagar	India	1712	C,L
4.950	R.Madre de Dios	Peru	0135	A
4.950	VOA via Sao Tome	Sao Tome	1930	E,G,H,L,P
4.955	R.Nac. de Colombia	Colombia	0100	A,H,L
4.960	Hanoi 2	Vietnam	1822	G,L
4.970	PBS Xinjiang	China	1605	L
4.970	AIR Shillong	India	0112	L
4.970	RTM Kota Kinabalu	Malaysia	2015	Q
4.975	Fujian 1, Fuzhou	China	0150	A
4.975	R.Uganda, Kampala	Uganda	1821	A,F,G,L
4.980	Ecos del Torbes	Venezuela	2147	A,C,E,F,G,H,J,L
4.985	R.Brazil Central	Brazil	0020	L,Q
4.990	AIR Ext.Service	India	0006	F,L
4.990	FRCN Lagos	Nigeria	1950	A,C
5.005	R.Nepal, Kathmandu	Nepal	0115	A,L
5.009	R.TV Malagasy	Madagascar	1735	L
5.010	R.Garoua	Cameroon	1805	L
5.010	AIR Thiru'puram	India	0055	A,L
5.020	PBS-Jiangxi Nanchang	China	1507	C,L
5.020	Xizang-Tb, Lhasa	China	2300	L
5.020	Voz del Upano, Macas	Ecuador	0315	A
5.020	La V du Sahel,Niamey	Niger	2110	A,G,K,L
5.020	SLBC Tamil Home Sce.	Sri-Lanka	2345	C,L,Q
5.025	ABC Katherine	Australia	2132	G
5.025	R.Parakou	Benin	2141	A,C,F,G,L
5.025	R.Rebelde, Habana	Cuba	0205	A,L
5.025	R.Uganda, Kampala	Uganda	1948	A,L
5.030	AWR Latin America	Costa Rica	2325	A,E,H,L
5.030	RTM Kuching	Sarawak	2111	G,L
5.035	R.Aparecida	Brazil	0232	Q
5.035	R.Bangui	C.Africa	1955	A,L
5.040	L.V. de Yopal	Colombia	0220	A
5.040	Voz del Upano, Macas	Ecuador	2344	C
5.045	R.Cultura do Para	Brazil	0200	A
5.047	R.Togo, Lome	Togo	2111	C,F,G,J,L,N
5.050	Haixia 1	China	1740	L
5.050	AIR Aizawl	India	0210	A,Q
5.050	R.Tanzania	Tanzania	0330	F,L
5.055	RFO Cayenne(Matoury)	French Guiana	2140	A,E,F,G,L
5.060	PBS Xinjiang, Urumqi	China	1638	C,L
5.075	Caracol Bogata	Colombia	2321	A,C,E,F,J,L
5.100	R.Liberia, Totota	Liberia	2240	Q
5.295	CNR 1	China	1630	L

DXers:-
(A) Robert Connolly, Kilkeel.
(B) Ron Damp, Worthing.
(C) John Eaton, Woking.
(D) David Edwardson, Wallsend
(E) Sheila Hughes, Morden.
(F) Eddie McKeown, Newry.
(G) Fred Pallant, Storrington.
(H) Roy Patrick, Derby.
(I) Clare Pinder, while in Appleby.
(J) Peter Pollard, Rugby.
(K) Vic Prier, Colyton.
(L) John Slater, Scalloway.
(M) Tom Smyth, Co.Fermanagh.
(N) Tony Stickells, Thornton Heath.
(O) Norman Thompson, Oadby
(P) Phil Townsend, E.London.
(Q) Mahendra Vaghjee, Rose Hill, Mauritius.
(R) Thomas Williams, Truro.

24442 at 1430 in Kilkeel; R.Australia via Darwin **11.660** (Eng to Asia 1430-1800) 33333 at 1500 in Truro; SRI via ? **12.075** (Fr, Ger, Eng to S.Asia 1500-1630) SIO434 at 1500 in Co.Fermanagh; R.Jordan via Al Karanah **11.690** (Eng to W.Eur, E.USA 1400-1730?) 44444 at 1542 in Woodhall Spa & 44444 at 1705 in Valencia; RTV Malienne, Bamako **11.960** (Fr to W.Africa 0758-1757) 43333 at 1737 in Woking; AIR via Bangalore **11.620** (Eng, Hi to Eur 1745-2230) SIO544 at 1840 in Macclesfield; R.Romania Int, Bucharest **11.940** (Eng to Eur 1900-1955) 44444 at 1921 in Storrington; R.Nederlands via Flevo **11.655** (Eng to Africa 1730-2025) 34343 at 1933 in Oxted.

