

shortwave magazine

MARCH 1998 £2.75

B R I T A I N ' S B E S T R A D I O M A G A Z I N E

Reviewed **Lowe HF-150 Europa**

Hoka Code3 Gold

The Medfrex Antenna

much more inside...



03 >



9 770037 426050



New Lower Price!

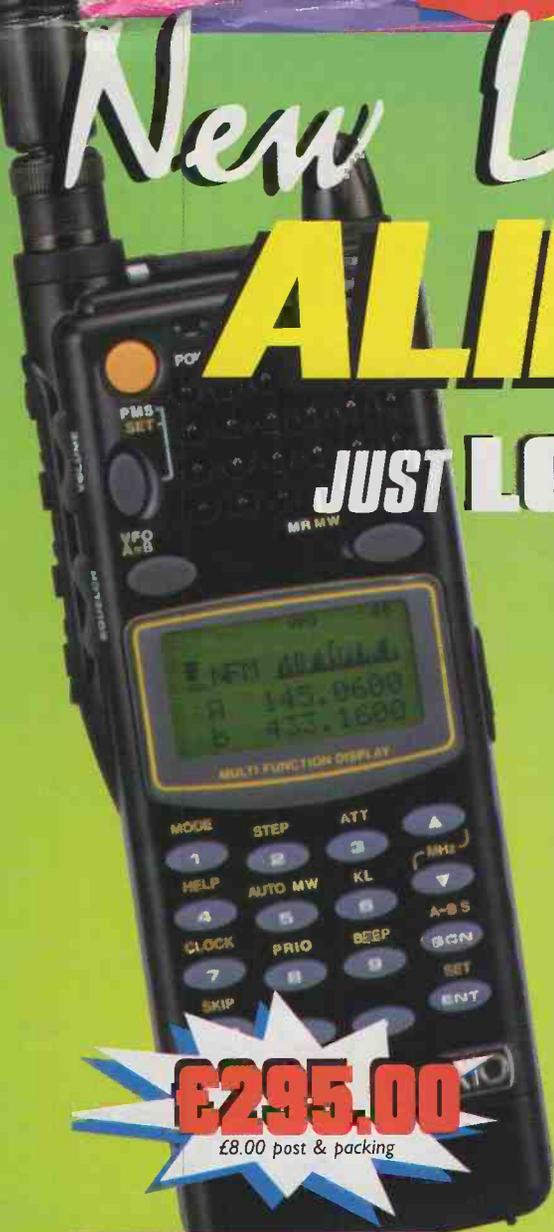
ALINGO DJ-X10E SCANNER

JUST LOOK AT THESE FEATURES!

- **RECEIVES** 100kHz - 2000MHz
- **MULTI MODE RECEPTION**
AM WFM - NFM - SSB - CW
- **1200 MEMORY CHANNELS**
- **CHANNEL SCOPE SPECTRUM ANALYSER**
that allows monitoring of 40 channels at a glance
- **CHANNEL SCOPE PEAK SEARCH**
During searches you can tune in the strongest signal displayed on the channel scope
- **ADVANCED SCANNING FEATURES**
that allow selection of these types of scanning:

Programmed Scan (up to 10 groups)	VFO search
Programmed Memory Scan	Dual VFO search
Any Memory Scan	Band excursion scan
Mode Scan	Priority scan
(not found on many scanners!)	Any channel ship scan
- **USER FRIENDLY FEATURES**
Help messages - Personalised Channel names - Memory cloning - Auto memory write scan - Beginner/Expert Mode - Memory Tune Mode
- **LARGE CLEAR ILLUMINATED DISPLAY**
with switchable backlight for easier use at night
- **TIMER FUNCTIONS**
With auto ON/OFF facility

- **BATTERY SAVE FACILITY** For extended use
- **SQUELCH CONTROL**
Fully adjustable and switchable squelch control
- **STYLISH CABINET WITH LARGE SPEAKER**
For clear sound quality
- **A SUPER SENSITIVE RECEIVER**
- **DUAL VFOs**
- **FACILITIES FOR CLONING ANOTHER SET**
- **BUILT IN 24 HOUR CLOCK**
- **DISPLAY - CONTRAST - CONTROL**
- **LOW BATTERY ALARM**
- **SWITCHABLE ATTENUATOR**
- **SELECTABLE CONTROL BEEP TONE**
- **KEYPAD LOCK CONTROL**



£295.00

£8.00 post & packing

OPTIONAL EXTRAS

- EBP-33N...Small size 650mAh NiCad...£39.95
- EBP-34N...Long life 1200mAh NiCad...£49.95
- ESC-29...Standard Soft Case...£7.95
- EBP-6...Mobile Mounting Bracket...£12.95
- EME-6...Earphone...£10.95

SPECIFICATIONS

- Frequency.....100kHz - 2000MHz
- Memories.....1200
- Scan Speed...25 ch/sec
- Scan Steps...Selectable (50Hz - 500kHz)
in 20 fixed steps
- Receiver.....Triple Superheterodyne
- Dimensions...57(H) x 150(W) x 25.5(D)
- Weight.....320g
(with EBP-37N Battery pack)

DJ X10E includes **FREE**

- **MAINS DROP IN CHARGER**
For easy and convenient use
- **NICAD BATTERY PACK**
4.8V DC 700mAh NiCad battery pack
- **BELT CLIP**
- **CARRYING STRAP**
- **FLEXIBLE LOW PROFILE ANTENNA**

ICOM PER 1000

ICOM'S NEW COMPUTER RADIO SYSTEM

100kHz - 1300MHz *plus LOTS MORE!*
ALL MODE RECEPTION

£349.00

now in stock!



YUPITERU MVT 3300

FREQUENCY:

66 - 88MHz 300 - 470MHz
108 - 170MHz 806 - 1000MHz

MODES: AM/NFM

STEPS: 5, 6.25, 10, 12.5, 25kHz

MEMORIES: 200

BAND MEMORIES: 10

(user re-programmable)

PRIORITY CHANNELS: 10

SCANISEARCH SPEED: 30 per sec

POWER: Requires 4 x AA batteries

SUPPLIED WITH: Antenna, Earpiece,

Carrying Strap and built-in Desk Stand

JUST ARRIVED!

An exciting new handheld packed with features - but at a price you can afford!

The receiver has "breathtaking performance" ensuring this set is destined to be a number one seller

OUTSTANDING
VALUE FOR MONEY!

£179.95



YUPITERU
MVT-9000 EU

PRICE
MATCH

£395.00

10 REASONS

to buy your scanner
with CONFIDENCE from
NEVADA

- We offer FRIENDLY expert advice
- We GUARANTEE to price match
- We hold LARGE stocks
- We offer SAME DAY despatch
- We give a NO-QUIBBLE guarantee
- We carry FULL SPARES BACK-UP
- We have IN-HOUSE SERVICE facilities
- We are UK DISTRIBUTORS for Yupiteru
- We have been established 28 YEARS!
- All our SCANNERS are CE approved

NEW
LOW
PRICE!

ICOM
IC-R10

£299.00

£259.00

AOR AR8000
STILL the No1 seller!



PRICE
MATCH

£269.00

YUPITERU
MVT 7100 EU

JRC NRD 345G



A cracking new receiver aimed at the Broadcast and Shortwave listener. JRC build some of the World's finest receivers and this is no exception. Designed to give clarity and interference free reception.

- AM synchronous detector
- Low noise PLL chip
- Wide dynamic range
- Sensitive receiver
- Noise blanker
- RS232 computer I/F
- 100 memories
- Clock/Timer functions
- Supplied cw AC mains adaptor

£695.00

DRAKE SW2



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

- 100kHz - 30MHz
- AM/SSB
- 100 memories
- Easy tuning
- Selectable Sideband
- Synchronous detection
- Dual antenna inputs
- Long wire short wave antenna
- 12V DC operation

£499.00

DRAKE R8B



NEW MODEL
-NOW IN STOCK!

- AM, FM, USB, LSB, RTTY, CW
- Freq range: 100kHz-30MHz
- Wide/narrow noise blanker
- RF pre-amplifier for enhancing weak signals
- 1000 memories
- RF attenuator
- Tone control
- Adjustable RF gain
- Notch filter
- AGC
- Two 24 hour clock timers
- RS 232 interface

£995.00

shipping world wide - fast - for 28 years!



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communications

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NEVADA

Announcing the **All NEW** Micro RF Detector

Techtoyz

the miniature test equipment line from optoelectronics

They're Compact and Easy to Use...Featuring **Techtoyz**, the Pager Sized Test Equipment line from **Optoelectronics**.

If compact test equipment is what you're looking for, then the **Techtoyz** line is for you. All three **Techtoyz** products are built into pager style cases, small enough to fit in your palm, yet powerful enough to take on your biggest jobs. The Techtoyz line includes the new Micro Counter and Micro DTMF decoder, and now introduces the all new Micro RF Detector, a two mode (bargraph or numerical display) signal strength meter. Each mode can be set to activate a beep when signal strength reaches a selectable level from 1 -100, that also activates the hit counter which stores up to 250 hits. The Micro RF detector covers a wide, 10MHz - 2GHz, frequency range.

TMC100 Rubber Duck Antenna



Micro Counter

- 10MHz - 1.2GHz Range
- 12 character LCD Display
- 1kHz, 100Hz and 10Hz Resolution
- 2.5mm stereo jack for optional antenna
- Store 3 frequencies in memory



Micro DTMF Decoder

- Internal microphone for audio input
- Line audio input jack
- 200 hour battery operation
- Auto blank insert after 3 second delay
- 2000 character scrollable memory



Bargraph Mode



Numerical Mode

**MADE
IN
U.S.A.**

OPTOELECTRONICS

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HAYDON COMMUNICATIONS

132 High Street • Middlesex • HA8 7EL
Telephone: 0181•951•5781 Fax: 0181•951•5782

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189 London Rd. • Portsmouth • Hampshire • PO2 9AE
Telephone: (01705) 662154 Fax: (01705) 690626

WATERS & STANTON ELECTRONICS

22 Main Road • Hockley • Essex • SS5 4QS
Telephone: (01702) 206835 Fax: (01702) 205843

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Cover Subject

Discovery heads for space - again.

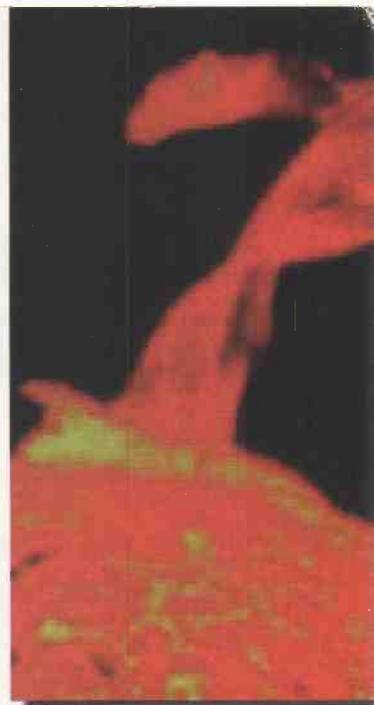
Courtesy NASA.



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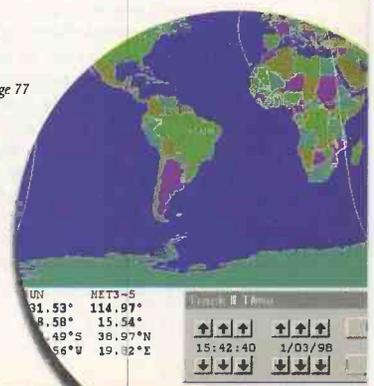


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UN	MET3-5		
31.53°	114.97°		
8.58°	15.54°		
49°S	38.97°N		
56°W	19.02°E		
15:42:40		1/03/98	

Communiqué

Shortwave Shop Open Day

The **Shortwave Shop** is holding its Open Day on **Sunday 15th March 1998** at the **Southern Electric Museum, Bargates, Christchurch, Dorset** on the B3073. The museum will be open from 10.30am through to 4.30pm and entry will be free of charge on the day.

The Open Day will give visitors an opportunity to view and purchase some of the latest amateur, short wave, scanning and CB equipment available as well as a range of quality used communications equipment and accessories. Visitors to the Open Day will also have the unique opportunity to view the museum's rare collection of electrical equipment, which is dedicated to the supply and use of electrical energy through the ages. Exhibits range from early domestic appliances, including radio and television, to the distribution and generating equipment.

There will be parking in the museum grounds, but it will be restricted to disabled visitors only, due to limited space on site. However, parking will also be available in either of two public car parks, one opposite the main entrance and a second within 300 yards.

So, make it a date and write it in your diary now!



Southern Electric Museum, Bargates, Christchurch.

Faster Route To Computer Fairs

Finding the right computer fairs, auctions, shows, amateur radio rallies has just got a whole lot easier as search engine supremos netXtra launch their latest search tool. A comprehensive data base of computer fairs, auctions, shows and radio rallies is being compiled by the Suffolk-based company, which is using software based on its award winning Accommodation Search Engine to produce the new search system.

Visitors will be able to select events by date, type and location. Event organisers will be able to avoid clashes and there will be low cost advertising space available if they wish to promote individual fairs or exhibitions. The system has been designed for quick and easy use and incorporates a map so that there is no need to enter specific towns or counties.

netXtra believe their new system is the most thorough and comprehensive in its sector and with a massive increase in Internet activity, it will soon become the natural way to look for event information.

The search engine is on <http://www.computerfairs.co.uk> and details of newly booked events can be passed to netXtra by E-mail on info@computerfairs.co.uk

For further information contact **Robert Schrimppff**, netXtra Limited, Maynard House, Bradfield St Clare, Bury St Edmunds, Suffolk IP30 0DX, Tel: (01284) 386112 or FAX: (01284) 386163.

Mary's Passed Her Morse!

Mary Pink, manageress of SRP Trading's Radio Centre, has been busy again! After gaining her class B callsign of M1BUB in the May 1997 RAE, Mary started to learn and practice the Morse code. All the practice paid dividends, as Mary took and passed her 12w.p.m. Morse test in early December.

Mary is now the proud owner of the class A callsign M0BMH. Mary, who has been very active on 'phone and digital modes on 2m, is now actively working the h.f. bands on both 'phone and key.

Mary is also a member of the Sandwell Amateur Radio Club, was tutored by both Clive

G0TVR who runs the club Morse class and on air by Steve M0ALH. Mary would like to say 'thanks' to both!

Finally, for those who don't know, Mary has worked in the radio communications field for almost 20 years, so if you are passing SRP Radio Centre in Birmingham, pop in for a browse, chat or perhaps a cup of coffee!



Mary, now the proud owner of the callsign M0BMH.

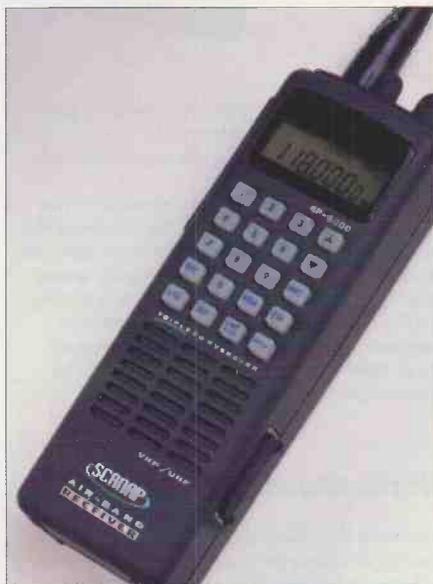
Live On-Line

Birmingham based developers of the ground breaking Scanap AP 1000 v.h.f./u.h.f. airband receiver has gone live on-line with its own comprehensive and informative Internet site. **AYP Electronics Ltd.** has placed the newly developed and unique Scanap AP 1000 unit at the centre of the site.

The AP 1000 has been designed to cater for the new, and potentially problematic, channel spacing which will be phased in throughout Europe in January 1999. The receiver will - at the push of a button - pick up either v.h.f. or u.h.f. bands catering for 12.5kHz and the soon to be introduced 8.33kHz spacing on the v.h.f. bands.

AYP's newly created Web site is part of the company's promotional push for the new product. The inter-active site is designed to satisfy a growing market of radio enthusiasts and to be an entertaining and imaginative source of information which will also allow visitors to link straight into other relevant sites as well.

The site will be updated and added to on a regular basis, so to keep up with development at AYP and with the market generally, and to take part in competitions and communicate with fellow aviation enthusiasts, visit the new AYP web site at <http://www.aypelectronics.com> or E-mail AYP at enquiries@aypelectronics.com



NTL Wins Contract

Solent Regional Radio Ltd., holders of the Solent regional licence, have chosen NTL to provide their transmission and distribution systems. The newly-formed company have looked to NTL for 'no worries' transmission to help them through the launch and beyond.

The first stage of the contract involves constructing a bespoke antenna and transmission system plus using NTL Sure-Link to connect the studio in Southampton to the transmitter sites. Once the station starts broadcasting, the contract also provides station-output monitoring using NTL Cerberus, remote control via the telemetry,

Lions Clubs

From 29th June to the 3rd July 1998, Lions Clubs International will hold their 81st International Convention in Birmingham. It will be the first time the International Convention is held in the United Kingdom and more than 40 000 Lion members and their partners from all over the world are expected to attend.

But who are the Lions? Well, Lions Clubs International is the largest service organisation in the world. It's members, active throughout the world, provide help and assistance to those less fortunate in their communities. There are now approximately 43 000 Lions Clubs in 186 countries and geographical locations, with a world-wide membership of around 1.4 million Lions.

Since the very beginning, Lions Clubs commitment to humanitarian service has never wavered. Their international motto 'We Serve' is an expression and philosophy defining the endless efforts of Lions Club world-wide to continually improve the quality of life for so many people.

To mark the occasion at the Convention, Lions are setting up an amateur radio station, which is planned to operate 24 hours a day for the week of the convention. This will give Lions visiting Birmingham a chance to send their greetings all over the world, and for the world to call Birmingham.

The station will also be marking the 50th Anniversary of Lions Clubs in Europe and the 100th Anniversary of the Amateur Radio Society of Great Britain. Licensed Lions will be operating, and non-Lions with the appropriate licences are invited to help out - indeed they will be essential, as it is planned to have each operator covering a four-hour shift.

A station is being set up within the National Exhibition Centre, where a majority of the convention activities will take place, with equipment from commercial supporters Icom, Yaesu and Strumach.

For further information please contact **Lion Norton Clark M0BNC at Abbey Cottage, 45 High Street, Kenilworth, Warwickshire CV8 1LY, Tel: (01926) 512268, FAX: (01926) 864378** or visit the Lions Website at: <http://www.lions.org.uk>

ISDN back-up, guaranteed availability of service at 99.8% and a round the clock emergency response as well as transmitter maintenance.

The stations plans to broadcast a soft rock service from May 1988 on 105.2MHz from the Chillerton Down transmitter on the Isle of Wight and 105.8MHz from the relay transmitter in Poole. Approximately 1 350 000 listeners in the south coast from Chichester, West Sussex to Weymouth in Dorset will be able to tune into the programmes, aimed at 25 to 54 year olds.

Jon Trowsdale, head of NTL's Broadcast's radio group said, "This is a strategic contract for both parties and demonstrates our willingness to enter into long term relationships with our customers. We are delighted to be able to help Solent Regional Radio realise their commercial and transmission objectives and we wish them the best of luck for the future".

Welz Competition Winner

The lucky winner of the competition in the November and December '97 issues of SWM to win a Welz 2000E scanner was **David Silcock** who lives in Wigan.

David will be receiving his Welz 2000E scanner, kindly donated by **Waters & Stanton Electronics** of Hockley, Essex, shortly.

ARD-2 ACARS & NAVTEX Decoder & Display Unit

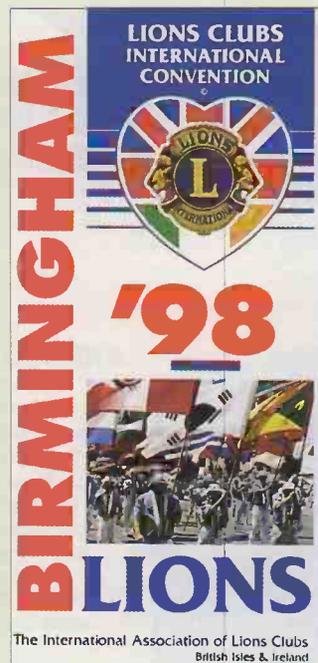
The AOR brand name is well known for producing innovative designs in the field of radio receivers and accessories. The very latest addition to the range is the new portable ARD-2 ACARS & NAVTEX decoder and display unit.

The ARD-2 is a self-contained unit that can be powered from internal batteries (four AA cells) or from an external 12V d.c. power source. A built-in l.c.d. provides two lines of 32 characters with a scroll back 512 character buffer.

This means that it is not necessary to connect a computer, although an RS-232 port is required should you wish to connect a computer for terminal operation, etc. An optional custom Windows-based PC software package is under development and should be available shortly.

The price of the ARD-2 is £295.00 + £4.00 P&P including VAT.

For further details please contact **AOR (UK) Ltd., 4E East Mill, Bridgefoot, Belper, Derbyshire DE56 2UA. Tel: (01773) 880788. E-mail: info@aor.co.uk <http://www.demon.co.uk/aor>**



Send your news to Zoë Crabb at the Editorial Offices

Communiqué

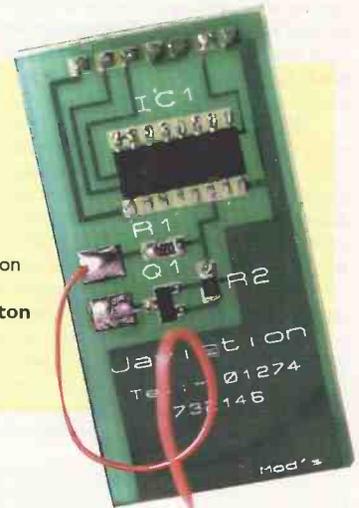
AR8000 Filter

Got an AR8000? Is your a.m. filter too wide? Can you solder? Got £35 to spare? Then Javiation have the answer for you - the DX-8000. A retro fit p.c.b. that allows the use of the s.s.b. filter to be used on a.m.

Once fitted the filter is selected via the AR8000 keypad. What could be simpler?

Supplied complete with comprehensive fitting instructions, the p.c.b. is available only from Javiation. Only a few simple tools are required. If required Javiation can fit this option board for you. The only additional costs are for each journey that your AR8000 makes.

For more information on the DX-8000 contact: **Javiation, Carlton Works, Carlton Street, Bradford BD7 1DA.** Tel: (01274) 732146, FAX: (01274) 722627. E-mail: info@javiation.co.uk or Web: <http://www.javiation.co.uk>



SAR Hoax

We have received reports that on the 8th January 1998, a Lancashire man was taken into custody after a hoax distress call caused a major search and rescue operation in the Irish Sea.

We understand that a 52 year old man of Preston, Lancs, was said to have made a call to the Liverpool Coast Guard claiming to be on board a catamaran that was in danger of sinking, and making the call from a cellular telephone. This sparked a major search and rescue operation which involved a Nimrod (Rescue 11), three helicopters (Rescue 140 and Rescue 141 from Belfast, Rescue 177 from Prestwick, Scotland), four Lifeboats, one fixed wing aircraft, nine auxiliary coastguard crews from the UK, plus three from the Irish Republic.

The caller then made further calls saying that he was taking on water, and then taking to a liferaft. Lancashire Police later visited his home, and after breaking down his front door he was taken into custody.

The search and rescue operation was abruptly cancelled by Kinloss Rescue at approximately 1340UTC, after over six hours of fruitless searching. This bogus operation is believed to

have cost around £240 000! The suspect is likely to be charged with a number of telecommunications related offences - that could carry prison sentences.

No mention was made as to whether or not the hoaxer is a radio enthusiast, but the event did receive extensive radio and TV coverage, with the local BBC North West *Tonight* news programme featuring shots of Nimrods taking off and landing from RAF Kinloss, interviews with spokesmen from both Liverpool and Portrush Coastguards, and an interview with a RAF spokesman in the Rescue Control Centre at RAF Kinloss.

World Standard TVs

Included in their *Product Information Update*, Grundig announce two multi-standard sets ideal for both satellite and DX reception. The sets are available in 590 and 660mm visible screen sizes. The World system Standard sets are capable of

Earth Images Hit By Storms

If you were trying to contact Earth Images in January you will have found out that they had a communications problem. All their telephone lines were put out of action by the spate of big storms. The problems should have cleared up by now and Earth Images have asked SWM to help them apologise to any reader who was unable to get in touch with them.

The CD mentioned in the January 98 issue of SWM costs just £29.95 inc. and the posters are £16.95.

Earth Images, PO Box 43 Keynsham, Bristol BS18 2TH.

INTELSAT 903 & 904 To Cover Atlantic

Latest news from Space Systems/Loral (SS/L), a subsidiary of Loral Space & Communications Ltd. The company has been awarded a contract to build two additional high-power satellites for the International Telecommunications Satellite Organization (INTELSAT).

Under the terms of the contract, SS/L will build and deliver INTELSAT 903 and 904 in March and July, 2001, respectively. The satellites, to be launched aboard Ariane launch vehicles, will provide voice/data and video service over the Atlantic Ocean Region (AOR), providing services to North America, South America, Europe, Africa, Greenland and Iceland.

INTELSAT 901 and 902 are currently under construction by SS/L and are scheduled to be delivered in the summer and late fall of 2000, respectively. They will provide service over the Indian Ocean Region (IOR).

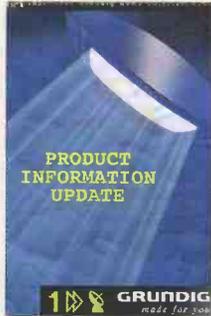
Each of the four satellites in the INTELSAT IX series being built by SS/L will operate 44 transponders in the C-band and 12 transponders in the Ku-band. The satellites will carry a significantly greater percentage of high-power amplifiers and solar array power than any previous INTELSAT series. The satellites, based on Space Systems/Loral's standard three-axis spacecraft, will have a mission life in excess of 13 years.

SS/L has been the prime contractor on several previous INTELSAT programs including INTELSAT V, INTELSAT VII, and INTELSAT VIIA.

INTELSAT owns and operates the world's most extensive global communications satellite system. With expected 1997 revenues of approximately US \$960 million, the INTELSAT system provides voice/data and video services to customers around the world. Further information on INTELSAT can be found at Web site: <http://www.intelsat.int>

both 4:3 and 16:9 aspect ratios. Nicam stereo and Fasttext capabilities are standard.

More information available from: **Grundig International Ltd., Elstree Way, Borehamwood, Herts. WD6 1RX. Tel: 0181-342 9400. FAX: 0181-342 9401.**



Equipment Sale

A selection of radio test equipment is currently being offered for sale by DDM Asset Management, Auctioneers and Valuers in Scunthorpe, on behalf of a leading finance house. Items for sale are:

Fluke Model 5100B Calibrator,
HP Model 5065A Rubidium Vapour Frequency Standard,
HP Model 5335A Universal Counter,
HP Model 1725 Oscilloscope,
HP Model 333A Distortion Analyser,
HP Model 34401A Multimeter,
Bruel and Kjaer Type 4420 Pistonphone.

All the above was supplied new in January and is currently located in the Scunthorpe based saleroom. For more information contact Paul Cooper at, **DDM Asset Management Ltd., 11 Atkinsons Way, Foxhills Industrial Estate, Scunthorpe DN15 8QJ. Tel: (01724) 281 144, FAX: (01724) 281 166.**

Radio and TVDX News

An odd news item appeared in the German press suggesting that plans are well advanced for 'Zoom TV', a 'pirate TV' operation based on a vessel just outside of territorial waters in the Baltic. The programme output will be transmitted down by satellite, the shipboard operation allows it to avoid national legislation on programme content. Already US\$3million has been promised up-front from the Monaco based 'Marcel Oswald Trust'.

January 1st 1999 and Spanish TV will be completely deregulated and with it two new terrestrial national channels bringing the total up to seven national networks - currently there are two TVE; Canal Plus; Antena 3 and Tele 5. The new networks will be transmitted via Retevision capacity and additional local, regional or national channels will be available subject only to frequencies being available. The government owned regional TV operations in Valencia, Catalonia, The Basque region, Madrid, Galicia and Andalusia will also be sold off to the private sector.

Advertisement seen for the Swedish RTA-AB company in a cellular communications magazine shows an Ericsson 300 series mobile phone with a stub antenna claimed to be 50% smaller than standard stub antennas. 'The 'Microstub' antenna has been developed using a technique known as brass bracket compressed coil (BBCC)...thus enabling the antenna size to be reduced to 16mm, compared to the generally available 35mm stub'.

Transmitter news - In the Czech Republic the Prima TV transmitter at Jihlava near Javorice ch.E59 is 600kW e.r.p. - all the others listed are under 1kW. In Germany the Flensburg-Stadt

More RNZI Changes

Since our update last month, Radio New Zealand International have again implemented some schedule changes, the latest - effective from 1650UTC 2 February 1998.

Time (UTC)	Frequency (MHz)	Day
1650-1750	6.145**	Monday - Friday
1751-1850	9.810	Monday - Friday
1851-1950	11.735	Sunday - Friday
1858-1958	11.735	Saturday
1951-2155	15.115	Sunday - Thursday
1959-2205	15.115	Friday & Saturday
2156-0458	17.675	Sunday - Thursday
2205-0458	17.675	Friday & Saturday
0459-0815	11.905	Monday - Friday
0459-0758	11.905	Saturday & Sunday
0816-1206	9.700	Monday - Friday
0758-1206	9.700	Saturday & Sunday
1206-1650	Off Air	Every Day
1206-1650	6.105 or 6.070	Occasional Use

Sport that begins before 1500 uses 6.105 and sport scheduled after 1500 uses 6.070MHz
** denotes change.

You can contact the station at: **Radio New Zealand International, PO Box 123, Wellington, New Zealand.** E-mail: rnzi@actrix.gen.nz Web: <http://www.actrix.gen.nz/biz/rnzi>



NDR-1 ch.E12 at 100W has been moved to ch.E10 at 200W to make room for DAB expansion. Rugen-TV at Garz uses ch.E26 @ 5kW e.r.p., a local station with programming 1730-0530 local - at other times text pages are shown. Check out the new Dutch TV Noord via Hoogezand on ch.E36 @ 100kW e.r.p. The PM5544 test card carries all this information.

Crocodile Clips 3

Crocodile Clips, the innovative electronic simulation software for both Mac and Windows computers, has just been upgraded to version 3.

This version has a range of new features including advanced editing and mechanical components. These now include a loudspeaker output and an increased range of signal generators.



To help make *Crocodile Clips 3* more accessible to students a Student edition has been introduced. Only running under Windows 95, this costs just £49.95 inc. VAT and cuts down on the amount of documentation and professional

level support that you get with the full-blown version. Although called a 'Student Edition', the only restrictions on its use is that you must be using it at home - so it could be of interest to readers with Windows 95 machines - a bit of a shame if you are a Mac user.

Crocodile Clips, 11 Randolph Place, Edinburgh EH3 7TA, Scotland. Tel: 0131-226 1511. FAX: 0131-226 1522. Web: www.crocodile-clips.com/education/

Silent Key

It is with sorrow that **The World Association of Christian Radio Amateurs and Listeners (WACRAL)** have asked us to record the loss of their Honorary Life President, **Leonard Colley G3AGX** in early December 1997.

A Merchant Navy wireless operator during WWII, Len was in his time Chairman of the Hull Club. He joined the World Association of Methodist Radio Amateur Clubs (WAMRAC) soon after its formation and became a close friend of the founder, the Rev. Arthur Shepherd G3NGF.

In 1974 G3AGX became Secretary of WAMRAC and, at their Whitby Conference in 1978, played a pivotal role in the work of reorganisation and the name change to WACRAL.

It is fitting that in this, their fortieth anniversary year, WACRAL report that they are enjoying a renewed growth in activity and membership, a lasting tribute to the lifetime of work by Len Colley.

No. 187

Jan 1998

Editorial

If you are a regular reader of *Short Wave Magazine* you will have noticed that this issue has colour throughout - or perhaps you haven't. Anyway, it has, and starting with the April issue we will be taking advantage of the flexibility that having the ability to use colour on every page brings, to improve the editorial content.

I have been aware for sometime now that we are trying to cram the proverbial quart into a pint pot - the metric equivalent of "two litres into a one litre pot" just doesn't have the same ring to it - and the only way out is to try to reallocate the available editorial pages more effectively. You will have to wait until the

April issue to find out the exact details of the changes, but - just like Whitehall - I will leak a few details here. There will be a completely new bi-monthly column on a subject not covered on a regular basis in any other UK magazine. The broadcast station listener will be getting better coverage of the subject. Some of the regular columns will get an increased page allocation to allow us to make the pictures larger. One of the quarterly columns will go bi-monthly.

I can assure you that I will be doing my best to ensure that *SWM* remains the best radio magazine you can buy. We have the best columnist, the most authoritative reviewers and some of the most interesting authors contributing to any hobby radio magazine in the UK - perhaps that's why we outsell all the others by a large margin!

Dick Ganderton G8VFH

Dear Sir

I agree wholeheartedly with Mr C.F. Goodhall's letter on Windows 95, etc., regarding the very large and ever increasing size of computer programs. Is this not a deliberate ploy on behalf of software writers and those involved in the manufacturer and distribution of computer hardware to keep the more naive amongst us on the never ending treadmill of upgrading? The answer to this would no doubt be that the inflow of money is required to keep the boundaries of technology moving forward.

Luckily, radio related software is largely immune from this trend as most of it is written to run from DOS or a DOS menu. The memory requirement for such programs is usually much smaller than those run from a graphic user interface.

To learn just how effective a DOS menu can be I would refer readers to the Mike Richards' column in January '98. In his review of the latest PDSL Ham Radio CD, Mike explains how 4000 programs can be run from a multi-layered DOS menu. Such a system is not only very fast, but can be run from a machine with modest specification, a 386SX 33MHz with 16Mb memory and 540Mb hard drive being the minimum I would suggest.

In reply to Mr Tony Ward, I have tried Windows 95. Due to the inordinate amount of time taken to load the system then exit to DOS to run my DOS programs I have dispensed with it for the present. I have since discovered a method whereby the computer may be booted to DOS and Windows 95 by typing 'win'. However, until cheaper and more reasonably sized radio related programs are written for Windows 95 I will continue to run everything from a home-brew DOS menu.

William Tait MM0BHY
Loanhead
Midlothian

Dear Sir

You were wondering what the age range of your readership was, well, I am 15 years old, and I got interested in short wave just over a year ago. I own a Sangean ATS-909 digital short wave portable receiver.

I receive my radio stations via an indoor long wire antenna, which rolls up. I tend to use this rather than the built-in whip, as it gives better reception. I really enjoy scanning all the bands (including u.s.b. and l.s.b.) for radio stations from different countries and ham radio operation.

I used to own an analogue receiver, this gave poor performance in comparison with the ATS-909 digital. Another good thing about the ATS-909 is it has a key pad, allowing direct frequency entry, this is very useful and convenient.

I send off for programme schedules from radio stations all around the world, e.g. Radio Romania



Letters

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.

International, Radio Nederland Wereldomroep, Radio Vlaanderen International, Voice of Russia, Radio New Zealand, etc.

My favourite station is Radio Nederland, Wereldomroep, Holland. My letters often get read out on-air. I also enjoy listening to Radio Jordan on 11.690MHz, there are some excellent programmes. I very rarely listen to radio stations in the UK!

I find foreign stations provide the best entertainment. I enjoy the letterbox and DX programmes. I also regularly send SINPO reports and receive QSL cards back.

Here in Bridgnorth, Shropshire, there are no radio clubs or any radio 'rallies'. This is extremely disappointing as I would really like to have a look at different receivers. The nearest 'DX Club', as you most probably know, is the British DX Club in London!

I hope you have found my letter interesting, you may wish to publish a little bit, you have my permission. I would also like it very much if you could write to me to let me know what you think of my interests.

Christopher Lewis (15)
Bridgnorth
Shropshire

I was very interested to read your letter, Christopher. The Sangean ATS-909 is a very good receiver to 'cut your teeth on'. I hope that you will continue to derive a lot of pleasure from 'listening' for the rest of your life.
Ed.

Dear Sir

As always, thanks for a great and diverse publication, I would like to comment on the article written by John Wilson about the Lowe HF-150 in December's *SWM* and would be very grateful if you could pass on my comments to Mr Wilson.

When I saw the adverts in *SWM* announcing the forthcoming Lowe HF-150 back in 1991, I thought to myself that "this looks like the receiver for me". I had been casting around for a new receiver for some time and had found nothing that met my requirements. Ideally I wanted the HF-225, but this was way beyond my reach and other

receivers were either too complicated and/or simply did not sound very good.

As soon as the HF-150 was launched, I dashed up-north to Lowe in Matlock and spent some time listening to the HF-225 and HF-150 to make comparisons. The HF-150 sounded absolutely superb, just like the HF-225 does, especially through hi-fi loudspeakers. I now use some excellent JPW speakers at home and the results can be stunning! Needless to say I came back from Matlock the proud owner of an HF-150 for £329.00.

As John pointed out, the HF-150 had to be built to a price and, certainly for me at any rate, had all the important features I wanted, i.e. excellent audio, simplicity of operation, easy tuning and synchronous detector with selectable sidebands (very useful). It is also built like a tank, which for butter fingers like me, was an important consideration! Okay it may not have the best dynamic range or intercept point figures, etc., but it is not a £600 or £800 radio, it may not have the spec. of an HF-250E but my trusty little HF-150 has never let me down and I have never been disappointed by its performance.

As for 'WIBNI' (Wouldn't It Be Nice If), I did wish that it had backlighting and a signal strength meter. The latter was easily resolved when I constructed an 'S' meter for £15 and housed it in a box with my Howes ASL5 s.s.b. audio filter (which is often very helpful on the crowded amateur bands). I have not figured out how to backlight the l.c.d. display, though!

I'm sure Mr Wilson may disagree with me, but the most practical add-on that I use is an a.t.u. He may say that proper pre-selection is much better - probably quite correct technically speaking - but I built my a.t.u. for about twenty quid and it works wonders. It is a 'T' match type with a home wound inductor covering 200kHz to 30MHz with two tuning capacitors and a simple potentiometer attenuator to tame extremely strong signals.

As the HF-150 can suffer with overloading (I do admit this) when connected directly to a large external antenna, especially from powerhouse longwave and medium wave signals and to a certain extent from strong 49m stations, the a.t.u. prevents all these problems as it seems to offer a degree of high pass filtering. Using the a.t.u. also adds a few 'S' points to many stations compared to a direct connection of the aerial to the radio.

To summarise, the HF-150 was and still is my ideal radio at this price point, sure I wouldn't say 'no' to a nice HF-250E if one were offered f.o.c. (and I shall not get one any other way!), but for the money, I find the HF-150 hard to beat. It's British, it's solid, simple to use with no over-complicated functions, fantastic audio, synchronous detector and perfectly acceptable performance, especially with the a.t.u. and a long random wire antenna and now that I've added an 'S' meter for a few pounds, I have absolutely nothing to complain about and nothing but praise for Lowe. I guess its horses for courses though.

Thanks for taking the trouble to read my thoughts on the HF-150. I hope that it may stimulate some debate. Keep up the good work.

Michael Smith
Warwickshire

Dear Sir

I thought readers of *SWM* would like to hear about the excellent service I have just had from Lowe Electronics. My ten year old FRG-7700 broke down just before Christmas.

I waited until the first week in January and telephoned Lowe Electronics to enquire if they would be willing to undertake repairs. They said they would, so I carefully packed the radio and sent it by Securicor on the 6th January to them.

By the 13th, the radio was repaired and I

received their invoice for the work, so I sent a cheque the same day by first class mail. This must have reached Lowe Electronics by the 14th and they must have sent the radio to my later that day, because at 10.25am on the 15th January, it was in my possession again!

The radio performs as good as it did when I first bought it and I am having things I have not heard for a long time! What a splendid service to the short wave listener this is, surely there can be no better!

Patrick Connor
Wiltshire

Dear Sir

Since you appear to be short of material to fill your Letters pages (why else would you repeat a letter which was in your January issue from C.F. Goodall of Gloucestershire, in your February issue?) here is a point to ponder for your many enthusiasts with an interest in airband.

My Yupiter MVT-5000 was getting on a bit so I was looking to replace it. Since my interest lies in airband, particularly military, the obvious choice for a replacement was the same company's VT-225, which advertisers in past months had claimed had full civil and military coverage. Indeed, your own John Griffiths, in the February 'Scanning' column, said he would have no reluctance whatsoever is recommending a VT-225 to Dean Forester of Oxfordshire, for his interest in airband.

But how can this scanner possibly be ideal for airband listening when the upper limit of the u.h.f. range is 391MHz? There are a number of airband frequencies between 391 and 400MHz. If you want to pick up, for example, Lakenheath Ground (397.975, I believe, according to *Airwaves 96*) what good is a VT-225 to you?

Don't get me wrong, I have heard this set in action and it is a superb performer, but that missing section between 391 and 400MHz worries me.

In short, your VT-225 might be just the bees knees at the moment, but if (or when) the frequencies change again, you may just find your handy local approach or tower frequency might end up between 391 and 400MHz, rendering your set virtually useless.

With that in mind, I went for a set with a much wider range which covered all the military airband and bought an MVT-7100. Now, there's a set I can highly recommend.

Terry Campbell
Moray

Dear Sir

I have never written to SWM Letters page before, although I have read it for many years. (I won a year's subscription as a runners'-up prize some years ago, at a previous address, by delving into the back issues to identify Radio Nederlands Flevo transmitter from an old SWM cover).

What has spurred me to pick up a pen at last is the danger of losing the elusive Irish s.w. QSL. Having just bought the 1998 *WRTH* I found that West Coast Radio Ireland was broadcasting from Claremorris in Co. Mayo via Deutsche Welle's transmitter.

I picked up the transmission clearly, only to find that just one more broadcast is expected, as the Minister for Communications has decided to withdraw funding. The programme was interesting and enjoyable and asked anybody who wished the broadcasts to continue to write to Sile De Valera, Minister for Communications, Dublin, Ireland, to make their feelings known.

I realise that this will likely be printed too late for other readers to receive what is probably the last broadcast on 31st January on 6.175MHz 1500 to 1600UTC, but if anyone wishes to hear this

broadcast again, it is up to them to write to the Minister and say so.

On a lighter note, I enjoy all articles on m.w., l.w. and s.w. listening, but I'm afraid that, using a computer at work all day, I'm glad to see the back of the thing when I come home and have no interest in them, and was pleasantly surprised at the Radio Canada International budget survey which showed that the popularity of listening to their broadcasts via Internet, cable and satellite is tiny compared to a.m. radio, which makes me feel less like I'm desperately clinging to a dying hobby.

I enclose a few notes of broadcasts heard this month which I've also not done before, so I apologise if all the required information is not there.

Mike Casey
Manchester

Dear Sir

My wife bought me a Realistic DX-394 for Christmas, which for most readers will be of no interest whatsoever, but for me it was totally unexpected because I had only mentioned vaguely over the years that I would like to get interested in listening to short wave radio transmissions, although being totally ignorant of the subject. Fortunately, in the village we have a 'ham' who guided her in the right direction.

After rigging a two core 'aerial' I started listening, but at the first opportunity I dashed to the nearest WH Smiths and picked up what appeared to be the most interesting magazine on the subject. It was, of course, *Short Wave Magazine* (January) and to my surprise, I could actually understand some of the articles and letters, the latter prompted me to write this response because:

(a) I am a 'new' listener. Unfortunately, I can't tell Kevin Nice that I am the youngest! and (b) G. Garraway shows me that I am certainly not the oldest.

(c) I can, however, give Mike Chamberlain a (totally uninformed) view of the DX-394. It appears to be very good once you can twiddle the fine tune without accidentally touching the main tuning knob.

(d) After a brief brush with the Internet, I am finding the ham frequencies much more interesting and current, while I can still use my 386 to do village newsletters and the myriad of committee minutes.

(e) I'm afraid I cannot help W. Saunders with the number of turns on his square frame main winding, but give me a couple of months' reading *SWM* and I am sure it will be no problem.

Realising that I did need some further guidance I turned (not tuned) to my ham neighbour who said that the best thing I could do was get *SWM*! I told him that I had already done that so at least I know I have started off on the right foot or whatever the 'Q' code is for that (I am learning quickly).

My first good contact was with Ray in Fribourg, Switzerland, although I didn't realise that a variety of alphabets were used so that at first I thought he was calling from Radio America via Yokohama!

Before I sign off, and switch on, I would like to thank all those communicators, including some of the 'locals' who keep me, and I'm sure others, interested (and amused) 'till late into the night. I find it fascinating and I cannot wait to get up something in the back garden that resembles a 'proper' antenna.

Finally, the reason that the average age of hams is probably so high is because you have to be retired to enable you to catch up on your sleep the following morning after a hard night's session!

G. Blackburn
Staffordshire

SWM Services

Subscriptions

Subscriptions are available at £30 per annum to UK addresses, £35 in Europe and £38 (Airsaver), £45 (Airmail) overseas. Subscription copies are despatched by accelerated Surface Post outside Europe. Airmail rates for overseas subscriptions can be quoted on request. Joint subscriptions to both *Short Wave Magazine* and *Practical Wireless* are available at £50 (UK) £59 (Europe) and £63 (rest of world), £74 (airmail).