Later, they include R.Globo, Rio de Janeiro, Brazil **11.805** (Port 0900-0330), noted as 23332 at 2000 in Galashiels; R.Kuwait via Kabd **11.990** (Eng to Eur, N.America 1800-2100) 45444 at 2005 by **Michael Griffin** in Ross-on-Wye; REE via Noblejas, Spain **11.775** (Eng to Eur, Africa 2000-2100) 44344 at 2006 in Newry; WWCR Nashville, USA **12.160** (Eng to N.America, Eur 1400-2300) 43333 at 2115 in Stalbridge; BBC via Ascension Is **11.835** (Eng to W.Africa 1930-2300) 45533 at 2140 in Wallsend; Monitor R.via WSHB **11.550** (Eng to Eur, M.East, Africa 2000-2300?) 44444 at 2153 in Plymouth; BBC via Ascension Is **11.750** (Eng to S.America 2000-0200) 34333 at 2213 in Freshwater Bay.

Noted in the **9MHz (31m)** band were R.New Zealand via Rangitaki **9.700** (Eng to Pacific areas Mon-Fri 0816-1206, Sat/Sun 0758-1206), rated 24552 at 0903 in Wallsend; AWR via KSDA Agat, Guam **9.530** (Eng to S.E.Asia 1000-1100) 33323 at 1030 in Morden; SRI via Sarnen **9.535** (Eng, Ger, Fr, It to SW.Eur 1000-1300) rated 54444 at 1116 in Plymouth; KHBN Palau **9.985** (Eng, Hin, Tag to S.Aisa 1100-1800) 34443 at 1400 in Galashiels; R.Kuwait via Kabd 9.880 (Ar to M.East 1315-2130) 55555 at 1545 in Oadby; R.Australia via Darwin **9.615** (Eng to Aisia 1500-2000) 43234 at 1600 in Dudley & 44444 at 1705 in Valencia; BBC via Skelton, UK **9.410** (Eng to Eur, N/C.Africa 02000-2230) SIO322 at 1700 in E.London; Monitor R.Int via WSHB **9.355** (Eng to E.USA, Eur 200-2300) 45333 at 2002 in Ross-on-Wye; VOIRI Tehran, Iran **9.022** (Eng to Eur 1939-2027) 55544 at 2012 in E.Worthing; China R.Int, Beijing **9.920** (Eng to Eur 2000-2157) 33233 at 2010 in Thornton Heath; R.Cairo via Abis **9.900** (Eng to Eur 2115-2245) 24222 at 2115 in Newry; Voice of Indonesia, Jakarta **9.525** (Eng to Eur 2000-2100) 45523 at 2030 in Colyton; AIR via Delhi? **9.910** (Eng to Australia 2045-2230) 24332 at 2105 in Oxted; AIR via Delhi? **9.950** (Eng to W.Eur 2045-2230) 44444 at 2204 in Woodhall Spa; SRI via Schwarzenburg? **9.885** (Ger, Eng Sp, Fr, It to C/N.America 0030-0315) SIO444 at 0126 by **Francis Hearne** in N.Bristol.

The **7MHz (41m)** band is still very congested and reception is often marred by co-channel interference. Noted in the reports were Monitor R.Int via WSHB **7.535** (Eng to Eur ?-0950), rated 44444 at 0948 in Woodhall Spa; R.Australia via ? **7.380** (Eng to Asia 1430?-1600?) 43433 at 1510 in Herstmonceux; R.Slovakia Int **7.345** (Eng to Eur 1830-1900) 42243 at 1851 in Bridgwater; VOIRI Tehran **7.260** (Eng to Eur, M.East 1930-2028) 34533 at 2013 in E.Worthing; AIR via Aligarh? **7.410** (Hi, Eng to Eur 1745-2230) 33333 at 2108 in Plymouth; R.Tirana, Albania **7.110** (Eng to Eur 2100-?) 42242 at 2116 in Storrington; R.Romania Int, Bucharest **7.195** (Eng to Eur 2100-2156) 42333 at 2140 by **Martin Cowin** in Kirkby Stephen; Voice of Russia **7.440** (Eng [WS]) SIO322 at 2200 in Co.Fermanagh; Monitor R.Int, via WSHB **7.510** (Eng to E.USA, Eur 2200-0000?) 54544 at 2235 in Oadby.