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, 12 Hazelhurst Road, Castlewich, Birmingham B36 OBH. Tel: 0121-681 4168 (Mon.-Fri. 9am-5.30pm).

PHOTOCOPIES AND BACK ISSUES

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

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

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

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

Technical Help

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

Australia

Bandscan Australia
 PO Box 3307, Manuka, ACT 2603,
 Australia
 E-Mail: bandscanvk@pwpub.demon.co.uk

Bandscan

In this month's column I have news on the Radio Australia (RA) Darwin transmitter site, more RA reception reports, more on government radio networks and a few other items of current news.

Radio Free Asia

Following the closure of the Darwin transmitter site of Radio Australia (RA) there has been some interest from international broadcasters for use of the facilities. The latest broadcaster wanting to lease the site is Radio Free Asia, a US government sponsored propaganda station.

US diplomats approached the Australian government with a proposal to use the Darwin facilities of RA to broadcast a three month trial into China and the south east Asia area. Conscious of the diplomat fallout possible from the Chinese government if such transmissions were to go ahead from Australian soil the government declined the opportunity to earn some foreign exchange.

CB Changes Proposed

The Australian Communications Authority (ACA) has issued a discussion paper mooted changes to the class licence that covers CB radio transmissions. The major changes proposed would allow the use of telemetry and telecommand services on selected CB frequencies particularly in the u.h.f. CB band.

The idea among other things is to make it possible for outback users to remotely operate equipment scattered around their often vast properties. Such equipment may include weather recording and transmitting equipment and equipment to turn farm gear on and off remotely.

The CB operators umbrella organisation Australian Association of Citizen and Band Radio Operators ACBRO has fears for the future of the band and is opposing such changes. I will bring further news as this story develops.

Radio Australia Reception

More SWM listeners have provided reception reports from RA. **Alfred Hopwood** from Alsace, France, writes that he is continuing to experience difficulties in receiving RA. He says that he has not had a single clear contact since those reported in SWM for December 1997. Alfred hopes that one day Darwin may reappear on air but feels that this is a forlorn hope.

David Smith has had more success reporting mid-afternoon reception on 11.660MHz varying from very poor to crystal clear in the period 1530-1630UTC. David reports that he likes to keep up-to-date with Australian news and sport and that one thing that RA has that the 'net does not for these things is the Aussie accent! He hails from Nottinghamshire and uses an NRD-525 receiver through a 12.5m long wire with balun and a Nevada Scanmaster base antenna.

Richard Reynolds from Surrey too has been able to bring in RA. He listens from 0800-1000UTC on 9.580MHz with fair to good reception but with fadeout variable between 0910-1000UTC. Richard first listened to RA's European service over 25 years ago transmitting from the Shepparton site. He says that then he used a 1950s Pye P28 Domestic receiver with a beam antenna pointed at 128°.

Martyn Gardiner from Portsmouth writes

again to report good reception of RA at 1500UTC on 11.660MHz. Martyn logged this broadcast using a JRC-535 with a long wire antenna. He adds that he has had no luck with RA on 11.695MHz later at around 2200UTC.

Bernard Curtis from Dorset reports that he can hear RA most days but with some sideband splatter from adjacent stations. He has found that the 1330UTC transmissions on 11.660MHz provide the best signal while the 9.580MHz morning signal is severely affected by Radio Mediteranee on 9.575MHz.

Bernard also notes that RA on 9.435MHz comes in well in the evenings but that there is often interference from an Israeli station on the same frequency. Bernard uses a Tating TMR-7602 receiver with a long wire antenna coupled through an a.t.u. He hopes that reception conditions will improve as winter approaches.

Mike Dickinson has also noticed the evening interference from Radio Israel as well. He wonders if this transmission can be heard in this part of the world. Unfortunately, my receiver is in for a grease and oil change and I am unable to comment on this at this stage.

Web Site Update

The Australian Radio DX Club is on <http://www.aaa.com.au/dx/> the Southern Cross DX Club is at <http://tolstoi.saccii.net.au/~stephenn/>

Rallies

February 28: The 13th Rainham Radio Rally is to be held at the Rainham School For Girls, Derwent Way, Rainham, Kent ME8 0BX. It is very easy to find from J4, M2 motorway, A278 to Gillingham or from the A2 at Rainham. Just follow the RRR Arrows. Talk-in on S22 GB4RRR. Doors open at 1000 (0930 for disabled visitors and items for the Bring & Buy). Admission is £2. There will be the usual excellent mix of trade stands, many special interest groups will also be represented: BARTG, Kent Repeater Group, Kent RAYNET, RNARS, KEPAC, TCP/IP, Kent ATV Group, G-DHP Club, BYLARA and local club stands. There is a large hard standing car park, a licensed bar, hot food and drinks and refreshments will be available plus somewhere to sit and eat. **Martin M0AAK** on Medway (01634) 365980 at any reasonable time.

***March 7/8:** The London Amateur Radio & Computer Show will be held at Lee Valley Leisure Centre, Picketts Lock Lane, Edmonton, London, N9. Doors open 1000 to 1700 each day. There will be trade stands with over 100 exhibitors, a Bring & Buy, RSGB committee stands, on-demand Morse tests, talk-in on 2m and 70cm, Special Interest Groups, disabled facilities, bars, catering, ample free parking and lectures. Adults £3, pensioners/under 14s, £2. (01923) 893929.

March 8: The Wythall Radio Club are holding their 13th Annual Radio Club Rally at Wythall Park, Silver Street, Wythall, near Birmingham on the A435, just two miles from junction 3 of the M42. Doors open from 1000 to 1600 and admission is just £1. There will be the usual traders in three halls and a large marquee, bar and refreshment facilities on site plus a Bring & Buy stand. Talk-in on S22. Contact **Chris G0EYO** on 0121-246 7267 evenings and weekends, FAX on 0121-247 7268 or E-mail at g0eyo@compuserve.com

March 14: The 5th West Wales Amateur Radio & Computer Rally will be held at Penparcau School, Aberystwyth. Doors

and the shortWWWave site is at

<http://www.ee.mu.oz.au/staff/pbd/SW/>

This latter site has, among other things, links to schedules, news, Australian and foreign radio stations and news and opinion.

Government Radio Networks

I have noted before in these columns that the New South Wales (NSW) government has moved towards a Motorola based, integrated, government radio network. In line with these moves, the Tasmanian government has begun to move its operations over to a similar system using frequencies in the 860MHz area.

The Tasmanians have opted for the Ericsson Enhanced Digital Access Communication System (EDACS). According to Australian commercial Radio and Communications (R&C) magazine the Tasmanian police will adopt this system and use full encryption for all of its transmissions. Their columnist believes that this will be the start of full encryption of all emergency services across Australia.

My own experience with emergency services managers is that they are less than enthusiastic about their utterances being overheard. Where matters with legal or public safety consequences are concerned I tend to agree but I do wonder about purely operational matters. Perhaps the border between the two is too fuzzy to define, clearly leaving the only conclusion to encrypt information.

open 1030 to 1600 (disabled visitors from 1000). Admission is £1 only. There are good parking facilities with easy access for disabled and traders to all stalls, demonstration area and catering facilities. Features include Amateur Radio, Bring & Buy, computers, software and hardware, electronics, h.f. and v.h.f. on air, packet station, repeater group, RAFARS, RSARS, WAB, RAYNET and other special interest groups, trade stalls and lots more. Talk-in on S22. Come and enjoy yourselves. For details and trade stand bookings contact **Katy GW0SFO** on (01545) 580675.

***March 15:** The 'Norbreck' Amateur Radio, Electronics and Computing Exhibition by the Northern Amateur Radio Societies Association is to be held at Norbreck Castle Hotel, Exhibition Centre, Queens Promenade, North Shore, Blackpool. Doors open at 1100 (disabled access from 1045). There will be over 100 trade stands, club stands, Bring & Buy, RSGB stand and book stall, construction competition, amateur computer stands and free car parking at the hotel, bus from extra car park. There is also wheelchair access to all the exhibitor stands. Radio talk-in on S22. Admission is £2, OAPs £1 and under 14s free. **Peter Denton G6CGF** on 0151-630 5790.

March 15: The Tiverton SW Amateur Radio Club. Starts 1000 with all the usual excellent displays and catering facilities. **Alan G0MAS** on (0884) 252259.

March 22: The Bournemouth Radio Society will hold its 11th Annual Sale at the Kinson Community Centre, Pelhams, Kinson, Bournemouth, Dorset. Doors will be open from 1000 until 1600. Talk-in by RAYNET will be available on S22. As usual, there will be a mixture of radio and computer equipment on sale plus a Bring & Buy stall. More information from **John G1HOK** on (01202) 535219 or mobile on (0850) 240931 or E-mail: jburtens@asgard.co.uk or via Packet as g1hok@gb7bnm with 'BRS Sale' as the subject.

***March 29:** The Cunninghame District Amateur Radio & Computer Rally will be held at the Magnus Centre, Harbourside, Irvine, Ayrshire, Scotland. Doors open at 1100 (1030 for disabled visitors). There will be a Bring & Buy, Morse tests and all the usual traders, etc. **Mr W. Gebbie** on (01560) 321009, E-mail: supergit@msn.com or gm3usl@qsl.net

The South Australian government has also signed a contract with Motorola for a system similar to that in operation in NSW.

Other News

The well-known, long-time New Zealand short wave listener Arthur Cushen has died at the age of 77. He was well known for his activity in DX circles as a writer and broadcaster on radio matters.

From R&C magazine also comes the news that Australian and regional DX news is now broadcast on HCJB in the DX Partyline programme. The proposed merger between pay television companies Foxtel and Australis Media I have reported before in SWM has come to the attention of the Australian Competition and Consumer Commission (ACCC).

The ACCC has claimed that the proposed merger is anti-competitive. The companies are gearing up for a major legal battle over the issue. Australis has its own liquidity problems and may be forced to stop transmissions if it cannot get approval for the merger from US junk bond holders.

The Jindalee Operational Radar Network to be completed in late 2001 will be managed by a joint venture between Lockheed Martin and Transfield Defence Systems.

And Finally

I welcome any news and comments. In particular I am interested in any s.w.l. information on Australian stations heard by SWM readers so I can chase up more details and interesting snippets from this end. My address is **PO Box 3307, Manuka, ACT 2603, Australia**. For personal replies please send two IRCs. Those with an Internet connection can get me at bandscanvk@pwpub.demon.uk



March 29: The Pontefract & District Amateur Radio Society Component Fair is to be held at Carlton High School. The venue is 300m from the Carlton Community Centre. Car parking will be at the school as usual. The venue will be signposted from the major roads. There will be a talk-in on 2m. For unlicensed visitors, Nigel Ferguson G0BPK can be contacted 0900 to 1400 on (mobile) (0411) 420409 for directions. Doors to the fair open at 1100 (disabled visitors will be admitted at 1030). Once again all traders will be on the ground floor. The bar and tea room (tea room open for early visitors) will be on the first floor. Morse tests will be conducted. Admission will be by prize programme. Contact Nigel G0BPK on (01977) 616935 in the evening or on (01977) 606345 during the day, or E-mail at g0bpk@aol.com Traders please contact Colin G0NQE on (01977) 677006.

April 5: The Cambridgeshire Repeater Group (CRG) are holding their annual rally at The Bottisham Sports Centre (Part of Village College), Lode Road, Bottisham, Near Cambridge. The event will feature an Auction Sale, Trade Stands, a Bring & Buy and a Car Boot Trading area. For further details and booking in of traders may be obtained from: Paul Dyke G0LUC, 41 High Street, Puckeridge, Ware, Herts SG11 1RX or telephone on (01920) 821536.

April 5: A Radio Fleamarket is to be held at the University Sports Centre - Uia Wilrijk/Antwerpen in Belgium, close to A-12, Belgium. Open from 1200 to 1800 local time. Radio stb: 145.7625MHz Repeater Antwerpen and 145.425MHz simplex freq. Call ON40SA. More information from **ON4CDV Gaetan CM/OSA**, E-mail: on4cdv@gmail.dma.be club site: <http://bewoner.dma.be/on40sa/main.htm>

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

Grassroots

AVON

Bristol International RC: Tuesdays, 2000. 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

South Bristol ARC: Wednesdays, 1930. Whitchurch Folkhouse Assoc., Bridge Farm House, East Dundry Rd, Whitchurch. March 4 - 15m activity evening, 11th - Portable radio demonstration, 18th - Club quiz night, 25th - SWL evening, bring your receiver/scanner. For more information ring (01275) 834282 on a Wednesday evening.

BEDFORDSHIRE

Dunstable Downs RC: Fridays 2000. Chews House, High Street South, Dunstable, Bedfordshire. February 27 - AGM, March 6 - Library Night, 20th - Quiz Night. New members and visitors welcome, just drop in or call Paul G7TSJ on (01582) 861936.

BUCKINGHAMSHIRE

Aylesbury Vale RS: Wednesday evenings, 2000. Hardwick Village Hall, (Hardwick is situated off the A413 between Aylesbury and Buckingham). March 4 - Quiz night, 18th - AGM. Gerry Somers G7VFFV on (01296) 432234.

CHESHIRE

Mid-Cheshire ARS: Meetings held every Wednesday, 2000, at Cotebrook Village Hall, North of Tarporley, Cheshire. March 2 - Committee meeting (Awanley Arms 2030 hours), 4th - HF on air G3ZTT plus construction night, 11th - Activity night, 18th - Informal, 25th - VHF on air G8ZTT plus construction night. Ted Banister G0RBA on (01606) 592207.

DEVON

Appledore & DARC: 3rd Mondays, 1930. Appledore Football Clubroom. March 16th - AGM. Den Williams G0UMT on (01237) 471802 for more information.

Torbay ARS: Fridays, 1930. ECC Social Club, Highweek, Newton Abbot. March 20 - Astronomy talk. Peter G4UTO. (01803) 864528.

DORSET

Christchurch ARS: Thursday evenings, 2000. The Radio Club Room, behind the Sports & Social Club, Grange Road, Somerford. Christchurch. Visitors welcome. (01202) 484892 (evenings).

EAST SUSSEX

Hastings Electronics & RC: 3rd Wednesdays, 1930. 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 Mephram G4ERA, 8 The Close, Fairlight, E. Sussex TN35 4AQ or phone on (01424) 812350.

EDINBURGH

Lothians RS: 2nd & 4th Wednesdays, 1930. Orwell Lodge Hotel, Polwath Terrace, Edinburgh. March 11 - Use of test equipment - demonstration by N. Stewart GM1C/NH, 25th - Junk Sale at St Fillans Church Hall. Tommy Main GM4DCL, QTHR on 0131-663 8501 day and evening.

GREATER LONDON

Wimbledon & DARS: 2nd & last Fridays, 1930. St Andrews Church Hall, Herbert Road SW19. February 27 - Morse practice, March 13 - Surplus equipment sale. J. Gale G4WYJ on (01737) 356745.

HAMPSHIRE

Hordean & DARC: 1st & 4th Tuesdays, 1930. Lovedean Village Hall, Lovedean Lane, Lovedean, Hants. March 3 - Club social evening, 24th - 'Measurements' by Dr. R. Bidolph G8DSPS. Swain (01705) 472846.

Southampton ARC: 1st & 3rd Mondays, 1900 in the CDT block at Cantell School, Violet Road, Southampton. This club is now up-and-running after some years of inactivity. New members welcome. Harold McIntyre on (01703) 737715.

HEREFORD & WORCESTER

Bromsgrove ARS: 2nd & 4th Tuesdays. Lickey End Social Club, Alcester Road, Burcot, Bromsgrove. March 10 - Video evening, 24th - Home-Brew by Tim Rochford G7RDQ. Barry Taylor. (01527) 542266.

Malvern Hills RAC: 2nd Tuesdays. Town Club, Worcester

Road, Malvern. March 10 - 'From Maxwell To Loops' - a discussion of basic aerial concepts and practical applications by Mike Ward G4GHL. Dave Hobro G4IDF on (01905) 351568 evenings and weekends.

HERTFORDSHIRE

Verulam ARC: 2nd & 4th Tuesdays, 2000. RAFA Club, New Kent Road, St Albans. New members and visitors welcome. March 10 - RF Measurements by Hugh Young G3YHY. Ian Forsyth G0PAU on (01923) 222284.

KENT

Dover RC: Wednesdays, 2000 to 2200 during term time. Duke of York's Royal Military School, Dover. Morse classes and Novice Training Courses are also conducted between 1900 and 2000 on the same evenings. March 4 - Talk by Dr. Ken Smith, 11th - Natter Night and Club Operating, 18th - A video of the history of the Dover Radio Club by G8ZYZ, 25th - Natter Night and Club Operating. Brian Hancock G4NPN on (01304) 821007.

LINCOLNSHIRE

Grimby ARS: Thursday nights, fortnightly, at the Cromwell Social Club, Cromwell Road. Informal meetings are held on the Thursdays in-between. Non members are welcome at any meetings, but may not attend more than three meetings in any year. March 5 - Planning for this year's exhibition, 19th - Construction night - Adrian G1BRB talks about components. G.J. Smith G4EBK, Hon. Sec. 6 Fenby Close, Great Grimby, N. E. Lincs DN37 9QJ.

Lincoln SW Club: Wednesdays, 1945. The Railway Sports & Social Club, Ropewalk, Lincoln. March 11 - Lincoln At War - talk by Dave Willey G1VVO. Cliff G3EBH on (01522) 750637.

Spalding & DARS: Fridays, Club Room, Old Fire Station, Spalding. March 7 - Combined Spalding & Peterborough Radio & Electronics Society coach trip to the London Show (all welcome), 20th - Talk on RAOTA by Dennis Hoult G4OO. G4OO, QTHR. (01775) 750382.

NORFOLK

Norfolk ARC: Wednesdays, 1930. Formal and informal meetings at the Ugly Bug Public House, Colton. March 4 - NARC Fox Hunt Forum - Part 2, bring along your home-brew for demonstration, 8th - Club visit to Picketts Lock, 11th - Night on the air, construction QRP and Morse practice, 18th - National Field Day - 1st briefing (c.w.), 25th - Night on the air, construction QRP and Morse practice. Mike G4EOL (01603) 789792.

West Norfolk Airband Monitoring Group: Regular informal meetings on Thursdays, 1930. Dave on (01485) 578183 for details.

NORTH YORKSHIRE

Hambleton ARS: All meetings held at Allertonshire School, Northallerton, 1930 to 2130. March 5 - Demo of new equipment, 19th - VHF/UHF operating night. More details from John G0VXH on (01845) 537547.

WARWICKSHIRE

Stratford-upon-Avon & DRS: 2nd & 4th Mondays, 1930pm. Home Guard Club, Main Street, Tiddington, Stratford-upon-Avon. March 9 - Surplus equipment sale, 23rd - Talk by Rob G3XFD, Editor of PW. The Society are again organising a course of instruction for the Radio Amateur Examination of the City & Guilds of London Institute and further details can be obtained by writing to the Chairman of the Society, Mr J. Harris G8HJS, enclosing a stamped addressed envelope. The address to write to is: 57 Evesham Road, Stratford-upon-Avon, Warks CV31 2PB.

WEST MIDLANDS

Coventry ARS: Fridays, 2000. Binley Church Hall, Brinklow Road, Coventry. February 27 - Night on the air, v.h.f., h.f. and Packet, March 6 - Slow Scan TV demo, 13th - Night on the air, v.h.f., h.f. and packet, 20th - Bowling evening. Robin Tew G4JDO on (01203) 673999.

South Birmingham RS: West Heath Community Association, Hamstead House, Fairfax Road, West Heath, Birmingham. March 8 - Club stand at Wythall Rally - help needed! Don Keeling on 0121-458 1603.

WILTSHIRE

Trowbridge & DARC: 1st & 3rd Wednesdays, 2000. The Southwick Village Hall, Southwick, Trowbridge. March 4 - Surplus equipment sale, 18th - natter night. Ian G0GRI on (01225) 864698.

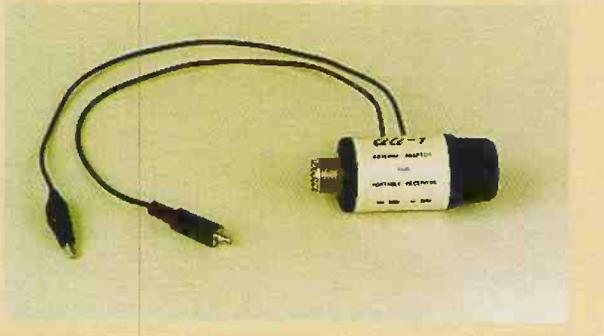
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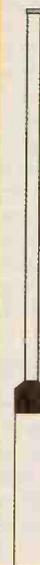
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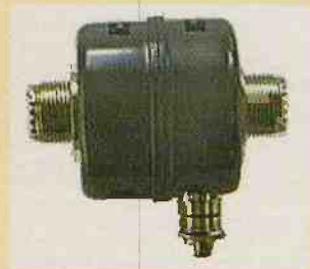
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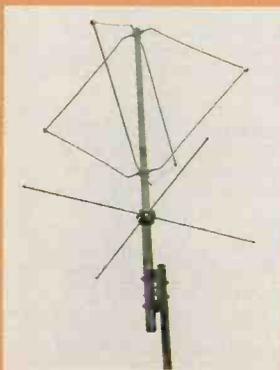
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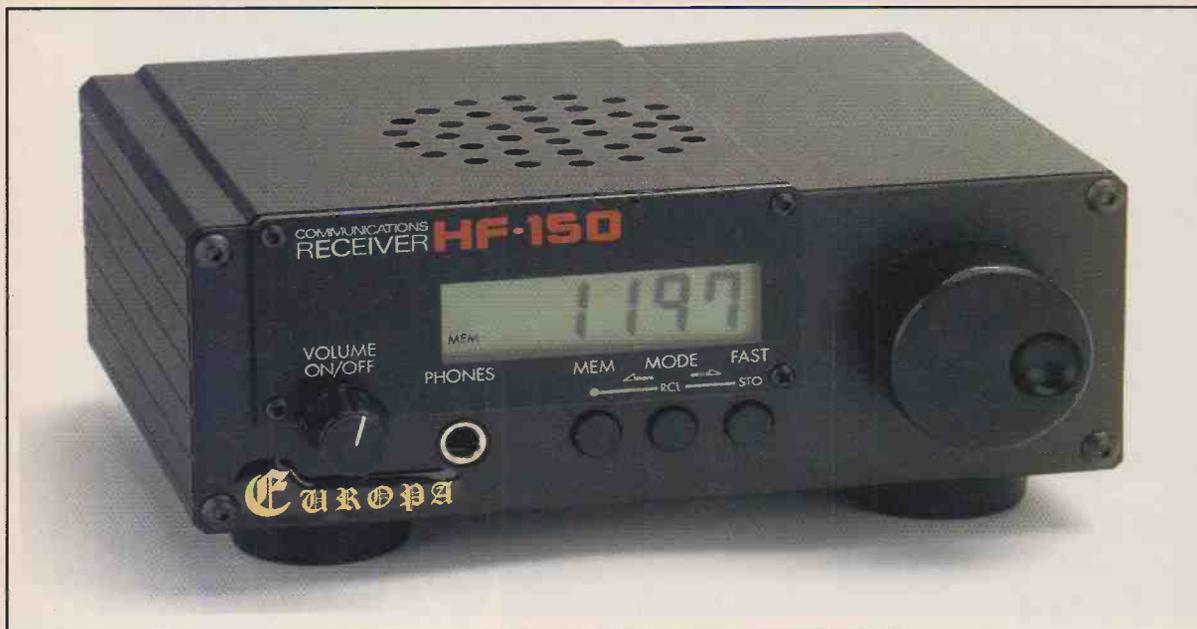
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RADIOSCIENCE OBSERVATION

Magnetometer Sensors

This month, in the concluding part, Joe Carr discusses gradiometers and interfacing with microcontrollers.

References

Janicke, J.M. (1994). *The Magnetic Measurements Handbook*, Magnetic Research Press, 122 Bellevue Avenue, Butler, NJ, 07405.

Kern, Erich (1996). *Fat Quarters Software*, 24774 Shoshonee Drive, Murrieta, CA 92562; 909-698-7950 (voice) and 909-698-7913 (FAX). Telephone consultation plus FGM-x literature and drawings.

Noble, Richard (1991), Speake & Co. Ltd., Elvicta Estate, Crickhowell, Powys. 'Fluxgate Magnetometry', *Electronics World and Wireless World*, Sept 1991, pp.726-732.

NASA/JPL photograph

PART 2

Gradiometers

One of the problems with magnetometers is that small fluctuations occur in otherwise very large magnetic fields. And those fluctuations can sometimes be important. A further problem with single-sensor systems is that they are very sensitive to orientation. Even a small amount of rotation can cause unacceptably large, but spurious, output changes. The changes are real, but are not the fluctuations that you are seeking.

A gradiometer is a magnetic instrument that uses two identical sensors that are aligned with each other so as to produce a zero output in the presence of a uniform magnetic field. If one of the sensors comes into contact with some sort of small magnetic anomaly, then it will upset the balance between

sensors, producing an output. The gradiometer gets its name from the fact that it measures the gradient of the magnetic field over a small distance (typically 300 to 1500mm).

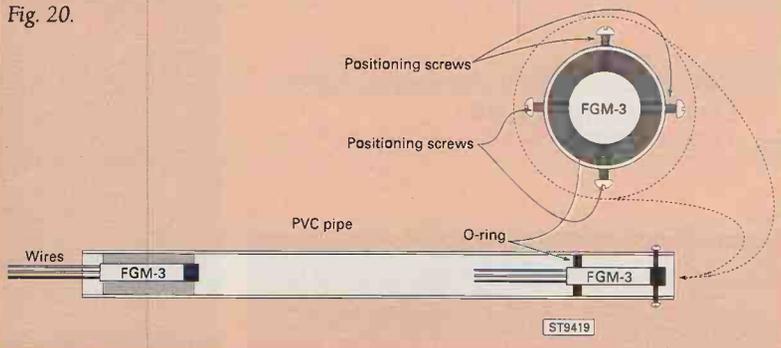
These instruments can be used for finding very small magnetic anomalies. For example, the metallic firing mechanism of plastic land mines buried a few inches below the surface, or a shipwreck buried deep in the ocean silt. Archeologists use gradiometers to find artifacts, and identify sites. Also, people who explore Civil War battlefields, western mining camps, and other sites often use gradiometers to facilitate their work.

The construction details for a simple gradiometer based on the FGM-3 device are shown in Fig. 20. It is built using a length of PVC pipe. One sensor is permanently mounted at one end of the pipe, using any sort of appropriate non-magnetic packing material. In one experiment, I used the standard 11mm adhesive backed window sealing tape used in colder areas of the country to keep the howling winds out of the house in wintertime. It worked nicely to hold the permanent sensor in place.

The other sensor is mounted in the opposite end of the tube using an 'O-ring' that fits snugly into the tube. Four positioning screws, made of non-magnetic materials, are used to align the sensor. The position of the sensor is adjusted experimentally. The idea is to position the sensor such that the gradiometer can be rotated freely in space without causing an output variation.

The gradiometer sensor is usually held vertically such that the end with the wires coming out of the

Fig. 20.



FGM-3 devices is pointed downwards. This allows you to find buried magnetic objects even if they are quite small.

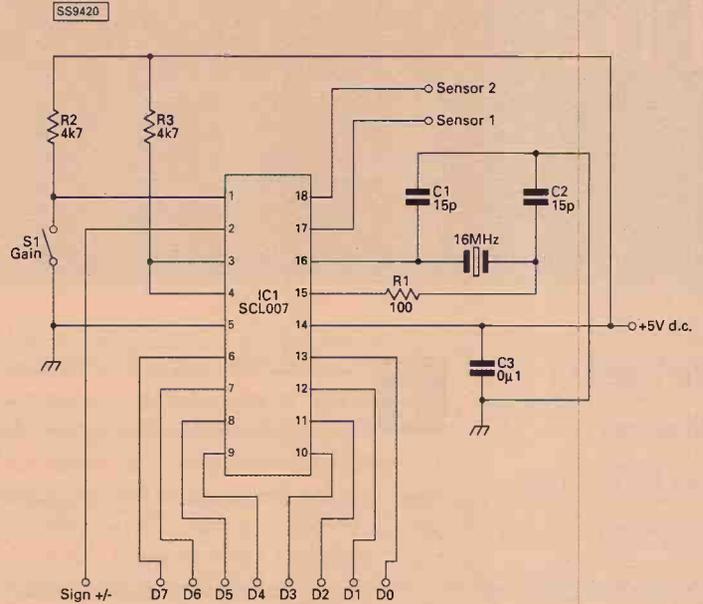
A practical gradiometer can be built using a special interface chip by Speake, the SCL007 device (Fig. 21). It is an 18-pin device that accepts the inputs from the two sensors, and produces an eight-bit digital output. It can receive the signals from the sensors in Fig. 20, and produce a digital output proportional to the field gradient. Also, if you want a d.c. output, then the same sort of D/A converter used in the magnetometer of Fig. 17 and Fig. 18 can also be used for the gradiometer.

The method of digital heterodyning (shown in Fig. 22, and earlier in Fig. 15) can be used to make a very sensitive gradiometer at low cost. The outputs of the two FGM-3 sensors are fed to the D-input and clock (CLK) input of a D-Type flip-flop. The output of the Type-D flip-flop is fed to an F/V converter such as the LM-2917 device discussed earlier.

Interfacing FGM-x Series Devices Via Microcontrollers

Microcontroller chips bring some of the advantages of digital computers in single integrated circuit or small assembly form. Figure 23 shows a method for

Fig. 21.



interfacing the FGM-x/SCL-00x series of devices to a device such as the Parallax, Inc. BASIC Stamp, or the Micromint PicStic product. If the calculations cannot be done in the microcontroller, then use the serial output capability to send the eight-bit data to a personal computer.

The Basic Stamps and PicStic can be programmed in a limited version of BASIC. For most instruments I suspect that the program for a magnetometer will be a simple program that inputs data from the binary output of the SCL006 (or other) interface chip, and then reflects it to the serial input of the computer.

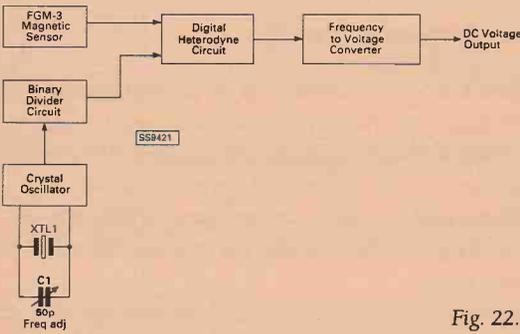
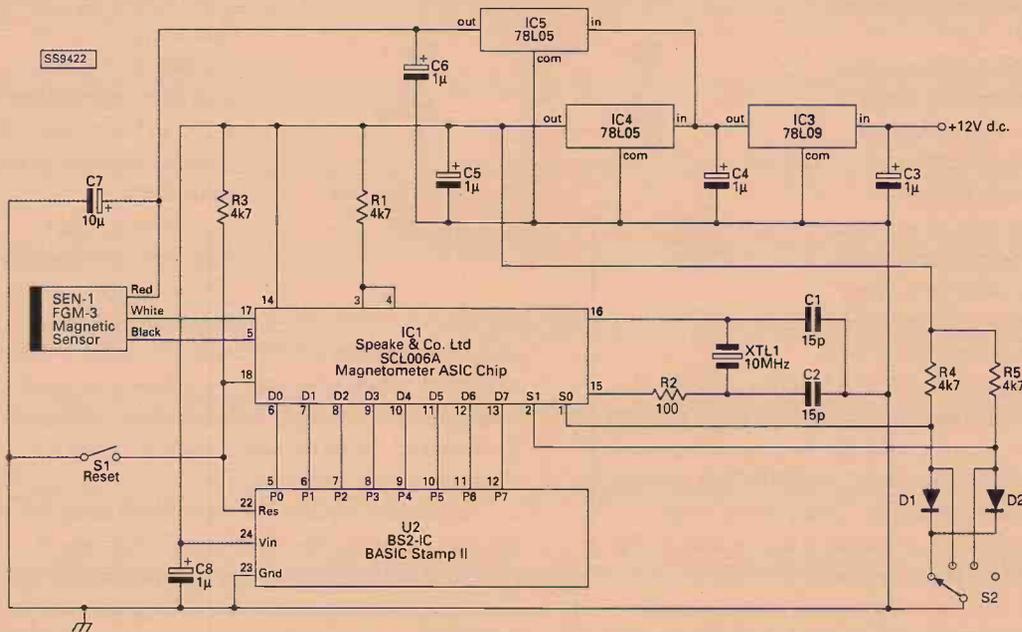


Fig. 22.

Fig. 23.



Acknowledgements

I wish to thank Mr. Richard Noble of Speake & Co. Ltd. in Wales, UK, and Mr. Erich Kern of Fat Quarters Software in USA, for assistance in preparing this article.

The MEDFLEX

Richard Q Marris G2BZQ, has recently been experimenting with a Medflex antenna. Medflex? - Medium Frequency Experimental, of course.

The requirement was for a narrow band, narrow beam, tuneable receiving antenna to attempt to receive transmissions in the USA 1610-1705kHz Experimental Band, often called the Medfer band. The second requirement was a DX receiving antenna, of small dimensions, for use on 'Top Band' (1.8 - 2.0MHz), in a very noisy environment.

The Medfer transmissions usually take the form of auto-keyed beacons, using the maximum FCC permitted power of 100mW with a short antenna. The permitted TX antenna has a maximum height of 3m, but with a circumference of up to 3m, some ingenuity and suitable TX siting, quite remarkable distances have been achieved. It is not an amateur band, though many of the transmitters appear to be operated by licensed amateurs using 2 or 3-digit callsigns.

The proposed series of tests have been co-ordinated with a 'W2' Jersey friend, who is one of the pioneers in this field. He has a beacon in this band, on the New Jersey coast, and can arrange for a number of other East Coast Beacons to be working, to coincide with my periodic short holiday breaks in a fishing village in south west England. Man-made noise is negligible in the early hours, in contrast to the high man-made noise level and general racket at my home in central southern England.

Initial exploratory tests, using a temporary long wire antenna, were conducted over Christmas 1995. It immediately became apparent that a narrow band, narrow beam, directional antenna would be required. This was also the case on 'Top Band' at the home QTH.

The 1.600 - 1.705MHz band lies conveniently between 'Top Band' and the h.f. end of the m.w. b.c. band. So, it was decided that the proposed antenna design should cover from 1 to 2MHz, with overlaps. In fact, for convenience, the initial antenna design experiments were conducted at the c.w. end of 'Top Band', which lies quite close to 1.705MHz.

The antenna would have to be small enough, in size, and robust enough to travel in a briefcase with a

Antenna

small digital receiver, headphones, paperwork and other bits and pieces. In addition, of course, it would be used for 'Top Band' (1.8 - 2MHz) reception, at my home QTH, where noise level is a problem, though the transmitter puts out a healthy signal. Aero/marine and other interesting stations also exist within the antenna frequency range.

The Antenna Design

Figure 1 shows the schematic of the Medflex antenna. It consists of a ferrite loop, tuned in a balanced circuit by a 500 + 500pF 2-gang variable capacitor, with fixed capacitors, C2 and C3, in series, giving a range of 1 to 2.5MHz. Half of a 500 + 500pF 2-gang variable was used as it is a readily available type, whereas 250 + 250pF is not.

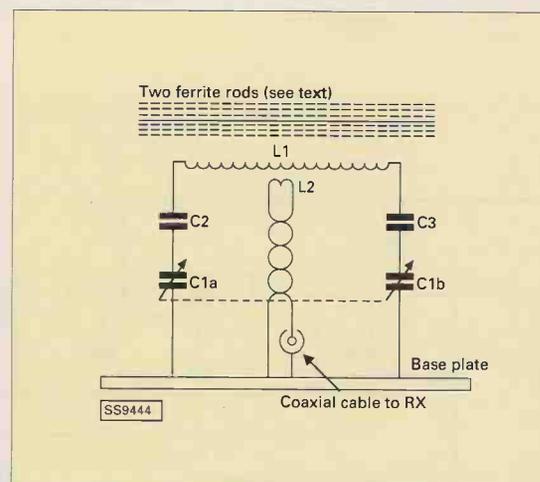


Fig. 1: Circuit diagram of the Medflex antenna.

To increase the antenna sensitivity (i.e. signal output voltage) two long, large diameter, Nickel Zinc ferrite rods (200 x 13mm dia.) are used, strapped side by side (Fig. 2). The rods used have a permeability of 220 and were designed for use in antennas up to about 3MHz.

Previously, I had experimented to find the effect of using one or two rods, using spot test

frequencies between 1.6 and 2MHz. The addition of the second rod enhanced the antenna sensitivity or signal voltage output, resulting in a quite dramatic increase in signal strength across the spot frequencies, while still maintaining a low noise level.

This was considered to be preferable to using one rod, with a pre-amplifier, which amplified the signals and also noise! In fact, reception of North American 'Top Band' c.w. stations exceeded all expectations at the home QTH.

Reverting to Fig. 1, the antenna uses a tuned winding L1 coupled to the receiver 50Ω output via a coupling winding L2, and a coaxial feed line. The whole circuit is mounted on a thick rigid aluminium base plate. The unit is not directly grounded, though the coaxial feed line is grounded at the receiver.

Construction

The Profile and Fig. 4 show the unit mounted on a thick base plate, the L1/L2 assembly (Fig. 2) is supported by two vertical wood blocks. The 2-gang variable capacitor, fitted with an integral reduction drive, is mounted on the base plate directly under the L1/L2 assembly, so that the end leads of L1 drop down to the stator plates of the variable capacitor.

The ends of L2 are slightly twisted and drop down to a tag strip, to which is connected a cleated coaxial feed line going to the receiver. It is essential that the variable capacitor extension shaft and the coaxial feed line are positioned in line with the coil/rod assembly, as shown, in line with the minimum signal, or null, as shown in Fig. 5.

Assembly

The aluminium base plate is cut 254 long x 89mm wide using 3mm thick plate, with two stand off wood strips glued on the underside, see Fig. 3. Onto this are screwed two shaped, hardwood, stand-off hardware supports, cut from 44 x 19mm stock.

These vertical stand-offs support L1/L2, as shown, with a cork block, each end, cut with a scalpel from a wine bottle cork, and cut to size, to wedge the ferrite rod ends. These ferrite rods will later be secured with two Nylon cable ties through the holes as shown.

The 2-gang variable capacitor used has a built-in reduction drive. An alternative is to fit an external slow-motion drive on a short bracket. A good strong rigid receiving type of variable capacitor should be used. It is mounted dead centre on the base plate, so that the L1

end leads can drop down vertically to the stator connection tags, which should be positioned at the top.

The two Neosid type F14 ferrite rods are 200mm long x 13mm diameter nominal. There is a quoted tolerance of ±2% on the length and ±3% on diameter. The two rods would be strapped together as Fig. 2.

Three layers of self-adhesive address labels are wound around the centre of the rods and L1, 40 close-wound turns of pvc insulated /0.6mm (1.2mm o.d.) wire, is wound on top of this. This wire specification should not departed from.

Over the centre of L1 are wound five turns of masking tape,

onto which is wound L2 consisting of four close-wound turns of the same wire as L1, with the ends slightly twisted together, to drop down to the tag strip and coaxial feed line, Figs. 2 & 4.

The L1/L2 rod assembly (Fig. 2) is held in position with Nylon cable ties as Fig. 4 and wedges cut, with a scalpel from a bottle cork, to dimensions necessary to hold the rods firmly in longitudinal position, but

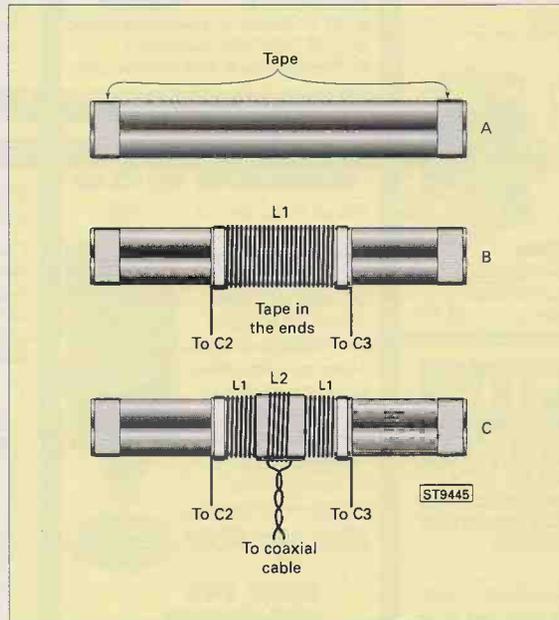


Fig. 2: The stages in the assembly of the ferrite rod coil.

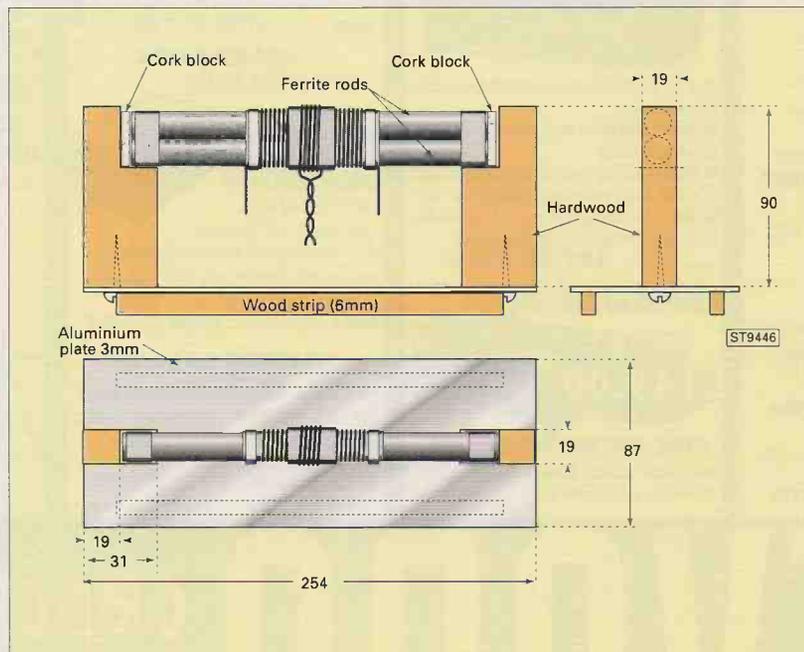


Fig. 3: Construction of the chassis for the Medflex antenna.

providing shock proofing. The few connections are securely soldered, ensuring that the variable capacitor is firmly bolted to the base plate.

In an ideal world, the unit can be boxed with clear

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A software package that allows reception of WEATHERFAX, NAVTEX, RTTY and MORSE CODE.

- ALL YOU NEED is an SSB receiver & a PC.
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 - Manipulate images after they are received
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Ideal for those looking to get started in digital communications.

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- **GATEWAY** firmware allows you to NODE-HOP and others to digi-peat through your TNC
- **GPS** use make stand alone tracking possible from Global Positioning Satellite systems

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IDEAL FOR THE NEWCOMER!

- Covers 150kHz-30MHz
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Improve the reception of your scanner with this Japanese made low noise pre-amp. A fully adjustable gain control -3dB to +20dB ensures best possible performance. 3 band pass filters reduce out of band interference.

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- 3 bandpass filters
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- Special VHF/UHF section
- For handheld & base scanners

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- 4mtr coaxial cable
- BNC Fitted

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

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 - 900MHz band
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- Ultra wideband TX capability

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- Route plot
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- 200 Memories
- Supplied c/w NiCads & charger

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UBC 3000XLT

New top of the range handheld from Uniden with TURBO SCAN

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

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Airband handheld that is easy to use with TURBO SCAN.

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- 100 memories
- Supplied c/w NiCads & charger

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DLB.....Long Wire Balun£29.95

Flex weave (plastic coated wire) .74p per mtr

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SW & VHF FM radio with RDS & SSB reception

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A really good no nonsense portable that covers SSB - unbeatable value for money!

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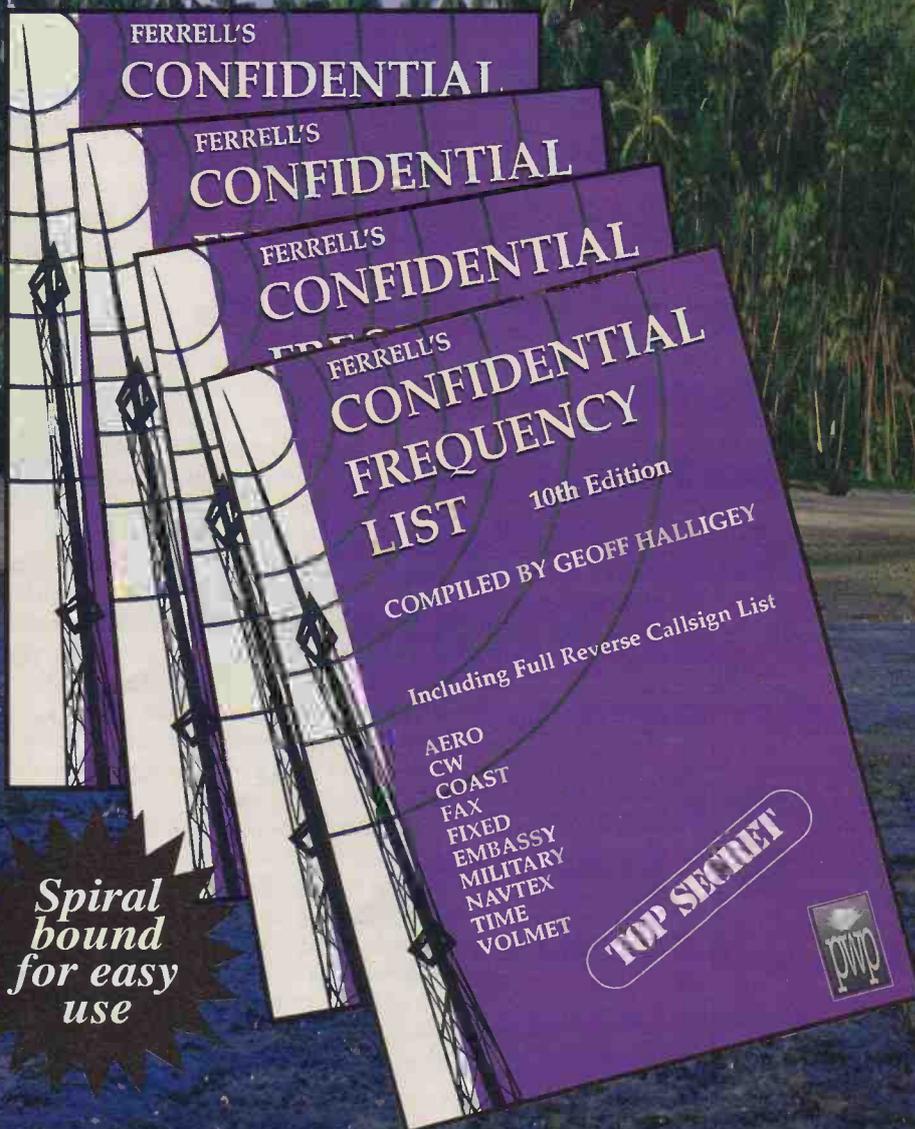
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A Day In The Life Of A Radio Inspector

J. Edward Brown brings us more tales of Kilocycle Ken and Young Golly.

"Put the 121.5MHz Yagi in the car." Kilocycle Ken said to Young Golly the Trainee Radio Inspector. "We've got to look for an EPIRB that's triggered."

"It's almost time to go home," Young Golly complained.

"The Air New Zealand flight from London this morning reported an Emergency Position Indicating Radio Beacon, or ELT - Emergency Locator Transmitter - on 121.5MHz, probably in the East Harbour Marina. Civil Aviation have been looking for it all day."

"Nobody in distress?" Young Golly asked.

"No, probably gone off accidentally. It's been thrown in a locker, or had gear dumped on it. This morning's 'Eye in the Sky' traffic aircraft circled above the marina and said it was there. A Singapore Airlines plane said at noon that it was strongest over Wespark Marina, down the coast. On a boat that moved, I suppose. I've just talked to the tower. A Polynesian Airlines flight reports it's still on the air, and it's not getting any weaker. Eventually, the battery will go flat, but that might take a couple of days."

Call In Experts

"Why wait until this time to call in the experts?" Young Golly asked.

"Civil Aviation put up a helicopter and the pilot said it was on E or F finger. Somebody had a wander around but couldn't find it."

"Now they call on us."

Kilocycle Ken said, "Radio Inspectors don't often get involved in serious searches for EPIRBs because then they are in the bush, from crashed aircraft, or at sea,

somebody adrift, and an aircraft can usually find them, but when they go off in the city, then it comes within our field, illegal transmission."

"Do we ever prosecute?" Young Golly asked.

"We could, but we don't, nobody does it deliberately, that I know of, it's invariably accidental, and finding it is part of our spectrum policing job."

"So who pays in this day of the user pays commercial environment?"

"We'll send a bill to the Maritime Safety Authority."

"So our overtime is chargeable. We could stay out all night on double time," Young Golly said.

"It won't take us long. If we can hear it we can find it."

"Wouldn't it be more efficient to mount the Yagi on top of the car, so we can rotate it from inside?" Young Golly asked.

"Yes, and we do have the big International van with the air hoist mast, which can have anything clamped on it, but it's too lumbering, our old Sierra is fast and gets in anywhere. No problem to stop, hop out and point the antenna. We'll use the Unaohm TV field strength meter, gives us an accurate intensity reading, the Yagi plugs into the top, no need for specialised gear, just experience."

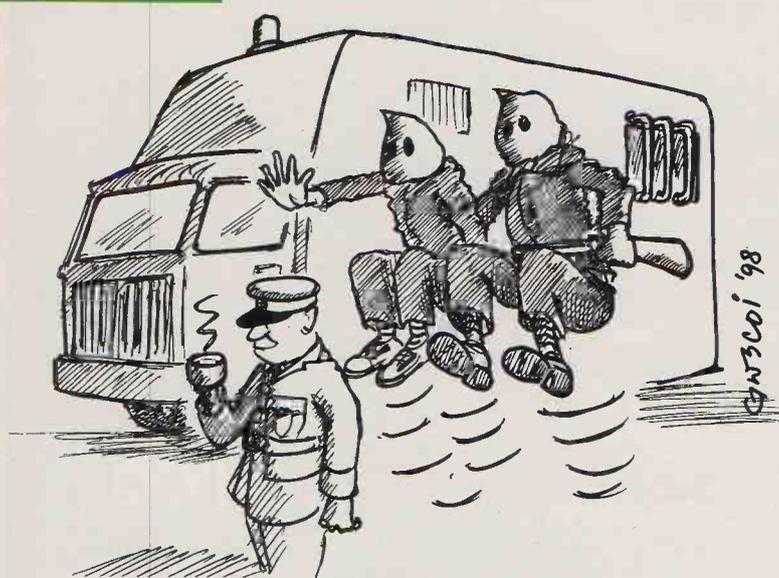
Close By Intensity

"We only have to get close by intensity, then take a couple of bearings, see what the lie of the land is, move in closer with the portable receiver and the Yagi, which you will carry and again, with a combination of intensity and direction finding, see which boat it's on."

"I've done this lots of time. And I've been up in a helicopter, we circled over this yacht, the guy didn't know his EPIRB was on. Very surprised."

"Commercial aircraft fly with a 121.5MHz receiver always on, military fly with 243MHz. They are life saving devices, but trying to find one accidentally tripped in a crowded marina can be a pain. We've had the recent New Zealand law that all offshore yachts must carry an EPIRB, but not all boats cruising inshore have them some that do think it's like setting off a fire alarm, but its not."

"Of course, the newer 406MHz system is much better. The SARSAT - Search and Rescue Satellite - can store the 406 signal until within range of a ground station, but they are expensive. Anybody can and does have a 121.5 but 406s are registered and when its activated its owner can be identified straight away, and we can find out where he is, or is thought to be, but not this one. Some Global Positioning System receivers for aircraft use have a 121.5MHz beacon incorporated, but



...Jumped by two men...

Continued on page 25

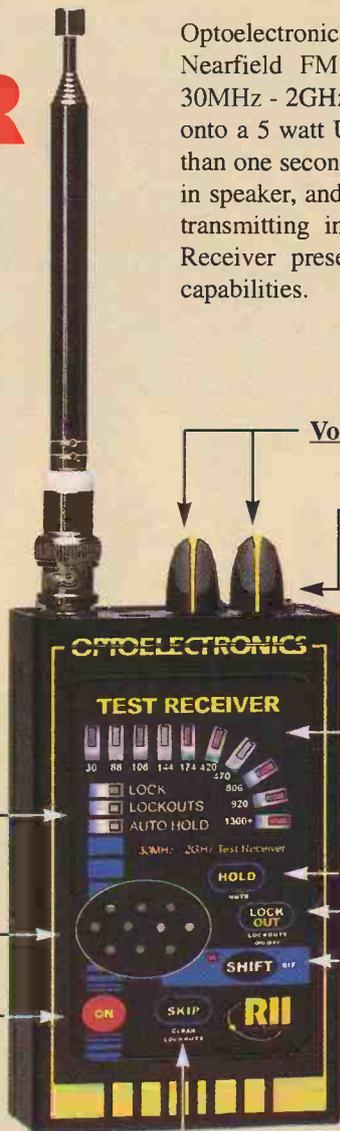


R11 TEST RECEIVER

.....
30MHz - 2GHz
.....

Handheld Receiver

Optoelectronics is pleased to introduce the all new R11 Nearfield FM Test Receiver. Capable of sweeping 30MHz - 2GHz in less than one second, the R11 can lock onto a 5 watt UHF signal as far away as 500 feet in less than one second, demodulate the signal through its built-in speaker, and display the general band the frequency is transmitting in on its LED indicator. The R11 Test Receiver presents all new performance, features, and capabilities.



Instruction Indicators:

LED's will illuminate which mode the R11 is configured for.

Built - in Speaker :

Instantly demodulate any receiver frequency between 30MHz - 2GHz.

Volume & Squelch Control Knobs

CI-V and Headphone jacks:

CI-V jack allows for connection to the Scout for Reaction Tune. The Headphone jack connection also allows for external speaker.

Frequency Band Indication:

Displays what band the received frequency is transmitting on.

Hold / Mute Button:

The Hold button allows the R11 to stay locked on the received signal.

Lockout / Lockouts on-off:

The R11 allows for 1000 user activated lockouts.

Shift / Off:

The Shift button controls all of the R11's secondary functions.

Power

Skip / Clear Lockouts:

Press the Skip button to continue sweeping. Clear Lockouts will empty the lockout memory.

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

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Also with every purchase over £50.00 at the PICKETTS LOCK SHOW we will be giving away vouchers to spend at our New Reg Ward shop in Axminster. This voucher will entitle you to £5.00 off any purchases over £50.00 and £10.00 off purchases over £100.00.

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they broadcast the aircraft type, registration number and current position in latitude and longitude, so it's not one of those, just an ordinary marine use EPIRB. And they come in many different brands, all much of a muchness, as far as efficiency is concerned. Some made in New Zealand, at least one Australian brand sells here, one see English models occasionally, but they have to be type approved, which costs money, so it's a restricted market."

Young Golly said, "You pays your money and takes your choice."

Rogue Transmitters

"We are the experts at rogue transmitters on a mark, as we say, such as vehicles in the land mobile service with the driver sitting on the microphone switch, or transmitters than jam on for a technical reason, chased them all over the city in past years, although we now tend to tell the licensees of the channels to find themselves.

"Jammed on transmitters on marine v.h.f. channel 16 is a problem, microphones dropped behind squabs and sat on, gear dumped on them so the switch is kept on. The volunteer coast guard usually tracks them down with the help of boats, but when they become desperate we might be asked to bring in the van with the rotatable Yagis.

"But none have the urgency of an EPIRB that is going off, it could mask another that is really squawking in a distress situation.

"Sometimes they disappear when we are in the middle of looking for them because the owner has discovered it's on. For this one, the Coast Guard have already broadcast a message on channel 16 telling everybody there's a beacon active and please check their EPIRBs."

Not Audible

They started the search on the hill above the Westpark Marina. It wasn't audible.

"I wish I owned a yacht," Young Golly said.

"Anybody can own a yacht, and does, a lot of taxi drivers own them, public servants, it's the national sport, we do hold the America's Cup. But gin palaces like in that marina come too expensive for public servants like us."

Kilocycle Ken spoke to the airport tower on the cellphone.

"The police helicopter *Eagle* says it's on the southern motorway."

"Boats don't travel on motorways," Young Golly said.

"Could be on a trailer," Kilocycle Ken said.

They went up on a ramp and got it on the Sprague, no mistaking that whooping tone modulation sweeping downward over a range between 300Hz and 1600Hz with a repetition rate of two or three sweeps a second.

They weaved in and out of the traffic. "the signal is increasing, we're almost on top of it," Kilocycle Ken said. But which vehicle? Ordinary Japanese sedans, a few trucks, vans. They were behind an Armouguard van. "It's coming from that van," Kilocycle Ken said. The output meter needle was slammed hard over. He



...Anyone can own a boat...

had maximum attenuation in, all 60dB.

The van turned into a strip shopping area and parked outside the Kiwi Tavern in a No Parking area. A neon sign of the flightless bird winked on and off.

Operating EPIRB

Kilocycle Ken pulled into a vacant parking slot. "Why would an armoured van have an operating EPIRB?"

The driver got out and was jumped by two men wearing balaclavas. Kilocycle Ken punched in 111. "An Armouguard van being attacked by two men, it looks like a shotgun pointed, a guard has his hands above his head, van number 121, Kiwi Tavern."

Young Golly was bouncing on the seat with excitement. The EPIRB whooped.

Flashing blue and red police vehicle lights, the *Eagle* above with its bright spotlight.

"Hey, this could make a television script, Kilocycle Cops who stop a robbery. First time I've been involved in anything like this."

They eventually got to talk to the driver, he'd pick up his boat from the East Harbour Marina, come down the coast to Westpark and started work with the van. He'd brought the EPIRB ashore to get it serviced before his annual holidays, when he was going fishing. He didn't know it was operating. It was on the seat of the van in a carrier bag with a brewery logo. They'd been all over the city, to TABs, Lotto outlets, pubs, a laundromat, now they had been heading for the depot, this was the last pick up of the shift.

"Maybe all money vans should carry EPIRBs," Young Golly said.

"Not available for such a service, they have their own alarm systems for alerting the base station, which controls them."

It was still beeping. Kilocycle Ken removed the battery.

"Why did it go off?" Young Golly asked.

"Technical fault," Kilocycle Ken said, vaguely. "He will probably be fired."

"But if he hadn't done it, then the cash would have been stolen."

"He'll have to fight that out with his employers." SWM

The World's First Wireless News

Eric Westman

One of the more obscure of the many radio distinctions claimed by the United States is that of producing the world's first daily newspaper whose general news was furnished solely by wireless telegraphy. Appropriately named *The Wireless*, this pioneering journal was published early this century at Avalon, the only town on Catalina Island, off the coast of South California.

Catalina, lyrically described as 'an enchanted isle set in a summer sea', was the most beautiful of the Santa Barbara group. It was also the favourite holiday resort of wealthy Californian businessmen lured by its magnificent tuna fishing and wild goat hunting.

Before the advent of the wireless, the island was virtually isolated from the rest of the world. Communication with the mainland was possible only by boat - a three and a half hour trip by steamer - or in an emergency by carrier pigeon. There was no cable linking the island to the mainland 53km away.

Island residents and vacationers were thus without news of the outer world for more than half of the day, since the daily boat bringing the mail and morning papers from Los Angeles did not arrive at Avalon until after one o'clock in the afternoon. And holiday-making financiers keeping an anxious eye on their business affairs, found it took at least two days to send an urgent message to the mainland and get a reply.

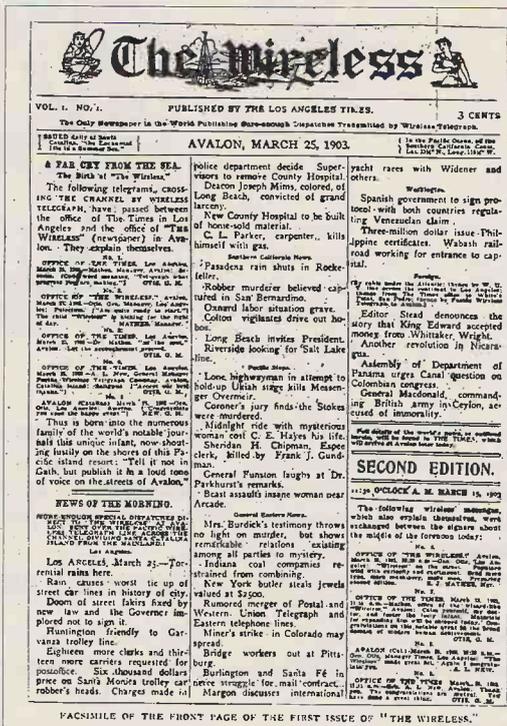
Speedy Communication

As the island's population and resultant trade with the mainland steadily increased, the need for speedy

Flash the news to Avalon -

*News of wreck and flood and fire,
News of battle dread and dire,
News that strenuous times require,
Good and bad news flashed entire,
Without cables, without wire -*

Flash the news to Avalon.



communication became urgent. Eventually, the island authorities were forced to consider the laying of an undersea cable, and it was at this point that an up and coming American wireless telegraphy company came on the scene.

They offered to install a wireless telegraph between the island and the mainland at far less expense than the laying of a cable would have entailed. Their offer was gladly accepted, and the islanders found that they

got not only a system of communication, but their own newspaper as well, a unique paper, as will be seen.

The company, who were trailblazers in the lucrative business of transmitting commercial and Press messages between fixed wireless telegraph stations, set up its headquarters in Los Angeles, in the Spring of 1902 and immediately started to install two identical stations. One was at White's Point, a headland on the coast of Los Angeles County near San Pedro, and the other at Avalon, on the opposite side of the channel that separated Catalina Island from the mainland.

Complete Success

Both stations were completed in only a few months and the facility was opened to the public on 22nd July 1902. It proved to be a complete success in its function of transmitting messages quickly and accurately across 53km of ocean, without a single breakdown or error on the part of the apparatus. And as the Western Union wires connected with the wireless station at White's Point, the island was now in telegraphic communication with the whole world.

The apparatus used by the company was claimed to resemble Marconi's but to differ in some details and to be an improvement, though in what way it is not known. Certainly the transmitters were of the spark-gap type, while reception was probably by means of a coherer. The received signals operated a Morse ticker.

Each station was sited on a high and isolated spot, to avoid electrical disturbances and had a tall mast with an arm from which ten wires were strung downwards. These connected at the foot of the mast with the

Newspaper

receiving and sending apparatus contained in a small hut. At first, only a single wire was used, but experiments showed that a multiwire antenna gave stronger signals.

Power for operating the system came from a dynamo driven by a small petrol engine, and an induction coil wound with 800km of fine wire provided the high voltage for the spark that flashed between two copper spheres. The method of sending differed from that employed on a telegraphic line in that the 'back stroke' was not used by the wireless operator wielding the Morse key, so that transmission was a little slower.

Press Despatches

Once reliable communication had been established between Avalon and the mainland, a leading Californian newspaper arranged to receive regular Press despatches sent to it from the island. This paper already had a large circulation in Avalon, where there was a daily rush to the newsagent when the boat came in with the morning edition at one thirty in the afternoon.

Noticing this eagerness for news, General Harris Gray Otis, a veteran publisher and editor who was also the president and manager of the wireless company, foresaw the possibility of further profits by 'serving the morning news to the islanders with their breakfast, as in any civilised place', as he put it. This led him to the idea of publishing a 'wireless' daily in Avalon itself, giving a synopsis of the news published in the Los Angeles morning papers and wirelessly across to the island, augmented with snippets of the island's local news.

Accordingly, a 'half medium job' printing press and accoutrements were shipped to the island, and arrangements were made to receive a special Press report there early every morning. *The Wireless*, as the General named his brainchild, was launched on March 25th 1903, to a lively reception by the elements.

First Night

On the very first night of going to press, a storm of almost unprecedented violence raged over the channel and island: thunder roared and lightning flashed, while the rain teemed down in a solid mass. Amazingly, and to the proprietor's relief, the report came through without interruption or error.

The birth of this, the world's first 'wireless' newspaper, was celebrated not only by an atmospheric display, but with much ceremonial and exchanging of congratulatory messages between Avalon and the places it was connected to through its wireless telegraph. Proudly gracing the first issue was an excruciating poem, worthy of William McGonagall.

First Edition

The demand for the first edition of *The Wireless* was so great that a second thousand copies were run off within 30 minutes of the first batch leaving the press, and when they had been sold, as much as a dollar was offered by frustrated souvenir hunters for a single copy of the three-cent paper. Soon the initial number became a collectors' item and many thousands were later run off to satisfy the demand by enthusiasts.

The *Wireless* started as a three-column folio on a page, 8 by 11 inches (203 by 279mm), but on the second week, it was increased to a four-column sheet. Its original 800 word report consisted of a digest of the leading California papers of that morning. This served as an appetiser for the fuller reports contained in the ordinary papers that would be available later in the day.

Meagre Content

If the paper's content was somewhat meagre at first, the same could have been said of its staff, which consisted of three persons. Mr J.S. Mathes, who was already the resident correspondent on the island of one of the California papers, presided as editor, while Mr C.E. Howell was the wireless operator who received the news message at early dawn. 'Wireless Joe' was the otherwise anonymous lad who sprinted down the hill from the wireless station to the newly built office in Metropolis Avenue, clutching the latest news report. Both the paper's content and its staff were soon to be increased.

Flash the news to Avalon -

*Read the news of frauds and shams,
Price of wheat and wool and hams,
Flooding rivers, bursting dams,
The lion's roar, the bleat of lambs,*

Flash the news to Avalon.

Daily Happenings

As well as telegraphed news, *The Wireless* contained a brief record of the island's daily happenings, including stories of marvellous tuna catches by holiday-makers, on their adventures as intrepid goat hunters. This happily resulted in a gratifying large demand by vacationers who bought multiple copies to send to their mainland friends, proudly showing off their exploits in the paper.

Catalina Island's *The Wireless* was unique in its day, and, unlike Marconi's one-off *Transatlantic Times* of November 1899, was an ongoing concern fulfilling an urgent need. It fully justified its claim to be the world's first daily newspaper to owe its existence entirely to wireless telegraphy.



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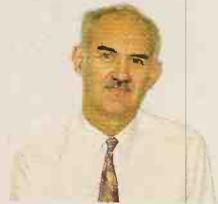
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- Ham Radio Today Review of WS-2000 says "Lovely little set - very sensitive receiver."

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PRICE MATCH



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

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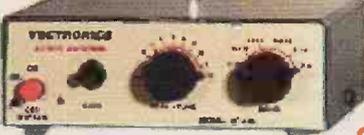
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WATSON

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SALE



This Month

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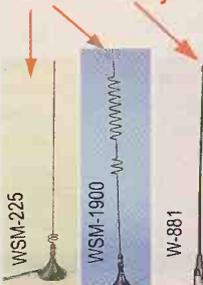
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EUPHORIC EU

It's been around for some time, but now the HF-150 gets all spruced up. Mike Richards checks out the nice life.

Quite simply the HF-150 has now been given the Europa treatment.

The HF-150 has been around for many years now and has rightfully earned itself a place amongst the classic receivers of the past few decades. So why another review? Quite simply the HF-150 has now been given the *Europa* treatment. The *Europa* tag originated back in 1992 when a specially modified version of the HF-225 known as the Finlandia was voted best DX receiver of the year by the European DX Council. The suggestions for the various HF-225 modifications came from the DX Club of Finland hence the original Finlandia name. Since then, the *Europa* name has been used by Lowe to signify specially enhanced versions of their receiver range. Although the treatment given to the HF-150 *Europa* is different to that of the HF-225, the basic aim remains the same - to use the latest technology to give enhanced performance!

The first point that strikes you about the HF-150 is its very compact form - there aren't many quality communications receivers that can match this physical size. This small size in itself is often a very important factor when setting-up a new station and is especially true if you have to fit your listening station into a very limited space. The HF-150's other attractive point is its very simple and uncluttered front panel. This is often a welcome relief for new listeners when compared with some other designs that

was very convenient as the power unit could be tucked neatly away somewhere behind the listening position.

If you really wanted to get adventurous you could easily use the HF-150 whilst on your travels thanks to the provision of an external power socket. The power requirement is 12-15V d.c. at up to about 300mA, making the HF-150 eminently suitable for mobile operation via a simple cigar lighter adapter. The only point to watch here is the risk of interference from the vehicle's noisy electronics. However, this can usually be overcome with some simple filtering in the power lead. The other power option is to make use of the internal battery facility. By using this facility and the optional padded carrying case you could even try some portable operation. The battery compartment comprise two slot-in holders which are to be found on the back panel of the receiver. These take a total of eight AA cells and, depending on volume levels and cell types, etc. you can probably expect around 10-12 hours operating time. If you want to use Ni-Cad batteries you will be pleased to hear that the HF-150 has a charging circuit built-in as standard that provides an automatic trickle charge whenever the receiver is being powered via the external power socket.

If you've never tried portable operation I can highly recommend it to bring a new dimension to your listening. If you're stuck with only being able to use a very

restricted antenna system at home imagine the fun you can have if you zoom off to a hill top with a reel of wire and sit there enjoying a 50m long wire antenna in the spring sunshine!

Whilst on the subject of antennas, the HF-150 is well set to work well with a number of different systems. This is all handled by a neat arrangement on the back panel. For higher impedance wire antennas there is a pair of clip connectors that are transformer coupled to the receiver providing a ideal 600 Ω impedance. For the more

conventional, low impedance, unbalanced, antennas there is a standard

SO-239 socket that presents a nominal 50 Ω impedance. Depending on the position of the rear panel antenna selection switch this socket can also be used as the input point for a short whip antenna.

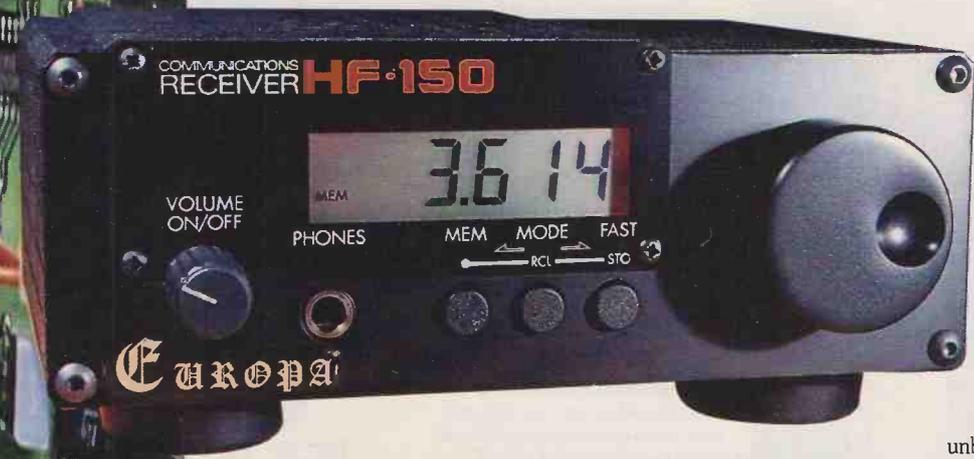
When the whip antenna is selected an f.e.t. preamplifier is switched into circuit to provide some additional gain and to help match the very high impedance presented by simple whip antennas. One word of caution here - don't be tempted to switch-in the pre-amp when using a decent length external antenna. If you do you will find there seems to be lots of extra signals on the band. However, most of these 'signals' will be spurious noise caused by overload!

Let's just take a look at the remaining connectors on the HF-150. On the front panel there's the usual 6.3mm headphone socket that's pre-wired to work with standard stereo headphones. Although the internal, lid mounted speaker provides surprisingly good quality you can connect an external speaker via a 3.5mm jack on the rear panel. This uses standard switching which causes the internal speaker to be muted when a jack is inserted in this socket. If you like to make recordings off-air or want to connect additional

seem to work on the basis that more knobs and buttons make for a better receiver! The lack of front panel controls doesn't mean the HF-150 is short on features it just indicates some clever ergonomic design.

Getting Going

One of the advantages of the simple layout is you don't have to spend the first week reading the manual before you can start receiving! Using the HF-150 really is straight out of the box and go and I'm sure every user gets first time success. As you can see from the photographs, the front panel is dominated by the large tuning knob and the digital display. The only other rotary control on the front panel is the straightforward volume control. Connecting-up was also extremely simple especially if you use the supplied mains power unit. This comprised a separate, compact box, containing the power pack which was fitted with a standard 13A mains plug and a short flying lead to connect to the HF-150's coaxial external power socket. This arrangement



ROPA

decoding gear, there's a very useful REC socket that provides a fixed level audio output (approx. 200mV) that's ideal for this purpose. The final connector is a 3.5mm jack for the excellent keypad, but more on that later.

Tuning Around

One of the secrets to the HF-150's simple, but very effective, layout is the clever tuning systems. Rotation of the tuning knob on the new Europa is now converted into digital information by a new, silky smooth, optical shaft encoder. This gives the tuning knob a wonderful weighty, but very smooth feel. As this is the most used control on any receiver its action really is a very important factor and one that's often overlooked during the selection process. In addition to its slick feel, the logic behind this knob holds a few secrets. The rate of tuning or frequency change per rotation is dependant on how fast you turn the knob. If you're tuning the knob slowly then you are most likely fine tuning so the receiver uses the smallest steps appropriate to the selected mode. This gives 60Hz for standard a.m. and an excellent 8Hz for all the other modes. However, when you speed-up the rotation the rate automatically steps-up to much coarser steps. This latter change depends on the mode selected and provides 1.6kHz per revolution on s.s.b. and the double sideband synchronous a.m. modes. Standard a.m. switches to 12kHz whilst the single sideband synchronous a.m. modes switch to 800Hz.

As you can see, a lot of thought has gone into this, apparently simple, tuning system. The proof of it's effectiveness is how seamlessly it works in the eye of the user. I can assure you they really have got this very well sorted and, being a long term user of an HF-150, I can confirm that this system really does work extremely well. If you want to change frequency over a large range use of the tuning knob on its own can get tedious, so Lowe have provided a fast tune option to really speed things up. To use it you just hit the FAST button and you can tune through the entire range of the receiver in just a few turns.

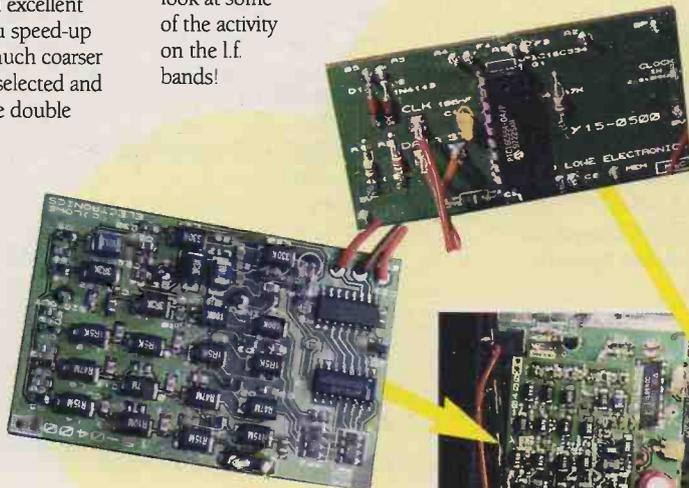
Whilst this is going on, the receiver remains tuned to the original frequency. Only when you hit FAST for a second time does the receiver change to the new frequency. One of the real gems of the old HF-150 was the excellent keypad. This has always been an optional extra and will never win any awards for its good looks. However, when it comes to simple functionality this one's hard to beat. In use all you have to do is punch in the frequency you want and the receiver automatically changes to that frequency.

The keypad remains active all the while its plugged-in but all the other tuning systems also work at the same time. This is wonderfully simple yet extremely effective and has won the HF-150 many fans. The keypad's operation is further enhanced by the fact that it's only connected by a thin wire so it can easily be located just where it's easiest to use.

Latest news from Lowe is that a new version of the keypad is about to be released that will add mode changing and some memory options thus making it even more useful. The particularly good news for existing users is the new keypad will work with all versions of the HF-150. Once

you've found all those hot frequencies you can use the HF-150's simple memory system to store them. There are a total of 60 internal memories, each of which can store both the frequency and the receive mode. You don't have to worry about the data being lost in the event of power failure as the HF-150 uses an electrically erasable programmable read only memory (EEPROM) to hold the data. Using the memories is really easy and there is even a preview facility so that you can see the stored frequency before it's transferred to the main tuning.

All these tuning facilities are displayed through the very clear front panel l.c.d. which in the Europa version gains some much needed and very effective back lighting. One, often ignored, aspect of a communications receiver is the frequency stability. This characteristic is particularly important if you intend to get involved in decoding some of the narrow-band data modes. The HF-150 passes this test with flying colours and it is specified to have an absolute frequency error of better than 50Hz with a drift better than 30Hz/hour, both at 20°C. If you're still not satisfied with the frequency control and storage options there's the HF-150 RS-232 interface which extends control of the HF-150 to an external computer where the range of storage and search options is limited merely by your imagination! You should also note that the HF-150 has an exceptionally wide frequency range stretching from 5kHz (yes that's 5kHz) through to 30MHz with no breaks. This makes it ideal if you want to take a look at some of the activity on the l.f. bands!

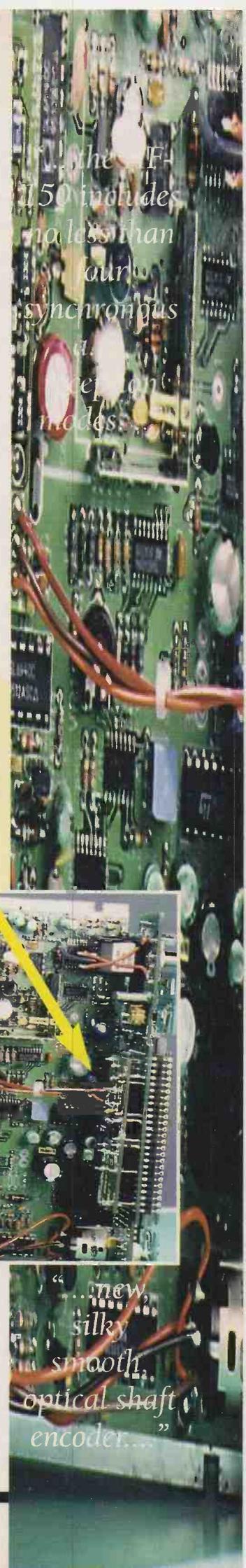
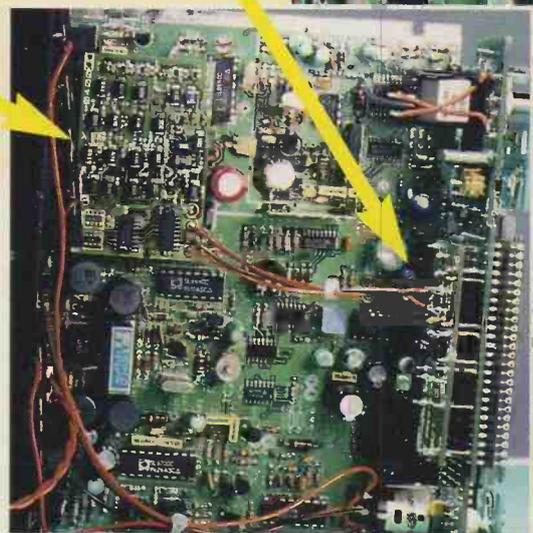


Mode Round-up

Now that we've established that the HF-150 Europa has all the tuning options necessary to make a fine communications receiver, we need to move on to the reception modes that it can handle.

If you're a broadcast fan then excellent a.m. performance is a must and the HF-150 does really well in this area. The a.m. detector is a low distortion full-wave device designed to give the best in a.m. reception. As a further aid, the i.f. filtering can be set to a wide 6.5kHz for best quality under good listening conditions or tightened-up to 2.6kHz when the going gets tough.

To really add power to the broadcast armoury the HF-150 includes no less than four synchronous a.m. reception modes. The synchronous systems are all based around using a locally generated carrier combined with a product detector



The HF-150 includes no less than four synchronous a.m. reception modes...

“...new, silky smooth, optical shaft encoder...”

to resolve a.m. signals. For double sideband reception you have the same choice of wide and narrow filtering as with conventional a.m. When using the single sideband modes the filtering uses the standard narrow s.s.b. filters and the listener is able to choose between upper and lower sidebands.

One of the common problems with synchronous detection is the loud heterodyne whistle you get when the station is off-tune. To help overcome this the HF-150 incorporates an automatic switching system that flips the receiver back to conventional a.m. when the tuning is too far afield. As a result, you can leave the receiver set to synchronous detection and freely tune around in the knowledge that the receiver will automatically switch to synchronous tuning when you are suitably close to the required station.

For utility fans the s.s.b. reception of the HF-150 is really excellent. The i.f. filters are just about spot-on for general purpose use and the quality of the recovered audio is amongst the very best. Hard core c.w. fans will regret the lack of a dedicated c.w. mode, but this can be overcome, to some extent, with external audio filtering.

Under The Bonnet

The design of the HF-150 follows fairly conventional lines with its dual conversion Superhet configuration utilising first and second i.f.s of 455kHz and 455kHz respectively. Following the antenna selection switching the original HF-150 just used a 30MHz low-pass filter to tidy things up before the first mixer. This has now been significantly improved and the Europa features five band-pass filters that are automatically selected by the on-board microcontroller. The change-over points for the new filters are 1, 5, 10 and 20MHz. There have also been some changes to the first mixer which have resulted in a significant improvement to the third order intercept point.

The new Europa boasts an impressive +18dBm against the original HF-150 result of +7dBm - this will be a great help when working in the presence of strong signals. There have also been some changes to the second mixer i.f. path with the addition of low capacitance switching diodes and the use of ferrite shielded inductors.

On the detection front, the HF-150 uses a product detector for the s.s.b. and synchronous a.m. modes with a low distortion full wave rectifier for conventional a.m. The generation of the carrier for synchronous a.m. is handled by a separate i.f. amplifier and mixer chain.

Specification

Frequency Coverage:	5kHz to 30MHz continuous.
Reception Modes:	Synchronous a.m. (u.s.b., l.s.b., d.s.b., Wide d.s.b.), l.s.b., u.s.b, a.m.
Receiver System:	Microprocessor controlled p.I.I., Dual conversion superhet. 1st i.f. 455kHz, 2nd i.f. 455kHz.
Display:	Backlit l.c.d., resolution 1kHz, mode and memory information.
Tuning:	By spin wheel, employing very accurate ball bearing optical encoder, with 8Hz resolution. Direct frequency entry using optional keypad.
Memories:	60 memories storing frequency and mode
Antenna Inputs:	50Ω via SO-239 socket. Longwire 600Ω via spring terminals.
RF Input:	Switched in five bands: Below 1MHz 1 - 5MHz 5 - 10 MHz 10 - 20MHz 20 - 30MHz
RF Attenuator:	Switched 20dB.
IF Filters:	Wide 7kHz, Narrow 2.5kHz.
Sensitivity (10dB SINAD):	(a.m. signal 70% modulation depth) <3μV 50kHz - 500kHz <2μV 500kHz - 30MHz <0.5μV 500kHz - 30MHz with internal whip amplifier. Unmodulated, s.s.b. signal resolved at 1kHz <1.5μV 50kHz - 500kHz <1μV 500kHz - 30MHz <0.3μV) 0.5 - 30MHz with internal whip amplifier.
Selectivity:	Narrow filter 2.6kHz @ -6dB, 4.1kHz @ -60dB Wide Filter 6.5kHz @ -6dB, 10.2kHz @ -60dB Reciprocal mixing using narrow filter 75dB @ 5kHz, 85dB @ 10kHz.
Dynamic Range:	>+18dBm.
IP3 Point:	Drift @20°C <30Hz/hour, error <50Hz -10°C to +50°C error <200Hz.
Frequency Stability:	1.6W into 8Ω at 5% t.h.d.
Audio:	Lock range: d.s.b. ±100Hz, s.s.b. ±5Hz
AMS Detector:	Internal speaker or external speaker via 3.5mm jack, Record output approx. 200mV via 3.5mm jack.
Audio Outputs:	Headphone socket (mono or stereo) 6.3mm jack 10-15V d.c. @ approx 150-300mA (2.1mm power jack) or internal battery (8 AA cells). An internal charging circuit is included for NiCd/NiMH cells. a.c. mains power unit.
Power Supply:	
Dimensions:	Size 185 x 80 x 175mm weight approx. 1.3kg

Control of the receiver's functions is handled by a microcontroller that operates in what is known as static idle. This means that whenever you leave the controls alone it basically shuts down. The idea being that if there's no data flowing then there's less chance of noise getting into the receiver.

Europa Difference

For those that just want to know what's changed, here is a brief run down on the main points:

A set of five band-pass filters, added prior to the first mixer, are controlled by an additional microcontroller. This facility is implemented with surface mount components on a new p.c.b.

First mixer output configuration changed to improve the third order intercept performance.

Use of lower capacitance diodes and ferrite screened inductors in the second i.f. path.

Back lighting has been added to the main l.c.d.

New high specification optical tuning encoder.

Cabinet colour changed to black and Europa logo added.

Summary

I've been a fan of the HF-150 for some time now, but the new Europa specification brings the performance bang up-to-date. All the extras are well worth having and make listening even more of a pleasure. I carried-out a number of side-by-side tests between old and new and the Europa certainly came through with much cleaner overall reception.

The new back lighting was set at just the right level and the tuning control is really silky smooth with just the right amount of free spin. Although the temptation is to recommend the HF-150 for the new listener, its performance is plenty good enough to support the advanced listener as well. If you like to have a battery of knobs to twiddle then the HF-150 is not for you, but if you just want to get on with your listening then the new HF-150 Europa will take some beating.

The Lowe is available from all their shops and many other good radio stores price £499. The real goods news is that Lowe will upgrade your old HF-150 to the new Europa spec. (including that black case) for just £200 inclusive of VAT.

For more information contact

**Lowe Electronics,
Chesterfield Road,
Matlock,**

Derbyshire DE4 5LE.

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FAX: (01629) 580020,

E-Mail:

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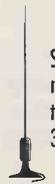


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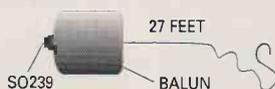
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The End Of An Era? The Trio R-820



John Wilson reckons that the Trio R-820 receiver represented the pinnacle of receiver design some twenty years ago. In this article he takes a look at the receiver and explains why he thinks that way.

In the history of h.f. receivers there seem to be a few defining points where design changes direction. Such a point marked the end of the 'bigger and heavier is better' design concepts when, in the late 1950s, American companies such as National, Hallicrafters and Hammarlund realised that Collins had suddenly taken off in a different direction and produced a range of lightweight, high performance receivers and transceivers that was to be the foundation for the next twenty or so years. In my view, this period came to an end in the late 1970s and the Trio R-820 represented the pinnacle of h.f. receiver design for the hobby user at this time. Even today, almost twenty years on, the R-820 is still a delight to use, and I thought that you might like to know why.

The first thing to remember is that the R-820, in



common with most h.f. receivers at the time, was designed to cover the amateur bands only, and the short wave listener who wanted general coverage was catered for in the Trio catalogue by the R-1000; an excellent receiver, but lacking the many detailed facilities offered in the R-820. The second thing to note is that the R-820 was fairly expensive, costing close to £800 at its UK introduction in 1979. In fact the radio amateur could buy a top-of-the-range h.f. transceiver for the same price, so the R-820 had to be pretty special to warrant the price.

Unpacking the R-820 reveals a moderately large package by today's minuscule norms, but you needed a decent size front panel to accommodate 18 rotary controls, ten switches of various kinds, a large analogue 'S' meter and a digital frequency display - plus of course the headphone jack. The layout and styling were clearly designed to match the very successful TS-820 transceiver with which Trio dominated the amateur radio market, and the R-820 had built in facilities for working in conjunction with the TS-820 to give the well heeled amateur one of the best stations in the world. Big claims, but verifiably true.

The Trio design team, headed by JA1CB, had been instructed to use the best techniques available for every feature of the R-820 and they certainly did some detailed homework. I could write a small book on the way each part of the circuit represented good design, but I'll confine my observations to just a few areas. The frequency readout, for example.

Truthful Display

A modest little six-digit display reading to 100Hz may not seem such a great innovation, but this frequency readout actually told the truth. An odd thing to say? Not really when you consider that today's readouts do not actually measure anything at all; they simply display the instruction carried on the data bus from the control processor to the frequency synthesiser system. This means that if the synthesiser fails, the readout (unless some fail safe shut-off system has been included) will gaily carry on telling you that you are tuned to 5.975MHz even though your receiver

Notch Filter

The R-820 was a triple conversion design, with 8.8MHz first i.f., 455kHz second i.f. and 50kHz final i.f. The receiver could easily have been a simpler double conversion design had it not been for the fact that the design team decided to include a notch filter as part of the specification, and the 50kHz i.f. is there just to provide the notch. Seems a bit excessive but they were determined to design the best notch filter that they could, and here's why it works so well. Let's start by remembering that the best place for a notch filter is somewhere within the i.f. system of the receiver, preferably before the a.g.c. system detector so that the interfering signal does not generate gain reduction. A notch, to be of proper use, has

to be tuneable by the user so that it can be placed accurately on to an interference source, but all the notch filters which are made tuneable change their characteristics when they are tuned, becoming lop-sided one way or the other, or changing their rejection bandwidth and/or the depth of the notch. So the Trio designers decided to make a fixed frequency notch which was perfectly symmetrical and instead of tuning the notch across the signal, tune the signal across the notch.