Some of the broadcasts to Europe in the **6MHz (49m)** band come from HCJB Quito **5.860** (Eng 0700-0900). noted as 45444 at 0815 by **Roy Patrick** in Derby; WEWN Birmingham, USA **5.825** (Eng ?-0950) 24222 at 0944 in Woodhall Spa; R.Austria Int, via Moosbrunn **6.155** (Ger, Eng, Fr, Sp 0400-2300) 33333 at 1030 in Truro; SRI via Lenk **6.165** (Fr, It, Ger, Eng 0400-2000) 44444 at 1350 in Plymouth; BBC via Cyprus **6.180** (Eng 1900-2200) 32443 at 1915 in Colyton; Polish R, Warsaw **6.095** (Eng 1930-2025) 42242 at 1930 in Storrington; China R.Int **6.950** (Eng 2000-2157) 45334 at 2010 in Thornton Heath; R.Prague via Litomysl **5.930** (Eng 2000-2030?) 43333 at 2017 in Storrington; R.Finland via Pori **6.120** (Eng 2000-2027) 43444 at 2025 in Storrington; BBC via Rampisham & Skelton, UK **6.195** (Eng 1700-2230) 43333 at 2043 in Storrington.

Also received in this band were WHRI South Bend, USA **5.745** (Eng to USA 2100?-0300?), rated 44454 at 2325 in Kirkby Stephen; R.Corp of Singapore (RCS) **6.155** (Eng [R.One] 2200-1600) 34333 at 2332 in Woking; R.Nederlands via Flevo **6.020** (Eng to N.America 2330-0125) SIO222 at 2354 in N.Bristol; BBC via Antigua, W.Indies **5.975** (Eng to C/S.America 2100-0800) 43443 at 0205 in Kilkeel.

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

LW Maritime

Radio Beacons

The propagation conditions at night were often favourable during January, February and March and extensive logs were compiled by some listeners - see chart.

Good openings to the Mediterranean were noted during some nights by **Robert Connolly** in Kilkeel, especially on February 16, when the beacon at Haifa, Israel (HA) on 287.3 was received! During other openings he logged the Italian beacons at Punta Carena (NP) 289.5, Vieste Lt (VS) 299.5 & Genova (GV) 310.5; also Algiers, Algeria (AL) 309.5 and Rabat Sale, Morocco (RBA) 352.0. On the night of March 15 he heard three in Greenland for the first time - Egedsminde (EM) 215.0, Federikshab (FH) 331.0 & Narssaq (NS) 404.0.

The O.Dikson beacon (CM) in Arctic Russia on 312.5 was logged at night by **Steve Cann** (Southampton) for the first time. He also heard at night the Prinz Christian Sund beacon (OZN) on 372.0, which is located on the southern tip of Greenland. Very strong signals were received from OZN during January by **Albert Moore** in Douglas, IoM. On the 16th it was audible until 0900!

None of the beacons in Greenland or Iceland were heard this time by **Peter Rycraft** (Wickham Market) but he logged quite a few in Scandinavia. Many in other areas were also received at night including Riga Lt, Latvia (DG) on 286.5; Pt de Coubre Lt, S.France (LK) 292.0; Elbe Lt, Germany (EL) 298.0; Hel Lt, Poland (HL) 310.5, which are rarities for him.

For many years the long range Consol beacon at Stavanger, Norway (LEC) on 319.0 radiated special signals. About a year ago they ceased and only the ident was sent by keyed carrier. Recently, **Kenneth Buck** (Edinburgh) observed another change - the carrier is now continuous and it is modulated by a keyed tone! The signal is very much weaker than hitherto, which suggests a reduction in power.

A very welcome first report came from **Dave Clench** in Worcester Park. Amongst the entries is Haifa, Israel (HA) on 287.3, which he heard at 0039. Whilst staying in Ford, Sussex, he picked up the ground waves from some quite distant beacons - see chart.

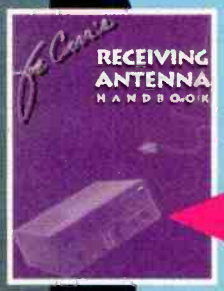
Note: Entries marked # are calibration stations.
Entries marked * were logged during darkness.
All other entries were logged during daylight or at dawn/dusk.

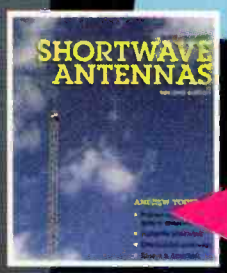
DXers:-

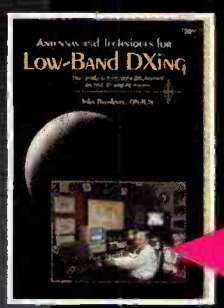
(A) Kenneth Buck, Edinburgh.
(B) Steve Cann, Southampton.
(C) Dave Clench, Worcester Park.
(D) Dave Clench, while in Ford
(E) Robert Connolly, Kilkeel.
(F) Dave Dawson, Birmingham.
(G) Brian Heath, Stapleton.
(H) Albert Moore, Douglas, IoM.
(I) Fred Pallant, Storrington.
(J) Peter Pollard, Rugby.
(K) Peter Polson, St.Andrews.
(L) Victor Robb, Belfast.
(M) Peter Rycraft, Wickham Market.
(N) Tom Smyth, Co.Fermanagh.
(O) Philip Townsend, E.London.
(P) Eric Tubman, Whitstable.
(Q) Peter Westwood, Farnham.
(R) John Woodcock, Basingstoke.
(S) Ross Workman, Shoreham-by-Sea.