They did this by an adaptation of the pass band tuning system first introduced in the Collins 75A series receivers, which I think I have described in the past in the pages of *Short Wave Magazine*, but the effect is quite remarkable in that when you tune the notch, you don't experience that "eeeeaaayowwww" noise in your ears; just the obvious 'hole' being passed across the pass band. The guaranteed notch depth was 50dB but in actual receivers it was more like 60dB. The accompanying diagram (Fig. 1) shows plots taken from a receiver, and you can see the excellent symmetry. Because the tuning range of the notch was not limited by the need to minimise 'lopsidedness', you can tune right through the i.f. pass band and still get the same rejection at any frequency.

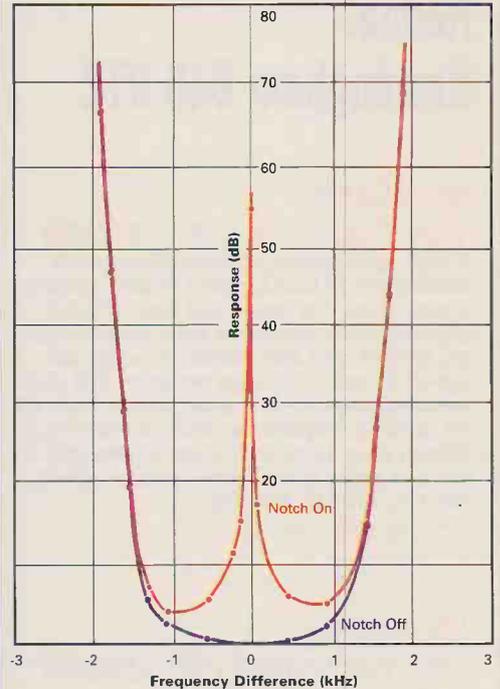
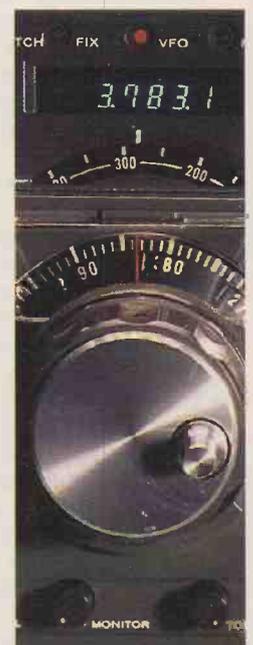


Fig. 1: The attenuation characteristic of the 'T' notch filter.

has effectively stopped working. The readout in the R-820 took in all the various oscillators used in the receiver and did the necessary mixing processes to give the true frequency to which the receiver was tuned. It's not a cheap way of reading the frequency, but it's certainly the best. If you couldn't quite afford the R-820 you could have it without the digital readout and rely on the extremely good analogue readout provided by the main tuning dial; and that's another feature worthy of note.

The 'HRO Dial'

Trio decided to use a dial mechanism which reaches back into the 1930s and had its most popular exposure in the National HRO receiver. This dial, with which some of you will be familiar, is a linear mechanism which splits the dial periphery into 100 divisions, with an additional little cut out window in which the numbers 1, 2, 3, and so on appear at each full revolution of the main shaft. In the HRO the window was blank for the first revolution then numbered 1 to 4, thus giving 0 to 499 divisions in total. Exactly the same system was used in the R-820 and it works so well that it's an example of how a good idea



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**(COM213)
100 CHANNEL SCANNER**

A high-specification scanner offering 100 channels in 10 banks, with 1 Priority Channel in each bank. For speed and ease of use it offers Jetscan, which can scan 100 channels per second, and also Jetsearch, which can search at up to 100 steps per second. It also features programmable band search, lock-out for up to 10 frequencies, channel look-out, 2 second scan delay, data noise/birdies skip, a key lock and a green back-lit display. 66-88, 108-174, 406-512, 806-956.

£119.99 + £5 P&P.



**(COM102)
10 CHANNEL SCANNER**

This state of the art 10 channel scanner is fully programmable and can receive a variety of PMR communications. It is robustly designed and offers a full frequency LCD display for ease of use. Also features an in-built circuit for recharging Nicad batteries. 66-88, 137-174, 380-512.

£49.99 + £5 P&P.



**(COM205)
400 CHANNEL SCANNER**

The B111 is the last word in programmable scanners. A free standing desk top unit covering nine radio bands in the 25-512MHz and 806-1300MHz ranges. Operates from AC mains or car cigar lighter via suitable adaptor. It incorporates a microprocessor avoiding the need to change crystals and gives special functions such as scan delay, memory back-up, priority channels and many more.

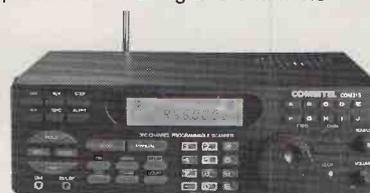
£249.99 + £5 P&P.



**(COM215)
200 CHANNEL SCANNER**

A highly-featured desktop scanner offering 200 channels arranged in 10 scanning banks, with one Priority Channel in each bank. For ease of use it offers Turbo Scan at 100 channels per second max with Autosort for maximum scan speed and Turbo Search at up to 100 steps per second. Other features include direct search programmable band search, auto station program mode, lock-out for up to 10 frequencies, manual frequency sort, programmable auto-recording and optional CTCSS tone squelch. The unit is powered by AC mains or 13.8Vdc. 66-88, 108-174, 216-512, 806-956.

£219.99 + £5 P&P.



SANGEAN ATS 909 FM-Stereo/MW/LW/SW PLL Synthesized receiver

The ATS-909 is a continuously tunable receiver from 153kHz-29999kHz. This receiver is capable of receiving and tuning all the short wave bands and any stations in between

- 307 memories (261 in SW, 18 each in MW/FM, 9 in LW plus priority station)
- Five tuning methods – direct frequency tuning, auto scan, manual tuning, memory recall and rotary tuning
- ATS (auto tuning system) – auto scan and preset in priority of signal strength in FM/MW/LW bands
- E2 PROM for memories back-up
- FM stereo via earphones
- 29 pages SW stations name memory, 9 memories in every page
- Automatic search strongest signal station within SW station pages
- SSB (USB/LSB) 40Hz/step on fine tuning
- AM RF gain control
- Built-in 42 world cities time plus D.S.T. device
- 3 individual timers
- Adjustable sleep timer
- Alarmed by radio or HWS (Humane Wake System) buzzer
- Battery and signal strength indicator
- Direct key to recall favourite station in one button
- Dual conversion device
- REC out and standby control output
- Pre-programmed station name and frequency according to customer's requirements before ex-factory
- AM wide/narrow filter and FM mono/stereo selector
- Optional features for European market
- RDS (Radio Data System) on PI, PS and CT for station name and clock time
- Size in mm: 215 x 133 x 37.5
- Weight: 850g without batteries



£169.95 + £5 P&P.

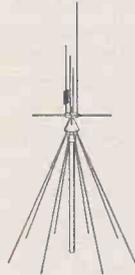
- ★ Free batteries
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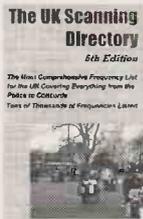
Super Syncro 1100 – 1100mAh Nickel Metal Hydride (NiMH) AA size rechargeable cells. No memory effect. Twice the capacity of NiCds. **£3.00** inc P&P.



Skyscan DX-V1300 base discone – Most discones only have horizontal elements and this is the reason that they are not ideal for use with a scanner. Most of the transmissions that you are likely to receive on your scanner are transmitted from vertically mounted antennas. The DX-V1300 has both vertical and horizontal elements for maximum reception. Constructed from best quality stainless steel and aluminium and comes complete with mounting pole. **£49.95** + £3 P&P.



Wideband mini-mag antenna – Wideband (25-1300MHz) receive antenna featuring super strong miniature magnet and coax cable terminated in BNC connector. **£29.95** + £3 P&P.



**NEW 6th edition
UK Scanning
Directory**

£18.50
+ £1.50 P&P



Uniden Bearcat 9000 XLT – AM/FM/WFM switchable base station HF/VHF/UHF scanning receiver. Covers 25-550 and 760-1300MHz. Features 500 memories, auto sorting, backlit orange LCD display. Scan rate of 100/300 channels/sec. **£259.95** + £10 P&P.



Yupiteru MVT-7100 – All mode switchable handheld HF/VHF/UHF scanning receiver. Covers 0.5-1650MHz. Features 1000 memories, over 500 pass memories, 10 limit search banks, 12 step sizes. Comes complete with earpiece, belt clip, wrist strap, rechargeable batteries, PSU, in-car adaptor and telescopic antenna.

**RING FOR
THIS MONTH'S
SPECIAL OFFER**



Skyscan Desktop Antenna Model Desk 1300 discone – Built and designed for use with scanners. Coverage: 25 to 1300MHz. Total height 36" and 18" wide at widest point. Comes complete with 4m of RG58 coax cable and BNC connector. High performance antenna, ideal indoor or as a car antenna when vehicle is stationary. **£49.00** + £3 P&P.



Airband mini-mag antenna – Civil (108-137MHz) and military (225-400MHz) dual band receive antenna featuring super strong miniature magnet and coax cable terminated in BNC connector. **£24.95** + £3 P&P.



AOR AR-8000 Best seller, 0.5 to 1900MHz. All mode.
Price match.



Radio shack DX-394 communications receiver – 150kHz to 30MHz base station AM, CW, USB, LSB communications receiver. Features include clock and timer, signal meter, 100+ memories, RF gain control and direct frequency entry. A steal at **£149.95** + £7 P&P.



Yupiteru MVT-3300 – Latest Yupiteru scanner AM/FM switchable. Limited stock at **£149.95** + £5 P&P.



Commtel COM 206 – AM/FM handheld VHF/UHF scanning receiver. Covers 66-88MHz (FM), 108-137MHz (AM), 137-174MHz (FM), 380-512MHz (FM). Full civil airband coverage, comes complete with free case and rechargeable batteries. **£129.95** + £5 P&P.



Realistic PRO-2042 – AM/FM/WFM switchable base station HF/VHF/UHF scanning receiver. Covers 25-520 and 760-1300MHz. Features 1000 memories, 100 monitor channels, backlit orange LCD display. Scan rate of 50 channels/sec. **£249.95** + £10 P&P.

**WE ALSO HOLD A LARGE RANGE OF SECOND USERS
SHORTWAVE AND SCANNING RECEIVERS.
PLEASE CALL WITH YOUR REQUIREMENTS**



Classic Design

Having begun at the end, I'll end at the beginning; the front-end of the R-820. This was classic design for the period, with a dual gate m.o.s.f.e.t. r.f. amplifier feeding a dual gate m.o.s.f.e.t. used as a source follower into a push pull balanced f.e.t. mixer converting to the 8.8MHz first i.f. How many m.o.s.f.e.t.s are too many m.o.s.f.e.t.s? This many. Receiver performance at this time was dominated by sensitivity figures, and apart from a few voices crying in the wilderness about dynamic range and intercept point measurements, the manufacturers went all out to get sensitivities which were really too high for the average h.f. receiver. The R-820 was no exception, and the -128dBm which I measured for 12dB SINAD on s.s.b. is probably 10dB too sensitive except for use above 25MHz. Use of the front-end attenuator is almost essential to make the best of the receivers of the period, and that is how I eventually tested the R-820 - because you do want to know how it compares, don't you?

The advantage of having the r.f. amplifier is that in the R-820 the designers included three lots of tuned circuits between the antenna and the first mixer, which meant that the out-of-band, second order intermodulation performance should have been good, but I couldn't vouch for the third order nor indeed the phase noise performance because these measurements were never included in manufacturers' specifications at the time. The input circuits coupling the antenna to the r.f. amplifier were cleverly arranged to allow the use of a single large coil with one input coupling winding, with separate inductors switched in parallel to give the correct values for each band. This saves one band switch section and simplifies the whole set-up. The other two sections of tuned circuit were arranged in the classic configuration of individually screened coils top coupled by small value capacitors, so small in fact that the higher frequency bands relied on the residual capacitance between two pads on the printed circuit board. The whole lot was tuned by three separate air spaced variable capacitors mechanically ganged together in a neat way, with the shaft brought out to the front panel as the 'Preselector' control. All you did to use this was to simply twiddle it for maximum signal, and assuming that the alignment of the coils was correct, you had a very respectably selective front-end.

The first conversion oscillator in the R-820 was a single loop p.l.l. with a separate v.c.o. for each band. Injected into the p.l.l. system was a 5 to 5.5MHz v.f.o. tuned by the main tuning control, and this gave infinite resolution at any frequency, unlike later fully synthesised systems which tuned in discrete steps. Some will recall the JRC NRD-515 receiver, which tuned in 100Hz steps and sounded like a mad bagpiper when tuned across a steady signal. However, using a tuneable v.f.o. meant that the design of this had to be very good indeed, and in the R-820 it was very good indeed. The structure of the frequency generation in the R-820 was quite complex and the team who thought it up certainly knew what they were doing, because it all works so well in practice.

Every other feature one might expect to find in a top class receiver was included: noise blanker, switchable a.g.c., crystal calibrator, switchable front-end attenuator and so on, and I have to mention the 'S' meter... what a pleasure to see a large, well illuminated, easy to read, analogue meter, and what accurate calibration! The scale carries not only the normal signal strength units but also a scale in dB relative to 1µV, and this takes some courage for a manufacturer to do, because it's so easy to check if it's wrong - which is what I did during my tests.

keeps being re-discovered time and time again. Incidentally, although many people refer to this as the 'HRO Dial', it was in fact a British invention and pre-dates the HRO receiver by some considerable time. Getting to grips, literally, with the R-820 tuning knob is a delight, for although the knob is not heavily weighted, it's as smooth as silk, and the diameter is perfect for human fingers. As for 'auto speed-up', if you want to move frequency faster, you simply twiddle the knob faster, aided by a free spinning little handle sticking out of the knob periphery.

Excellent IF Filters

The i.f. filters themselves were excellent, particularly the optional 455kHz 8-pole crystal c.w. filters, and the front panel design of filter selection was well executed. A switch selected the filter you wanted, from 250Hz, 500Hz, 2.4kHz or 6kHz, or you could leave the switch in 'auto' in which case the appropriate filter for the mode in use came in as the receiver mode switch was turned. Concentric with the filter switch was the fully variable bandwidth control, so it was all there at your fingertips.

Reception modes were a.m., c.w., u.s.b., l.s.b. and RTTY where the b.f.o. was automatically offset to give correct audio tones from the RTTY signal. Frequency coverage matched the amateur bands at the time; 1.8-2.3MHz, 3.5-4, 7-7.5, 14-14.5, 21-21.5 and 28 to 30MHz in four 500kHz bands. There was also a 15 to 15.5MHz range for calibrating against WWV, but since WWV is an American standard transmission, even though you may be able to hear it in Europe it's not safe to use because of propagation delays in the path. Trio did give a nod in the direction of the short wave broadcast listener by building in a separate h.f. converter which used the 29.5-30MHz section of the R-820 as a tuneable i.f. and gave coverage of 5.9-6.4MHz for the 49 metre band, 9.4 - 9.9MHz for the 31 metre band, 11.5-12MHz for the 25 metre band and 17.7-18.2MHz for the 16 metre band. However, it didn't take me long back in 1980 to realise that if I could enable the whole of the 28-30MHz band to use as the tuneable i.f., I could extend these broadcast bands considerably. I devised a simple little modification to extend the coverage as follows:- 4.4-6.4MHz, 7.9-9.9MHz, 10-12MHz, and 16.2-18.2MHz. This still didn't give full coverage, but it was an improvement.



On The Test Bench

I subjected the twenty year old R-820 to the same tests that I use for today's reviews, and here's how it came out:

Sensitivity for 12dB SINAD at 14.2MHz was -128dBm on s.s.b. and -120dBm on a.m., and I will say once again that this is too sensitive for today's h.f. listening below about 25MHz. For the purpose of the next tests I reduced the sensitivity by using the first 10dB step on the R-820 attenuator switch, which has the effect of normalising my results so that you can do direct comparisons with my later reviews. Third order intercept point measured at -4dBm at 20kHz spacing and an intermodulation free dynamic range of 80dB which was again good for the period and better than the competition, whilst the second order intercept point with input signals of 7.0 and 7.2MHz measured at 14.2MHz was a very good +85dBm with an intermodulation free dynamic range of 105dB. This is entirely as a result of having the three-section front-end preselector and highlights the need for good front-end selectivity in h.f. receivers (unless you have an outstandingly good first mixer).

The phase noise measurements were extremely impressive bearing in mind that the R-820 employs a phase locked loop synthesiser for the first conversion, but this low noise performance is probably due to the use of an analogue v.f.o. as the frequency changing method rather than full digital synthesis. Whatever the reason, the R-820 has a quiet oscillator system and it shows when you use the receiver. Its phase noise performance is very close to the outstanding AR7030.

Spacing from wanted signal (kHz)	Reciprocal mixing ratio (dB)	dBc/Hz
5	83	-114
10	97	-131
20	104	-158
50	111	-145
100	116	-150

And that lovely analogue 'S' meter was spot on throughout its range, with the dBµV calibration being correct from 3µV at the +10dB point right up to 3mV at the +70dB calibration. Needless to say the traditional 'S' units were also bang on correct.



Thunder Out Of China

One final effect of using an entire i.f. section and pass band tuning to achieve the notch filter is that when you use the other i.f. facilities of fully variable bandwidth and i.f. shift, the notch remains on the rejected signal throughout, unlike some systems in high grade receivers and transceivers, even today, where moving the i.f. pass band also moves the notch, and the signal you thought you had rejected comes up like thunder out of China and blows your ears off. (No prizes for identifying the source of the mini quote.)

Having mentioned the other i.f. facilities which contribute to the overall selectivity of the R-820, let me tell you a little about them. Using the established pass band tuning system *a la* Collins, the R-820 used high specification crystal and ceramic filters at 8.8MHz and 455kHz to provide steep sided characteristics and a wide shift range.

At the same time, the first and second i.f. filters could be tuned in opposite directions using a single front panel control to give variable bandwidth, so the user could decide to listen to a particular signal, and without moving the main receiver tuning dial could then adjust the i.f. bandwidth to suit the signal and interference conditions, and if necessary slide the selected bandwidth filter around and across the signal for best results. (Fig. 2)

If a stonking great carrier appeared anywhere near the wanted signal, the notch could be used to remove it, in the secure knowledge that any subsequent adjustment of i.f. shift or bandwidth would not affect the notch - brilliant. As examples of the bandwidth adjustment range, the 2.4kHz s.s.b. bandwidth could be continuously varied down to a 6dB bandwidth of 600Hz, whilst the c.w. bandwidth could be varied from 500Hz down to 150Hz (but only if the optional c.w. filters were fitted).

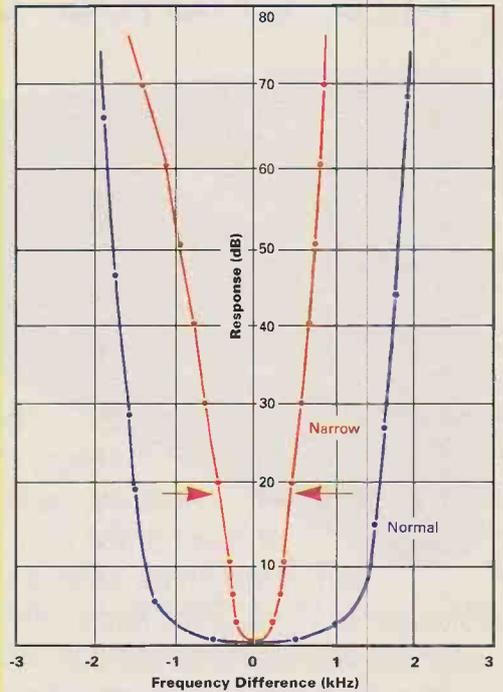


Fig. 2: The variable bandwidth characteristic of the s.s.b. filter.



In Conclusion

For a twenty year old receiver the R-820 is a joy to use. The only area in which its performance has been overtaken is in the third order dynamic range, but this is more than offset by the array of i.f. selectivity features which mean that in the hands of a decent operator the R-820 will wrinkle signals out better than almost anything else I have handled. If your interests lie in amateur band listening, buy a second hand R-820 and learn what a real receiver can do. I'm now going to go back and listen with pleasure for a bit longer before I once again pack away the 'landmark' receiver that ended the pre-microprocessor control age.

However, I am looking forward with even greater interest to the eventual arrival of the JRC NRD-5+5 - because, if JRC have done their homework on the DSP system, they might just have given us the same range of selectivity control which Trio gave us some twenty years ago. It's been a long time coming!

The choice of professionals, for high



AR7030

High dynamic range, short wave receiver, awarded table-top receiver of the year 1996/97 by

WRTH and 5-star editor's choice by

Passport to World Band Radio 1997 & 98.

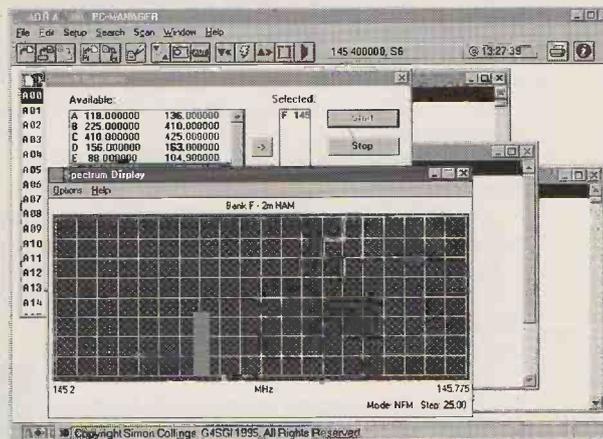
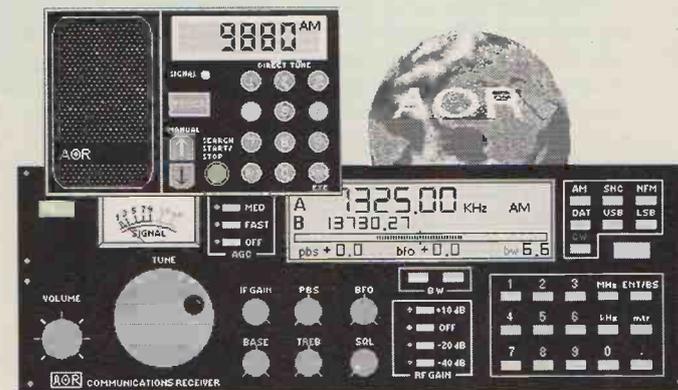
Supplied with mains power unit, infrared hand control & comprehensive operating manual. **£799**

AR7030 PLUS Enhanced version, fitted with narrow AM filter, optical encoder, features CPU with 400 memory channels with alpha-tag, multi timers, optimised IP2 & IP3, high tolerance DDS ladder components for minimum reciprocal mixing, high performance RF input transformer. **£949**

Data-Master is a PC Windows based software package for control of the AR7030, AR7030 PLUS and AR3030 receivers. **£129**

ARD-2 ACARS & NAVTEX decoder and display unit. Very simple to use, only one audio connection is required

from a suitable receiver. Can be used portable from internal batteries or external 12V. A computer port is provided for enhancement but is not required for operation. **£295**



AR8000 wide-band all-mode receiver with alpha-tag and computer control (via CU8232). **£349**

CU8232 optional interface to enable computer control of the AR8000. **£99**

PC-Manager for Windows is a PC based software package for the AR8000 & AR2700. **£49**



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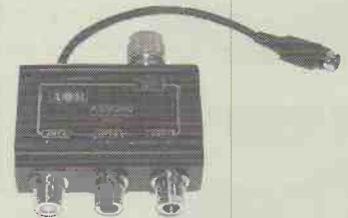
AR5000 True high performance, voted best wide-band receiver by readers of the German *Funk* magazine in 1997. **£1495**

AR5000+3 includes AFC, Synchronous AM and noise blanker. **£1749**

Spectrum-Master Windows based PC software, virtual radio & text control panels, data base, logbook and HAWK SDU control. **£129**

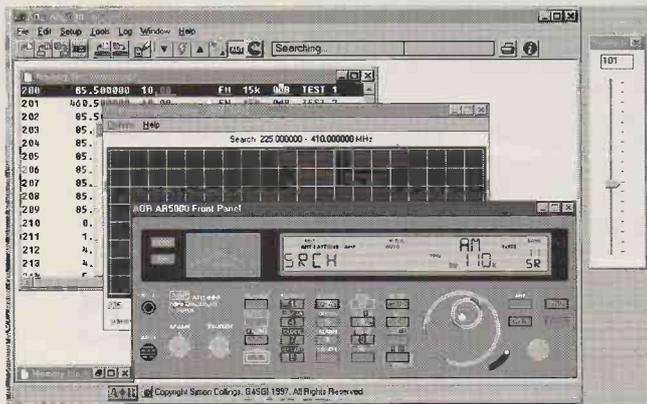
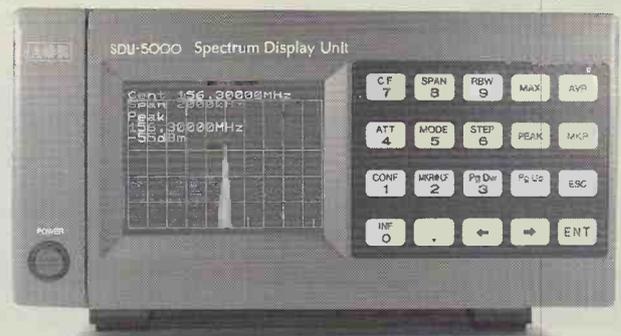


Various options are available for the AR5000 which include the AS5000 automatic aerial switch, CT5000 CTCSS squelch & search, Collins CW filter and more... Shown here is the **AS5000. £89**

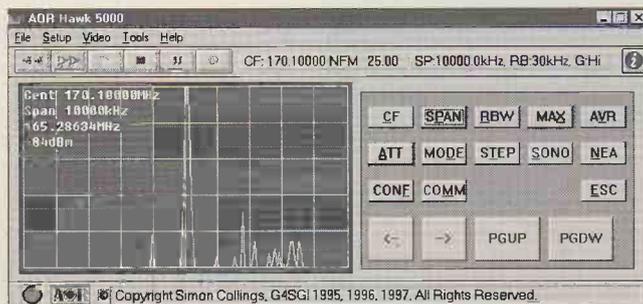
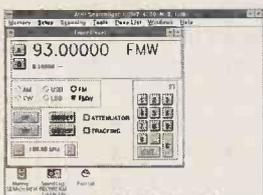


AR3000A Evolution at its very best. Wide-band all-mode receiver, high performance, respected best seller and well established. **£799**

SDU5000 Cost effective answer to spectrum monitoring. Provides a maximum of 10MHz bandwidth, built-in colour LCD with external output. Compatible with several AOR and ICOM receivers. Many facilities including dBm signal indication and frequency. **£799**



Searchlight is a Windows PC package for control of the AR3000A and AR3000 receivers. Control, memory management, sound recording and spectrum graph. **£99**

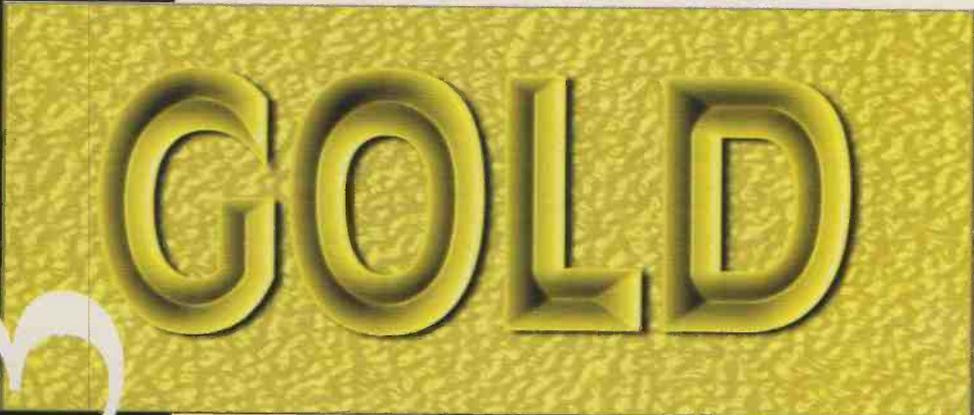


HAWK5000 is a PC Windows based software package for control of the SDU5000. A virtual display is provided with AVI recording to disk and many more features. Receivers supported by the SDU5000 will interface, this includes the AR5000, AR3000A, ICR9000, ICR8500, ICR7100 & ICR7000.

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HOKA Code3



As my main listening interests are h.f. data, my shack consists mainly of gear related to this aspect of our wide and varied hobby. As a result I don't get much of a chance to investigate seriously some of the digital signals above 30MHz.

I took up a recent offer to borrow the latest Code3 Gold and together with a shiny new Icom IC-R8500 and a 486 notebook computer, set off on a road of discovery - quite literally - into the distance as I took the combination out for a weekend in the camper.

Installation Time

The C3G package includes three items, a floppy disc, a dongle/interface and a 60 page A4 manual. Installation is explained in the manual and is straightforward enough. Requiring as you will probably guess, is a case of getting the code on the host computer's hard disk in an appropriately named sub directory, connecting the interface module and configuring the software so it knows where to look for the interface and setting up screen type. The interface is a compact affair and is built into a

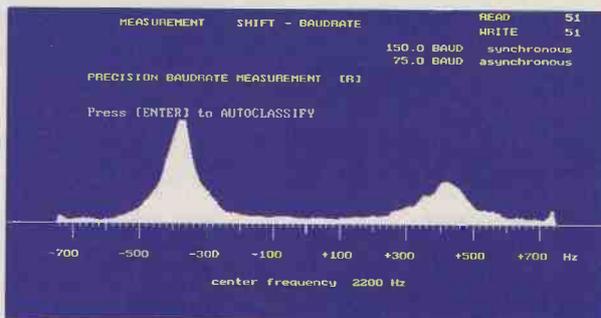


Fig. 1: The first step for all decoding activities with the Code3 Gold is to use this module to determine the two most vital parameters of any system - shift and speed. The screen shown here is actually not the Gold screen but it's almost the same. Details displayed are: Centre Frequency, Estimated shift, Off-set from centre (tuning error), Baud Rate. Both synchronous and asynchronous rates are given as there is no way at this stage of determining which type the system is.

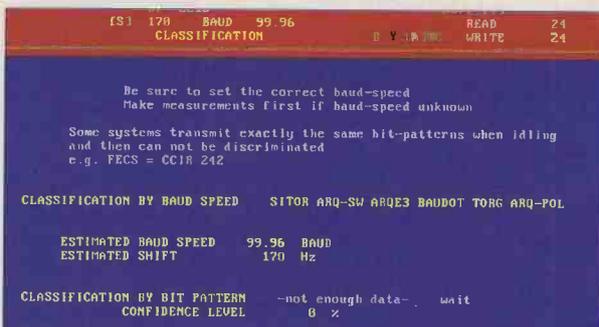


Fig. 2: The Auto Classification module at work. The module has just been initiated and is busy shuffling bits hence the 'not enough data-' message and the accompanying 0% confidence rating. Note the display of Centre Frequency - CF, Shift [S], and Baud.

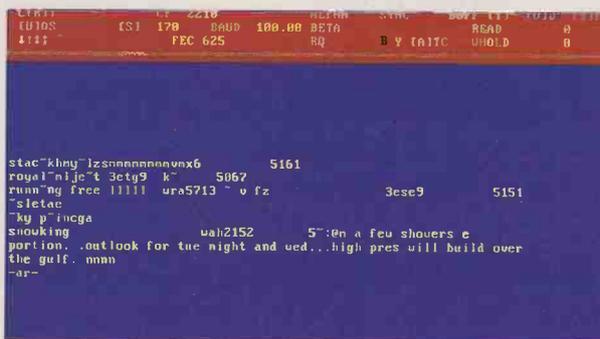


Fig. 3: Now the Auto Classification module has decided upon the mode, SITOR B or FEC 625, depending who you are. Note also the tuning indicator at the bottom of the orange top bar has been turned on. Two tone indicators can be seen illuminated.

standard serial interface 9-way to 25-way D-type adapter. This allows easy connection to either 9-way or 25-way serial ports so most machines are likely to be catered for.

A short length of screened audio lead with an in-line phono socket attached dangles from the interface which duals as a security 'dongle'.

Hoka have, with the C3G software, moved away from their usual copy protection scheme of software security key located on the installed hard disk. This change allows the easy use of the decoder on more than one PC, though only one at a time. I personally prefer this approach as it allows dual site operation without the need to de-install and the reinstall on the second machine. All you have to do is remember to pocket the dongle for use at the alternative location. The lack of an interface renders the program inoperable, since the hardware interface is more than just a comparator comprising a custom integrated circuit.

Five minutes after opening the package and I was up and running. As an existing user of Hoka products the user interface was comforting familiar. The same blue and yellow display is presented - well at least when I connected a colour monitor that is! Keyboard input is also the same old Hoka standard. Speaking of displays, though - there is no specific driver for a mono VGA screen such as the one on my notebook - fine if you're using the latest colour offering but with my six year old 486SX33 mono

machine lots of adjusting was required to see properly the status of some of the toggle indicators for the likes of 'output to disk'. This is a minor grumble but it is amazing to number of software authors that don't cater for VGA mono screens.

Once you've run through the installation routine there are two things left to do, before you can attempt to decode anything at all, first you must set the centre frequency of the 'Gold' to match that of your receiver's filters. Secondly the 'clock offset' must be calibrated, this ensures that any measurements of time and speed are accurate.

Ideally you should have an i.f. filter which is symmetrically placed in the receiver's passband. The more expensive communication receivers provide this option, it's not the end of the world if you don't have a RTTY filter though, you can use the c.w. filter or even u.s.b. (or l.s.b.) but the beauty of having a RTTY filter setting on your receiver is being able to set the receiver and decoder to operate as an optimum configuration. What I mean here, is that the signals to be decoded can be placed in the centre of the receiver's filter and you can directly read the frequency of the station being monitored. Which does help a great deal when trying to tune to a specific station that you've just heard about from a fellow listener. It helps get your log right, too.

Setting this vital centre frequency for the Code3 Gold is straightforward enough and it is explained fully in the bound A4 user guide.

Once the setting-up is dispensed with, you can get on with finding some interesting traffic. The Code3 Gold is supplied, these days, fully specified with both h.f. and v.h.f. systems - for a full list see the specification panel. This is great, as when this decoder was first introduced to the market the basic product included only the v.h.f. set-up, h.f. being an additional £100+ option!

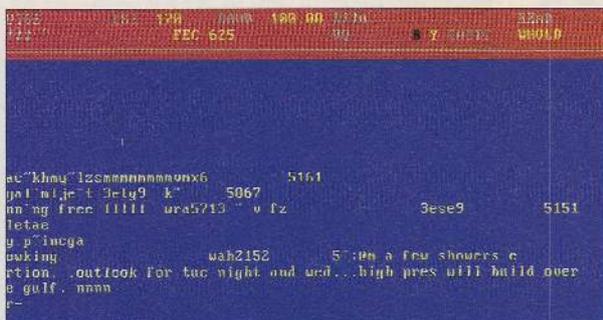


Fig. 4: Happy with the mode suggested by the Auto Classification module, the appropriate decoding module is entered. This window is much the same for all of the decoding modules. The top bar is used to display status of both the signal and the decoder.

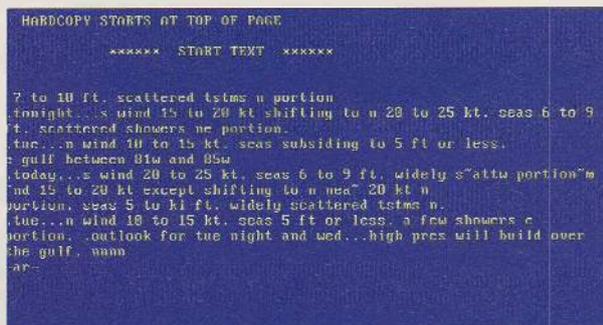


Fig. 5: The decoded text can be printed at any time, but you can't print what has been and gone!



Fig. 6: A METEOSAT WXSAT image admirably captured by the Code3 Gold.

In Use

The simplest way to use the C3G is to invoke the Auto Classification function. This is only available for the h.f. option due, I would guess, to the higher data rate used with the wider bandwidth v.h.f. systems. This would demand an awful lot of number crunching indeed.

As it is, there is a very complex task involved in determining just which h.f. system is being captured by the C3G. The way in which the classification is performed goes something like this. The incoming audio - from the receiver - is sampled and 'zero crossings' are detected. The frequency of these transitions allows the determination of the mark and space tones, to take a two tone systems as an example, though the theory is the same for m.f.s.k. systems. Once the tone frequencies have been established - allowing determining of 'shift', then the presence of each tone can be timed to give the speed. At this stage assumptions can be made about likely systems based on knowledge of typical shift and speed configurations.

The actual bit patterns received, can be captured and analysed to determine their

characteristics and compare them against systems which are decodable by the C3G. Once a match is found and it continues to check-out, the Code3 Gold reports the name of the likely system. Displayed under the name of the system is a confidence factor, which is shown in percentage. This percentage display, for a true match and a consistent signal, increments to about 80%. At this confidence level the decoder is happy with its choice and then kindly selects the appropriate decoding module which it presets with the correct shift and speed and immediately start displaying decoded text. This may be all the user has to do if the system being monitored is simple with few derivatives. If it is one such as Twinplex, with many possible data interleaves, then it is time to press a few keys in the hope of seeing clear texts

Kevin Nice couples his now ageing notebook PC to an IC-R8500 to try out the Hoka Code3 Gold d.s.p. h.f. and v.h.f. decoder.

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Is It For You?

The whole point of the review process, is to enable you, the reader, to evaluate a product without actually using it. The obvious question that arises is "should I buy one?" In answer to this query I have the following to say. If you are interested in setting up a decoding station and your interests are in ACARS or POCSAG alone then the Code3 Gold is competitive and performs well. If you require a well specified h.f. decoder then again there aren't many choices. Of course, you'll need to have a PC and a suitable receiver.

Then there's the next stage of wanting to do some serious analysis...but that's another story and another product.

The Code3 Gold is available from Hoka Sales UK, PO Box 2630, Eastbourne, East Sussex BN20 9RU. Tel:/FAX: (01323) 487919. E-mail: Hokasales@pavilion.co.uk Price is £369 plus P&P and insurance.

Specifications:

Synopsis:

The Code3 Gold is the latest incarnation of the capable Code 3 series of decoding software. Arriving in a newly repackaged interface, now fitting into a dongle style standard r.f. shielded serial connector. This interface needs no external power supply, with all power coming directly from the PC serial port. Both 9-pin and 25-pin serial connectors are supported. For Windows 3.1 users, the software will run in a DOS Window. This package is aimed at those who wish to decode the systems found on the h.f. and v.h.f. airwaves but if you want to get into the underlying details you will find that only the basic analysis tools are included. For more advanced tools a Code 3 or Code 30 is recommended.

Modes Decoded:

The v.h.f. and h.f. systems include: ACARS/SITA, POCSAG (All known baud speeds - 512, 1024, 1200, 1536 & 2400), DTMF, Packet (300+1200), Baudot, ASCII, Sitor ARQ/FEC, Pactor, Fax (FM and AM Meteosat) and SSTV (Martin 1 only). Annex10, Hell, Morse, ARQ-S, ARQ-SWE, ARQ-E, ARQ-M2/4 (CCIR242/CCIR342), ARQ-N, ARQ-6, ARQ-E3, POL-ARQ, Twinplex, Artrac, F7BBN Baudot Twinplex, FEC-A, FEC-S, Autospec, Spread, HC-ARQ, TORG10/11, ROU-FEC, HNG-FEC, Coquelet8, Coquelet13, Piccolo Mk6, GMDSS/DSC and SYNOP (AAXX/BBXX with a 10 000 station database)

Analysis Tools:

AutoClassification
Oscilloscope
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Extras Required:

PC with 386DX40 or more. 486 HIGHLY recommended. VGA supported (SVGA supported with Tseng ET4000)

scrolling across the Code3 Gold's viewable area.

My brief description is an extreme simplification of the processes going on and assumes a very good and consistent signal to noise ratio, no interference from other signals, no phase distortion due to ionospheric change, no multiple reflections, etc. In reality all these things are present, and the auto classification becomes of limited use.

There is however nothing quite like the thrill of tuning in a data signal and watching the decoder work out the system, automatically set-up the correct module and start displaying clear traffic for the first time!

It is the algorithms that make this possible that make the difference between the experience of a company like Hoka and the authors of shareware decoders. Hoka have many man years experience in writing professional data decoding systems for classified systems that we hobbyists don't even know exist!

If you are more than a raw beginner and you have acquired the ability to recognise the sounds of the various different digital systems that pervade the airwaves, then you can manually select the appropriate decoding module from one of the Code3 Gold's main modes menu.

The key here is to have first use the 'Shift Speed' measurement module, this will allow the decoder to store the measured values both the shift of the mark and space tones and the baud rate. Upon entering the chosen decoding module all that is required to use these predetermined values is to depress the 's' key and the 'b' key twice and the values are transferred. Then off you go decoding commences. Just so long as the correct

module is selected and you are accurately tuned to the signal.

The choice of mode take many hours of building experience, but as all dedicated data enthusiast will tell you this is where the fun lies!

Accurate tuning is aided in the decoding module by a tuning bar which is toggled by pressing the 'g' key. Two markers are displayed hopefully either side of the centre datum. If they are not located symmetrically you need to retune. Here the Code3 Gold, like all the other Hoka products is of help, you have the choice of either tuning the receiver frequency, or if your receiver isn't able to tune in fine enough steps, you can change the centre frequency of the module by using the '←' and the '→' keys on your keyboard. The down side of resetting the module centre frequency is the you'll have to do some addition or subtraction to determine the station's correct frequency.

The step size of each increment applied to the module is dependant to the actual module you are in, but for example, the Baudot increment is 5Hz, in the tightly specified Piccolo module you are able to shift by 2Hz increments. For larger steps you can hold the shift key whilst depressing the arrows.

As an aid to navigation around the Code3 Gold there is a rudimentary on-line help facility provided. Which ever module is being run, depressing the '?' invokes the context sensitive help. This allows checking of the typical settings for each of the decoding modules. A handy page of likely modes based on measured speed and shift is invoked from the speed/shift measurement module.

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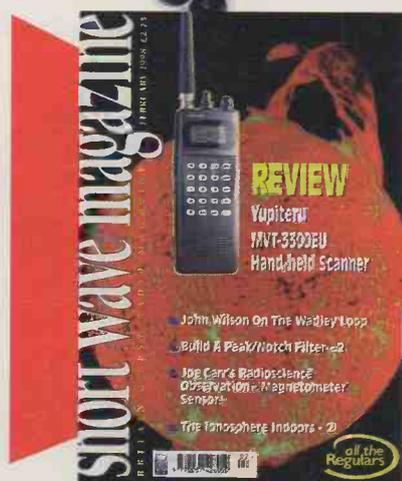
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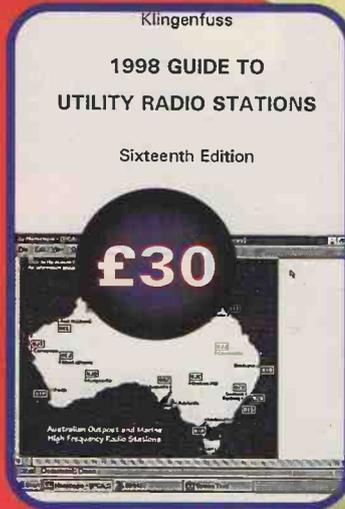
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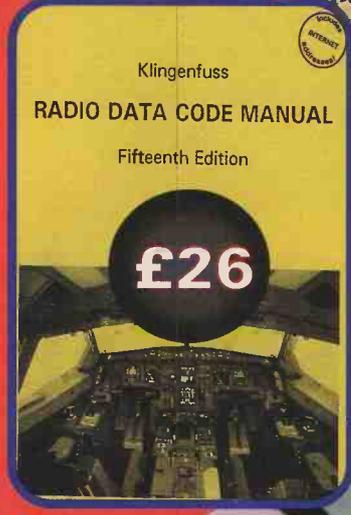
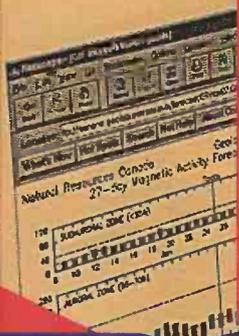
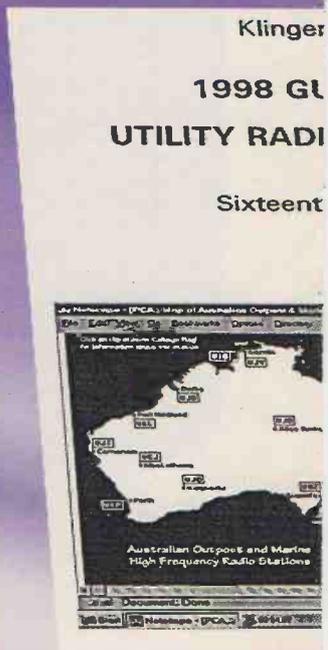
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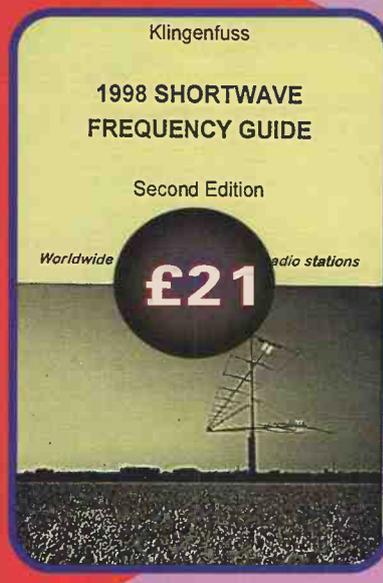


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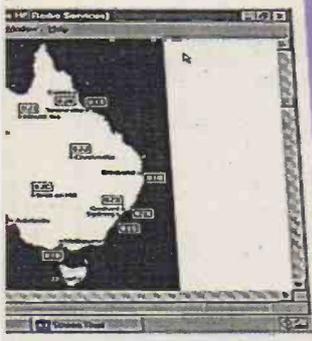
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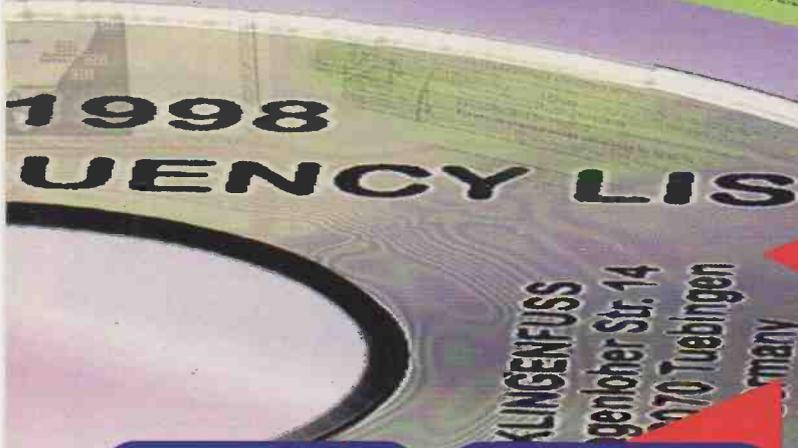
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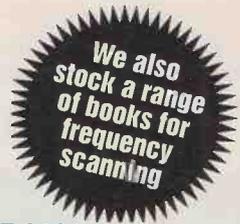
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Concorde

Bill Hillier writes in with some info on *Concorde* for the benefit of **Derek Hine**, who's letter was mentioned a few months back. As the information was so useful, I thought that it was worth repeating here for the benefit of everybody else interested in this unique bird. I know that *Concorde* seems to get more than its fair-share of mentions, but every time I mention it in this column, I get deluged with letters asking for more information.

Bill has had an avid interest in *Concorde* for a couple of years, and regularly listens to *Concorde* as it flies up and down the Bristol Channel to and from the US. He regularly sees the vapour trail as *Concorde* flies inbound to Heathrow at approximately 1655 local every day, at what is normally 37000ft; soon after, it gets instructions to descend and expect to be 14000ft, 64km before the reporting point of OCKHAM, which is just south of Heathrow.

To give you an idea of the best time to hear *Concorde*, Bill has provided the following approximate timings:

Outbound from Heathrow 1025 daily (Callsign Speedbird Concorde 1/BAW001).

1055, South of Cardiff, usually getting clearance direct to the supersonic acceleration point (51°24N 003° 50W).

1105, briefly contacts Shanwick Oceanic to get their Oceanic clearance.

1120, working Shannon Control, south of Ireland.

1130, passing 15°W, contacts Shanwick on h.f. 5.649MHz for a selcall check.

1145, position report at 20°W on 5.649MHz.

1205, position report at 30°W on 5.649MHz. After passing 30°W, *Concorde* changes frequency to 8.879MHz and works Gander. **Inbound** to Heathrow daily (callsign Speedbird Concorde 2/BAW002).

1545, position report on 5.649MHz at 30°W.

1605, position report on 5.649MHz at 20°W.

1615, at 15°W contacts Shannon Control on v.h.f. This flight lands at Heathrow at about 1725.

Outbound from Heathrow at

1900 daily (callsign Speedbird Concorde 3/BAW003).

1925, South of Cardiff with clearance direct to the acceleration point.

1930, contacts Shanwick Oceanic for clearance.

1955, with Shannon Control, south of Ireland.

2005, at 15°W contacts Shanwick on 5.649MHz for a selcall check. 2015, position report at 20°W on 5.649MHz.

2035, position report at 30°W on 5.649MHz.

2055, position report at 40°W on 5.649MHz.

2115, at 50°W *Concorde* switches to v.h.f.

From personal experience, this flight usually leaves Heathrow at 1920 (±5min), so you should add 20min to each of the times listed for BAW003. Although I live about 8km from Heathrow, the take-off noise of *Concorde* is very distinctive (certainly louder than anything else).

Inbound to Heathrow daily (callsign Speedbird Concorde 4/BAW004).

2030, position report on 5.649MHz at 40°W.

2050, position report on 5.649MHz at 30°W.

2115, position report on 5.649MHz at 20°W.

2125, at 15°W contacts Shannon Control on v.h.f.

This flight usually lands at Heathrow at about 2225. Of course, the other airline operating *Concorde* is Air France, and they fly from Paris/Charles de Gaulle airport to New York. Their flights fly across northern France and reach The Channel near Le Havre, before heading for their acceleration point (does anyone know the lat/long of this?). Bill reports that he has monitored the Air France *Concorde* flights on h.f. as follows:

Air France *Concorde* 001 from New York to Paris daily, on 5.649MHz, working Gander or Shanwick:

1950, position report at 40°W.

2010, position report at 30°W.

2030, position report at 20°W.

Estimate 15°W at 2045, where it contacts Shannon Control.

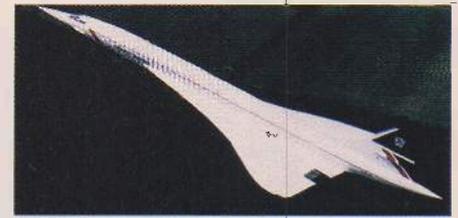
According to Bill, this flight arrives in Paris at about 2145. A quick check with my local travel agent shows this flight arriving at 1745, which is 1645UTC, so I am unsure which is the correct time.

Air France *Concorde* 002, from Paris to New York, on 5.649MHz, working either Shanwick or Gander: 1120, selcall check at 15°W. 1135, position report at 20°W. 1145, position report at 30°W. At 30°W the flight changes frequency to 8.879MHz and is then controlled by Gander. According to my information, this flight leaves Paris at 1100, but this is 1000UTC, so 1 hour and 15 minutes to 15°W seems a bit much to me. Can anyone confirm the arrival and departure times of the Air France *Concorde* flights from Paris?

Bill makes an interesting observation about these flights. It is possible to hear three different *Concorde* flights working the same h.f. frequency at the same time. At about 2000, there should be three flights in the air - Air France 001, Speedbird 003 and Speedbird 004. The main h.f. frequency is 5.649MHz, but can change to lower or higher frequencies if conditions dictate.

Bill says that he would like to know the v.h.f. frequencies used by *Concorde* as it departs from London and heads towards the Bristol Channel. If anyone can provide these, I will pass them on to Bill. He also wants to know the frequencies used by *Concorde* as it flies between Paris and The Channel - can anyone help? For the record, here are the selcall codes of the British Airways and Air France *Concordes* taken from *High in the Sky*.

British Airways		Air France	
BD-CM	G-BOAA	EJ-AD	F-BTSC
BD-EG	G-BOAB	HL-FG	F-BTSD
BD-FH	G-BOAC	DH-AB	F-BVFA
BD-AK	G-BOAD	DG-KL	F-BVFB
BD-CF	G-BOAE	DG-KM	F-BVFC
AG-EJ	G-BOAF	DG-LM	F-BVFD
BH-FJ	G-BOAG	AK-HJ	F-BVFF



In my research for this item, I came across an interesting page of the World Wide Web which gave details of *Concorde* flight arrivals and departures at New York. Although this is US-based information, it does contain a lot of detail about flight-numbers, times and frequencies. The URL is http://www.li.net/j4dice/scanning_info/concorde

I would assume that Bill already has a copy of Godfrey Manning's *Airband Factsheet*, as this contains two maps showing the supersonic routes across the Atlantic and around the south-western approaches. Copies are available from the SWM Editorial Offices enclosing a s.s.a.e., and Godfrey's column usually includes full details of how to get a copy each month.

More Cubana

Following on from the recent item about Cubana Airlines flights across the Atlantic, **Noel Fairhurst** writes with details of a flight that I was unaware of. It seems that Cubana now operate a weekly flight from Manchester directly to Havana on every Friday, and (presumably) the return flight is overnight Thursday/Friday. The flight is operated by a DC-10 aircraft, and uses the callsign Cubana 425 between Manchester and Havana. Noel reports that one Friday afternoon he heard the flight working Santa Maria ATC in the NAT-E network on the frequency 6.628MHz.

Questions

Richard P. from Oxford writes to ask about some signals which he has heard. Richard says that he has picked up a ship on 4.149MHz with a crew member talking to somebody on shore, passing engine information and weather report information. Well Richard, I have personally never heard anything on this frequency, but it is used as a simplex frequency by both ships and coastal stations; it can also be used for inter-ship cross-band working. The adjacent frequency of 4.146MHz can be used for exactly the same purpose.

Richard also questions a synthesised voice broadcast which he picked-up on 4.645MHz. He says that the broadcast included details of VOR, DME and ILS availability, the air temperature (-6°C!) and which runway was in use. Well Richard, this is quite a well-known broadcast - it comes from Tallinn in Estonia, one of the former-Soviet republics on the Baltic Coast. The broadcast actually relates to the civil airport at Tallinn, known as Tallinn/Yulemiste.

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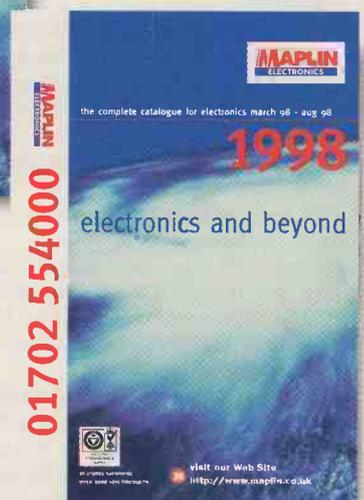
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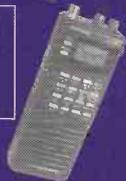
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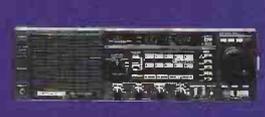
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No scanner goodies here this Christmas but a chance to listen out on h.f. during Christmas Day/Boxing Day morning. Did anyone else hear the distress call from the Dutch registered vessel *Aruba*, callsign PJSJ, the crew of which abandoned ship due to fire aboard at 01°13N - 031°20W? The crew of 14 abandoned and the distress traffic was handled by stations both sides of the Atlantic but with St. John's Radio co-ordinating? Land's End, Malin Head and also Stornoway Coastguard were also heard. I'd appreciate any information anyone may have on this dramatic scenario. I listened through to 0400 on Boxing Day morning but had to leave it then!

A telephone message now from **G4GDL Robert** who works as the communications officer with 115 Peterborough Squadron of the Air Training Corps. Robert informs me that the ATC net can be heard on Sundays and on Wednesday nights on various h.f., v.h.f. and u.h.f. frequencies and would like to request QSL cards from amateurs and others who catch them on. The ATC also operate special event stations such as the GB ATC series and, while they cannot reply to any QSLs, would appreciate any you may wish to send. You can 'phone Robert on (01733) 760005 or write to him at: 21 Clayton, Orton Godhay, Peterborough PE2 5SB.

He also tells me that the squadron enjoyed a visit to an Architect Station before Christmas and that it was a brilliant session which allowed him to see just how things work in the RAF. Please try and QSL if you possibly can! Some frequencies available for those who might be interested and who have a unit near to them can be found as follows:

149.275, 149.400, 153.825, 158.825, 159.625 - v.h.f. and 435.750, 435.625, 456.8625 u.h.f. Keen readers will have spotted that these are listed, variously, but they can be confirmed as being used. Also, Sea Cadets have been reported on **69.300 a.m.** Lower down, the ATC can be heard on their channels Victor 11 - **37.300, V12 - 36.800, V13 - 38.100 and V14 - 40.200.** Nets can also be caught variously around the country and I would try out **69.225** or **69.975.** Again, do let me know what you get.

Overload?

Problems now, and a listener in London - **John Mathews** - asks for help. John has an MVT-7000 scanner but encounters problems with it at around 140MHz when using a Telegain antenna. John tells me that he also attaches a discone...by which I suspect the reason for the overloading is that he is using, in effect, two antennas! If this is the case, then you need to use one antenna and not both. However, it could be this is the way I am reading the letter. If overloading continues then your problem is the connection of the two antenna to the set, causing intense overloading to the front-end. Be careful or you could blow it, John - and that's expensive. My advice would be to disconnect the telescopic and re-connect the discone and you'll see a difference. Let me know what happens. One possible problem here is that some form of overloading is obvious and to get rid of it you may be advised to purchase a notch



RNLI Relief fleet Arun class in rough seas. photograph Malory Maltby.

filter. In simple terms this is a high Q tuned piece of kit which, used in line with the roof antenna and scanner, can then be adjusted to attenuate the irksome signal. Seeing as you have problems in the 140MHz area, you may be wise to purchase a type made by Garex. Fitting is simple as it goes in line and allows you to tune out the problem. Other types available are the Scanmaster SNFI 70, which gives a good notch of around 30dB plus a handy rejection figure of 70dB below 1.7MHz, or the medium and short wave bands. It is priced at £27.95 and available from Nevada.

Many thanks also to **DP** of Humberside for his copy of a book produced for a radio club which contains all of the Humberside frequencies on v.h.f. and u.h.f. I found it well produced and very nicely made. It shows that some areas can log in all their locals and then distribute them for the benefit of all. However, DP did not send any contact name or address and I can guarantee a response from various Humber-based individuals who will want both a copy and the address of the club concerned! If you're reading this, DP, can you oblige? I'll make sure the info only gets to those who enclose a stamped envelope, which I will forward on to you. Nothing on the envelope, please - just a stamp and if DP gets in touch then I'll forward the mail.

Anyone in Burnley fancy getting together with a like minded enthusiast? Are there any clubs in the area which welcome new members? A letter from **D. Whalley** asks for anyone interested to assist him in getting the most from his hobby. He has purchased a DX-394 receiver and would love to hear from others about the hobby. If you do send in, I have a copy of Mr. Whalley's address and I will forward on all details. Please try!

Colin Westel of Avonmouth writes to ask if I have anything on what used to be the old Royal Observer Corps frequencies. Colin was an ex-ROC member and is new to scanning, having just purchased an MVT-3300, and asks if their old channels are still in use. Well, yes, they are. The set of frequencies were used in the 452MHz allocation as a connection with the UKEWMO and ROC. This was done via a microwave link around 1.668-1.670 paired to 1.698-1.700GHz area. Its primary function was as a back-up should telephone land lines be taken out in any confrontation. How a microwave mast might survive an explosion was, ahem, another question - but there you go. Forward planning and all that!

However, there were also lower frequency links between 168/174MHz and at 466MHz. This equipment has now been handed over to local authorities for use by the emergency planners. Carriers at 452MHz can be heard most places in the UK and carry both speech and teleprinter traffic on a simultaneous basis. Some have been allocated to other users as well. You could try having a listen on **166.4375/171.2375 f.m.** as this is the National Channel 1. Also try **466.100/466.225**, both designated Emergency Communications Network Local Authority Open Carrier National. I'd be interested in what you can pick up. Staying with ROC matters for a bit - what became of their underground posts?

Tina McAvoy of Llanystumdwy - which was Lloyd George's old stamping ground for the historians amongst us - asks about rally frequencies. I don't have much on this, I'm afraid Tina, but what I do have I will, of course, share. The RAC 1995 Rally ran a number of channels, but team use - which is what you ask about - was a mix of scrambled and plain voice. I believe most channels will become scrambled eventually. However, on that year's run, Nissan were heard on **169.0125**, Subaru on **457.2875/462.7875** and Ford on **457.4875/462.9875**. By the small spacing between them, you could effectively scan between say 457.000 and 463.500 and possibly catch a few more. What will happen at the next rally is anyone's guess, but maybe these are good places to try and find out what's what.

Gordon Howe of Prenton, Merseyside, asks if I have frequencies for airships. Hmm...perhaps Godfrey Manning is your man as he is the undoubted aviation expert and I don't dabble in that area since Peter Bond came along. However, from memory, I would suggest that you try **130.575**, which I heard being used by Airship Industries as an air-air-ground link. This frequency is also confirmed by PROMA.

Franklyn Thomaston of Howgill 'phoned to ask if I have news on frequencies used by private rescue services. He recently spent some time on the Solent and wanted to know if I knew of anything around there. Actually, I do know one. Gosport and Fareham have a private inshore rescue service and they can be heard on marine v.h.f. channel 50 **158.550/163.100**. As an aside,

Continued on page 60

Satellite TV News

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

Looking back on 1997 we saw the onwards march into digital satellite transmission, enthusiasts are now experiencing a noticeable reduction in news feeds and outside broadcast links to the studio. Fortunately many operators still use their existing analogue equipment and will do so for some years - for example Intelsat K at 21°W is still very active and Roy Carman (Sandown, IoW) logged no less than six analogue, location to studio, video circuits at 1730UTC via DFS Kopernikus-2 @ 28°E. Despite the EBU maintaining they are going digital, sound in sync transmissions still prevail such as the 'Asiavision' news compilations around 0900UTC on Eutelsat II F4 @ 7°E - though certain of the EBU circuits are in digital and more will go that way this year. There's still a degree of confusion over digital receivers - me included - software updates seem to appear every few weeks and comments from those already using Nokia digital receivers say that programming in digital programming/feeds is time consuming. New receivers are appearing with auto locking i.e. they self-adjust to the incoming FEC/Bit rate/PID. I'm sure the 2nd generation digital receiver will be much easier to use, I'll wait a little longer before parting with the hard earned readies!

Roy Carman being aware of the reducing number of satellite feeds is already considering a receiver this year such as the Nokia 9600. Having said that, he has sent in a very extensive listing of his analogue receptions this past month, proving that there is still analogue life in the Clarke Belt!

Wintertime and skiing is everywhere but other sporting items have included the Lipton World Cup Finals from Jakarta, Indonesia, the World Handball Championships and, of course, football.

December 17th and whilst monitoring the Reuters Moscow lease on Intelsat K (11.533GHz hor.) up come various shots of the MIR control room in Russia (0840UTC). Orbital tracks showed the MIR passing SE towards Saudi Arabia, apparently they were awaiting a reverse video feed from MIR to Moscow. Later at 1300UTC Kopernikus DFS-2 (12.730GHz vert.) relayed excellent pictures from inside the MIR space station and from another docking craft external to MIR.

I've been watching the programme output from IRIB, Iran via Hot Bird 3, 13°E, 12.436GHz hor. and it's worth checking out these programmes, which are something completely different. Much of the output is sourced from the University of Sahar and production standards are pretty basic. Content seems heavily religious, competitions such as contestants chanting from the Koran and finding the best offering compared to a 'professional' caller to prayer. Another evening had cloaked and covered children with more religious competitive singing. IRIB offerings are better and in programme intervals show truly beautiful scenes of Iran. Check it out!

Hugh Cocks (Algarve) has been battling with a Nokia 9200 and digital reception, suggests its about time that the computer and TV folk got together to make user-friendly digital satellite receivers! Most of the Norwegian programming on Intelsat 701 @ 1°W has now departed for the Thor sat at 0.8°W which has poor footprint coverage into Portugal compared to 707, much anguish from exiled Scandinavians!

The story also runs that the vertical transponders were wired horizontally and vice versa to the advertised and expected parameters!

Sports feeds, and of course Dean Rogers (London SE2) comes into the frame. He revelled in December's coverage of golf - the Sun City Million Dollar Challenge from South Africa - he monitored on Eutelsat II F2 @ 10°E (11.163GHz hor.) the European distribution feed (analogue) taken from the digital World feed going into Australasia, Hong Kong, the USA and the UK's Sky Sports. This was in clear video with audio FX 6.60MHz and FX + commentary 7.20MHz. UEFA Cup football and other Euro-football was extensively screened with the Telecom 2C @ 3°E being a good source for free 'footie' viewing. Check out the 12.60-12.70GHz vertical chunk of spectrum for premium football.

December 11th at 1830UTC and 'Pegasus Test' via Intelsat K @ 11.498GHz, merely colour bars and then they cut. I wonder if digital activity was apparent within the analogue signal? But more predictable are the GMTV Breakfast Show OB feeds usually on Intelsat K around 11.497/11.532GHz. They always ident with colour bars and captions such as 'GMTV OB UNIT 1' and UKI-149 or UKI-264 (SISLINK 27). December 17th and lots of snow hit the UK causing traffic chaos. SISLINK 27 is sat atop a bridge over the M3 with traffic rushing underneath and the reporter commenting on the state of traffic play.

The day before UKI-257 (SISLINK 26) was at the races (unknown course) and on-air 0730.

Our old friend the BBC Plymouth satellite truck (UKI-231) appeared in analogue with Christmas greetings from the Devon village of Chagford, carols etc., though this time not via Orion-1 but on the Intelsat 27°W bird.

Reflections of more violent times came on December 22nd when up came an analogue circuit in NTSC on Orion-1 37°W @ 12.584GHz vertical and ident 'US TV POOL SARAJEVO' 0835UTC. Later the same day a revised ident 'US TV POOL TUSLA' came up and pictures of President Clinton visiting the US troops in Bosnia. One shot identified the base as 'Eagle Base, Tusla, Tuzla, Bosnia'. A few minutes later when looking for the inclined and rare catch Eutelsat I F5 nominally 25°E I found very strong carriers in both Ku and Telecom band - I was later advised that this was Astra 1G on test at 24°E prior to slotting at the prime hot spot 19.2°E stable.

Nicholas Earley (Victoria, Australia) is using a Nokia 9500-S digital receiver which is performing well though the handbook isn't too complete and doesn't mention the all important red menus, "though once you get the hang of it is easy to use". Nicholas uses a 1.5m dish in the garden for Ku and is considering fitting a C-band (4GHz) LNB. The Golden West Network (a remote area broadcaster) is now using encrypted MPEG-2 transmissions on PAS-2 at 12.265GHz vertical with 16200 K/bits and FEC @ 1/2. He comments this is odd when other broadcasters use analogue with Irdeco encryption on the Optus B3 satellite!

Correction...fellow columnist Godfrey Manning ('Airband') points out a captioning error in the January, 1998 column - the picture showing live digital pictures from the cockpit of a rescuing craft nearing MIR...in fact they are live pictures from a rescuing helicopter cockpit over Siberia!

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Check out Hotbird at 13°E for the programming from IRIB/SAHAR, Iran.

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MIR progress seen via the Reuters Moscow output lease on K.

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 6.6 AND 7.4

REUTERS TELEVISION

Can anyone offer suggestions for the Pegasus Test?



RTP Lisbon, earth station via Eutelsat II F2 at 10°E.

Orbital News

New channel update - 'African-Caribbean Satellite Television (ACTV) is an Afro-Caribbean channel targeting black pan-European audiences and launches in the UK and Europe via Eutelsat II F3 @ 16°E in April broadcasting daily between 2000-2200 local. 'Forum Planete' is a new digital channel via the French CanalSatellite platform and showing documentaries and current affairs content. Sky Latin America launched over Christmas across Latin America and offers 75 clear, encrypted and PPV channels. Palestine has reserved five satellite channels in a DTH agreement with the WRC. Sweden's TV8 hit the airwaves last October 15 offering a daily service from 1730-2400 local with mainly business and news content in both analogue and digital via the Sirius 2 5°E bird. Astra 2A will slot at 28.2°E and use 250MHz of spectrum space 'leased' from the Kopernikus-DFS-2 satellite (28°E) thus avoiding confrontation with Eutelsat who have carefully guarded the 28°E slot as their own. Australia's Optus Vision are planning video-on-demand (VoD) in Hong Kong and the UK within the next 2-3 years.

More on the two African channels recently launched - African Independent Television operates on a 24-hour basis from Intelsat 601 @ 34°W with programming sourced from a new TV studio outside Lagos. Minaj-TV is based in Obosi, Eastern Nigeria and uses PAS-3R @ 43°W for digital distribution of its programme output across Africa, both services operate in C-Band.

In the drive for more spectrum space there have been discussions between the FCC/ITU over use above 30GHz - Ka-Band. This may be subdivided down to Q-Band 36-46GHz and V-Band 46-56GHz.

Not a happy Christmas for News Corporation with news of the Russian Proton K launcher failing to put AsiaSat-3 into orbit, instead of a 110 second burn in the final orbit push it fired for just one second and the satellite has been abandoned to eventually burn up on re-entry. Cost nearly \$300 million - they've also lost

their no-claims bonus!

Happier are the Arianespace group in Kourou, French Guinea with their Ariane 5 launcher flying successfully after their spectacular firework display when their first 5 launcher was aborted shortly into its first flight. A further qualification series 5 launch will take place in the spring and there-after - if successful - commercial launches will commence in the Autumn. Already booked for series 5 launches are Intelsat birds are 901 @ 60°E; 902 @ 62°E; 903 @ 24°W and 904 @ 34°W.

France's CanalSatellite and Television Par Satellite (TPS) are expected to join forces this Spring with nearly 1.3 million subscribers. AB Sat have also agreed to share common encryption access and the German Bertelsmann and Kirch groups have agreed to stop selling the Kirch d-Box and to use the proposed EU digital standard for the Premiere platform.

Shell Oil are seeking tenders for a mega VSAT (very small aperture terminals) network comprising 11000 satellite systems across Europe.

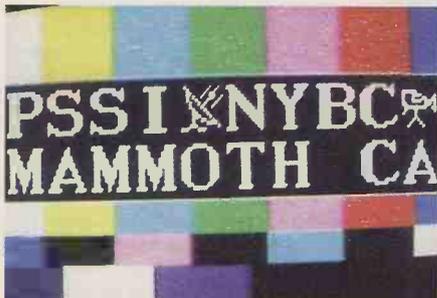
Piles of press releases! Intelsat advise the telemetry problems on their 605 craft are resolved and the bird is relocated now to 27°W.

Intelsat 806 will launch March '98 and slot at 40°W for Latin American coverage. Intelsat have given their ancient 515 satellite to Columbia and to operate same at 37°W and as part of the deal acquired use of the former Columbian 41°W slot (TDRS-4). Additionally Columbia may lease back 515 capacity to Intelsat if requested - now known as Columbia 515.

New bird in the sky is Intelsat 804 that flew December 21st slotting in at 64°E with 38 C-band and six Ku-band transponders. In South East Asian skies Intelsat's APR-1 bird at 83°E arrives July '98 offering 39dBW C-band coverage. K-TV flies Spring '99 with total Ku-band output up to 55dBW suitable for 'Direct To Home' with 0.55m dishes.



A more exotic DX reception via Orion-1 at 37.5°W.



Skiing ex British Columbia carried via PAS-3R at 43°W.



Summer recap, Ken eventually turned up!

Scanning

Continued from page 58

Franklyn, you may also like to know that the Auxiliary Coastguard use Channel 99 - 'double niner' - on 160.600. This is nationwide. I'd appreciate any private rescue company frequencies, stickers and so forth out there! As an ex-RNLI man and passed coxswain of fast rescue craft, I'm still very much into this area of maritime activity. Please do send in what you have.

I'm indebted to an un-named military source for the 'phone call concerning Army frequencies. This gentleman reports good activity on 39.800 as a Helio link. 36.250 as 847 NAS Royal Marines - who fly their own choppers - and both 38.825/51.100 as ground stations. Possibly used in exercises like Hazel Flute and so forth, the channels continue to be used when exercises are on. May be worth a listen when there is a TACEVAL or the like in progress.

US Scanning

In January's column I promised that I'd keep you posted about events in the US on scanning. It's all gone very quiet I'm afraid, although I do have it on reasonably good authority that the move has been quietly scuppered. Anyone confirm or deny this? On the double image problem with scanners, any moves to tighten up listening would probably bounce back into the manufacturing of scanners, and make image rejection better. I can't really advance on that as my contact has been

silent! However, as the scenario unfolds I will let you know what's going on.

Keen scanner users may like to know that the Paul Wey, Karl Ashby duo have their excellent list out on disk now. You can contact Paul for a copy - subscriptions are £12.50 and Paul would prefer to supply the list on disk, though print-outs are available at the same price due to copying costs. My advice is go for the disk, as this includes regular updates. Paul can be contacted at: PROMA, 4, Icknield Way, Baldock, Hertfordshire SG7 5AJ. Tel: (01462) 893826.

Extra lists are also available on items such as ahem, security force organisations...if you catch my drift! My opinion? Paul produces the best available scanning guide with hot frequencies and up to the minute news and new moves, etc. I appreciate the fact I get my copy free in return for advertising this but, as I also get many commercial items as well, all I can say is that if you want a comprehensive list filled with frequencies and info - this is the best possible place to start. No scanner should be without it! Likewise, Javiation's airband guides are - in my humble opinion - also the best. And no, I'm not saying that because I got this year's free. I didn't, and haven't-but if they'd like to send one along for approval!

Notes on the supposed TAV crash from a previous issue on the Isle of Lewis crash. A TAV is an acronym for Tactical Air Vehicle - military jargon again which basically means fighter aircraft. A bit like saying 'watch your 180' when you mean

'watch your back!' The news is...it isn't logged! An aviation source in Northern Ireland who operates an extensive station on 24 hour logging with tape back confirms that on the date in question nothing unusual was heard. Thanks to all those who sent cuttings in from the local paper. In this case, I checked the authenticity of this reporter with aviation monitoring groups and his credentials were above board. Two telephone calls with him also confirmed he knew his stuff by dropping 'names'. I'd like to thank all of my aviation sources on milair for their continued info sharing of such things as TAD lists - up to date, pukka ones and absolutely correct - and hope we can continue to keep this area going. Peter Bond deals with this in the magazine but my own sources - culled and kept from when I carried milair in this column - are still jealously guarded and maintained and no, I'm not going to share them with anyone! I'm still into milair all types h.f., v.h.f. and u.h.f., but request that general enquiries are directed to Peter.

Well, I guess that about wraps it up for another month then! Keep all the info flowing and watch the column masthead for an E-mail address which will appear soon. I've just landed a senior position with a leading charity as a Qualified Social Worker and intend to splash out on a new PC 'soon' with Internet facilities - which should ensure I get around a bit more! I guess three years in college eventually paid off!

All letters with an s.s.a.e. please - or no reply! All the best!

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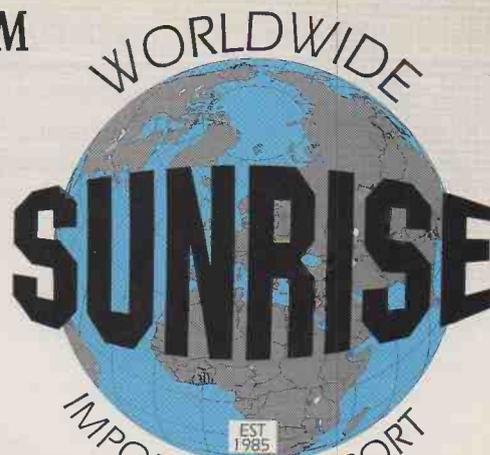
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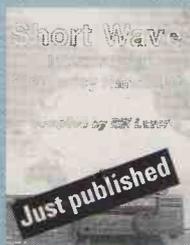
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Air Defence Radar

I am grateful to all the readers who sent me letters and information on this subject. As I have used a fair bit of column space on ADR recently, I am going to move on to other items this month, but don't worry the subject will return in the near future.

Channel Spacing

I know that many of you view, with some trepidation, the future introduction of 8.33kHz channel spacing to the United Kingdom airbands. The following, is the latest information and was released towards the end of 1997. The original implementation dates for the UK and Europe have been delayed by a year and they are now planned as follows. The **official date** for Europe to start operational use of the new spacing is the 1 January 1999. This will apply to all airspace, above Flight Level 245 and for France only, above Flight Level 195. The future plan is to then apply this spacing to all countries above FL195, by the year 2003. There is a meeting due in Brussels during early February to discuss the final details for the introduction of this new spacing into Europe. Pre-empting this meeting, word has reached me that several of the European countries have already stated that they will not make the January 1 deadline and may well have to delay the introduction well into 1999.

The United Kingdom, are planning to introduce this spacing during the year 2000, although no exact date has yet been published. (Probably because they want to see what sort of chaos ensues after the implementation within Europe!) Although the UK is not introducing this spacing until the year 2000, all aircraft leaving UK airspace for Europe above FL195/FL245, will be required to have 8.33kHz equipped radios from the 1 January 1999. In the UK, it is currently planned that 25 and 8.33kHz spaced frequencies, **will not** be made operational on the same sector. This will inevitably mean, that some frequency changes and re-assignments will take place during the transition.

Hopefully, if the current schedule remains the same, we will not start to see any associated movement of frequencies until the year 2000. After the transition, lower airspace and airfields should continue to use frequencies with 25kHz spacing, although this does not necessarily mean that their frequencies will remain the same and some may be altered to tie in with the upper airspace changes. The official line seems to be that the number of frequency changes will be kept to a minimum but that remains a matter for conjecture!

There are certainly still some unanswered questions. The ICAO/CAA information appears to relate directly to civilian controlled airspace, consequently military aircraft using civil upper airspace will have to have their radios converted or replaced. So far, I have no information regarding what will happen to London and

Scottish Military above FL245, but, logic dictates that they will follow the same course and introduce the new spacing. Having said that, it is documented that there are to be some exemptions, which may include the military in a limited capacity. We shall have to wait and see! My thanks go to Anon and Photavia Press for the information.

Connected with this subject, I have been learnt that a firm in Birmingham is currently

Two photographs this month, both aircraft are seen arriving on Runway 11 at Mildenhall for Air Fete 97.

Right: EA-6B, 161882/MD-04, Callsign 'Dog 23' from VMAQ-3.

Below: EC-135C, 63-8054/OF, Callsign 'Look 77' from the 7th ACCS.



involved with the introduction of a new scanner which will have 8.33kHz spacing. AYP electronics, are marketing the AP-1000 which covers 118 to 137MHz and 225 to 400MHz and has a 100 memory channels. I understand that the radio will be introduced early in 1998 but as yet I have no information on the price. AYP Electronics can be reached on Tel: 0121-358 6299.

Mildenhall

Two readers including **Des** from Chelmsford, have written to me regarding the dates of the possible closure of the runway at Mildenhall for maintenance - as reported in the January '98 column. Des tells me that he annually spends a week or ten days at Mildenhall and Lakenheath photographing the aircraft, usually at the end of June. He was therefore rather concerned when he read my comments regarding the possible closure after the Air Show. My friend who lives near to Mildenhall informs me that the local word is still that the closure is scheduled for June, he regularly reads the 'base newspaper' and as far as he is aware, no official dates have yet been released. If and when I hear some definite information I will of course include it in this column.

IAT 98 - RAF Fairford

I am certain that many readers of this column will be making the annual pilgrimage to Gloucestershire for the 1998 International Air Tattoo. This year's show is to be held over the weekend of 25/26 July and once again will

provide a marvellous array of the world's military aviation hardware. As in previous years a 'Park and View' area will be open from Wednesday to Friday before the show and on the Monday afterwards. Anyone who has not utilised this area before should consider a visit as it provides an excellent site from which to view the arriving and departing Air Tattoo participants. The three main themes this year are SKYWATCH 98, the 80th anniversary of the



RAF and the 50th anniversary of the Berlin Airlift. SKYWATCH 98, will bring together a collection of surveillance and reconnaissance aircraft from many different air-arms. This promises to be an excellent theme, especially if some of the more obscure air-arms can provide aircraft for this meet.

Clive from Cirencester has kindly sent me a list of the Fairford frequencies he noted during 1997.

Tower 337.575/119.15/142.225 - Ground 259.975 - Operations 371.2/307.8/379.475. Brize Norton controls the Approach and Radar frequencies. Area Radar 257.1 and 134.3. Approach 342.45/119.0 and 376.625 for general radar. Also noted in use were common frequencies: Approach 362.3 and Tower 122.1/257.8. (121.175/122.175 have been noted in use for the Tower at the IAT only - also IAT Operations on 130.5).

C-130 Formation

FBH from Staffordshire, writes to ask if readers have any information regarding formations of Hercules that he has noted regularly, 32km Northeast of Birmingham. Usually seen in the area of Cannock Chase, the formations of three and sometimes five or more aircraft are seen around midday, flying from West to East. My first thoughts was that it could be a practice for a memorial flyby or similar, but why do that in the Midlands when they could practice in the local airspace around Lyneham? If anyone knows the purpose of these formations please will you drop me a line.

Callsign 98

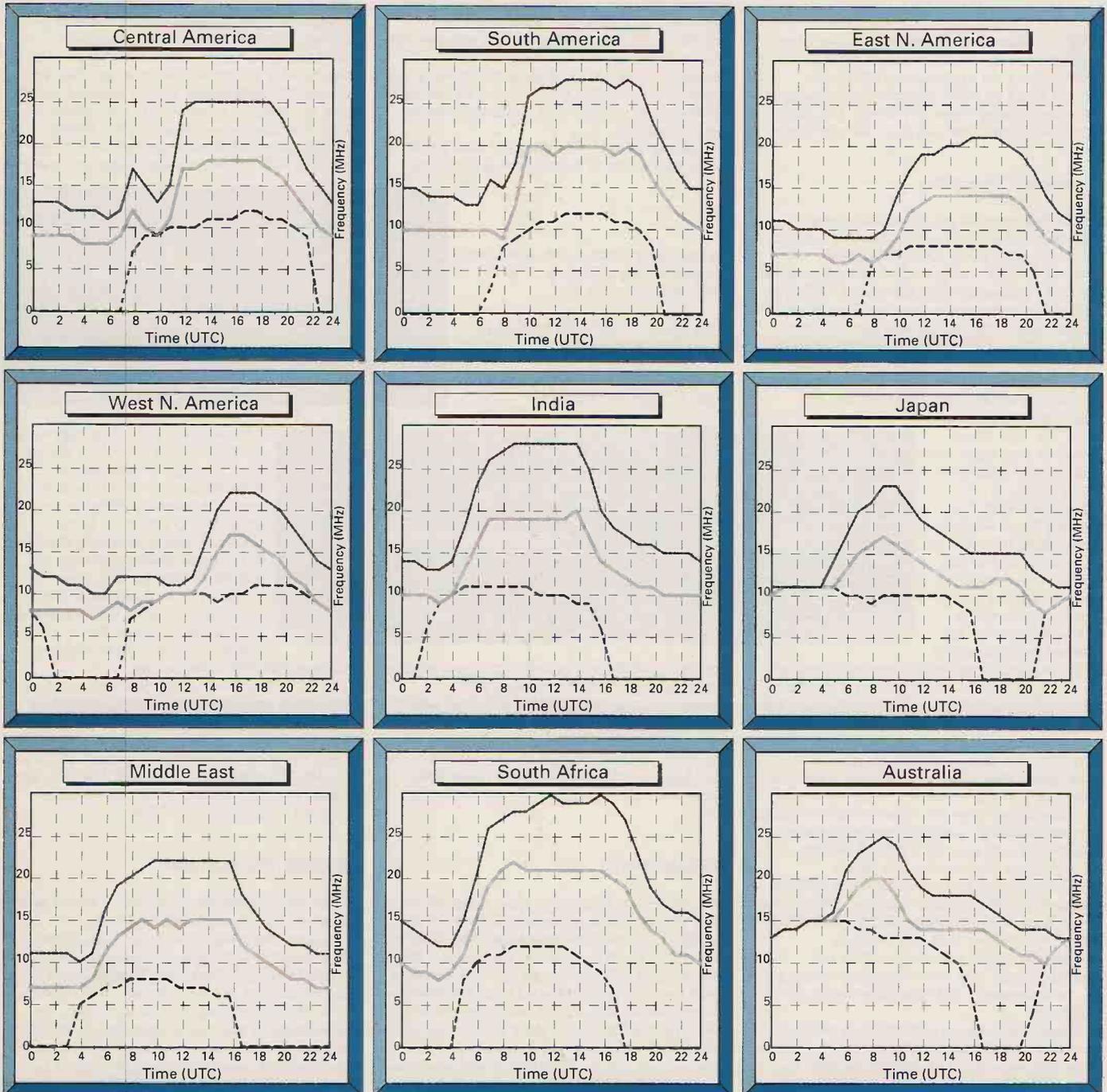
Photavia Press, have sent me some information regarding the new 1998 edition of their Civil and Military Aviation Callsign directory, *Callsign 98*. They tell me this new edition has well over 2000 additions and amendments, and is currently on schedule to be published at the end of February. The price remains the same as 1997 at £8.95 and will, of course, be available from the SWM Book Store.

World

Propagation Forecasts

■ JACQUES D'AVIGNON
 ■ VE3VIA

March 1998
 Circuits to London



How to use the Propagation Charts.

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

success below this frequency are very slim.

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

Lastly, the upper dashed line, represents the maximum usable frequency (MUF) a 50%

probability of success for the path and time.

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

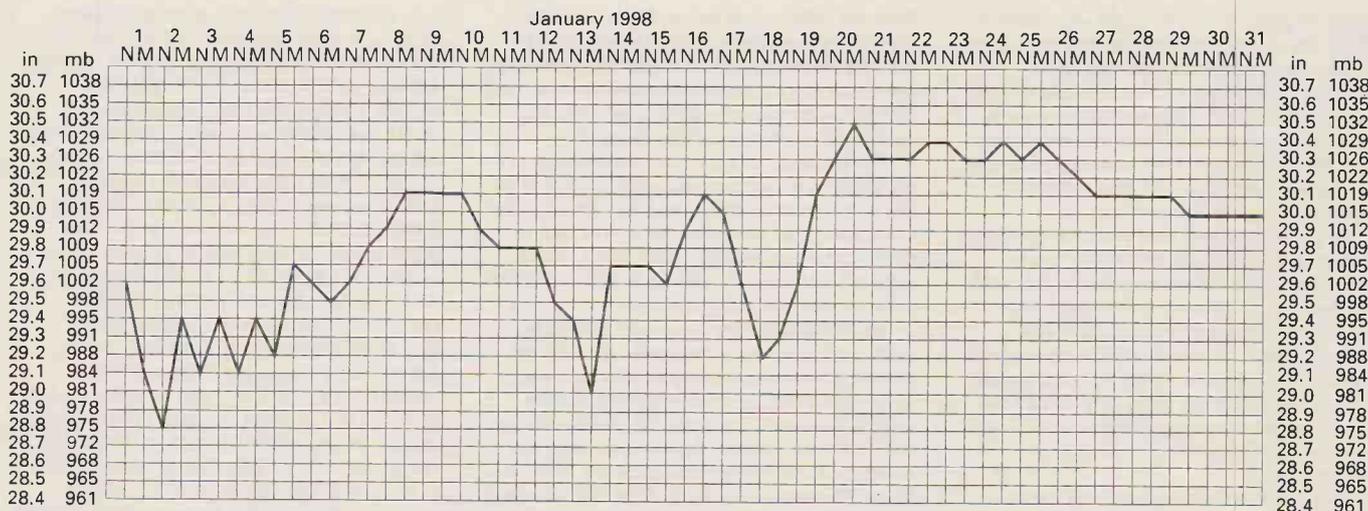
determined by the values of the intersections of the plots against frequency.

Good luck and happy listening.

Propagation Extra

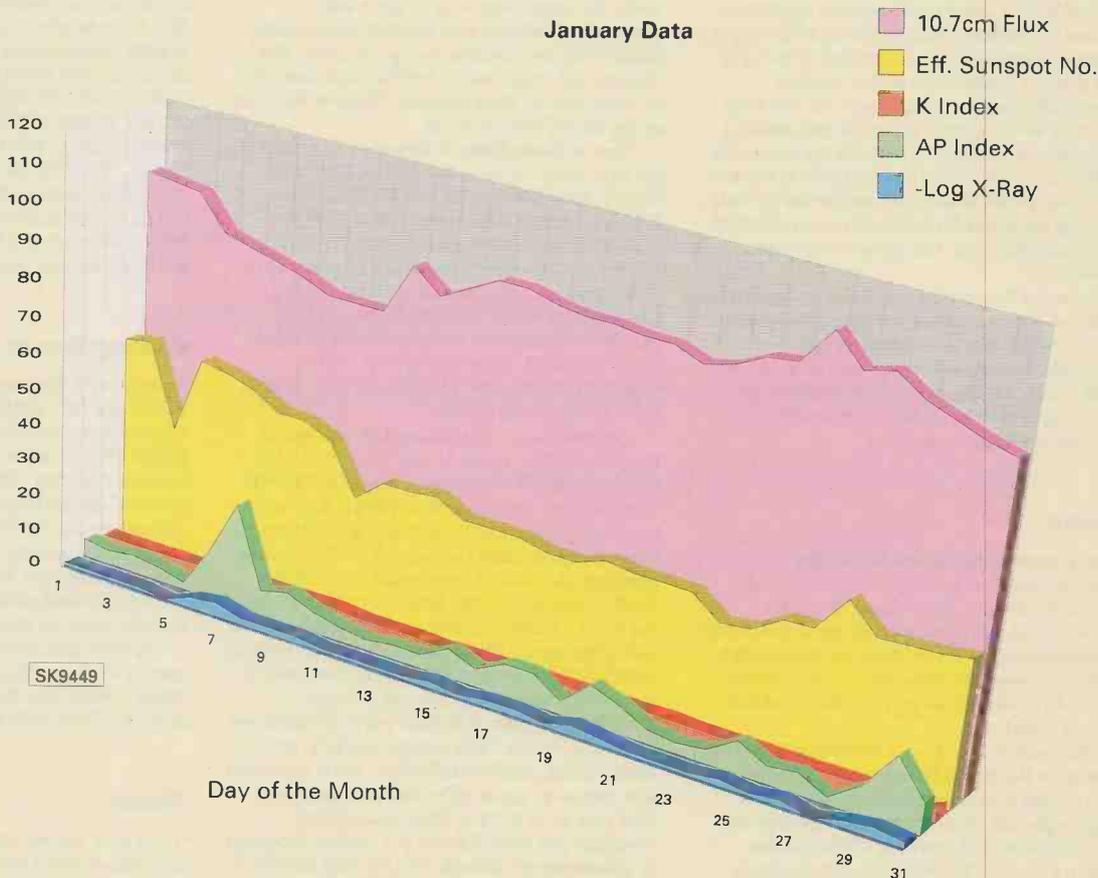
■ KEVIN NICE
 ■ G7TTC
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 EDITORIAL OFFICES
 BROADSTONE

Ron Ham's barometric pressure chart, taken at Storrington, W. Sussex, January 1998.