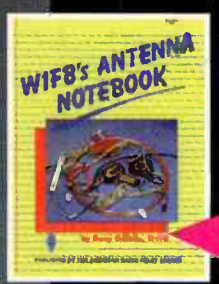
Freq (kHz)	C/S	Station Name	Location	DXer
215.0	EM	Egedsminde	Greenland	E*
284.5	LZ	Lizard Lt	S.Cornwall	A,B*,D,E,F*,G,H,I,L,M*,O,Q,R,S
284.5	MA	Cabo Machichaco	N.Spain	A,E,F*,G*,H,J,L*,M*,O*,S*
284.5	PR	Porkkala	Finland	F*,K*
285.0	NO	Cabo de la Nao Lt	S.Spain	E*
285.0	NP	Nieupoort W.Pier	Belgium	E*,M*,O,Q
286.0	TR	Tuskar Rock Lt	S.Ireland	A,B*,E,F*,G,H,J,K*,L,M*,N*,O,Q,R,S
286.5	AL	Almagrundet Lt	Sweden	J,M*
286.5	BC	Baily Lt	S.Ireland	E,H,L,N
286.5	DG	Riga Lt	Latvia	M*
286.5	FI	Cala Figuera	Majorca	E*,L*,S*
286.5	FT	Cap Ferret Lt	W.France	E,F*,G,H,I*,J,L*,M*,O*,Q*,S*
286.5	NK	Inchkeith Lt	F of Forth	A,K*
286.5	PZ	Cozzo Spadaro	Sicily	E*
287.3	BT	Bjargtangar Lt	Iceland	E*
287.3	HA	Haifa Lt	Israel	C*,E*
287.3	IB	I.Berlenga	Portugal	E*,M*
287.3	LE	Leba Rear	Poland	E*
287.3	MD	Cabo Mondego	Portugal	H*
287.3	RO	Rozewie	Poland	E*
287.5	CV	Cabo Carvoeiro Lt	Portugal	F*,L*
287.5	DO	Rosedo Lt	France	E*,M*
287.5	FR	Faerder Lt	Norway	E*,I*,L*,M*
287.5	MD	Cabo Mondego	Portugal	E,M*
288.0	HH	Hoek van Holland	Holland	E,H,M*
288.0	KL	Sklinna Lt	Norway	E*,K*,M*
288.0	OH	Old Hd of Kinsale	S.Ireland	B,E*,F*,L*
288.5	FI	Cabo Finisterre Lt	N.W.Spain	B*,E,F*,H,J,K*,M*,O*,S*
288.5	YM	Ijmuiden Lt	Holland	E,M*,O
289.0	BL	Butt of Lewis Lt	Is of Lewis	K*,N*
289.0	BY	Baily Lt	S.Ireland	A,B,E,F*,H,K*,M*,N
289.5	LO	Landsort S Lt	Sweden	E*,F*,G*,K*
289.5	MN	Hammerodde	Denmark	E*,H*,M*
289.5	NP	Punta Carena	Italy	E*
289.5	SN	Ile de Sein NW Lt	France	B*,E*,F*,H,M*,O*,Q,S*
290.0	AV	Aveiro	Portugal	E*,L*,M*
290.0	FD	Fidra Lt	F of Forth	A,E*,H*,K*
290.0	MR	Montedor	Portugal	E*
290.5	DY	Duncansby Hd Lt	NE.Scotland	E,K*
290.5	LL	Hallo Lt	Sweden	E*,M*
290.5	SB	S.Bishop Lt	Pembroke	A,B*,C*,E,F*,G,H,I,J,M*,N,O,Q,R,S
290.5	VI	Cabo Villano Lt	N.Spain	E,F*,G*,H,I*,J,K*,L*,M*,O*,S
291.0	OR	Orskar Lt	Sweden	E*
291.0	SN	Cabo San Sebastian	S.Spain	E*
291.5	SU	South Rock LV	Co.Down	A,B*,E,F*,G,H,J,K*,L,M*,N,O
291.9	LC	Leca	Portugal	M*
291.9	LT	La Isleta	Canaries	E*
291.9	NA	Punta Lantailla	Canaries	E*
292.0	LK	Pt de la Coubre Lt	France	M*
292.0	MH	Mahon, Minorca	Balearic Is	E*
292.0	SJ	Souter Lt	Sunderland	A,B,E,F*,G,H,J,K*,L,M*,O
292.0	TO	Torungen Lt	Norway	K*
292.5	SM	Pt St.Mathieu Lt	France	B*,C*,D,E,F*,H,I,K*,L,M*,Q,R,S
293.0	CP	St.Catherine's Lt	I.O.W.	B*,C*,D,F*,G,H,I,J,M*,O,Q,R,S
293.0	RN	Rhinns of Islay Lt	Is of Islay	A,E,H,J,L,N
293.0	SY	Svinoy Lt	Norway	E*,K*
293.5	RO	Cabo Silleiro Lt	N.Spain	E*,M*
294.0	KU	Kullen High Lt	Sweden	E*,J,M*
294.0	PH	Cap d'Alprech	France	B*,C*,D,E,F*,G,H,I,J,K*,L,M*,O,P,Q,S
294.5	BA	#Black Hd Lt	N.Ireland	E
294.5	KC	#Old Hd of Kinsale	S.Ireland	E*