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.



Amateur Bands

Round-up

The gales which battered the west coasts of UK on Christmas Eve took electricity from many people for several days. *Chez GW3KFE* we lost power for a mere couple of hours or so, and thanks to Mr Camping Gaz we had light, heat and the wherewithal to brew tea - but looking from a first-floor window it was amazing to see how many houses appeared to be in total darkness, without even a candle or a torch!

The power came back later that evening while the wind was at its peak. Just a second after a peep outside reassuringly showed the mast and beam still aloft, there was a loud crack and the upper mast section broke a couple of feet above the pivot bringing the beam, the rotator, and the upper guys all down to earth - of course, in the next door garden! Before I could recover my wits a bang on the front door showed my next-door neighbour at the ready to give me a hand recovering and lashing the wreckage down.

So - a couple of lessons arise. Firstly, the thick-walled upper mast broke at a point where there was a small hole, drilled when it was in use for a different service. Putting a magnifying glass on the broken ends showed clearly that a crack had started from the hole. As the hole was on the upwind side of the mast, wind stresses over years had tended to open the crack. Had the hole been on the downwind side, likely no damage would have occurred.

Secondly, the upper mast guys were attached to the mast by a standard masthead fitting which comes with slots to enable the eye at the head of each guy to be dropped in place - the sort of standard commercially available arrangement I, for one, have been using for forty years. When the mast broke, it first dropped vertically, thus releasing the upper guys. The bottom of it hit the deck by the base of the mast and the wind then rolled it over and turned the beam into scrap aluminium. Had the guys remained locked to the mast-head much less damage would have occurred.

Christmas Day saw me working up an appetite for my dinner while dismantling and tidying the remains - so it's an ill wind that blows no-one good!

Getting the mast and rotator back up in the air will be a mere nothing, but repairing/replacing the beam a major exercise - meantime the end-fed 1.f. wire must serve for all bands.

Letters

Firstly, a sincere thank you to all who sent Christmas/New Year greetings, cards, letters, etc. The one from **Harry Richards** in Barton-on-Humber amused - a totally out-of-control sledge with panic-stricken driver aboard about to collide with a solidly built snow-man while the snow-man builder child looks on with an evil grin, anticipating what is about to occur!

The question of an a.t.u. is brought up by **Arthur Oglesby** in Harrogate, he having been told that one is not needed with his receiver. Let's get this one straight right now. The receiver is designed to look into an impedance of - normally - 50Ω resistive. There is a standard law which says that maximum power transfer takes place from source to receiver when the two impedances are conjugate. That implies the presence of an a.t.u. or an antenna presenting close to pure resistance (low s.w.r.) to the receiver.

Either the salesman was very wrong or someone's changed the laws of nature while I wasn't looking - and I dispute the latter! Such, incidentally is probably one reason why the receiver likes 21MHz rather than 14MHz - on 21MHz the receiver 'sees' a tolerably good impedance but on 14MHz it's way off.

The solution is to use an a.t.u. My only caveat to this would be to comment that, since so much of the DX tends to haunt 14MHz it may and often is, buried under wall-to-wall Europeans! An antenna such as dipole can be used without a tuner over a limited range of frequencies. Outside this limited range it will present a poor match to the receiver.

For example, consider an end-fed wire against earth; it will look fine to the receiver if it is an odd number of quarter-waves long. At even half-waves it will present a high but resistive impedance which might be acceptable, but in the intermediate areas it will be 'all over the place' depending on length and frequency. A quarter-wave on Top Band is 275m - say around 40 metres - long and it will be high-impedance around 3.5, 7, 14, 28MHz. On 10, 18, 21 and 24MHz, it will need to be coupled via an a.t.u. for good results and it is preferable on all but Top Band. Incidentally, even a dipole can't be expected to cope with all of a proportionately wide band like 1.8 or 3.5MHz - which is why you sometimes see a Top Band dipole equipped with two 'legs' of, say, around 275m each and two more of 248m each, perhaps suspended below the longer ones, so as to give a wider bandwidth - one leg of each length attached to the coaxial inner, and the other two to the outer. This situation also occurs on 3.5-3.8MHz - and even more so if you listen to Yanks between 3.8 and 4MHz - and on the 28-29.7MHz band, too.

Now to **Colin Dean** in Barnsley, who looked on the s.s.b. end of Eighty to find BA4TA, D35RNM, EK6GC, PA0GJA/HI3, JA9CNG, JG1GBY, K6UA, KD7HN, K7XB, KH2D, N7JW, NP4A, TF3BM, TG9NX, TI4CF, UN0N, VK3AJJ, W6BY, W6KW, ZA1MH, 3V8BB, 4L4MM and 4L5O. Cranking up to 7MHz sideband, Colin booked in A61AJ, BV5BG, C56/JAI OEM, ET3BT, E21CJN, FK8HC, FP5B, FR/DF6PW, FR/DJ4VW, HL3ERJ, HZ1RT, JF7DZA, OD5NJ, R1ANZ, SU3AM, SV2ASP/A, VK1MJ, VK8AV, YK0RJ, YS1FE, ZL1BMV, ZL4BD, ZL4PO, 4L1DX, 6C50H and 6C50O.

Next we turn to **Paul Goodhall** who lives at Holywell, Oxford, where he runs a full-sized G5RV coupled to the R71E receiver by way of an MFJ948B Antenna Tuner. Looking first on 3.5MHz Paul had a late-evening session on December 4 at 3.790MHz where he found G10EJU working VE3TXT and a few moments later G14VKS, who booked in AP2VJG, VY2CC, LA6GJA, LA2PA, EI0EJU, VY2ROB, VE2SO, and N4UK. Another basinful on December 13, at the same place yielded 9A4A calling CQ, OH5LF working W4VR, DJ7SR working K3ZM, EA6BH with VA2DF, and EI8HZX with WIHJ. Then on 16th again on 3.790MHz he picked up G14VKS working VA2ZZ and W2PM. So - follow Paul's example and listen around 2200 onwards, at 3.790-3.800MHz - and it sometimes pays even to go above 3.8 as the American Phone band goes up to 4.0MHz. Often you will find Americans just above 3.8 who are working Europeans by split-frequency methods. Around 1800 Z31DX was heard working F6CNY and CT1PUE was into PA0AGA, both on 7MHz. Apart from an isolated few moments on 18MHz when KZ1H was logged working SM4PBL/4, all the rest of Paul's time was

spent on 14MHz. Over the month, the following signals were noted hereabouts: VK7KH, UA1MU, RA3AA/MM, RK9KWI, UA9HL, UA9FDR, VK3SEC, W3KHQ, K1UOV, N7DD, W6FR, VE1DHU, VK5AFA, W4FLA, 5B4/T97M, working KAIUQ, W1BIA and UR0HO in succession, 3A2MD working GB3RN, VK6BFI, EA6EA1(IOTA-EU004), working G3IZM, K1MAN transmitting ARRL *Ham News*, RA9DX working successively VP8CW1, ZL2KW, S53BMS, DL2NRE; then W0OKC, VA2KO were logged on that day. Next time the receiver was on, a couple of days later KB3TH, N1TW, AB2DZ, N3URS, KZ1H, VE2AUM, W2ONV, VE2DUV, 7X2VZK, W2LFO, VK2WA, ZL1ALN, ZL1BD, JA6CAP, VK2AMD, ZLUG0JPX, VK7CK, PY2CC, JA6CM, TK5EL snapping up PY2CC, ZP9SC, UA0AAM, VE3OTN, K8PX, VE1MS, K0GH working AC6AA, K6VX, VK2WA, ZL1ALN, VP9KK, VK5AFA, VK5CC, VK5RD, VO1MP, KD1TR, K3IE, K2QNU, W9LZE, KC1DX, K1UOV, VE2KJL, VE3WQ, N5WT, VE3IHQ, VE3HDA, VE2CA, VE3EGO, VE3XN, KI6MH, KA0DUH, K5YG, AC6HY, W1BHL, N3ROA, W8JV, WD8OAK, KD5BFJ, EA8BYR, K6GB, KA0DUH, N9PM, WA6COS, plus of course the Europeans who came as the 'other half of the package'.

Now for some c.w. from **Ted Trowell** in Sheppey. Some mornings on Top Band gave with TF3IRA, TK6NN, EA61B, and around 200VE1ZZ and OY9JD were knocked off. On 3.5MHz HB0/HB9LF filled in a hole before sneaking down to 7MHz where an 0800 session yielded JA0UMV and DJ4GX/HI3 and another at 1800 5B4/EU1AA and EA6E/EA5WU. at 200 BV2FT, EA6ZY, PY1VDY, CU2BJ, YB0BRT, 9H1JR, YV1NX, W0IAK, VP2EEB, and DL8HCM/HI8. At 10MHz a solitary W6PM and on 14MHz PY2CJ, TF8GX, W7WHO, DL1HCM/HI8, P4OJ, W61J, and VE6JY. From there to 18MHz for N0AH, KC2AVC, W4YE, at 21MHz ZF1A, W6XR, N4AR, VE9DH and finally 28MHz where K3MD, N4AR, K4OJ, W3LPL, and W4XJ were all copied.

Coming Events

Agalega and St Brandon activity is promised for May - 3B7AZ and 3B7/HB9JA1. Also in the first week of May, expect to hear 3D2LJ with the cards going to JM1LJS. 9M8CC will be on from East Malaysia for six weeks in April-May 1998. The location is Serian, IOTA OC-88 and PB0ALB the operator. The QSLs go to his home call. RA9VWX is now resident in Sharjahin, and working on the matter of getting a call, with assistance from A61AJ.

Again in the April-May period, CE0ZAM hopes to be active from San Felix for 20 days as XQ0X

Another spot which you might just have time to catch is Chatham, ZL7, between February 23 and March 9. More time though to grab Thailand in the form of HS0/VK3DX1 said to be there until August.

Finale

That's it for another time. Send your letters and lists, as always, to arrive by the first of the month, addressed to me at PO Box 4, Newtown, Powys SY16 1ZZ. Meantime, enjoy your listening!

■ PAUL ESSERY GW3KFE
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A distinct lack of Sporadic-E activity and only a hint of localised tropospheric reception this December has meant a dismal end to 1997. Meteor-Shower (MS) produced short, weak bursts of unidentified pictures most days on various Band I channels. The highlight of the month was the sight of a programme schedule, via MS, from Norway on Channel E3 on December 28th. Consequently we're scraping the barrel for this month's log!

Reception Reports

Pertti Salonen (Finland) reports tropospheric reception from SVT-1 Vännas (Sweden) on E2, ORT St. Petersburg (Russia) on R1 and ETV Tallinn (Estonia) on R2. Sporadic-E activity has been absent and even the anticipated Meteor-Shower peak around December 15th failed to produce anything significant.

In view of the generally poor condition in Band I, **Peter Barber** (Coventry) has been scrutinising Band III frequencies to see if anything can be seen on a daily basis. Careful monitoring of Channel E8 has revealed that RTBF-1 signals from Wavre in Belgium flutter up and down many times during the course of the day, even under flat reception conditions. Other DXers have had similar daily successes with French and Irish channels in Band III and u.h.f. It is surprising how far some of these signals penetrate inland areas of the United Kingdom.

In the last column we mentioned south-east Asian signals being received by **Lt. Col. Rana Roy** in northern India. Since then **Peter Chalkley** (Luton) informs us that **Keith Greenwell**, an experienced DXer also of Luton, may have encountered F2-Layer signals on Channel E2 last November (on the 10th) at 0900UTC. The pictures were very smeary, a characteristic of F2 propagation, and lasted only a few minutes. Meanwhile, **Tim Bucknall** (Congleton) heard transatlantic a.m. CB around 1522UTC on December 2nd from a CBer (Dennis 2 AT) in Detroit, Michigan.

Starting Out

Garry Crawford (Fife) is a keen s.w.l. and satellite TV enthusiast. Inspired by this column, Garry wants to branch out into receiving terrestrial TV signals but like most of us initially, he is not sure what equipment is needed.

There are two main receiver options: buy a small-screen multi-band TV from a catalogue store such as Argos or go for a converter with a reduced video i.f. bandwidth. The former will give good results when signals are strong but the narrow-bandwidth converter will provide a lower noise threshold, which will enhance weaker reception.

A copy of *DX-TV For Beginners* is recommended, which is available from the SWM Book Store. It discusses the advantages and disadvantages of the various receiver options available. Remember, a simple indoor antenna such as a dipole will suffice when Sporadic-E signals are strong but for pulling in weaker reception, a multi-element outdoor antenna (preferably one which can be rotated) is recommended.

Receiving OIRT FM

Over the years, Eastern Europe and the former USSR have used frequencies between 62 and 72MHz for f.m. broadcasting. The OIRT f.m. band, as it was once officially called, is now on the decline with stations migrating to the more conventional f.m. band used in the West.

TV Channels R4 and R5 which once occupied the 84-100MHz spectrum have now closed in some Eastern European countries, but in Russia and many CIS countries these remain active. Consequently, scores of OIRT f.m. stations are still on-air, broadcasting in stereo, and are regularly received during Sporadic-E openings. These stations are a pleasure to listen to with many broadcasting folklore music instead of the usual British diet of endless adverts briefly interrupted by pop music!

Monitoring the OIRT f.m. band can be a problem. A scanner covering these frequencies is one solution, especially if 'lo-fi' sound quality in mono is not a problem.

An easy solution for general listening is to buy a cheap multi-band radio, the type usually found on market stalls or at car-boot sales. Apart from the normal f.m. and m.w. bands these usually have Air, a.m. CB, USA TV sound, etc.

Using a D-100 converter with sound take-off is another way of tuning into the f.m. transmissions. Hi-fi stereo broadcasts can be heard when fed via a good-quality tuner. Upconverting the 52-72MHz part of Band I to an appropriate part of the f.m. band would also offer a solution.

Another approach would be to feed the harmonics of a standard TV tuner directly into the antenna input of an f.m. receiver, tuned towards the top end of the band. This might be effective with strong signals but weaker ones may be a problem.

A dedicated receiver could be built or an existing f.m. tuner modified. **Gösta van der Linden** (Netherlands) wishes to pursue this latter option and is seeking details. Apparently, there was a circuit in *Practical Wireless* magazine around 1986. Can anyone help? If so, we'll forward the details.

Tuner substitution is not as straightforward as it might seem. This is because the i.f. output frequency of an f.m. tuner is 10.7MHz whereas a TV tuner output is considerably higher at around 35MHz, thus some form of frequency conversion would be required.

During the early Seventies, a tuner module covering TV and OIRT f.m. frequencies in Band I was available which could be supplied with a 10.7MHz output. This was possibly of Mullard origin. Do any readers remember these and whether any are still available?

FM Reports

From a local high spot, **Tim Bucknall** (Congleton) has had considerable success receiving distant f.m. transmitters under flat conditions. Stations include 'Vibe FM' on 104.6MHz from Mendlesham, Suffolk; 'East Coast Radio' on 94.9MHz from Wicklow, Eire; Radio Ireland on 100.9MHz from Mt. Kippure and on 101.4MHz from Mt. Leinster. An unidentified signal at 97.6MHz sounded like 'Control FM'. Tim thinks this could be located in North Wales.

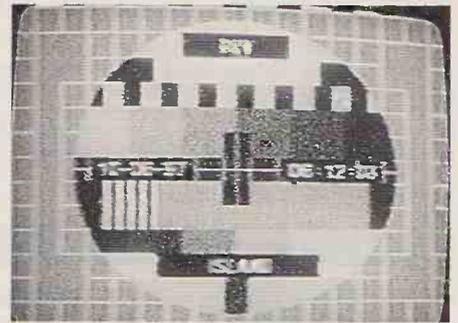


Fig. 1: Icelandic PM5534 test card received on Channel E4 by Stephen Michie (Bristol).



Fig. 2: German FuBK test card from MDR displaying local identification, circa 1992.

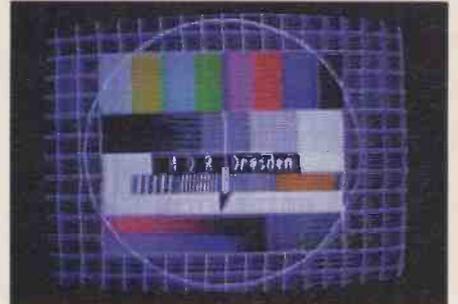


Fig. 3: Colour-bar pattern used by MDR during main test transmissions, circa 1992.

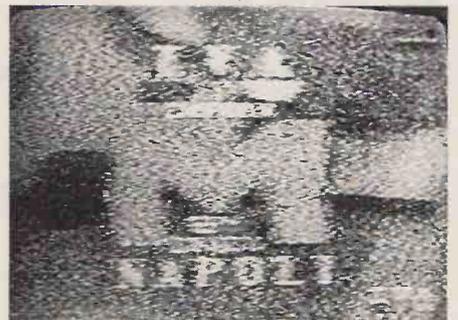


Fig. 4: Italian private station 'TVA Napoli' caption seen on Channel 1A.

Service Information

Laszlo Kozari (Hungary) advises that changes to the Hungarian TV networks mean good and bad news for DXers in Band I. Until the changes took place late in 1997, MTV-1 was available on Channel R1 from Budapest and Nagykanizsa and on R2 from Pecs.

MTV-1 is still available on both R1 channels although there are plans to close the Budapest outlet. A replacement transmitter on u.h.f. Channel R41 is already operating. The Pecs R2 outlet (25kW e.r.p.) now broadcasts 'RTL Klub' which means there is a new station to look out for during the forthcoming Sporadic-E season.

In Tenerife, local adverts are shown via the Izaña (Tenerife) Channel E3 outlet of TVE-I. The transmitter site is located 1500 metres above sea-level and has an e.r.p. of 350kW. In Gran Canaria, 'Canarias Arte' relays German news items via 'OTM 6' on Channels E42 and E44. On the islands of Tenerife, La Palma, El Hierro and La Gomera, it is relayed via 'Tele 21' on Channels E21, E38, E40 and E42 respectively.

New BBC Idents: A Cheaper Solution!

We recently asked for comment about the graphics used for the new BBC Identification Symbols. Godfrey Manning (SWM Airband column) has a message for the BBC which is echoed by many viewers. He writes: "I gather you spent £15 million out of licence-fee revenue on the new graphics. Apparently you decided to straighten out the BBC boxed letters (in a style reminiscent of the old monochrome days) and sent a balloon floating across the screen. Well, if

that's all you wanted for your money you should have asked me first. I'd have done it at half the price!"

Well, Godfrey, if they'd asked us first, we would have done it for even less! Finally on this topic (at least for the moment), who is this 'BB Cone' which seems to appear for half the time at the foot of the screen? It sounds like some future female pop star about to be assisted to the Number One slot in the charts. (More like a blues guitarist if you ask me - KN)



Fig 5: Primitive graphics from CLT Lebanon during the Sixties. Note the shadows on the clock face caused by poor illumination!

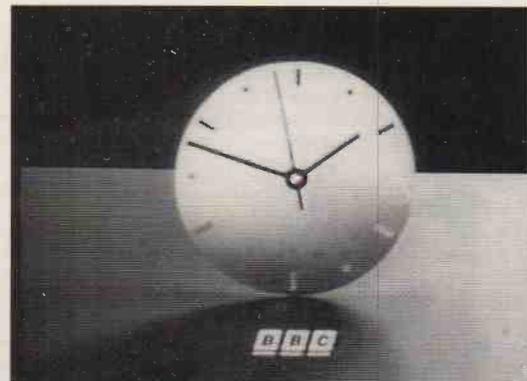


Fig 6: A blast from the recent past in this month's trip down Memory Lane: the laser-generated BBC-2 Clock caption used from February 16th, 1991.

Keep On Writing!

Please send your DXTV and f.m. reception reports, news, off-screen photographs and information by the first of the month to:- Garry Smith, 17 Collingham Gardens, Derby DE22 4FS.

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PZL Kaliber & Godfrey. Christine Mlynek.

Your 'Airband Team' (Chris and I) hope to meet some of you on Sunday March 8th at the Pickett's Lock Show. I'll be calling in at the SWM stand in the Red Hall regularly during the day so ask for me there.

In Flight

A frequent problem is whether or not electronic equipment, when operated in the passenger cabin, could endanger safety while flying. The answer is yes, it could, and indeed has on a number of occasions. If you insist on operating a radio receiver or a GPS unit when you're a passenger then Rule One is **don't** do it and Rule Two is, if you must do it, ask the Commander's permission first! If your equipment causes strange behaviour by the avionics, at least the pilot will know whom to tell to switch off the source of interference.

I'm reminded of this by the accident to Fokker F27 G-CEXA at Jersey on May 6 last year. It was reported in the Air Accidents Investigation Branch *Bulletin* 12/97 page 8 ref. EW/C97/5/1. Due to various factors (including a crosswind) the aircraft was badly damaged on landing.

As part of the investigation the cockpit voice recorder was replayed. The recording was interrupted by bursts of interference from the pilot's cellular radio (mobile 'phone?') which had remained switched on while carried inside the aircraft.

Sometimes airborne radios do fail. It can be frustrating to find your transmitter still sending carrier wave but without speech. All is not lost, squawk code 7600 indicates radio failure if you're being monitored on radar.

There's also the Speechless Code. In summary, the push-to-talk button is keyed to send Morse like bursts of carrier. Most importantly, it's one dash for 'Affirm' and two for 'Negative' (we never say 'Yes' or 'No'). In an occurrence report from the CAA, I'm glad that this Code helped a Slingsby 67 to land safely on September 10 last year.

Receiver Hardware

What points should be considered when buying a new receiver? **Ted Care** (Helston) and no doubt many other readers would like to know. First of all, the v.h.f. and military airbands are amplitude modulated so forget f.m. only sets. Then you need full frequency coverage, 108 to 137MHz being the case for the v.h.f. airband.

If you want to receive other beacons such as

n.d.b.s, markers, d.m.e.s or glidescopes, you'll need a much wider coverage set and you should ask yourself if this is worth the cost and performance compromise. Some equipment (particularly I think to American specification) has gaps just where you need coverage.

Transmissions are channelised, that means they're on certain frequencies spaced a fixed amount from their neighbours. The navigation band (108-118MHz) is at 50kHz spacing so, for example, 108.5 or 108.1 are valid channels but 108.02MHz wouldn't be. The u.h.f. airband is split into 12.5kHz channels.

What about the v.h.f. communication band? Presently it's split into 25kHz channels (this started in 1974) and pilots usually omit to mention the third decimal place when stating frequencies over the air. Hence, 118.025 is a valid channel but would be quoted as 118.02MHz when pilots and controllers converse.

Unfortunately, there are two complications



Mignet Pou-du-Ciel. Christine Mlynek.

as far as this 25kHz spacing on v.h.f. is concerned. Firstly, some stations are relayed on more than one transmitter (VOLMET, airways, etc.). To avoid interference, each relay is given its own frequency slightly off-tune.

The pilot might tune 118.025MHz but the actual transmission might be a few kHz to one side of this nominal frequency. You either need a radio that accepts these offset stations (has a wide bandwidth) or that can be tuned in small (500Hz?) increments so as to be spot-on to the actual transmission.

Now for the second catch. Wide bandwidth may not be such a good idea and fine tuning might be more advisable because they're probably going to introduce extra channels. These will be tightly packed at 8.33kHz spacing, enabling two new channels to be squeezed in between each existing 25kHz slot.

Can a new receiver cope with these tightly-packed channels without picking up signals from

adjacent frequencies? No such 8.33kHz channels yet exist and the only way to test a receiver is to find a powerful transmission and then tune 8.33kHz away from it - you should then hear nothing! I wouldn't consider converting existing equipment to 8.33kHz channels as filtering and frequency selection would all have to be modified.

General points to look for. Some sets are pure scanners, only receiving frequencies previously entered in memory. I recommend the direct entry facility where you key in the frequency you want and it starts receiving it immediately. I agree with Ted that you should expect a good life from equipment after paying out all that money.

Ted is near the Davidstow LATCC repeater (that's London Airways, not a Heathrow facility). Unfortunately, the CAA have asked me not to specify exactly which frequencies are handled at each relay.

One receiver offering 8.33kHz spacing is the Scanap AP-1000 from **AYP Electronics Ltd., 34 St Margarets Road, Great Barr, Birmingham B43 6LD, Tel: 0121-358 6299**. Now, I haven't tried one myself, but information sent to me by **Alan Proctor** (Southport) shows that it misses out 108-118MHz. It does cover the u.h.f. airband 225-400MHz.

If anyone tries one, I'd like to know just how selective it is against adjacent channels and how it manages with offset relays.

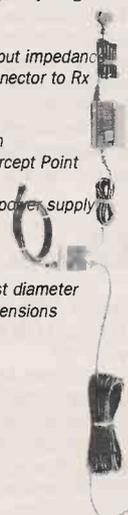
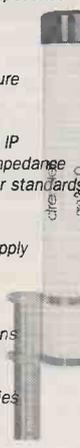
Changing the subject, band 2 broadcasts (f.m. stereo) now extend right up to the boundary with the 108MHz navigation band. Previously the segment 100-108MHz was a guard band, only low-powered transmissions being allowed. Any broadcast receiver would pick up the Police, etc., if tuned here! At least the low-powered Police radios didn't interfere with the nearby v.o.r. beacons and i.l.s. localisers. That all changed some time ago.

Apparently there is a demand for a vast number of commercial broadcasters and these high powered stations are now found right up to 108MHz (the Police moved out of this segment, of course).

I've never understood the business sense of having so many stations which nearly all carry the same sort of material. Total audiences are falling (so I read in the *Radio Listener's Guide* on sale from the SWM Book Store). So, it's more stations chasing fewer listeners.

It also means the end of protection to the navigation band. But, then, what does safety

Continued on page 72

ARA 40	ARA 60	ARA 2000
<p>Technical performance</p> <p>Frequency range 40kHz-40MHz at full performance 40MHz-108MHz 2.3dB gain</p> <p>Output impedance 50-75 ohm coaxial</p> <p>Connector to Rx PL comes as the standard. Other standards can be fitted upon request</p> <p>Gain 5dB +/-0.2dBs</p> <p>Intercept Point +45dBm IP 3rd order (10MHz/12V)</p> <p>DC power supply 11.5-13 volt DC at 70mA typ. (230V mains adaptor for 12V DC is supplied with the antenna)</p> <p>Mast diameter 30-50mm can be fitted</p> <p>Dimensions ARA40 115cm total length with glassfibre whip. Antenna tube 40mm x 140mm ARA40 TEL 125cm total length with telescopic whip extended. 45cm minimum length. Antenna tube 40mm x 140mm Ideal for portable radio</p> 	<p>Technical performance</p> <p>Frequency range 40kHz-60MHz (full performance) 60-120MHz 2-3dB less gain</p> <p>Output impedance 50-75 ohm coaxial</p> <p>Connector to Rx PL type delivered as standard. Other standards can be fitted upon request</p> <p>Gain 10dB +/-0.2dBs</p> <p>Intercept Point +50dBm IP 3rd order (10MHz/12V)</p> <p>DC power supply 11.5-13 volt DC at 80mA typ. (230V/12V DC stabilised mains adaptor is supplied with the antenna)</p> <p>Mast diameter 30-50mm can be fitted</p> <p>Dimensions 115cm total length. Antenna tube 50mm x 160mm Ideal for base stations</p> 	<p>Technical performance</p> <p>Frequency range 50-2000MHz</p> <p>Output impedance 50-75 ohms coaxial</p> <p>Gain 19dB -1000MHz 18dB -1400MHz 16dB -2000MHz</p> <p>Noise figure 1.5-2dB -1000MHz 1.8-2.5dB -1500MHz 2.5-4dB -2000MHz</p> <p>3rd order IP +35dB typical</p> <p>Output impedance 50-75 ohms coaxial</p> <p>Connector standards N type connector at the antenna. BNC male connector to the receiver</p> <p>Power supply 12V DC at 160mA DC. Power supply for 230V AC is delivered comes with the antenna</p> <p>Dimensions Length 450mm. Diameter 90mm</p> <p>Weight 2kg</p> <p>Accessories Mains wall plug adaptor (230V A/12V DC). Interface unit (remote supply unit) 12m coaxial cable and mast mounting clamps</p> 

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Airband

Continued from page 70

matter when someone else could be making a profit? Some newer receivers are able to reject the f.m. interference. Older equipment can't be relied upon to do this. The official solution? A cockpit placard stuck near the set stating "This equipment is NOT FM immune".

Arthur Oglesby (Harrogate), when not angling, uses a different kind of 'rod' to 'catch' radio waves. Sorry I can't advise about your poor reception without seeing your set-up, Arthur, but certainly an a.t.u. has been known to help h.f. reception in other cases - can you borrow one to try out?

Arthur was once an army signaller and owns a Miles Messenger when in civvy street (those were the days!). His son is an airline pilot and flew the VC-10 as well as more recent Boeings. Although retirement looms at age 55, with younger entrants eager to fill the vacated left hand seat, would your son stay on longer if the current debate results in raising the age to 60, Arthur? Did you know some countries (even Italy) forbid overflights if the crew are above a certain age?

Your Flying Experiences

On the Isle of Man, Mrs B is planning a trip to the States to finish her PPL course. Unlike Arthur, you won't have flown in a Miles, Mrs B, but the Cessna 172 Skyhawk and PA-28 Warrior (that's a Cherokee with a bigger engine and more windows) are just right for you and Chris and I wish you luck.

Fancy a quick flight? Anne Reed RS87871/G20126 (Cheltenham) did! She went to Iceland for the day on an Air 2000 'stick insect' Boeing 757 from Bristol. The sector to Keflavik takes two and a half hours, usually routing A25, Stornoway, then direct.

Lucky Anne, though, visited the cockpit and found that there was a

diversion over Ireland and that NAT-D frequency 4.675MHz was being worked. Such visits are entirely at the Captain's discretion and are a privilege. However, to earn points in your favour, if you look neatly turned out and haven't obviously drunk any alcohol then you enhance your chances of being accepted (little bit of inside information there!).

Frequency & Operational News

From the CAA come GASIL 6 of 1997, AIC 147/1997 and (via Martin Sutton with thanks) AIP amendments. Aerodromes first: Clacton's ICAO code changes from EGSW to EGSQ. The Aerodrome Traffic Zone at Crowfield, Suffolk, has been withdrawn. A new aerodrome at Old Buckenham, Norfolk, has Air/Ground on 124.4MHz.

Controlled airspace: the LOREL IQ arrival is off A20 for Luton and Stanstead. The Stanstead Approach radar 120.625MHz is renamed Essex Radar and also handles Cambridge and Luton LOREL arrivals and certain Northolt traffic. Gatwick HARDY and BOGNA departures are now controlled by London 133.175 (was 120.475MHz).

Beacons: the Aberdeen n.d.b. (AOS, 377kHz) has been withdrawn at Oxford (Kidlington) the OX n.d.b. changes from 403.5 to 367.5kHz.

New reporting points: DAGGA on R123, POKIT and VATON in the south-east, NESTA, SMOKI TIGGY and VAMLA on Scottish helicopter routes. Full coordinates from me on request.

The next three deadlines (for topical information) are March 9, April 6 and May 11. Replies always appear in the column and it is regretted that no direct correspondence is possible.

Abbreviations

AIC	Aeronautical Information Circular
AIP	Aeronautical Information Publication
a.t.u.	antenna tuning unit
CAA	Civil Aviation Authority
d.m.e.	distance measuring equipment
f.m.	frequency modulation
GASIL	General Aviation Safety Information Leaflet
GPS	Global Positioning System
h.f.	high frequency
Hz	hertz
ICAO	International Civil Aviation Organisation
i.l.s.	instrument landing system
kHz	kilohertz
LATCC	London Area & Terminal Control Centre
MHz	megahertz
NAT	North Atlantic
n.d.b.	non-directional beacon
PPL	Private Pilot's Licence
u.h.f.	ultra high frequency
v.h.f.	very high frequency
VOLMET	VOLume METeorological report
v.o.r.	very high frequency omni-directional radio range

Decode

Finding DX Stations

Many listeners that are new to decoding often get somewhat confused when they get a copy of the latest frequency guide and start looking for stations. Inevitably it turns out that a very high proportion of the stations are nowhere to be found - why is this?

The first point to get straight is the purpose of the frequency guides. If you take the popular Klingenfuss guides, reviewed elsewhere in this column, you will find that they are packed with all manner of interesting stations, however their prime purpose is to aid identification rather than to find the stations in the first place. That doesn't mean to say you can't use a frequency list to find interesting stations, you just have to make sure you take a few important points into consideration first.

Why can't you hear all the stations that are listed? Two main reasons, propagation conditions and whether or not the station is on air! This latter point is pretty basic but obviously very significant! You also need to appreciate that many utility stations use directional antenna systems to help get as good a signal as possible to the intended destination. If you're not in-line with that directional signal you will in effect be trying to receive the station using the spurious radiation from the sides of the antenna. These can be significantly weaker than the main lobe. In order to make good use of a frequency list to find new stations you inevitably need a basic understanding of the main propagation systems that effect short wave signals.

There are two main factors that most obviously effect propagation and they are the change from day to night and the sun spot cycle. The change from day to night is clearly the one that's easiest to observe as the effects are both dramatic and frequent. I'm not going to delve into propagation theory, but the main difference between day and night is the height and intensity of the ionised layers of the atmosphere. These changes effect the way in which radio signals are reflected or absorbed by the ionosphere, as it's known.

Most short wave communications that extend beyond the horizon get to you by bouncing between the earth and the ionised layers. During the change from day to night the ionised layers alter both height and their ability to reflect radio signals. It's also important to note that the different ionised layers are also frequency sensitive, so adding a further complication.

As I'm not going to attempt any great detail, here's a simple rule-of thumb to get you basically listening in the right place at the right time. Dawn - look for really long distance stuff as there's a period of enhanced propagation along what's known as the 'grey line'. These are the parts of the earth that are changing from day to night and vice versa. This is an excellent time to look out for those Australian and New Zealand FAX stations. An additional benefit at dawn is that it's a time when local interference from TVs and other household equipment is at its lowest. As a result you will find that the bands are much cleaner so you stand a better chance of actually being able to hear and resolve that DX station!

Next is the main part of the day when you will find that most of the activity will focus on the powerful middle distance FAX and RTTY type stations below 10MHz with just occasional DX on the higher frequency bands. As we move into the evening there's another opportunity for some 'grey line' DXing around dusk. However, this is often spoilt by the very high levels of local noise in the early evening. This is because the vast majority of TVs are on, the kids are playing the computer games and all the other household machinery is working overtime! Once into the evening conditions will change significantly and you will find that good DX can be found on the lower frequency bands.

The only snag being the severe congestion!

If you want to get into rather more detailed predictions of propagation conditions you'd be well advised to get yourself a copy of a program such *GWinProp* discussed elsewhere in this column. This will provide predictions that take into account the sun spot cycle and you can use it to find the best time to listen-out for a particular station. Having gained a basic understanding of the propagation system, the next thing to look out for is information to tell you when a station is likely to be transmitting. Rule number one is set your shack clock to UTC not BST. This is because UTC is the universal time standard used by all countries and it's also the time that you'll find printed in virtually all the frequency lists. If it's FAX stations you're after, a copy of the station's schedule is clearly very useful.

One good way to get a copy of this is to buy a frequency guide that includes FAX schedules as do those from Klingenfuss. If, on the other hand, you want to take a look at other forms of data signal you need to take a close look at your frequency guide to see if the notes for that station give an indication of the transmission times. Certainly, the *Guide to Utility Stations* does this. So now you're ready to roll you can use your frequency list with confidence to find a station, work out it's transmission times and combine this with your knowledge of propagation to work out when's the best time to listen-out.

The only other skill that can be really helpful is to develop an ear for data signals. If you speak to any experienced data monitors you will find that they can recognise all the major transmission modes before they even turn-on their decoder. This is because all the differing systems have their own distinctive sound that your ear gradually gets accustomed to. Having a trained ear can work wonders if you're just tuning around as you can instantly detect the type of signal you're looking for and pre-set your decoder to that mode so you can start decoding before the station disappears. When looking for that rare DX a trained ear can save you time as you will instantly recognise the station when it appears. Another important point to note is that most of the more sophisticated military and diplomatic stations all use encryption on their signals, so don't expect to find much plain text around.

Super Frequency List

Yes, the latest, 1998 Klingenfuss *Super Frequency List* on CD-ROM is now available. This wonderful CD-ROM is getting better every time and the latest has lots of extras included. The main frequency list comprises some 11800 frequencies taken from the 1998 *Guide to Utility Stations*. This basic information is supplemented by a listing of 920 abbreviations and 15400 formerly active frequencies. The latter feature being useful because these frequencies are often reactivated and used as standby circuits. The disk also contains an 11100 record database covering the latest schedules of all clandestine, domestic and international broadcasting services on short wave. This list having been compiled by Michiel Schay of The Netherlands. The real change for this year has been the inclusion of some sample software of particular interest to utility listeners. First off there's a demo copy of Francois Guillet's excellent *RadioRaft* version 2.0. This is a great opportunity to give this program a trial. Next on the list are demos versions of three of the most popular receiver control programs. If you're lucky enough to own a receiver that supports computer control I would strongly recommend that you

MIKE RICHARDS G4WNC

PO BOX 1863, RINGWOOD, HANTS, BH24 3XD

E-mail: decode@pwpub.demon.co.uk

Web: <http://www.btinternet.com/~mikespage>

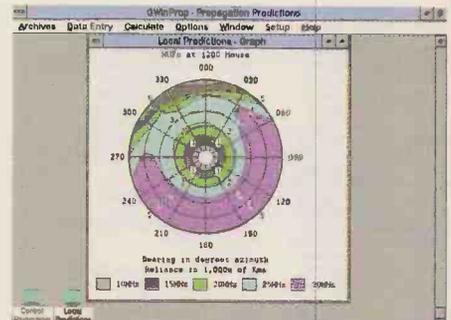


Fig. 1: GwinProp - Local Prediction graph.

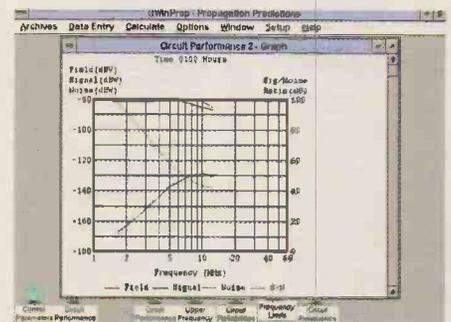


Fig. 2: GwinProp - Circuit Reliability graph.

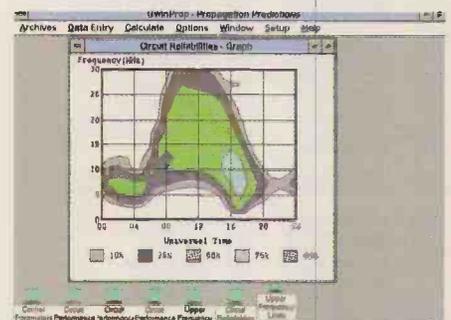


Fig. 3: GwinProp - Circuit Performance graph.

give one of these programs a try to see just how it can transform your listening. Not only do they automate many of the tuning and searching operations, but they allow you to automatically tune your receiver to frequencies in the Klingenfuss database! The three demo programs supplied were *Radio Manager*, *RCON* and *Visual Radio*.

1998 Guide To Utility Stations

This comprehensive annual publication has earned itself a formidable reputation as the most up-to-date comprehensive frequency list available. Whilst many think of it as just that, it is in fact very much more and there are a host of features that can prove very valuable to the data listener.

If you want to monitor services from a particular country then Station List comes into its own. This shows all the main services for that country along with the active frequencies separated into AIR, DIP, PTT, NAV, MAR, etc. The identification of stations from the callsign is an important part of the detective process and the Klingenfuss guide provides the standard ITU series plus a detailed list showing all known utility stations.

Complex Stations

Now that many of you are running Francois Guillet's excellent *RadioRaft* I thought you might appreciate a listing of some of the complex data modes. The list printed in the column - Table 1 - has been extracted from Day Watson's excellent logs and is organised by mode and frequency.