294.5	MH	Mohni Lt	Estonia	E*
294.5	PA	Pakrineem Lt	Estonia	E*
294.5	PS	#Pt Lynas Lt	Anglesey	E,H,L,N
294.5	PT	#Souter Lt	Durham	A
294.5	UK	Sunk Lt V	Off Essex	B*,C*,F*,G,J,M*,P,Q,R,S
294.5	VG	O.Zhizhginskiy	SSR Arctic	G*
295.0	DV	Djupivogur	Iceland	E*,G*
295.0	JA	Jaroslawiec	Poland	E,F*,G*,H*,K*,L
295.0	SN	Sletnes Lt	Norway	E*,M*
295.5	CB	La Corbiere Lt	Jersey C.I.	B*,E,F,M*,O*,Q,S
295.5	CR	Cap Couronne	France	E*
295.5	RE	La Rochelle	France	E,M*
296.0	BH	Blavandshuk Lt	Denmark	A,B*,E*,F*,H,K*,L,M*
296.0	GR	Goeree Lt	Holland	B,M*
296.0	KN	Skrova Lt	Norway	E*,F*,K*,L*
297.0	B	Cabo Trafalgar	SW.Spain	M*
297.0	FG	Pt de Barfleur Lt	France	B*,D,E*,F*,G,H,I,J,L*,M*,O,P,Q,R,S
297.5	MA	Mantyluoto	Finland	E*,K*
297.5	PS	Cabo Penas Lt	N.Spain	E,F*,M*,L*,N
298.0	EL	Elbe Lt F	?	M*
298.0	GX	Ile de Groix	France	B,E*,F*,H*,L*,M*,O,R,S
298.0	TA	Cabo Gata	S.Spain	O,E*
298.5	RR	Round Is Lt	Is Scilly	A,B*,C*,D,E,F*,G,H,I,J,K*,L,M*,N*,O,Q,R,S
298.5	SW	Skagen	Denmark	E
298.5	HQ	Hornbjarg	Iceland	E*
299.0	AD	Ameland Lt	Holland	A,E,F*,H,K*,M*,O
299.0	BN	Les Baleines	W.France	E*,M*
299.0	O	Tarifa	S.Spain	E*
299.0	UN	Understen Lt	Sweden	E*
299.5	NP	Nash Pt Lt	S.Wales	B*,E,F*,G,H,I,M*,O,R,Q,S
299.5	SK	Skomvaer Lt, Rost	Norway	E*,J,K*,L*
299.5	VR	Utvaer Lt	Norway	A,E*,H*,J,K*,L*,M*
299.5	VS	Vieste Lt	Italy	E*
300.0	MZ	Mizen Head	S.Ireland	B,E,F*,H,I*,L*,M*
300.0	TI	Cap d'Antifer Lt	N.France	M*
300.5	DU	Dungeness Lt	Kent	B*,C*,D,F*,G,H,I,J,L,M*,O,P,Q,R,S
300.5	IO	Ilichevsk	Ukraine	E*
300.5	LA	Lista	Norway	A,C*,E*,F*,G*,H,K*,L,M*
301.0	CA	Pt de Creach	France	B*,C*,D,E,F*,G,H,I,J,L,M*,O,Q,R,S
301.0	ER	Eierland Lt	Holland	E*,M*
301.1	RG	Raufarhoefn	Iceland	E*,O*
301.5	KO	Kinnards Hd Lt	NE.Scotland	A,E*,G,H*,K*,L
301.5	L	Torre de Hercules	N.Spain	E*,H*
301.5	OB	Hoburg	Sweden	E*,G*,M*
302.0	RB	Cherbourg Ft W Lt	France	B*,C*,D,E,F*,G,H,I,J,L,M*,O,Q,R,S
303.0	D	Rota	SW.Spain	E* S*
303.0	FB	Flamborough Hd Lt	Yorkshire	A,B,C*,E,F*,G,H,J,K*,L,M*,O,P,R,S
303.0	FV	Falsterborev Lt	Sweden	E*,F*,H*,K*,M*
303.0	YE	Ile d'Yeu Main Lt	France	O,E*,I*,M*,S
303.5	BJ	Bjornsund Lt	Norway	A,B*,C*,E*,F*,G*,H*,J,K*,L,M*,O*,R
303.5	FN	Feistein Lt	Norway	A,K*,M*
303.5	GR	Gedser	Denmark	E*
302.5	IA	Llanes Lt	N.Spain	E*
303.5	OR	Punta de Llobregat	S.Spain	E*,L*,S*
303.5	VL	Vlieland Lt	Holland	F*,G,H,M*,N,O,R,S
304.0	PS	Pt Lynas Lt	Anglesey	A,B*,C*,E,F*,G,H,J,K*,L,M*,N,O,Q
304.0	SB	Sumburgh Hd Lt	Shetland Is	K*
304.5	MY	Cabo Mayor Lt	N.Spain	F*,M*,S
305.0	BA	Estaca de Bares	N.W.Spain	S*
305.0	C	Cabo Priorino Lt	N.Spain	E*
305.0	FP	Fife Ness Lt	SE.Scotland	A,B*,E,F*,G,H,K*,L
305.0	GA	Malaga	S.Spain	G*
305.0	GL	Ile de Giraglia Lt	Corsica	M*,N