MHz	Mode	Time	Sation				
2.233	ARQ/E/NFT	2233	MOI BONN	18.2894	ARQ/RS/228/E/170	0700	MFA BONN (DMK)?
2.238	ARQ/E/75/E/85	2235	GSK BONN [HF]	19.2264	ARQ/RS/228/E/170	1914	MFA BONN ?
2.235	ARQ/E/96/E/85	2240	LSK BONN [HF]	14.9704	ARQ/SWE/1100/I/400	0709	MFA STOCKHOLM ?
3.2729	ARQ/E/96/E/85	1843	LKA DUSSELDORF [HFVNW]	17.4291	ARQ/SWE/1100/I/400	1320	MFA STOCKHOLM (SAM)
5.0232	ARQ/E/96/E/85	1938	LKA MUNICH [BY]	16.1590	ARQ/61/200/E/400	1034	FRENCH EMB ? LOC
5.2628	ARQ/E/96/E/85	1425	LKA BONN [BRVHF]	16.2129	ARQ/61/200/E/400	1138	FRENCH EMB DAKAR
5.2645	ARQ/E/96/E/85	1433	LKA BONN [THVBR]	18.1700	ARQ/61/200/E/400	1140	MFA PARIS [RFGW]?
5.2652	ARQ/E/77/E/85	1456	GSK BONN [GOVHF]	19.8550	ARQ/61/200/E/400	1244	MFA PARIS [RFGW] ?
6.9638	ARQ/E/11/92/I/170	2035	FF CAYENNE [RFLGA]	3.8327	ARQ/342/200/E/400	2232	FF PARIS [RFPF] ?
7.6140	ARQ/E/11/92/E/170	1940	FF MARSEILLES [RFFH]	4.9917	ARQ/342/200/E/400	2330	FF SAREJEVO [RFFVAY] ?
7.8417	ARQ/E/96/E/400	1850	FF UNID	5.1600	ARQ/342/96/I/400	2250	NIAMEY AIR (SUA)
8.1050	ARQ/E/11/84.6/E/400	2123	UNID.	5.2215	ARQ/342/96/I/400	2305	COTONOU AIR (TYE)
8.5107	ARQ/E/96/E/400	2354	FF PARIS [RFFX]?	7.5240	ARQ/342/96/E/400	1738	CONTONOU AIR (TYE)
9.2590	ARQ/E/11/92/E/170	1212	UNID	14.4626	ARQ/342/96/E/400	1300	BRAZZAVILLE AIR (TNL)?
10.3640	ARQ/E/11/81/850	1839	FF LIBREVILLE [RFT]DA?	8.0502	ARQ/342/200/E/400	2035	FF DJIBOUTI [RFQP]?
10.6260	ARQ/E/11/84.7/1375	1530	UNID.	8.0632	ARQ/342/200/E/400	2108	FF PARIS [RFFA]
10.9550	ARQ/E/48/E/400	1558	UNID.	16.1252	ARQ/342/200/E/400	1448	FF DJIBOUTI [RFQP]
10.9551	ARQ/E/48/1/850	2035	FF PORT BOUET [RFT]F?	16.1652	ARQ/342/200/E/400	1125	FF PARIS [RFFA]
12.2760	ARQ/E/288/I/170	1336	BONN [6XMB]	16.1932	ARQ/342/200/E/400	1143	FF DJIBOUTI [RFQP]
13.5725	ARQ/E/11/84/340	1421	FF PARIS [RFFX]	16.2802	ARQ/342/200/E/400	1158	FF PARIS [RFFA]
14.7815	ARQ/E/96/E/340	0702	MOSSAD TEL AVIV [CJL]	8.4016	ARTRACJ/125/N/170	1305	MFA BUDAPEST (HGX21)
14.7995	ARQ/E/77/I/400	1959	UNID	12.2624	ARTRACJ/125/N/170	1253	MFA BUDAPEST (HGX21)
15.8617	ARQ/E/96/E/400	1541	FF PARIS [RFFX]?	13.4284	COQ/8/126/I/1	1348	MFA ALGIERS
16.0777	ARQ/E/11/92/E/400	1316	FF PARIS [RFFA]	16.2786	COQ/8/126.7/E/1	0820	ALGERIAN EMB BERUT
16.2777	ARQ/E/96/E/400	1513	FF BANGUI [RFFX]	18.1807	COQ/8/126.7/E/1	1057	MFA ALGIERS
17.5509	ARQ/E/11/92/E/170	0951	FF DAKAR [RFT]?	18.5294	COQ/8/133/I/1	1050	ALGERIAN EMB ANKARA
6.8367	ARQ/E3/200/E/400	1941	FF NDJAMENA [RFTPA] ?	2.1875	DSC/1100/E/170	0808	GMDSS ALERT CHANNEL
6.8627	ARQ/E3/200/E/400	1950	FF DHARHAN [RFFVAE]	4.2075	DSC/1100/E/170	0822	GMDSS ALERT CHANNEL
7.8222	ARQ/E3/200/E/400	2215	FF PARIS [RFFA] ?	8.4145	DSC/1100/E/170	2324	GMDSS ALERT CHANNEL
7.8315	ARQ/E3/48/I/400	2220	ANTANANARIVO AIR (SST)	13.5515	FEC/11/92/E/400	1518	MFA PARIS [RFGW]
7.8316	ARQ/E3/48/I/400	2146	UNID.	15.8980	FEC/11/92/E/400	1031	MFA PARIS [RFGW]
9.0797	ARQ/E3/100/E/400	2022	FF DJIBOUTI [RFQP]	18.7042	FEC/11/96/E/400	0725	PIAB BONN (DGS70H5)
10.1775	ARQ/E3/11/92/E/400	0756	FF PARIS ? [RFFA]	8.0280	FEC/ROU/1164.5/R/400	1003	MFA BUCHAREST [VSG]
10.4937	ARQ/E3/48/E/400	2253	FF PORT BOUET [RFT]F?	10.4930	FEC/ROU/1164.5/R/400	1006	MFA BUCHAREST [VSG]
10.5126	ARQ/E3/11/92/E/385	0930	FF FT DE FRANCE [RFL]	13.8550	FEC/ROU/1164.5/R/400	1302	MFA BUCHAREST [VSG]
10.9177	ARQ/E3/48/E/400	2324	FF DAKAR [RFT] ?	14.6810	FEC/ROU/1164.5/R/400	1011	MFA BUCHAREST [VSG]
11.0437	ARQ/E3/11/92/E/400	1550	FF LIBREVILLE [RFT]D	16.3320	FEC/ROU/1164.5/R/400	1022	MFA BUCHAREST [VSG]
12.1367	ARQ/E3/200/E/400	0947	FF UNID ?	13.9980	PACT/1001/200	1223	I.F.R.C. GENEVA [IFRCGVYA]
13.5437	ARQ/E3/11/92/E/400	1902	FF LIBREVILLE [RFT]D	19.3096	PACT/1001/200	1238	UN GENEVA [HCSWIGE]
13.8867	ARQ/E3/11/92/E/400	1720	FF PARIS [RFFA]	5.1050	PIC/CI/NFT	1300	UNID
14.5857	ARQ/E3/200/E/400	1425	FF NDJAMENA [RFTCT] ?	5.1055	PIC/CI/	1301	UNID
14.6267	ARQ/E3/11/92/E/400	0655	FF FT DE FRANCE [RFL]	7.4920	PIC/CI/NFT	2319	UNID
14.7987	ARQ/E3/200/E/400	1835	FF DAHRAN [RFFVAE]?	13.8130	PIC/CI/NFT	1127	UNID
14.9267	ARQ/E3/11/92/E/380	1331	FF DAKAR [RFT] ?	14.9405	PIC/CI/	2154	UNID.
14.9276	ARQ/E3/11/92/E/400	1344	FF DAKAR [RFT]?	15.8170	PIC/CI/	1508	UNID.
14.9598	ARQ/E3/11/92/E/380	0653	FF DAKAR [RFT]?	18.6059	PIC/CI/	1138	UNID
15.9617	ARQ/E3/11/92/E/370	1113	FF FT DE FRANCE [RFL]	11.0165	TWINPLEX/1100/I/-	0831	MFA MADRID
16.0877	ARQ/E3/1100/E/400	1621	FF LE PORT [RFV]	16.2099	TWINPLEX/1100/E/-	1035	NORWEGIAN EMB ANKARA ?
16.1057	ARQ/E3/200/E/400	1447	FF DHARHAN [RFFVAE] ?	16.386	TWINPLEX/1100/I/-	1038	MFA ISLAMABAD ?
16.2617	ARQ/E3/11/92/E/385	1338	FF LIBREVILLE [RFT]D	18.4454	TWINPLEX/1100/E/-	0940	MFA OSLO
16.3057	ARQ/E3/200/E/400	1557	FF NDJAMENA [RFTCT] ?	18.4879	TWINPLEX/1100/E/-	0956	MFA OSLO
16.3247	ARQ/E3/11/92/E/380	1050	FF LIBREVILLE [RFT]D	18.5139	TWINPLEX/1100/E/-	1032	UNID.
16.6277	ARQ/E3/200/E/400	1309	FF NDJAMENA [RFTCT] ?	18.5139	TWINPLEX/1100/E/170	1152	MFA COPENHAGEN
18.3208	ARQ/E3/11/92/E/400	1517	FF DAKAR [RFT]?	19.0317	TWINPLEX/1100/I/-	1113	PAKISTAN EMB .LOC
18.3808	ARQ/E3/1100/E/400	1619	FF PARIS [RFFA] ?	6.8300	ARABIC/50/N/400	1614	PETRA AMMAN
19.0487	ARQ/E3/11/92/E/400	1125	FF PROVENCE ?	10.1625	ARABIC/75/N/400	1508	INA BAGHDAD (Y1L71)
19.0507	ARQ/E3/11/92/E/400	1615	FF PROVENCE ?	11.0800	ARABIC/50/N/425	1515	SANA DAMASCUS
19.2167	ARQ/E3/96/E/400	1149	FF FT DE FRANCE [RFL]	14.5605	ARABIC/50/N/400	1040	PETRA AMMAN (IYF2)
19.5303	ARQ/E3/96/I/400	0947	TA.A.K. KERGUELLEN (FY2)	14.5730	ARABIC/50/N/400	1420	JANA TRIPOLI
19.5303	ARQ/E3/96/I/400	1030	DTR KERGUELLEN (FY2)	14.6990	ARABIC/75/N/400	1114	INA BAGHDAD (Y1X70)
7.4840	ARQ/POL/1100/-J350	0841	MFA WARSAW (SNN299)	18.4961	ARABIC/50/N/400	1028	MAP RABAT (CNM80X11)
18.0640	ARQ/POL/1100/I250	1330	MFA WARSAW (SNN299)	4.2025	3SCI/50/N/170	1650	SHIP "THA SWERDLOW"
5.2990	ARQ/RS/228/E/170	0628	MFA BONN ?	6.3415	3SCI/50/R/170	1118	RIGA RADIO (YLQ)
6.8380	ARQ/RS/228/-/170	1323	MFA BONN ?	8.4140	3SCI/50/N/170	1055	SHIP UNID (UPAA)
8.0130	ARQ/RS/228/E/170	0832	MFA ROME	16.7975	3SCI/50/R/170	1520	SHIP UNID
9.2540	ARQ/RS/240/I/-	1545	MFA ANKARA ?	16.7985	3SCI/50/R/170	1045	SHIP NOWOROS/UFXI
9.2779	ARQ/RS/228/E/170	1241	MFA BONN ?	16.7995	3SCI/50/R/170	1332	SHIP UNID (UBCI)
11.4590	ARQ/RS/228/E/170	0750	MFA BONN	16.8025	3SCI/50/R/170	1513	SHIP "MARIQ POLIWANOWA"
11.5365	ARQ/RS/228/E/170	1009	MFA BONN	16.8030	3SCI/50/R/170	1552	SHIP "FRUX ARGENTINA/CATW"
11.5392	ARQ/RS/228/E/170	0827	MFA BONN	17.0200	3SCI/50/N/170	1310	MURMANSK RADIO (UDK)
11.5392	ARQ/RS/228/E/170	0851	GERMAN EMB CAIRO	18.8930	3SCI/50/R/170	1212	SHIP "SRTM1 TARHAN"
11.5401	ARQ/RS/228/E/170	2224	MFA BONN ?	18.8935	3SCI/50/R/170	0722	SHIP UNID
13.3755	ARQ/RS/228/E/170	1948	MFA BONN ?				
13.8944	ARQ/RS/228/E/170	1404	MFA BONN ?				
14.6190	ARQ/RS/240/E/-	0929	MFA ANKARA ?				
14.6644	ARQ/RS/228/E/170	0740	MFA BONN				
14.6644	ARQ/RS/228/-/170	1155	GERMAN EMB NDJAMENA				
15.8549	ARQ/RS/228/E/170	0755	MFA BONN ?				
15.8576	ARQ/RS/228/E/170	0753	MFA BONN ?				
15.8585	ARQ/RS/228/E/170	1020	MFA BONN				
16.0204	ARQ/RS/228/E/170	0929	MFA BONN				
16.3530	ARQ/RS/228/-/170	1146	MFA ROME				
18.2876	ARQ/RS/228/E/170	1135	MFA BONN ?				

have tightened things up, local interference remains a problem for those of us trying to seek-out those weak, rare stations.

Whilst checking through the Internet recently I came across an interesting publication that may be of help to some. The book in question is the *FCC Interference Handbook*. Whilst this is aimed primarily at fixing local TV interference there's lot of information that will be useful to all. If you'd like to take a look it can be found at

<http://www.fcc.gov/Bureaus/Compliance/WWW/W/tvbook.html> If you know of any other useful sources please drop me an E-mail with the details.

Propagation Prediction

In my earlier note on finding those DX stations I mentioned that you can use a suitable computer program to help you out. The latest to come my way is *GWinProp* from Gordon West. This excellent program has been based on a report and program issued by the Institute for Telecommunications Sciences in Boulder, Colorado. Gordon has taken this excellent work and customised it to make it more suitable for amateur use.

The main changes are to increase the frequency coverage to 1.5-60MHz and to use a set of tables to hold details of the local station, antenna, etc. This latter point saves having to enter this information every time the program starts. Gordon has also changed the from absolute measures to logarithmic units i.e. dBW and dBuV. To run the program you will need Windows 3.1 or later with at least a 386 processor.

The program can either be used to help you decide the best times and frequencies for general listening or to find the best frequency/time for reaching a particular area. To use the program for general listening you just have to enter your station location and details and ask it to calculate the result. The output is presented both in table form and as a very easy to read graph. Using this tool you can very easily run a quick check to find out where you should be listening. I've shown some sample outputs in this column. If you want to link-up with a specific station then you really can get technical. In addition to your own station details you just add the transmitter location, transmitter power and antenna type. The program can then be set to carry-out a number of complex calculations to not only find the best path but also provide expected signal levels so you can see whether or not you are likely to be able to resolve the station.

This really is extremely powerful stuff that can not only increase your chances of catching the rare stations but also teach you a lot about propagation at the same time. What really makes this program a winner is that Gordon has released this version as freeware. Once I've got Gordon's permission, I'm hoping to be able to upload the program to my Web site so that it's available to all. My thanks to Gordon for his excellent work.

Short Wave Guide

If it's just frequencies you want without the frills then the new *Short Wave Frequency Guide* may well fit the bill. It has particular appeal to the general listener as it includes an easy to use utility station list plus a similarly formatted broadcast station list. As it is primarily a frequency list the station schedule details are somewhat restricted but format used is very easy to use and ideal for those that like to cruise the bands.

Interference Help

Interference is the scourge of the modern listener and is fuelled by the huge increase in domestic electronics over the past few years. Whilst the emission control regulations

If, like many, you have a particular interest in looking at weather reports, section eight is the one for you. The *Meteo* section has been recently restructured to combine FAX and RTTY weather report schedules into the same section. Where available the entry for each station shows the timings of all the charts along with the chart type.

This has been supplemented with the Internet address for the latest station schedule, where available. If you've ever wondered what all those Q and Z codes mean the explanation is to be found in section 12 along with the international phonetic alphabet and the SINPO/SINPFEMO codes. All this information is supplemented by a set of air route maps and maritime channel allocation details. I'm sure you can see why this guide remains the most comprehensive and up-to-date guide of its type. Copies are available from the SWM Book Store.

WIN Logger Software

Compatible with:- AR-3000A



Windows '95 software. Logs bank data to disc files with a comment field for each memory channel to log call signs and station names etc. Bank data can be sorted and printed, ideal for spotting duplicates.

An additional separate database is also included to store all your favourite frequencies and provides unlimited memory storage capacity. The AR-3000A can be tuned to any of these frequencies at the click of a button.

A bandscope is also included to visualise band activity and the frequencies observed can be transferred to the database at the end of the scan period.

Special Introductory Offer - ONLY £29.95 + £2.95 P&P including FREE data cable. Send cheque or postal order for £32.90, including P&P, payable to 'Computer Specialities' or SAE for details, to:

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Web site address to be released soon

SHORT WAVE MAGAZINE

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WHERE?

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1998 will be the ninth year at Picketts Lock for the London Amateur Radio and Computer Show. A traditional event with bargains galore. Again, a two day event with over 100 trade stands including the special events section, with our huge **BRING AND BUY** stand looking just like Aladdin's Cave. Also disabled facilities, bars and restaurants.

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PICKETTS LOCK

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Info in Orbit

When I see weather forecasts showing 100mph winds likely to hit Plymouth, I have no alternative but to dismantle some of my satellite dishes and prepare for the storm. On an early January Friday this was the changed forecast for the following day (!) so I had just a few hours to prepare. The satellite television dish is 1.2m diameter, motorised, and firmly fixed to the ground, but experience tells me that 100mph gusts might actually reach much higher speeds. In 1987 we experienced an unexpected hurricane in which recorded wind speeds of about 120mph were measured! At that time, part of the roof of our house was blown away - but all those years ago I had just one 1m METEOSAT dish, which I simply laid on the ground.

On another occasion when 60mph winds were forecast while I was at work, I returned home to find the 1.6m PDUS dish had left its support and was standing vertically (gravitationally extremely difficult!) at the side wall of our house.

This time I dismantled the 1.2m dish and brought it indoors. The two big dishes of 1.6 and 1.8m diameter are still 'resting' on the ground between operations, waiting to be set up for METEOSAT Primary Data, and while horizontal, they present little wind resistance. The storm came and did its worst - as seen on television! I made a point of collecting some NOAA-12 and -14 images of the deep depression as it crossed the south-west. Correspondents **Jim and Hilda Richardson** of Strathkinness also collected some images and the following pictures show the sequence:

The first image - see Fig. 1 - is from Jim and Hilda and shows the vigorous 'low' arriving in Britain. Christmas Day remained wet and windy - a taste of what was still to come!

My own first image of the New Year came from METEOR 3-5 - see Fig. 2 - which is currently passing northbound during the day. It only transmits a.p.t. (picture telemetry) in sunlight - while its solar panels are illuminated - so new readers of 'Info' should not be too surprised when the signal (on 137.85MHz) suddenly ceases despite the satellite being several degrees above the local horizon. Telemetry ends as the WXSAT crosses into the dark polar region. The picture looked innocent enough - just approaching depressions!

By Saturday 3 January the storm warnings were on every television forecast with various 'guesstimates' indicating 80 to 90mph winds - more than enough to justify the dismantling of the dishes. Figure 3 shows the main (highest elevation) afternoon pass from METEOR 3-5 received by Jim and Hilda at about 1200UTC. The complex depression shows the first front having crossed to the east, having already brought powerful gales across the country, particularly the south-west - and a new one was brewing further west.

My son Timothy was home for the holidays so he helped me lower the METEOSAT dish from its mounting and lay it on the ground. Our home is fairly exposed to the south-westerlies and even winds over 35mph give me cause for concern.

A few hours later I collected Fig. 4, the main NOAA-12 pass that evening (3 January) which shows the movement of the depression since the previous METEOR 3-5 pass.

The final picture in this sequence is Figure 5, a visible-light image on 5 January from NOAA-14 showing the storm having crossed the south-west a few hours earlier. Not long after the storm, the winds dropped to breeze level, enabling me to refit the dishes. Fortunately we suffered no obvious structural damage.

My thanks to Jim and Hilda for sending me their comprehensive collection of images from that period.

Current WXSATs

The hours of daylight are increasing and one of the first improvements to occur is the level of illumination seen during daytime NOAA-14 passes. Figure 6 shows a typical raw NOAA-14 image obtained during its daylight northbound pass. The left channel is thermal infra-red, the right channel is visible-light - at a low level during winter. Near the top end of the pass the change from this low level of visible-light illumination to infra-red (the water vapour section of the spectrum) can be seen.

To help enhance the actual amount of detail available in the visible-light section, I have enhanced two different areas of the image - Figs. 7 and 8 - and enlarged them for clarity.

METEOR 3-5 Transmissions in February

During December, January and early February METEOR 3-5 has been passing north-bound during the day, so transmissions could be received until the satellite entered northern polar darkness and switched off. The satellite does not transmit a.p.t. in darkness - a fact which understandably confuses some newcomers to the hobby. By mid-February the satellite's orbital plane has rotated such that it passes over Britain during the early morning, and is catching up with the morning terminator (the day/night boundary) well before the satellite has risen very far. Consequently transmissions from METEOR 3-5 during its north-bound passes are unlikely to be heard in Britain during the latter half of February. South-bound passes take place during the afternoon while the satellite is just on the daylight side of the terminator, so it will not be transmitting until it has reached more southerly latitudes. By the end of the month, or during early March we should receive its transmissions once more, as it passes southbound during the afternoon, a little further from the evening terminator.

FENGYUN-2B

An E-mail from **Arthur Andrews** in Australia responded to my request for an image from the Chinese geostationary WXSAT FENGYUN-2B. When not dealing with severe bush fires, Arthur has a comprehensive h.r.p.t. (high resolution) receiving station and has been monitoring the Chinese WXSAT since it started transmissions.

The Pacific Ocean, the South China Sea and the Bay of Bengal are seen to be very warm in this infra-red image. Country outlines are added by the satellite operators, making it easy to identify the land mass.

Listen Out For - ORBCOMM

I have occasionally mentioned the frequencies of satellites which operate in the 137MHz band - other than the WXSATs. The latest constellation - ORBCOMM - operates throughout the band and readers may wish to use their scanners to do some monitoring of these. The ORBCOMM satellite based global messaging system is being deployed, and initially consists of 26 satellites. Down-links are in the 137-138MHz band - Table 1 and up-links use the 148-149.9MHz.

The signal bandwidth is believed to be about 7kHz and 20W e.i.r.p. (compare this with about 5W for the WXSATs!). The transmitters may change their operating frequency from time to time. Gateway down-links are on 137.56MHz using a lower power with

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Fig. 1: NOAA-12 infra-red channel at 1750UTC on 24 December 1997.

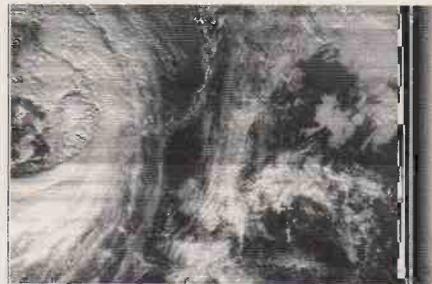


Fig. 2: METEOR 3-5 1230UTC 1 January 1998.



Fig. 3: METEOR 3-5 1200UTC 3 January 1998 from J&H.



Fig. 4: NOAA-12 1727UTC 3 January 1998.

50kHz bandwidth. More satellites are scheduled to be launched in this year. My thanks to members of the 'Hearsat list' on the Internet for providing this data.

More global messaging systems are planned - E-SAT, FAISAT and LEO for the USA, TEMISAT for Italy, and possibly COURIER-1 for Russia. All these constellations plan to use the 137-138MHz band for down-links. My thanks to **Keith Stein** of Launchspace for this info.

Other non-WXSATs using 'our' band include:

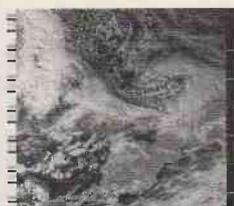


Fig. 5: NOAA-14 1420UTC 5 January 1998.



Fig. 6: raw NOAA-14 image 1336UTC 9 January 1998.

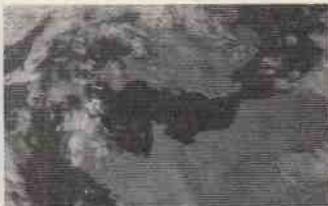


Fig. 7: Zoomed close-up showing southern Britain and France.

TRANSIT 5B-5 on 136.65MHz, MuSAT-I on 137.95MHz, PROSPERO on 137.56MHz

There are a few others that I have not monitored recently so have not included. I welcome all reports of satellites in this band for inclusion in the column.

SPUTNIK PS2 Ceases Transmission

I last logged SPUTNIK-40 (PS2) during December but reports from around the world confirmed that the mini-satellite stopped transmitting around December 29 or 30. The lithium battery-powered 100mW transmitter had worked for eight weeks after its launch by hand from the Russian MIR space station on 3 November, transmitting a beep-beep tone on 145.82MHz. The frequency of the tone indicated the satellite's internal temperature.

Correspondence

Recent letters have mostly come from readers new to the topic of WXSAT monitoring, and Christmas appears to have prompted wives to purchase scanners for husbands. [I am pleased to say that I know of several families where the wives are the hobbyists and husbands are being encouraged to take part - particularly north of the border!] **Ray Slane** of Antrim is the proud possessor of a new Uniden Bearcat Twin Turbo UBC3000XLT scanner - bought by his XYL. Ray has been an aircraft enthusiast for many years (I also monitor some of these frequencies which are active at our local Roberorough airport). Ray's interest has taken him to the possibility of Shuttle monitoring. The construction of the International Space Station is scheduled to start later this year (probably July) and transmissions from MIR and ISS should be fairly easy to monitor. I shall be giving all the frequencies likely to be used, in future editions of this column, to enable monitoring of the construction.

Upgrade Time!

The gales have subsided and as I write this column I am about to perform a significant upgrade to my QTH! The computer has a CPU running at 120MHz which, when I bought it some 18 months ago, seemed to run like an express train. Recently I had noticed that the chip is running flat-out whenever I download data from the Internet, so because the machine is in almost continuous use, I decided to fit a new motherboard. This upgrade takes me to 200MHz and will hopefully keep up with everything. I also took the plunge and laid my old WXSAT receiver to rest. It was bought some ten years ago in kit form and has served me well, but lacks the facility to be programmed to change frequencies in my absence. A new PROscan receiver was bought from Timestep and, together with a 4Gb hard drive, can now be programmed to collect both METEOSAT, METEOR and NOAA passes in my absence. All I have to do is fit the new motherboard and install the hard drive!

STS-Plus software upgrade

Yes its time for the next upgrade to STS-Plus! The new release of David Ransom's satellite tracking program is issue 9748, released in late December. This new version



Fig. 8: Zoomed close-up showing the islands of Corsica and Sardinia off the coast of Italy.

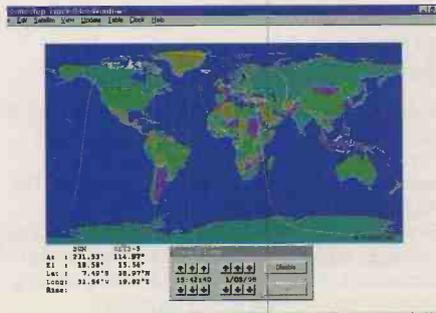


Fig. 9: METEOR 3-5 footprint. Southbound passes during the afternoon.

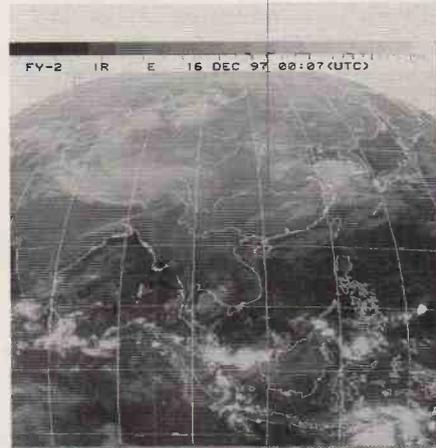


Fig. 10: FY2 infra-red image 16 December at 0007UTC from Arthur Andrews.

is a 'maintenance upgrade' which consolidates recently added features and eliminates a few bugs discovered during beta testing. The program comes as two zipped files totalling 758Kb so anyone wanting a copy should send a standard HD 3.5in floppy disk with return, stamped envelope and secure 50p coin.

Next month

Beginners to the field of WXSAT monitoring may be aware of the 'standard' WXSAT antenna - the crossed-dipole and the turnstile. These designs are accepted as being the most appropriate for reception of the right hand circular polarised signals of the WXSATs. Next month I hope to provide a short feature on the building of the quadrifilar helical antenna (QFH) which has received much acclaim from users.

Shuttle Launch Schedule

My postbag shows a very high level of interest in Shuttle flight information. Details of future flights will be listed here as appropriate. STS-90 is scheduled for launch on 2 April carrying the NEUROLAB Space Life Sciences Laboratory. Its orbital inclination is 39°. A comprehensive listing of all Shuttle flights and payloads, together with associated information is available from me as the *Shuttle Pack*. Please include a £1 and stamped s.a.e. for the A4 booklet.

Kepler elements - MIR and Shuttle

- 1 For a print-out of the latest WXSAT elements, MIR, and the Shuttle (if in orbit), send a stamped addressed envelope and secured 20p coin or separate, extra stamp. Transmission frequencies are given for operating satellites. This data originates from NASA. I send Kepler elements by return-of-post.
- 2 I also send monthly Kepler print-outs to many people. To join the list please send a 'subscription' of £1 (secured, plus four self-addressed, stamped envelopes) for four editions.
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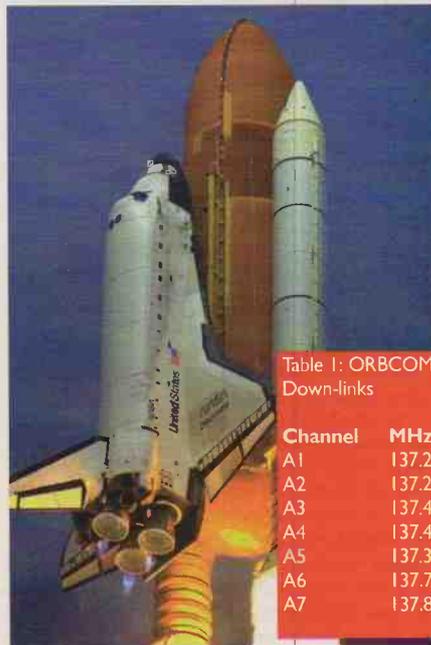


Fig. 11: Shuttle STS-85 ready for launch. Picture courtesy NASA.

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 (rare transmissions)
- METEOSAT-6 (geostationary) uses 1691 and 1694.5MHz for WEFAX
- GOES-8 (western horizon) uses 1691MHz for WEFAX
- MIR uses 143.625MHz for voice.

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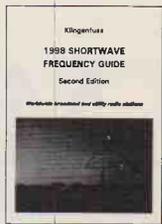


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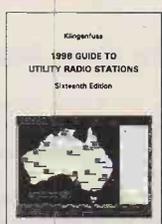
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Many of the International Broadcasters may change their short wave transmission schedules on March 29 to compensate for seasonal changes in propagation. Until that date most of the s.w. data herein should apply.

Reports on the effects of such changes will be especially welcome here - please send them to the above address.

Long Wave Reports

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

Unless otherwise stated, all logs were compiled during December.

Pop music and announcements in Icelandic broadcast by Ríkisutvarpid via their new 300kW outlet at Gufuskalar, W.Iceland on **189kHz**, were picked up by **Fred Pallant** in Storrington during the evenings of December 12, 21 & 23. The best reception was at 2155UTC on the 23rd, when their transmission rated SINPO 13443.

Medium Wave Reports

A marked improvement in the propagation of m.w. transmissions over the Atlantic was evident during some nights in December. Quite a few of the broadcasts from stations in Canada and the USA reached our shores - see chart.

Favourable conditions were noted on the 10th & 11th by **Harry Richards** in Barton-upon-Humber but the only time he heard CJYQ in St.John's, NF on **930kHz**, which often acts as a pointer to conditions, was at 0050UTC on the 15th. At 0020 on the 19th **Sheila Hughes** (Morden) heard for the first time ever a broadcast from a m.w. station in the USA - it came from WNRB in Boston, MA on **1510kHz** and rated 23212. In nearby Thornton Heath **Tony Stickells** heard most of the stations in his list during the period 2315-0150 on the 21st & 23rd.

Up in Wallsend **David Edwardson** found the band sometimes open until quite late in the morning - particularly on the 7th, when WQEW in New York, NY on **1560** was audible at 0955. Very good conditions were noted around 0300 on the 29th, when CFRB on **1010**, WNRB on **1510** and WWKB on **1520** were so strong they could be received on a domestic portable!

North of the border, **Eric Duncan** (St.Andrews) searched the band during the nights of 14/15, 19/20, 20/21, 21/22, 22/23, 23/24, 24/25, 28th, 29th & 30th. His extensive log included three stations which he had not heard before - WLW Cincinnati, OH on **700**; WBBM Chicago, IL **780**; WJAE Portland, ME **1440**.

Over in Troon **Paul Crankshaw** found the conditions to be exceptionally good during the period 24-29th. He noticed that some stations could be heard until very late in the morning. The highlight for him was receiving KBRV in Barrow, Alaska on **680** between 1140 & 1155 on the 29th! Good reception until the late morning was also reported by **John Slater** in Scalloway, Shetland. Whenever he listened he found that WBBR in New York, NY on **1130** was audible between 0800 and 0900. A new one for him was

WOWO Forth Wayne, IN on **1190**, which rated SIO344 at 0907.

The broadcasts from some stations in E.Asia, the Middle East and N.Africa were also received in the UK after dark - see chart.

Short Wave Reports

At present the **25MHz (11m)** band is not used for broadcasting, but test transmissions may commence soon.

Frequent changes in propagation occur in the **21MHz (13m)** band but reception from some areas is often good. Noted during the day were UAER, Dubai **21.605** (Eng to Eur 1030-1100), rated 44444 at 1035 by **Bernard Curtis** in Stalbridge; BSKSA Saudi Arabia **21.495** (Ar [Holy Quran] to SE.Asia 0900-1200) 34333 at 1115 by **Robert Hughes** in Liverpool; BBC via Ascension Is **21.660** (Eng to W/E.S.Africa 1100-1700) 34433 at 1146 by **Rhoderick Illman** in Oxted; RFI via Issoudun **21.620** (Fr to E.Africa 0900?-1500) 25322 at 1244 by **Eddie McKeown** in Newry; HCJB Quito, Ecuador **21.455** (Eng, u.s.b. + p.c.) 34333 at 1245 in Scalloway; BBC via Cyprus **21.470** (Eng to E.Africa 1400-1700) 43433 at 1430 by **Stan Evans** in Herstmonceux; RAI Rome **21.535** (Tt [R.Uno] to Lat Amer 1345-1700, Sun only) 44444 at 1615 by **Robert Connolly** in Kilkeel; WYFR via Okeechobee, USA **21.525** (Eng to Eur, Africa 1600?-2200?) 34433 at 1656 by **Darren Beasley** in Bridgwater; WYFR via Okeechobee **21.725** (Russ to CIS 1700-1800) 24212 at 1744 by **Thomas Williams** in Truro.

Some improvement in reception has been noted in the **17MHz (16m)** band. During the morning R.Australia via Shepparton **17.750** (Eng to Asia 0600-0900) was rated 25552 at 0600 by **John Parry** in Larnaca, Cyprus and 44333 at 0845 in Herstmonceux; DW via Rwanda? **17.800** (Eng to Africa 0900-0950) 35443 at 0915 in Bridgwater; Voice of Russia **17.795** (Eng [VWS]) SIO444 at 0938 by **Francis Hearne** in N.Bristol; R.Austria Int via Moosbrunn **17.870** (Ger, Eng to Australia 0800-1100) 44444 at 0940 in Truro; Voice of Russia **17.860** (Eng [VWS]) 22222 at 1000 by **Clare Pinder** in Appleby; R.Prague, Czech Rep **17.485** (Eng to W.Africa 1000-1030) 54444 at 1014 by **Tom Winzor** in Plymouth; BBC via Skelton & Woofferton, UK **17.640** (Eng to E.Eur, M.East, E.Africa 0700-1500) 44444 at 1020 by **Tony Hall** in Freshwater Bay, IoW; AIR via Bangalore **17.387** (Eng to Pacific areas 1000-1100) 34333 at 1030 in Scalloway; R.Japan via Gabon **17.630** (Sw, It to Europe 1100-1130) 25332 at 1100 in Storrington; R.Pakistan, Islamabad **17.835** (Eng to Eur 1100-1120) 44333 at 1100 in Morden; BSKSA via Riyadh **17.880** (Ar [Holy Quran] to SE.Asia 0900-1200) 42332 at 1155 in Oxted.

After mid-day RFI via Fr.Guiana **17.575** (Eng to Africa, Asia 1200-1300) was noted as SIO544 at 1230 by **Philip Rambaut** in Macclesfield; BBC via Ascension Is **17.830** (Eng to W/C.Africa 0730-1000, 1100-2100) was 33322 at 1250 in Stalbridge; BBC via Skelton, UK **17.705** (Eng to Eur, Africa 1200-1630) 22222 at 1300 by **Ernest Wiles** while in Tenerife; Israel R, Jerusalem **17.545** (Heb [Home Sce rly] to W.Eur, N.America 0700-1700?) 55555 at 1335 in

LONG WAVE CHART

Freq (kHz)	Station	Country	Power (kW)	Listener
153	Donebach DLF	Germany	500	A,B,C*,D,E*,FG
162	Allouis	France	2000	A,B,C*,D,E*,F,G,H
171	Bshakovo etc	Russia	1200	A,B,C*,D,E*
171	L'vov	Ukraine	500	C*
177	Oranienburg	Germany	750	A*,C*,D*,E*
183	SaarLouis	Germany	2000	A,B,C*,D,E*,G,H*
189	Gufuskalar	W.Iceland	150	E*
189	Caltanissetta	Italy	10	B*
196	Droitwich BBC	UK	500	A,B,C*,D,F,G,H*
207	Munich DLF	Germany	500	A*,B*,C*,D,E*,G,H*
207	Azilal	Morocco	800	E*
216	Roumoules RMC	S.France	1400	A,B*,C*,D,E*
234	Beidweiler	Luxembourg	2000	A,B*,C*,D,E*,FH
243	Kalundborg	Denmark	300	A,B,C*,D,E*,H*
252	Tipaza	Algeria	1500	B*,D*,E*
252	Atlantic 252	S.Ireland	500	A,B*,C*,D,E*,F,G,H
261	Burg(R.Ropa)	Germany	200	A*,B*,D,E*
261	Taldom Moscow	Russia	2500	A*
270	Topolna	Czech Rep	1500	A,B*,C*,D,E*,H*
279	Sasnovy	Belarus	500	A*,B*,C*,E*

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

Listeners:-

- (A) Ted Harris, Manchester.
- (B) Sheila Hughes, Morden.
- (C) Eddie McKeown, Newry.
- (D) George Millmore, Wootton, IoW.
- (E) Fred Pallant, Storrington.
- (F) Paul Pybus, Hull.
- (G) Tom Smyth, Co.Fermanagh.
- (H) Thomas Williams, Truro.

Liverpool; BBC via Antigua, W.Indies **17.840** (Eng to N/C.America 1400-1900) 45243 at 1510 in Newry; VOA via Morocco **17.895** (Eng to Africa 1600-1800) 43333 at 1610 in Kilkeel.

Reception over long distances has more often been possible in the **15MHz (19m)** band. Mentioned in the reports were the BBC via Kranji, Singapore **15.360** (Eng to SE.Asia, Far East 0500-1030) rated 23221 at 0817 in Oxted; Voice of Malaysia, Kajang **15.295** (Mal to S.Asia 0830-1025) 23222 at 0845 in Scalloway; R.Australia via Shepparton **15.415** (Eng to Asia 0100-0400, 0600-0900) 43333 at 0845 in Herstmonceux; KTWR Agana, Guam **15.200** (Eng to F.East 0755-0915) 22222 at 0805 in Morden; VOA via Philippines **15.425** (Eng to E.Asia 1100-1500) 35553 at 1230 in Cyprus; R.Netherlands via Madagascar **15.585** (Eng to S.Asia 1330-1525) 54444 at 1459 in Plymouth; WWCR Nashville, USA **15.685** (Eng to N.America, Eur 1100-2200) 44444 at 1515 by **Peter Pollard** in Rugby; WEVN via Vandiver, USA **15.745** (Eng to Eur, Africa? 1200-1755?) 45444 at 1536 in Freshwater Bay; BBC via Antigua, W.Indies **15.220** (Eng to C/N.America 1400-1600) 24332 at 1550 in Liverpool; WYFR via Okeechobee **15.695** (Eng to Eur, Africa 1600-1845) 44444 at 1600 by **Gerald Guest** in Dudley; Channel Africa via Meyerton **15.240** (Eng, Port to C/W Africa 1700-1800?) 45544 at 1800 in Bridgwater; RNB Brazil **15.265** (Port, Eng, Ger to Eur 1630-2020) SIO333 at 1820 in Macclesfield; KTBN Salt Lake City, USA **15.590** (Eng to N.America 1600-0000) 24222 at 1820 by **Vera Brindley** in Woodhall Spa; R.Netherlands via Bonaire, Ned.Antilles **15.315** (Eng to Africa 1830-2025) 44444 at 1945 in Kilkeel.

Also logged in this band were R.Finland via Pori **15.225** (Eng to Australia, Asia 0900-0930), rated SIO444 at 0918 in N.Bristol; AIR via Aligarh? **15.050** (Eng to NE.Asia 1000-1100) 33333 at 1010 in Stalbridge; VOIRI Tehran **15.260** (Eng to M.East, Asia 1130-1230) SIO222 at 1130 by **Tom Smyth** in Co.Fermanagh; BBC via Skelton & Rampisham, UK **15.565** (Eng to Eur, M.East, Africa 0600-1500) 33333 at 1300 in Tenerife; UAER, Dubai **15.395** (Eng to Eur 1330-1355) 44544 at 1332 in Wallsend; Voice of Greece via Kavala **15.175** (Eng to Eur, N.America 1335-1345) 54454 at 1335 in Newry; RCI via Sines, Portugal **15.325** (Eng to Eur, M.East, Africa 1430-1500) 44444 at 1430 in Truro.

In the **13MHz (22m)** band R.Australia via Shepparton **13.605** (Eng to Pacific 0000-0800) was 35553 at 0515 in Cyprus; R.Austria Int via Moosbrunn **13.730** (Eng to Eur 0830-0900?) SIO444 at 0832 in N.Bristol; R.Nederlands via Irkutsk **13.700** (Eng to Pacific 0830-0925) 32332 at 0857 in Oxted; SRI via Sottens? **13.635** (Eng, Ger, Fr, It to SE.Asia 1100-1330) 43443 at 1110 in Kilkeel; Croatian R, Zargreb **13.830** (Cr, Eng to N.America 1230-1300) 44344 at 1240 in Liverpool; UAER, Dubai **13.675** (Eng to Eur 1330-1355) 45444 at 1332 in Wallsend; R.Prague, Czech Rep **13.580** (Eng to Europe, E.Africa, N.America 1400-1427) 33333 at 1425 in Truro; WHRI South Bend, USA **13.760** (Eng to E.USA, Eur 1400-0100?) 54444 at 1502 in Plymouth; R.Marti via Greenville, USA 13.820 (Sp to Cuba 1400-0000) 34333 at 1617 in Scalloway; WEWN Birmingham, USA **13.615** (Eng to N.America, Eur 1600-2000) 35333 at 1619 in Bridgwater; UAER, Dubai **13.675** (Eng to Eur 1600-1640) 34433 at 1633 by **Ted Harris** in Manchester; WVCR Nashville, USA **13.845** (Eng to Africa 1400-0000) 33333 at 1625 in Tenerife and 34323 at 1824 in Woodhall Spa; RCI via Sackville 13.650 (Fr, Eng to Eur, Africa 2000-2200) 44344 at 2104 in Newry; VOA via Selebi-Phikwe, Botswana **13.710** (Eng to Africa 1600-2130?) 33333 at 2120 in Rugby.

Broadcasts from many areas were received in the **11MHz (25m)** band. The most distant came from R.New Zealand on 11.905 (Eng to Pacific areas 0459-0816 Mon-Fri, 0459-0758 Sat/Sun), rated 35533 at 0745 in Wallsend. R.Australia via Shepparton was logged on **11.880** (Eng to Asia 0900-1100) as 22332 at 0955 in Freshwater Bay; also on **11.660** (Eng to Asia 1330-1700) as 44334 at 1430 in Dudley and 44334 at 1400 in Cyprus.