305.5	AL	Pt d'Ailly Lt	France	B*,C*,D,E,F*,G,H,I*,J,K*,L,M*,O,P,Q,R,S
305.7	DA	Dalatangi Lt	Iceland	B*,E*,K*,L*
306.0	FN	Walney Is Lt	Off Lancs	B*,E,F*,G,H,J,K*,L,M*,O*,Q,R
306.0	TN	Thyboron	Denmark	A,F*,K*
306.5	H	Hel Lt	Poland	H
306.5	KL	Kolkasrags	Latvia	E*,F*,H
306.5	KR	Kubassaar	Estonia	E*
306.5	OR	O.Osmussaar	Estonia	E*
306.5	RS	Ristna	Estonia	B*,E*,F*,G*,H,K*,L*
306.5	SY	Sorve	Estonia	E*
306.5	UT	Utsira	Norway	A,B*,E*,F*,G,H,J,K*,L,M*,O,S*
307.0	GL	Eagle Is Lt	Ireland	A,B*,E,F*,H,K*,L,M*,N
308.0	AK	Table D'Oukacha	Morocco	E*
308.0	PI	Cabo Espichel	Portugal	E*
308.0	RC	Cabo Roca	Portugal	E
308.0	RO	Roches Douvres Lt	France	E,H,M*
308.5	NZ	St Nazaire	France	B,E*,G*,H,L*,M*
309.5	AL	Algiers	Algeria	E*
309.5	BA	Punta Estaca Bares	N.Spain	E*,H,M*
309.5	FH	Fruholmen Lt	Norway	E*,M*
309.5	MA	Marstein Lt	Norway	A,E*,F*,G*,H,K*,L,M*
309.5	PB	Portland Bill Lt	Dorset	B*,D,E*,F*,G,H,I*,J,L,M*,O,P,Q,R,S
310.0	ER	Pt de Ver Lt	N.France	B*,E*,F*,I*,M*,O,Q,R,S
310.5	AS	Castellon	Spain	E*
310.5	BO	Bokfjord Lt	Norway	E*
310.5	GV	Genova	Italy	E*
310.5	HL	Hel Lt	Poland	M*
310.5	SG	Sjaellands N Lt	Denmark	E,K*
311.0	GD	Girdle Ness Lt	NE.Scotland	A,E,H,K*,L
311.0	NF	N.Foreland Lt	Kent	B*,C*,D,F*,G*,H,J,M*,O,P,Q,R,S
311.5	LP	Loop Hd Lt	S.Ireland	E,H,291*,L*
312.0	HO	Tennholmen Lt	Norway	E*
312.0	OE	Oostende	Belgium	E*,F*,L,M*,N,O,S
312.0	UH	Eckmuhl Lt	France	E*,M*
312.5	AK	Akmenrags	Latvia	E*,M*
312.5	BK	Baltiysk	Russia	C*,E*,L*
312.5	BT	Mys Taran Lt	Latvia	E*,K*,N
312.5	CM	O.Dikson	Arc.Russia	B*,E*
312.5	CS	Calais Main Lt	France	E,G,M*,P,S
312.5	KA	Klaipeda Rear Lt	Lithuania	E*
312.5	LB	Liepaja	Latvia	E*
312.5	SR	Skardsfjara	Iceland	E*,L*
312.5	VS	Cabo Estay Lt	N.Spain	J,L,M*,O
313.0	HA	Halten Lt	Norway	E*,K*,L*,M*
313.0	PA	Cabo de Palos Lt	S.Spain	E*,S*
313.0	TY	Tory Is Lt	N.Ireland	A,E,H,K*,L
313.5	BR	Cap Bear Lt	S.France	E*,M*
313.5	CM	Cromer Lt	Norfolk	A,B*,F*,G*,H,J,K*,M*,O,P,Q,R,S
313.5	OG	Olands Sodra Grund	Sweden	E*
314.0	HK	Heldkingen Lt	Norway	K*
314.0	PQ	Porquerolles	S.France	E,H*,L*,M*
314.0	VG	Ile Vierge Lt	France	B*,C*,D,E,F*,G*,H,I*,J,K*,L,M*,O,Q,R*,S
314.5	TL	Punta D'Penna	Italy	B*,E*,K*,L*,S*
315.5	ND	Nidden	Lithuania	E*
316.0	IN	Ingolfshofdhi Lt	Iceland	B*,E*,K*,L*
319.0	LEC	Stavanger	Norway	A,B*,C*,E,F*,G*,H,J,K*,L,M*,O,P*,R*,S*
331.0	FH	Frederikshab	Greenland	E*
337.0	MY	Myggenaes	Faeroe Is	A*,L*
352.0	RBA	Rabat Sale	Morocco	E*
367.0	JV	Jakobshavn	Greenland	E*
372.0	OZN	Prins Chris's Sund	Greenland	B*,E*,F*,G*,H,L*
381.0	AB	Akraberg	Faeroe Is	A*,B*,E*,F*,G*,H,J,L,M*,O*,R*,S*
404.0	NL	Nolso	Faeroe Is	A*,B*,E*,F*,G*,H*,J,L,M*,R*,S*
404.0	NS	Narssaq	Greenland	E*