Also mentioned in the reports were Georgia R. via Dusheti **11.910** (Eng, Ger to Eur 0800-0900), rated 53433 at 0835 in Herstmonceux; FEBC Bocaue, Philippines **11.635** (Eng to Asia 0930-1100) 22232 at 1048 in Bridgwater; KFBS Marpi, N.Mariana Is **11.650** (Russ to E.Eur 0900-1100) 34333 at 1055 in Scalloway; HCJB Quito, Ecuador **12.005** (Eng to N.America 1100-1530) 43223 at 1120 in Truro; R.Jordan via Al Karanah **11.690** (Eng to W.Eur, E.USA 1000-1630) 54444 at 1124 in Plymouth; REE via Noblejas **12.035** (Sp to Eur 0600-1600) 43333 at 1300 in Stalbridge; BBC via Skelton & Woofferton, UK **12.095** (Eng to Eur, N/W.Africa 0500-2100) 33333 at 1300 in Tenerife; Voice of Vietnam, Hanoi **12.020** (Eng to E.East 1330-1400) 43344 at 1335 in Liverpool; SRI via ? **12.075** (Eng, Ger, Fr to S/C.Asia 1400-1615) 44344 at 1405 in Newry; RCI via Sines, Portugal **11.915** (Eng, Fr to Eur, Africa 1430-1600) 55555 at 1441 in Manchester; Voice of Israel, Jerusalem **12.080** (Eng to W.Eur, N.America 1500-1530) 55444 at 1500 in Appleby; R.Japan via Sri Lanka **11.880** (Eng to M.East, N.Africa 1700-1800) 34333 at 1708 in Woodhall Spa; HCJB Quito, Ecuador 12.015 (Eng to Eur 1900-2200) 41144 at 2006 by **David Hall** in Morpeth; DW via ? 11.865 (Eng to Africa 2100-2150) SIO333 at 2107 in N.Bristol; AIR via Bangalore **11.620** (Eng, Hi to

LOCAL RADIO CHART

Freq (kHz)	Station	ILR BBC	e.m.r.p (kW)	Listener
558	Spectrum, London		0.80	B, E, F, G
585	R.Solway	B	2.00	A, B
603	Cheltenham R.		0.10	A, B, E, F
603	Invicta SG, Litt'brne		0.10	E, F, G
630	R.Bedfordshire(3CR)	B	0.20	A, B, E, F, G
630	R.Cornwall	B	2.00	A, F
657	R.Clywd	B	2.00	A, E, F
657	R.Cornwall	B	0.50	A, E, F
666	Gemini AM, Exeter	L	0.34	A, E, F
666	R.York	B	0.80	A, E, G
729	BBC Essex	B	0.20	D, E, F, G
738	Hereford/Worcester	B	0.037	E
756	R.Cumbria	B	1.00	A
756	R.Maldwyn, Powys	J	0.63	B, E
765	BBC Essex	B	0.50	D, E, F, G
774	R.Kent	B	0.70	D, E, F
774	R.Leeds	B	0.50	A, B, E, G
774	Cl.Gold 774, Glos	I	0.14	E, F
792	Cl.Gold 792, Bedford	I	0.27	B*, E, F, G
792	R.Foye	B	1.00	A
801	R.Devon & Dorset	B	2.00	A, B*, E, F
828	Cl.Gold 828, Luton	I	0.20	E
828	Magic 828, Leeds	I	0.12	B
828	ZCR CG, Bournemouth	I	0.27	F
828	Townland R, Ulster	I	0.80	A
837	R.Cumbria/Furness	B	1.50	A, B, G
837	Asian Netwk Leics	B	0.45	B, E, F, G
855	R.Devon & Dorset	B	1.00	A, F
855	R.Lancashire	B	1.50	A, B
855	R.Norfolk, Postwick	B	1.50	E, G
855	Sunshine 855, Ludlow	I	0.15	E
873	R.Norfolk, W.Lynn	B	0.30	E, F, G
936	Brunel CG, W.Wilts	I	0.18	C, E, F
936	Yks Dales R, Howes	I	1.00	A, E, G, H
945	Derby (Gem AM)	I	0.20	A, B, G
945	S.Coast R, Bexhill	I	0.75	D, E, F, G
954	Gemini AM, Torquay	I	0.32	E, F
954	Cl.Gold 954, H'ford	I	0.16	E, G
963	Asian Sd, Manchester	I	0.80	A, B, G
963	963 Liberty (Viva)	I	1.00	E, F, G
990	R.Devon & Dorset	B	1.00	A, E, F
990	Big Easy Magic AM	I	0.25	G
990	WABC, Wolverhampton	I	0.09	E
999	Gem AM, Nottingham	I	0.25	E, G
999	Red Rose 9.99 P'stn	I	0.80	A, B
999	R.Solent	B	1.00	E, F
1017	WABC, Shrewsbury	I	0.70	A, B, E
1026	R.Cambridgeshire	B	0.50	B*, E, G
1026	Downtown, Belfast	I	1.70	A, B*, H
1026	R.Jersey	B	1.00	C, E, F
1035	RTL Country 1035	I	1.00	B*, E
1035	R.Sheffield	B	1.00	G
1035	N.Sound, Aberdeen	I	0.78	A
1116	R.Derby	B	1.20	A, B, E, G
1116	R.Guernsey	B	0.50	E, F
1116	Valleys R, Ebbw Vale	I	0.50	C
1152	LBC 1B	I	23.50	E, F
1152	Pic'ly 1B, Manch'r	I	1.50	A, B
1152	Xtra-AM, Birmingham	I	3.00	C
1161	R.Bedfordshire(3CR)	B	0.10	E
1161	Brunel CG, Swindon	I	0.16	A, C, E
1161	Big Easy Magic 1161	I	0.35	G
1161	Southern Counties R	B	1.00	E, F
1161	Tay AM, Dundee	I	1.40	B*, E
1170	GMR, Stockton	I	0.32	A, B
1170	SCR, Portsmouth	I	0.50	E, F
1170	Signal 2, Stoke-on-T	I	0.20	B

Freq (kHz)	Station	ILR BBC	e.m.r.p (kW)	Listener
1170	1170AM, High Wycombe		0.25	E
1242	Invicta SG, Maidstone		0.32	E
1242	loW Radio, Wootton		0.50	F
1251	Amber SGB, Bury StEd		0.76	B*, E
1260	Marcher G, Wrexham		0.64	B
1260	Sabras Snd, Leicester		0.29	G
1260	R.York	B	0.50	A, G
1278	Cl.Gold 1278 W.York	I	0.43	G
1296	Radio XL, Birmingham		5.00	A, E, F, G
1305	Big Easy Magic AM		0.15	A, B*, G
1305	Premier via ?		0.50	E, F
1323	S.Coast R, Southwick	I	0.50	D, E, F
1323	Somerset Snd, Bristol	B	0.63	A
1332	Premier, Battersea	I	1.00	E, F, H
1332	Cl.Gold 1332, P'tbo	I	0.60	G
1332	Wiltshire Sound	B	0.30	F
1359	Breeze AM, Chelmsford	I	0.28	E
1359	Cl.Gold 1359, C'try	I	0.27	E, G
1359	R.Solent	B	0.85	B*, F
1368	R.Lincolnshire	B	2.00	E, G
1368	Southern Counties R	B	0.50	D, E, F
1368	Wiltshire Sound	B	0.10	F
1377	Asian Sd, E.Lancs	I	?	B
1413	Premier via ?		0.50	B*, E, F
1413	Yks Dales R, Skipton	I	0.10	A
1431	Breeze AM, Southend	I	0.35	B*, E
1431	Cl.Gold, Reading	I	0.14	B*, E, F
1449	R.Peterboro/Cambs	B	0.15	A, E, F, G
1458	R.Cumbria	B	0.50	A
1458	R.Devon & Dorset	B	2.00	A, F
1458	1458 Lite AM, Manch'	I	5.00	B, H
1458	Sunrise, London	I	50.00	E, F
1458	Asian Netwk Langley	B	5.00	C
1476	County Snd, Guildford	I	0.50	E, F
1485	Cl.Gold, Newbury	I	1.00	E
1485	R.Humberside (Hull)	B	1.00	G
1485	R.Merseyside	B	7.20	A, B, D*, F, H
1485	Southern Counties R	B	1.00	E, F
1503	R.Stoke-on-Trent	B	1.00	A, E, F*
1521	R.B1 Craigavon, NI	I	0.50	A, B*
1521	Fame B1, Reigate	I	0.64	D, E, F
1530	R.Essex	B	0.15	D, E, F
1530	Cl.Gold W.Yorks	I	0.74	A, B, E, G
1530	Cl.Gold, Worcester	I	0.52	E, F
1548	R.Bristol	B	5.00	E
1548	Capital G, London	I	97.50	E, F
1548	Magic 1548 Liver'p	I	4.40	A, B
1557	R.Lancashire	B	0.25	A
1557	Mellow, Clacton	I	0.125	E
1557	Cl.Gold 1557, N.hant	I	0.76	B*, E, G
1557	S.Coast R, Sol'on	I	0.50	E, F
1584	KCBC, Kettering	I	0.04	D*
1584	London Turkish R	I	0.20	E, F
1584	R.Nottingham	B	1.00	D*, E, G
1584	R.Shropshire	B	0.50	A, E
1602	R.Kent	B	0.25	B*, D, E, F

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

Listeners:

- (A) Robert Connolly, Kilkeel.
- (B) Ted Harris, Manchester.
- (C) Francis Hearne, N.Bristol.
- (D) Sheila Hughes, Morden.
- (E) Brian Keyte, Bookham.
- (F) George Millmore, Wootton, loW.
- (G) Paul Pybus, Hull.
- (H) Tom Smyth, Co.Fermanagh.

Europe 1745-2230) 43333 at 2109 in Rugby; R.Nac da Amazonia, Brazil **11.780** (Port 0900-0200) SIO322 at 2125 in Macclesfield; RCI via Sackville **11.945** (Fr, Eng to Eur, Africa 2000-2300) 25442 at 2135 by **Ross Lockley** in Galashiels; BBC via Ascension Is **11.750** (Eng to S.America 2000-0200) 44444 at 2305 in Kilkeel.

R.New Zealand also reached the UK in the **9MHz (31m)** band. Their 100kW transmission via Rangataiki, N.Island on **9.700** (Eng to Pacific areas Mon-Fri 0816-1206, Sat/Sun 0758-1206) was rated SIO323 at 0800 by **John Eaton** in Woking and SIO322 at 1100 in Co.Fermanagh.

Other broadcasters noted in this band during the morning were HCJB Quito, Ecuador **9.365** (Eng to Eur 0700-0900) 44444 at 0710 in Plymouth; BBC via Skelton, UK **9.410** (Eng to Eur, N/C.Africa 0400-2230) 33333 at 0800 in Tenerife; TWR Monte Carlo, Monaco **9.870** (Eng to Eur 0755-0920 Mon-Fri, 0745-0935 Sat, 0745-0950 Sun) 45444 at 0900 in Newry; R.Finland via Pori **9.760** (Eng to Asia, Australia 0900-0930) SIO444 at 0916 in N.Bristol; R.Vilnius, Lithuania **9.710** (Eng to Eur 0930-1000) 43333 at 0930 in Morden; KTWR Guam **9.865** (Eng to Asia 1000-

1100) 43333 at 1000 in Truro; BBC via Kranji, Singapore **9.740** (Eng to SE.Asia 0500-2330) 22332 at 1005 in Kilkeel.

After mid-day SRI via Sarnen **9.535** (Eng, Ger, Fr, It to SV.Europe 1100-1330) was 33333 at 1315 in Stalbridge; VOA via ? **9.575** (Eng to M.East 1500-1700) 44554 at 1510 in Cyprus; BBC via Masirah, Oman **9.510** (Eng to Asia 1615-1830) 24332 at 1631 in Oxted; TWR Manzini, Swaziland 9.500 (Eng to C.Africa 1600-1830) 44433 at 1715 in Scalloway; R.Nederlands via Madagascar **9.605** (Eng to Africa 1730-2025) was 41144 at 2000 in Morpeth; R.Australia via Shepparton **9.500** (Eng to Asia, Pacific 1430-2200) 44334 at 2012 in Rugby; R.Thailand, Udon Thani **9.535** (Eng to Eur 2030-2045) 33222 at 2030 in Appleby; AIR via Aligarh? **9.950** (Hi, Eng to Eur 1745-2230) 43333 at 2110 in Liverpool; Voice of Armenia, Yerevan 9.965 (Eng to Eur 2115-2145) 33333 at 2130 in Galashiels; RCI via Sackville **9.805** (Fr, Eng to Eur, Africa 2000-2230) 33343 at 2202 in Freshwater Bay; R.Nac del Paraguay 9.735 (Sp 0800-0400) 34433 at 2350 in Bridgwater.

Many of the broadcasts in the congested

MEDIUM WAVE CHART

Freq (kHz)	Station	Country	Power (kW)	Listener
520	Hof/Wurzburg (BR)	Germany	0.2	B*,F*
531	Ain Beida	Algeria	600/300	B*,G*,J*
531	Torshavn	Faeroe Is.	100	B,E
531	Berg	Germany	20	D*,F*,G
531	RNE5 via ?	Spain	?	F*
531	Beromunster	Switzerland	500	G
540	Wavre	Belgium	150/50	B*,F*,G
540	Sidi Bennour	Morocco	600	F*,G*
549	Les Trembles	Algeria	600	G*
549	Thurnau (DLF)	Germany	200	B*,F*,G
558	Espoo	Finland	100	F*
558	RNES via ?	Spain	?	F*,G*
567	Tullamore (RTE1)	Ireland (S)	500	B,C,E,G,J
576	Muhlacker (SDB)	Germany	500	B*,F*,G*,I
576	Riga	Latvia	500	G*
576	Barcelona (RNE5)	Spain	50	D*,F*,G*
585	Paris (FIP)	France	8	G
585	Madrid (RNE1)	Spain	200	B*,D*,F*,G*
585	Dumfries (BBC Scot)	UK	2	J
594	Frankfurt (HR)	Germany	1000/400	B*,D*,F*,G*,J
594	Oujda-1	Morocco	100	G*
594	Mude	Portugal	100	D*,G*
603	Lyon	France	300	B
603	Sevilla (RNE5)	Spain	50	F*,G*
603	Newcastle (BBC)	UK	2	E*,J
612	Athlone (RTE2)	Ireland (S)	100	B,D,E,G*,I
621	RNE1 via ?	Spain	10	G*
621	Wavre	Belgium	80	B*,F*,G
621	RNE1 via ?	Spain	10	F*
621	Barcelona (OCR)	Spain	50	G*
630	Vigra	Norway	100	F*,G*
630	Tunis-Djedida	Tunisia	600	F*,G*
639	Praha (Liblice)	Czech	1500	B*,F*,G*
639	RNE1 via ?	Spain	?	B*,F*,G*
648	RNE1 via ?	Spain	10	F*
648	Orfordness (BBC)	UK	500	B*,E,G,I,J
657	Napoli	Italy	120	G
657	Madrid (RNE5)	Spain	20	F*,G*
657	Wrexham (BBC Wales)	UK	2	B,D,E,F*,J
666	Messkirch (Rohrdt) (SWF)	Germany	150	B*,F*,G*
666	Sitkunai (R. Vilnius)	Lithuania	500	F*
666	Lisboa	Portugal	135	F*,G*
675	Lopic (R10 Gold)	Holland	120	B*,F*,G*,I
684	Sevilla (RNE1)	Spain	500	B*,F*,G*
684	Avala (Beograd-1)	Yugoslavia	2000	F*,G*
693	Tortosa (RNE1)	Spain	2	F*
693	Droitwich (BBC5)	UK	150	B,G,I
702	Flensburg (NDR)	Germany	5	B*,F*,G*
702	Monte Carlo	Monaco	40	G*
711	Rennes 1	France	300	B*,F*,G,I
711	Laayoune	Morocco	600	G*
720	Langenberg	Germany	200	B
720	Lisnagarvey (BBC4)	Ireland (N)	10	G*
720	Norte	Portugal	100	F*
720	Lots Rd. Ldn (BBC4)	UK	0.5	B,E,G,J
729	Cork (RTE1)	Ireland (S)	10	B,E,F*,G,I
729	RNE1 via ?	Spain	?	B*,F*,G*
738	Paris	France	4	B,G
738	Poznan	Poland	300	F*,G*
738	Barcelona (RNE1)	Spain	500	B*,F*,G*
747	Flevo (Hiv2)	Holland	400	B*,F*,G,I
756	Braunschweig (DLF)	Germany	800/200	B*,D*,F*,G*,I
756	Bilbao (EI)	Spain	5	G*
756	Redruth (BBC)	UK	2	E*,G*,J
765	Sottens	Switzerland	500	B*,F*,G*
774	Enniskillen (BBC)	Ireland (N)	1	F*
774	RNE1 via ?	Spain	?	B*,F*,G*
774	Plymouth (BBC)	UK	1	E
783	Leipzig (MDR)	Germany	100	B*,F*,G*,I
783	Miramar (R. Porto)	Portugal	100	G*
783	Dammam	Saudi Arabia	100	G*
792	Limoges	France	300	B,D*,G
792	Lingen (NDR)	Germany	5	G*
792	Sevilla (SER)	Spain	20	F*,G*

Freq (kHz)	Station	Country	Power (kW)	Listener
801	Munchen-Ismaning	Germany	300	B*,F*,G*,I
801	Ajlun	Jordan	2000	G*
801	RNE1 via ?	Spain	?	F*,G*
810	Madrid (SER)	Spain	20	G*
810	Westerglen (BBC Scot)	UK	100	B,D*,E,G*,I
819	Warsaw	Poland	300	B*,F*,G*
819	S. Sebastian (EI)	Spain	5	F*
828	Hannover (NDR)	Germany	100/5	F*
837	Rotterdam	Holland	20	F,I
837	Nancy	France	200	B*,F*
837	COPE via ?	Spain	?	G*
846	Rome	Italy	540	B*,G*
855	Berlin	Germany	100	F*
855	RNE1 via ?	Spain	?	D*,F*,G*
864	Paris	France	300	B*,C*,F*,G,I
864	Socuellamos (RNE1)	Spain	2	G*
873	Frankfurt (AFN)	Germany	150	B*,E*,F*,G*
873	Zaragoza (SER)	Spain	20	G*
882	COPE via ?	Spain	?	F*,G*
882	Washford (BBC Wales)	UK	100	B,E,G,I
891	Algiers	Algeria	600/300	G*
891	Huisberg	Netherlands	20	B*,F*,G,I
900	Brno (Czo2)	Czech Rep	25	F*,G*
900	Milan	Italy	600	B*,F*,G*
909	B'mans Pt (BBC5)	UK	140	B,G,I
918	Plisnev (Sloven nR)	Slovenia	600/100	A*,B*,G*
918	Madrid (R. Int)	Spain	?	F*,G*
927	Wolvertem	Belgium	300	B*,F*,G,I
936	Bremer	Germany	100	B*,F*,G*
936	Venezia	Italy	20	G*
936	RNE5 via ?	Spain	?	G*
945	Toulouse	France	300	F*
954	Brno (Czo2)	Czech Rep.	200	G*
954	Madrid (CI)	Spain	20	F*,G*
963	Pori	Finland	600	A*,F*,G*,H*
963	Tir Chonail	Ireland (S)	10	G*,J*
972	Hamburg (NDR)	Germany	300	B*,F*,G*
981	Alger	Algeria	600/300	G*
981	Berlin	Germany	300	B*,F*,G*
990	R. Bilbao (SER)	Spain	10	G*
990	Redmoss (BBC)	UK	1	F*
990	Twynn (BBC)	UK	1	E
1008	Flevo (Hiv-5)	Holland	400	B*,F*,G,I
1017	Rheinsender (SWF)	Germany	600	B*,F*,G*
1017	RNE5 via ?	Spain	?	G*
1026	SER via ?	Spain	?	F*,G*
1035	Lisbon (Prog3)	Portugal	120	F*,G*
1044	Dresden (MDR)	Germany	20	B*,F*
1044	S. Sebastian (SER)	Spain	10	F*,G*
1053	Zaragoza (COPE)	Spain	10	F*
1053	Talk R. UK via ?	UK	?	B,G,I,J
1062	Kalundborg	Denmark	250	B*,F*,G*
1062	R. Uno via ?	Italy	?	G*
1071	Riga	Latvia	50	F*,J*
1071	Bilbao (EI)	Spain	5	G*
1071	Talk Radio UK via ?	UK	?	B,I
1080	Katowice	Poland	1500	B*,F*,G*
1080	SER via ?	Spain	?	F*,G*
1089	Krasnodar	Russia	300	F*
1089	Talk Radio UK via ?	UK	?	B,G,I,J
1098	Nitra (Jark)	Slovakia	1500	B*,F*,G*
1098	RNE5 via ?	Spain	?	F*
1107	AFN via ?	Germany	10	B*,F*
1107	Talk R. UK via ?	UK	?	B,G,I,J
1125	La Louviere	Belgium	20	F*,G*
1125	RNE5 via ?	Spain	?	G*
1125	Clare (Rindrod Wells)	UK	1	B*,E
1134	COPE via ?	Spain	2	C*,G*
1134	Zadar (Croatian R)	Yugoslavia	600/1200	B,C*,F*,G*
1143	AFN via ?	Germany	1	B*,F*,G*
1161	Ain-Salah	Algeria	5	G*
1179	Sulvesborg	Sweden	600	B*,F*,G*
1188	Kuurne	Belgium	5	B*,F*,G*
1197	Munich (VOA)	Germany	300	F*
1197	Virgin via ?	UK	?	B,G,I,J
1206	Bordeaux	France	100	B*,F*
1206	Wroclaw	Poland	200	F*,G*
1215	Virgin via ?	UK	?	B,G,I,J

Freq (kHz)	Station	Country	Power (kW)	Listener
1224	Lelystad	Holland	50	B*,F*
1233	Liege	Belgium	5	F*
1233	RFE? via ?	?	?	F*
1233	Virgin via ?	UK	?	B,I
1242	Virgin via ?	UK	?	B,I
1251	Marcali	Hungary	500	F*
1251	Huisberg	Netherlands	10	F*
1260	SER via ?	Spain	?	F*
1260	Guldford (V)	UK	0.5	G*,J
1269	Neumunster (DLF)	Germany	600	B*,F*,G*,I
1278	Dublin/Cork (RTE2)	Ireland (S)	10	B,E,G*,J
1287	RFE? via ?	?	?	B*,F*
1287	Lerida (SER)	Spain	10	F*
1296	Kardzali	Bulgaria	150	B*,G*
1296	Valencia (COPE)	Spain	10	F*
1296	Orfordness (BBC)	UK	500	B*,E,J
1305	Rzeszow	Poland	100	F*,G*
1314	Kvitsoy	Norway	1200	F*,G,H*
1314	RNE5 via ?	Spain	?	A*,B
1323	W'brunn (V. Russia)	Germany	1000/150	A*,B*,F*,H
1332	Rome	Italy	300	B*,G*
1341	Lisnagarvey (BBC)	Ireland (N)	100	B,E,G
1341	Tarrasa (SER)	Spain	2	G*
1350	Cesvaine/Kuldiga	Latvia	50	C*,F*
1359	Arqanda (RNE-FS)	Spain	600	B*,F*,G*,J
1368	Foxdale (Manx R)	I.O.M.	20	B,E*,F*,G*,J
1377	Lille	France	300	G,I
1386	Bolshakovo	Russia	2500	A*,B*,C*,E*,F*,G*
1395	Filake	Albania	1000	G*
1395	TWR via Filake	Albania	500	B*,F*
1395	Lopic	Netherlands	120/40	C*,F*,G,I
1404	Brest	France	20	B*,F*,G,I
1404	Ukraine (UR2) via ?	Ukraine	?	B*
1413	RNE5 via ?	Spain	?	F*,G*
1422	Heusweiler (DLF)	Germany	1200/600	B*,F*,G*,I,J
1431	Kopani	Ukraine	500	F*
1440	Marnach (RTL)	Luxembourg	1200	B*,C*,F*,G,I
1440	Dammam	Saudi Arabia	1600	F*
1449	Squinzano (RAI)	Italy	50	G*
1449	Redmoss (BBC)	UK	2	F*
1467	Monte Carlo (TWR)	Monaco	1000/400	B*,D*,F*,G*
1476	Wien-Bisamberg	Austria	600	A*,B*,C*,D*,F*
1485	SER via ?	Spain	?	C*
1494	Clermont-Ferrand	France	20	C*,F*,G
1494	St Petersburg	Russia	1000	A*,B*,C*,F*,G*
1503	Stargard	Poland	300	B*,F*
1512	Wolvertem	Belgium	600	A*,B*,C*,D*,F*,G*,H
1521	Kosice (Cizitice)	Slovakia	600	G*
1521	Duba	Saudi Arabia	2000	B*,G*
1530	Vatican R	Italy	150/450	A*,D*,F*,G*
1539	Mainflingen (ERF)	Germany	350/700	B*,F*,G*,J
1566	Nagpur	India	1000	G*
1566	Mayak	Russia	?	C*
1566	Stax	Tunisia	1200	C*
1575	Genova	Italy	50	G*
1575	SER via ?	Spain	?	G*
1584	SER via ?	Spain	?	G*
1593	Holzkirchen	Germany	150	B*,C*,D*,F*,G*,J
1602	Victoria (EI)	Spain	10	G*
1611	Vatican R	Italy	15	B*

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

Listeners:-

- (A) Bernard Curtis, Stalbridge.
- (B) Ted Harris, Manchester.
- (C) Sheila Hughes, Morden.
- (D) Rhoderick Illman, Oxted.
- (E) Brian Keyte, Bookham.
- (F) Eddie McKeown, Wootton.
- (G) George Millmore, Newton IotW
- (H) Clare Pinder, while in Appleby.
- (I) Paul Pybus, Hull.
- (J) Tom Smyth, Co.Fermanagh

7MHz (41m) band are intended for listeners in Europe. Among those noted were R.Japan via Woofferton, UK **7.230** (Jap, Eng 0600-0800), rated 44333 at 0700 in Appleby; AWR via Forli, Italy **7.230** (Eng 0900-1000) 35232 at 0930 in Newry; R.Slovakia Int **7.345** (Eng 1730-1757) SIO333 at 1730 in Co.Fermanagh; VOIRI Tehran **7.260** (Eng 1930-2028, also to M.East) 31233 at 1943 in Morpeth; Israel R, Jerusalem **7.465** (Eng 2000-2025, also to USA) 55444 at 2000 in Galashiels; DW via Sines **7.285** (Eng 2000-2050) 55455 at 2005 in Liverpool; R.Romania Int, Bucharest **7.195** (Eng 2100-2156) 33332 at 2104 in Oxted; AIR via Aligarh? **7.410** (Hi, Eng 1745-2230) 43333 at 2105 in Plymouth; Monitor R.Int, via WSHB **7.510** (Various 2000?-0000?) 43433 at 2135 in Rugby; China R.Int via Russia **7.170** (Eng 2200-2257) 44444 at 2200 in Dudley; Voice of Russia 7.390 (Eng [VYS]) 44444 at 2200 in Freshwater Bay; R.Tunisia Int via Fax **7.475** (Ar [Rly of Nat.Network] 0400-0600, 1700-2330)

44444 at 2245 in Kilkeel; R.Moldova Int **7.520** (Eng 2300-2325) 34432 at 2315 in Scalloway. Some to other areas were also mentioned in the reports: WJCR Upton, USA **7.490** (Eng to E.USA 24hrs), rated SIO444 at 0945 in Macclesfield; RFPI Costa Rica **7.385** (Eng 24hrs) 25343 at 0947 in Bridgwater; Monitor R.Int via WSHB **7.535** (Eng [Various Sat/Sun] 0400-0958) 43333 at 0950 in Stalbridge; VOA via Selebi-Phikwe, Botswana **7.415** (Eng to Africa 1900-2230) 43333 at 2145 in Morden; R.Norway Int, Oslo **7.570** (Norw to S.America 2200-2229) 44444 at 2210 in Truro; R.Austria Int via Moosbrunn **7.325** (Ger, Fr, Eng to N.America 0000-0230?) SIO444 at 0144 in N.Bristol. The **6MHz (49m)** band also carries many broadcasts to Europe. Some come from WEEVN Vandiver, USA **5.825** (Eng 2100?-1000), rated 33333 at 0716 in Plymouth; HCJB Quito **5.865** (Eng 0700-0900) 54433 at 0755 in Herstmonceux; R.Austria Int, via Moosbrunn

6.155 (Ger, Eng, Fr, Sp 0400-2300) 44454 at 0945 in Cyprus; R.Netherlands via Wertachtal **5.975** (Eng 1130-1325) SIO333 at 1130 in Co.Fermanagh; BBC via Rampisham & Skelton, UK **6.195** (Eng 1600-2330 also to N.Africa) 44444 at 1710 in Tenerife; R.Prague, Czech Rep 5.930 (Eng 1800-1827) 44444 at 1820 in Woodhall Spa; RAI Rome **6.015** (Eng 1935-1955) 43333 at 1945 in Stalbridge; R.Korea via Kimjae **6.480** (Eng 2100-2200) 31331 at 2100 in Galashiels; China R.Int via ? **6.950** (Eng 2000-2157) 34434 at 2100 in Dudley; RCI via Skelton, UK **5.995** (Eng 2100-2230, also to Africa) 32332 at 2107 in Oxted; Bayerischer Rundfunk, Germany **6.085** (Ger 24hrs) 55555 at 2145 in Rugby; R.Sweden via Horby **6.065** (Eng 2130-2158) 33333 at 2150 in Truro; VOFC Taiwan via WYFR? **5.810** (Eng 2200-2300) 44344 at 2200 in Appleby; R.Ukraine Int. **5.905** (Eng 2200-2300) 43333 at 2235 in Morden. Whilst beaming to other areas R.Netherlands

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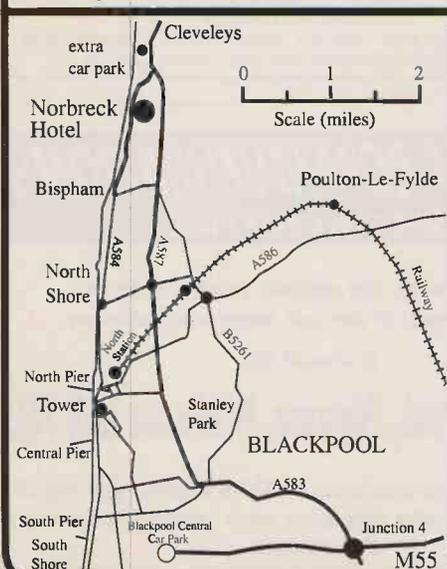
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As the chart clearly shows, extensive logs were compiled by some listeners during October, November and December. At night, **Peter Rycraft** (Wickham Market) logged many regulars plus six newcomers: **TO 292.0**, **HB 299.0**, **KV 300.5**, **NA 306.5**, **PI 308.0**, **CE 311.0**. In Birmingham **Dave Dawson** also listened only at night but mainly during October. Beacons on the Faeroes (AB & NL) and Greenland (OZN) were among those received.

The Icelandic beacon (DA) on **305.7** was heard for the first time by **Brian Keyte** (Gt. Bookham) at 2230 on December 29. It was also heard at night by **Peter Pollard** (Rugby) who added **BY 289.0**, **TI 300.0**, **OR 303.5**, **RS 307.5**, **GR 308.0** to his growing list.

During most mornings in December **Albert Moore** (Douglas, IoM) received a strong signal from OZN on **372.0** until after 0900. He noticed that the callsign was only sent once every 35 seconds. A change in the operating frequency of three beacons was observed, with Pt St. Mathieu Lt (SM) on **291.0** (Not 292.5); Jaroslawiec, Poland (JA) on **295.5** (Not 295.0); Ristna, Estonia on **307.5** (Not 306.5). These changes were also reported by some other listeners.

The band was searched during the day and at night by several contributors - see chart. Beacons along both sides of the English Channel, the Isles of Scilly and more distant locations were received during daylight by **George Millmore** (Wootton, IoW) and **Peter Westwood** (Farnham). At night Peter heard the beacons at Isle de Groix (OX) on **298** and Pt. de Creach (CA) on **301**. Searching the band at night proved to be disappointing for **Eric Tubman** in Whitstable. Only the ground waves from fewer of those heard during the day were received.

In Worcester Park **Dave Clench** was plagued by a high level of TV line timebase interference virtually 24 hours-a-day but he did manage to receive at 0933 the ground waves from Flamborough Head Lt (FB) on **303.0**, also twelve other beacons some mornings.

Recently, **Robert Connolly** (Kilkeel) up-dated his popular guide to the LW Marine and Aero radiobeacons in Europe (Arctic to N. Africa). This new fourth edition, which has 54 combe-bound A4 pages and opens flat, is now available. For more detailed information please send an s.a.e. to Robert via me.

LONG WAVE MARITIME RADIOBEACON CHART

Freq (kHz)	C/S	Station Name	Location	Dxer
284.5	IZ	Lizard Lt	S. Cornwall	BC'D'E'FGH'I'J'K'L'N'P'Q'R
284.5	MA	Cabo Machichaco	N. Spain	BC'D'E'FGH'I'J'K'L'N'P'Q
284.5	PR	Porkkala	Finland	C'
285.0	NO	Cabo de la Nao Lt	S. Spain	B'
285.0	NP	Nieuport W. Pier	Belgium	D.E.L'
286.0	TR	Tuskar Rock Lt	Co. Wexford	BC'D'E'FGH'I'J'K'L'Q
286.5	FI	Cala Figuera	Majorca	B' C' E' G' K' L' Q
286.5	FT	Cap Ferrat Lt	W. France	BC'D'E'G'I'J'K'L'Q
286.5	NK	Inchkeith Lt	F. of Forth	J'
286.5	PZ	Cozzo Spadero	Sicily	B'
287.3	BT	Bjartangar Lt	Iceland	B'
287.3	HA	Haifa Lt	Israel	B'
287.3	IB	I. Berlenga	Portugal	L'
287.5	CV	Cabo Carvoeiro Lt	Portugal	B'
287.5	DO	Rosedo Lt	France	B' L'
287.5	FR	Faerder Lt	Norway	B' J' K' L'
287.5	MD	Cabo Mondego	Portugal	B' L'
289.0	HH	Hoek van Holland	Holland	E' H' L'
289.0	KL	Skinnva Lt	Norway	B' K' L'
289.0	OH	Old Hd of Kinsale	Co. Cork	B' E' G' K'
289.5	CT	Pt de Combril Lt	France	L'
289.5	FI	Cabo Finisterre Lt	N.W. Spain	BC'D'E'G'H'J'K'L'N'Q
289.5	UD	Cabo Saiou	L'	
289.5	YM	Ijmuiden Lt	Holland	BC'D'E'L'N'Q
289.0	BY	Baily Lt	Co. Dublin	BC'E'G'I'K'L'M
289.5	KY	Oksoy Lt	Norway	B'
289.5	MN	Hammerodde	Denmark	B' C' E' J' K' L'
289.5	NP	Punta Carena	Italy	B' E'
289.5	SN	Ile de Sein N.W. Lt	France	B' D' E' K' L'
290.0	AV	Aveiro	Portugal	B'
290.0	BS	Port en Bessin Lt	France	L'
290.0	FD	Fidra Lt	F. of Forth	B' G' J'
290.5	DY	Duncansby Hd Lt	N.E. Scotland	BC'E'J'
290.5	LL	Hallo Lt	Sweden	B'
290.5	SB	S. Bishop Lt	Pembrok.	BC'D'E'FGH'I'J'K'L'M'N'P'Q'R
290.5	VL	Cabo Villano Lt	N. Spain	B' G' H' I' J' K' L' M' N' P' Q' R
290.5	VY	Vishy	Sweden	L'
291.0	CF	Capo Ferro	Sardinia	L'
291.0	SM	Pt. St. Mathieu	France	BC'D'E'FGH'I'J'K'L'N'P'Q'R
291.0	SN	Cabo San Sebastian	S. Spain	B' E' Q'
291.5	SU	South Rock Lt	Co. Down	BC'D'E'G'H'J'K'L'N'Q
291.9	LT	La Isleta	Canaries	B'
291.9	NA	Punta Lantilla	Canaries	B'
291.9	RN	Rydganes Lt	Iceland	M'
292.0	MH	Mehon, Minorca	Baleares Is	B' E'
292.0	SJ	Souter Lt	Scot. Islands	B' C' D' E' G' H' J' K' L' N
292.0	TO	Torungun Lt	Norway	J' L'
292.0	CP	St. Catherine's Lt	I.O.W.	ABC'D'E'FGH'I'J'K'L'N'P'Q'R
293.0	RN	Rhims of Islay Lt	Is of Islay	B' G' J' K' M
293.0	SY	Svinoy Lt	Norway	B' J' K'
293.5	RO	Cabo Silleiro Lt	N. Spain	B' L'
294.0	KU	Kullen High Lt	Sweden	B' C' E' K' L'
294.0	PH	Cap d'Alprech	France	ABC'D'E'FGH'I'J'K'L'N'P'Q'R
294.5	FP	#Lymouth F. Lind Lt	N. Devon	E'
294.5	KC	#Old Hd of Kinsale	Co. Cork	B' E'
294.5	PS	#Pt. Lynas Lt	Anglesey	B' D' G' K' M
295.0	OV	Dunmoygur	Iceland	B'
295.0	SN	Sietnes Lt	Norway	B' L'
295.5	GB	La Corbiere Lt	Jersey C.I.	BC'D'E'H'K'L'N'Q'R
295.5	CR	Cap Couronne	France	B' L'
295.5	JA	Jaroslawiec	Poland	BC'D'E'G'J'K'
295.5	RE	La Rochelle	France	B'
295.0	BH	Blavandshuk Lt	Denmark	B' C' E' G' J' K' L'
296.0	GR	Goeree Lt	Holland	E' L'
296.0	KN	Skrove Lt	Norway	B' C' E'
297.0	B	Cabo Trafalgar	SW. Spain	L'
297.0	FG	Pt de Barfleur Lt	France	ABC'D'E'FGH'I'J'K'L'N'P'Q'R
297.5	MA	Mantyluoto	Finland	B' C'
297.5	PS	Cabo Penas Lt	N. Spain	BC'D'E'G'K'M
298.0	GX	Ile de Groix	France	B' C' E' G' J' K' L' N' P' Q' R
298.0	TA	Cabo Gara	S. Spain	B' L'
298.5	RR	Round Is Lt	Is. Scilly	ABC'D'E'FGH'I'J'K'L'M'N'P'Q'R
298.5	SW	Skagen	Denmark	B' L'
298.8	HO	Hornbjarg	Iceland	B'
299.0	AD	Ameland Lt	Holland	B.E.L'
299.0	BN	Les Baleines	W. France	B' E' G' H' K
299.0	HB	Hals Barre Lt	Denmark	L'
299.0	O	Tarifa	S. Spain	B'
299.5	NP	Nash Pt Lt	S. Wales	BC'D'E'FGH'I'J'K'L'Q'R
299.5	SK	Skonvaer Lt, Rost	Norway	K
299.5	VR	Uthvaer Lt	Norway	B' E' J' K' L'
299.5	VS	Vieste Lt	Italy	B'
300.0	MZ	Mizen Head	Co. Cork	BC'D'E'G'H'K'L'Q
300.0	TI	Cap d'Antifer Lt	N. France	F' I' L' Q
300.5	DU	Dungness Lt	Kent	ABC'D'E'FGH'I'J'K'L'N'P'Q'R
300.5	KV	Nordvalen	Sweden	L'
300.5	LA	Liste	Norway	B' C' E' G' J' K' L'
301.0	CA	Pt de Creach	France	BC'D'E'FGH'I'J'K'L'M'N'P'Q'R
301.0	GR	Eierland Lt	Holland	B' E' L'
301.1	RG	Raufarhoefn	Iceland	B'
301.5	KD	Kinnards Hd Lt	N.E. Scotland	B' E' J' K

301.5	L	Torre de Hercules	N. Spain	B' C' E' G' K' L'
302.0	RB	Cherbourg Ft W Lt	France	A.B.C'D'E'FGH'I'J'K'L'N'P'Q'R
303.0	D	Rota	SW. Spain	B'
303.0	FB	Flamborough Hd Lt	Yorkshire	A.B.C'D'E'FGH'I'J'K'L'N'Q'Q'R
303.0	FV	Falsterboev Lt	Sweden	C' E' K'
303.0	MY	Myggenaes Lt	Faeroes	B' L'
303.0	YE	Ile d'Yeu Main Lt	France	B' C' D' E' F' G' H' I' J' K' L' R
303.5	BJ	Bjornssund Lt	Norway	B' C' E' G' J' K' L'
303.5	FN	Feistein Lt	Norway	L'
303.5	GR	Gedser	Denmark	B' C' D' E' F
303.5	IA	Llanes Lt	N. Spain	B'
303.5	OR	Punta de Lobregat	S. Spain	B' E' L'
303.5	VL	Vlieland Lt	Holland	L' Q
304.0	BR	Cap Bear	France	B'
304.0	PS	Pt Lynas Lt	Anglesey	A.B.C'D'E'G'I'K'L'M'N
304.0	SR	Sumburgh Hd Lt	Shetland Is	J'
304.5	MY	Cabo Mayor Lt	N. Spain	C' E' H' L' R
305.0	FP	Fife Ness Lt	SE. Scotland	B' C' E' G' J' K
305.0	GL	Ile de Giraglia Lt	Corse	M'
305.5	AL	Pt d'Alilly Lt	France	A.B.C'D'E'FGH'I'J'K'L'N'P'Q'R
305.7	DA	Dafatangi Lt	Iceland	B' E' J' L' R
306.0	FN	Walney Is Lt	Off Lancs	B' C' D' E' G' J' K' L' N
306.0	TH	Thyboron	Denmark	L'
306.5	NA	Nakkehoved	Denmark	L'
306.5	UT	Utsira	Norway	B' C' D' E' G' J' K' L' Q'
307.0	GL	Eagle Is Lt	Co Mayo	B' C' G' I' K' L' M
307.5	RS	Ristna	Estonia	B' C' E' G' J' K' L'
308.0	GR	Grimsey	Iceland	L'
308.0	PI	Cabo Espichel	Portugal	B' L'
308.0	RC	Cabo Roca	Portugal	B
308.0	RD	Roches Douvres Lt	France	B' L' Q'
308.5	NZ	St Nazaire	France	B' E' L'
309.5	AL	Algiers	Algeria	B'
309.5	BA	Punta Estaca Bares	N. Spain	B' C' E' G' J' K' L'
309.5	FH	Fruholmen Lt	Norway	B'
309.5	MA	Marstein Lt	Norway	B' C' E' G' J' K' L'
309.5	PB	Portland Bill Lt	Dorset	A.B.C'D'E'FGH'I'K'L'M'N'P'Q'R
310.0	ER	Pt de Ver Lt	N. France	B' E' H' I' N' P' Q' R
310.5	DA	Damietta Mouth	Egypt	B'
310.5	RO	Rozewie	Poland	B'
310.5	SG	Sjællandss N Lt	Denmark	B' L'
311.0	CE	Ceuta	S.W. Spain	L'
311.0	GD	Girdle Ness Lt	N.E. Scotland	B' J' K
311.0	NF	N. Foreland Lt	Kent	A.C'D'E'FGH'I'J'K'L'N'Q'Q'R
311.5	LP	Loop Hd Lt	Co. Clare	B' C' G' K'
312.0	HO	Tennholmen Lt	Norway	K'
312.0	OE	Oostende	Belgium	B' C' D' E' F' I' K' L' M' N' O' R
312.0	UH	Eckmuhl Lt	France	B' G'
312.5	AK	Akmenmags	Latvia	B'
312.5	BK	Baltiysk	Russia	B' K'
312.5	BT	Mys Iarun Lt	Latvia	B' K'
312.5	CS	Calais Main Lt	France	B' D' E' H' L' N' O' R
312.5	KA	Klaipeda Rear Lt	Lithuania	B'
312.5	LB	Liepaja	Latvia	B'
312.5	SR	Skardsfjara	Iceland	B' K'
312.5	VS	Cabo Estay Lt	N. Spain	A' J' K' L' Q'
312.6	KB	Krausand	Germany	B'
313.0	HA	Haltun Lt	Norway	J' L'
313.0	PA	Cabo de Palos Lt	S. Spain	B' E' J' L'
313.0	TY	Tory Is Lt	Co. Donegal	B.C.G.K.M
313.5	BR	Cap Bear Lt	S. France	L'
313.5	CM	Cromer Lt	Norfolk	B' C' D' E' G' J' K' L' N' O' Q' R
314.0	HK	Heikingen Lt	Norway	K' L'
314.0	PD	Porquerolles	S. France	B' L'
314.0	VG	Ile de Vergne Lt	France	A.B.C'D'E'FGH'I'J'K'L'M'N'P'Q'R
314.0	WU	Wustrow Lt	N.E. Germany	B'
314.5	SK	Strandhofn	Iceland	B'
314.5	TL	Funte D. Passa	Italy	E' L'
315.5	ND	Nidden	Lithuania	B'
316.0	IN	Ingolfshofdi Lt	Iceland	B' L'
337.0	MY	Myggenaes	Faeroe Is	D' E' J' K
352.0	RBA	Rabat Sale	Morocco	B'
367.0	JV	Jacobshavn	Greenland	B'
372.0	OZN	Prins Christ's Sund	Greenland	B' C' D' E' G' H' I' J' K' L' Q'
381.0	AB	Akraberg	Faeroe Is	B' C' D' E' G' H' I' J' K' L' Q'
404.0	NL	Nolso	Faeroe Is	B' C' D' E' G' H' I' K' L' Q'
404.0	NS	Narsarsuaq	Greenland	B'

- D'Xers:-
 (A) Dave Clench, Worcester Park.
 (B) Robert Connolly, Kilkeel.
 (C) Dave Dawson, Birmingham.
 (D) Brian Heath, Stapleton.
 (E) Brian Keyte, Gt. Bookham.
 (F) George Millmore, Wootton, IoW.
 (G) Albert Moore, Douglas, IoM.
 (H) Fred Pallant, Storrington.
 (I) Peter Pollard, Rugby.
 (J) Peter Polson, St. Andrews.
 (K) Victor Robb, Belfast.
 (L) Peter Rycraft, Wickham Market.
 (M) Tom Smyth, Co. Fermanagh.
 (N) Philip Townsend, E. London.
 (O) Eric Tubman, Whitstable.
 (P) Peter Westwood, Farnham.
 (Q) John Woodcock, Basingstoke.
 (R) Ross Workman, Shoreham-by-Sea.

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

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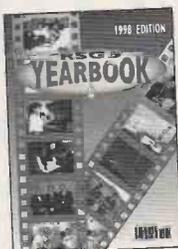
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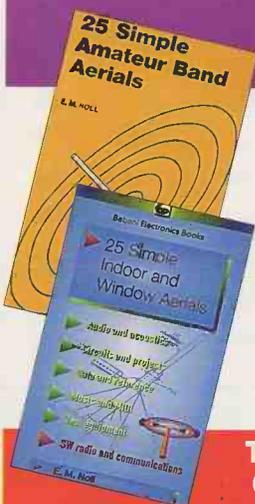
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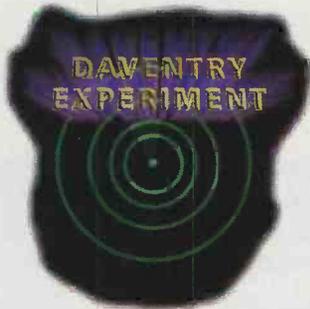


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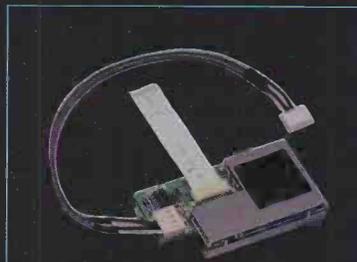
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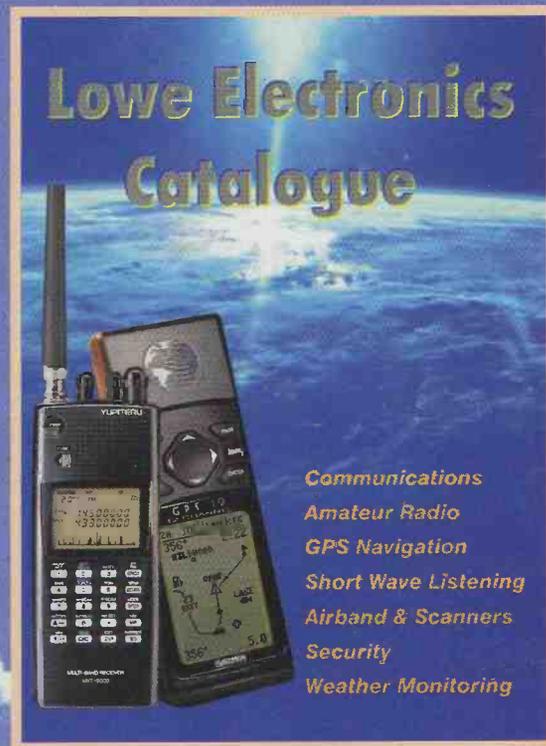
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