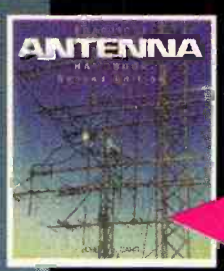
This month we take a look at some











Joe Carr's Receiving Antenna Handbook

This book is a complete guide to high performance receiving antennas for long wave, all the way to the upper end of the short wave spectrum. This is a comprehensive examination of antennas intended specifically for receiving purposes.

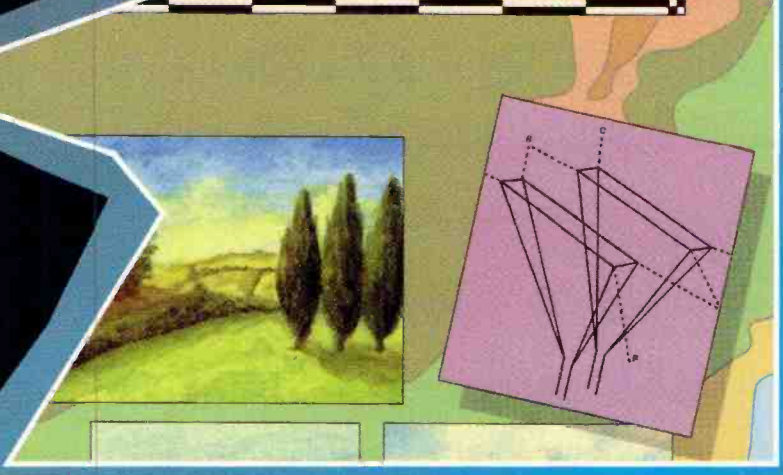
Among the many topics, *SWM* author Joe Carr discusses: the basic theory behind all receiving antennas, getting a good ground connection at radio frequencies, safety considerations in antenna design and installation, loop antennas for the a.m. broadcast band and lots more.

To find out just what else is covered in this book, you'll just have to order yourself a copy. Give your receiver what it needs to pull in those weak signals out of the noise, a good antenna (and this book!).

Available for £17.50, order now, what are you waiting for?

HF Antenna

This book provides a reference source for all h.f. antenna work, whether it be for fixed, mobile or using test equipment. In



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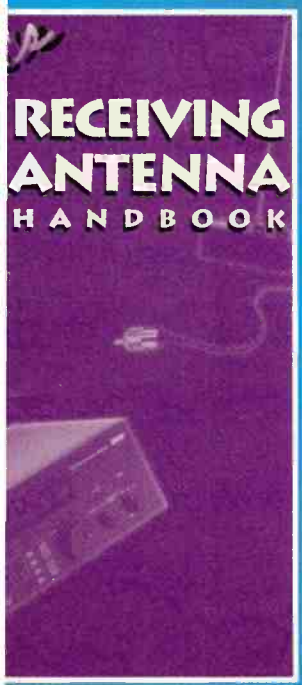
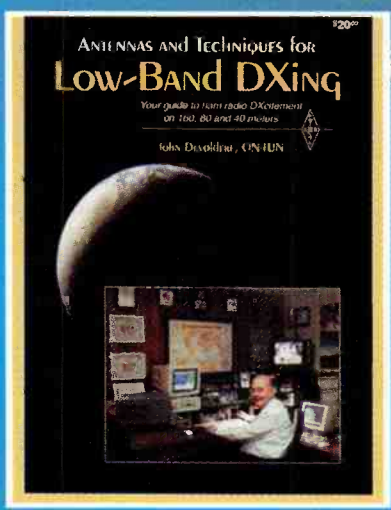
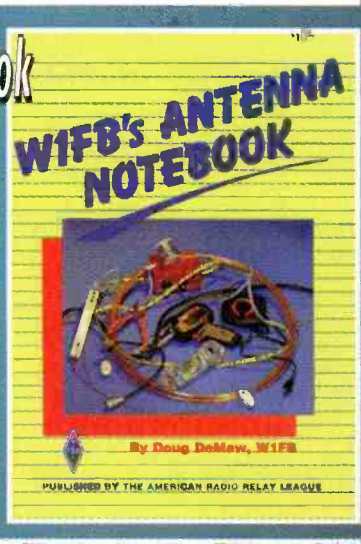




Antennas And Techniques For Low - Band DXing

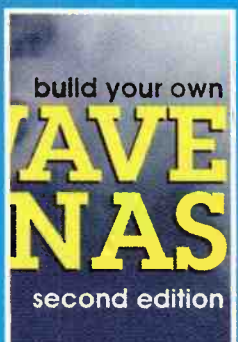
Drawing on the experiences of successful DXers and the author's own considerable experience. John Devoldere ON4UN, shares the tips and techniques that can make the difference between a station that takes part in a contest and one that wins it. This second edition is extensively revised and expanded, it focuses on the antenna systems, from dipoles to vertical arrays, that can make a station truly competitive. Yours for £15.50.

W1FB's Antenna Notebook



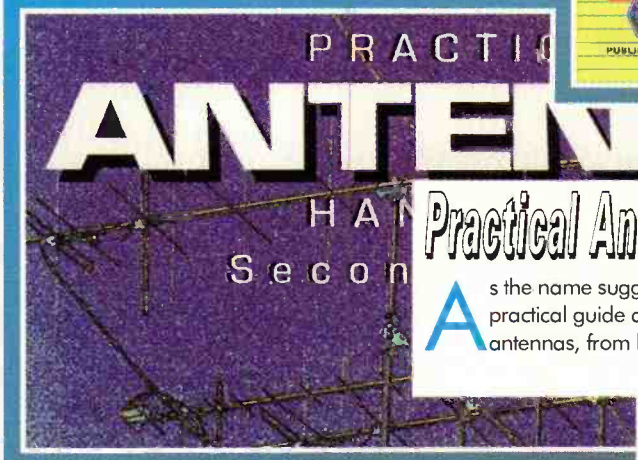
A volume aimed not at engineers or scientists, but enthusiasts and hobbyists. Contains material which is easy to understand even if you don't have a strong technical base from which to work.

The emphasis, for the most part, is on simple wire and tubing antennas which can provide satisfactory performance for a variety of operating objectives. Just £7.50 buys this useful volume.



For All Locations

effect it is a manual on antenna work, with useful tips, projects and ideas.
At £14.65 can you afford to be without it?



Practical Antenna Handbook

As the name suggests, this book offers a practical guide at everything to do with antennas, from h.f. to microwaves. It also has sections on propagation, transmission lines, antenna fundamentals and a helpful introduction to radio broadcasting and communication.

The book neatly balances a practical approach with the minimum of mathematics, good diagrams and a lively text. Another star buy from *SWM* author Joe Carr - £23.95.

ANDREW YODER

- Indoor and limited-space antennas
- Portable antennas
- Directional antennas
- Tuners & couplers

Build Your Own Shortwave Antennas

This practical handbook puts at your fingertips the information you need to build your own short wave antennas and improve the reception of far away stations. Andrew Yoder's easy-to-follow instructions and clear diagrams and photos show how to construct a variety of inexpensive, yet powerful, antennas and masts. £15.95.

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

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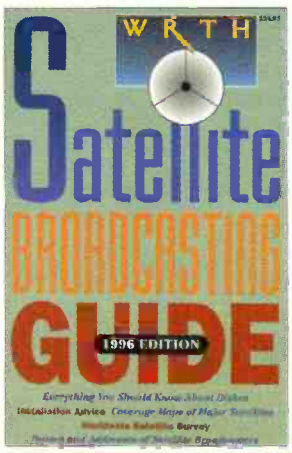

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