

# Monitoring & Propagation Modes

Most listeners assume that the propagation modes of radio waves are the same in all parts of the electromagnetic spectrum. This is an easy assumption to make, but it is not totally correct. Jacques d'Avignon explains all.



**A**s we know, v.h.f. transmissions can become unorthodox under certain atmospheric or topographic conditions. In the h.f. (high frequency) and m.w. (medium wave) segments of the spectrum between the v.h.f. (very high frequency) and the e.l.f./v.l.f./l.f. (extremely low frequency, very low frequency, low frequency), the propagation follows the 'normal' propagation modes that we are accustomed to: refraction from the ionospheric and reflection from the ground and, in some instances, direct ground waves propagation. When we look at propagation in the low frequency part of the spectrum, we need to revise our thinking.

## Lowest Frequency

The US Navy transmitters located in Clam Lake WI and Republic MI operate on a frequency of 76Hz, (yes Hertz!) - that is the lowest man generated frequency used for the conveyance of intelligent information. Apparently, it takes three minutes to transmit a single letter, definitely not a high speed T1 Internet circuit!

Both transmitters are keyed simultaneously and transmit the same message. This ultra low frequency can be considered to be part of the audio spectrum and the transmission mode of this frequency is unusual. The transmissions from these two sites do not seem to follow any normal radio wave behaviour.

A few years ago it was postulated that at such a low frequency the earth was resonating like a bell and/or acting as an echo chamber, carrying the 'tune' around the world. This unusual transmission set-up is used for alerting deeply submerged submarines, ringing their bell!

These are the only transmitter sites known operating in the e.l.f. range that uses horizontal polarisation: each of the horizontal antennas are about 48km long. The major enemies of these Navy antennas are the woodpeckers carving holes in the supporting wooden telephone poles!

There seems to be nobody else in that really low

area of the radio spectrum. This frequency is very close to the frequency of the power grid in Europe, 50Hz, and in North America, 60Hz. As an aside, I have not heard of any reported intercept of these 76Hz transmissions by amateurs.

An interesting fact about the European power grid frequency is that the 50Hz hum can be heard in North America when propagation conditions are conducive to hear the European broadcasters on l.f. and long antenna (0.5 to 1km) are used during DXpedition.

## Spectrum Basement

There are other transmissions to be found in the spectrum 'basement' between 10 and 500kHz. First we hear the only remaining e.l.f. world-wide navigation system, this one operated by Russia: the Alpha system with frequencies clustered around the 11-12kHz. (The American Omega system operating in the same frequency band, was decommissioned in late 1997).

The transmissions of the Alpha system can easily be heard in North America if you are listening from a very quiet location. The power utilised by the Alpha system is very large in order to cover the planet.

In the slice between 15 and 150kHz we can hear the following users: radio teletype stations operated by the armed forces of the world, time standard stations such as WWVB, DCF77 and BSF, weather facsimile stations, the pesky 'rat tat tat' of the Loran 'C' navigation system transmitting exactly on 100kHz in many areas of the world and also, for a while longer, the transmissions of the British Decca system in the vicinity of 89kHz (*though it'll be gone by the time you read this - Ed.*).

## Very High Power

In ITU (International Telecommunications Union) Region 1, North Africa and Europe, the slice between 153 and 279kHz band is allocated to broadcasting using with very high power: 500 to 5000kW. In Eastern North America, these transmissions can often be intercepted as long as the complete path

between the transmitter and the receiver is in complete darkness.

One of the easiest stations to listen to is Iceland on 189kHz. Atlantic 252 has also been intercepted very often, similarly BBC on 198 can be heard. In all these cases, two conditions are required to permit good reception of these broadcasts: full darkness on the path and long antennas.

It is common to layout antennas more than 500m long when attending DX camp! In Western North America, the signals of Russian broadcast stations on the same frequencies have been intercepted.

Overlapping the ITU region 1 broadcasters slice, we have, in North America, the various n.d.b.s (non directional beacons) utilised for air and marine navigation, and the new DGPS stations (Differential Global Positioning System) using, in many areas of the USA, the old Ground Wave Emergency Network (GWEN) transmitters.

All these stations operate in the 200 to 530kHz part of the band, except for a small portion of this band that is set aside for the maritime service. In the UK, the signals of many of the Canadian East Coast n.d.b.s have been intercepted.

### Fully Legal

And let's not forget the USA and Canadian 'lowfers', fully legal radio beacons operated by experimenters in the 160 to 190kHz sliver. The power radiated by these beacons is minimal and it would take you a long time to brew a cup of tea using the power radiated by these beacons.

These stations cannot transmit more than 1W, feeding an antenna that cannot exceed 15m including the feed line! In many European countries and in New Zealand there are now amateur transmissions permitted in the 76 and 136kHz.

Most of the transmissions in this part of the spectrum are vertically polarised, except as noted above in the case of the Clam Lake/Republic US Navy system where the antennas are horizontal. The broadcasters and the various naval transmitters world-wide use extremely high power, and it is common for these stations to 'pump' between 0.5 and 5MW.

The antenna systems at these frequencies have a very low efficiency and the power that are finally radiated is very small. On a frequency of 100kHz, a one quarter wave vertical antenna would be about 750m high! Obviously quite an impossible feat, so there is a great loss of power in the antenna/loading coil/ground system of all these stations. These same conditions apply to the transmissions from the amateurs and 'lowfers' operating in this area of the spectrum.

### Via Ground Wave

When we 'cruise' this section of the spectrum, many assume that the signal received is via the ground wave propagation mode. In daylight, I believe that is the mode of choice for a signal in the 200 to 500kHz band to follow to reach your simple receiver and antenna.

Distant stations in that band are not normally heard during the daytime, specially if the complete path is in daylight. Marine and air navigation beacons can normally be heard from a distance of about 150km in daylight using simple antennas

and receivers. Even if you increase the antenna size and operate from a very quiet location, you will not be receiving signals from beacons located much further.

In the 10 to about 100kHz range, the signal strength of the signals received in daylight and at nighttime is approximately the same. The noise level varies depending on the time of day and the season, but most of the time if you hear a signal at night, you will also hear it during the day. There seems to be very little difference in reception in that part of the spectrum and you will hear the various high power armed force's transmitters 'chirping' away 24-hours a day.

### Interesting Stations

We will now have a look at the propagation in the slice between 100 and 500kHz. This slice is where you find some very interesting stations: ITU Region 1 broadcasters, 'lowfers' and air/marine navigation beacons.

If you live on the East Coast of North America, chances are that in Summer you will not hear the European broadcasters. Maybe in the dead of night you might catch a few sentences between static crashes. But come Winter, when the complete path between you and Europe becomes dark by mid to late afternoon in eastern North America, chances are that you will hear the Icelandic station on 189kHz and the BBC on 198kHz.

If you are participating in a DXpedition in a very r.f. quiet environment, you might also hear Algeria, Turkey, Germany, Ireland and a few others. If you live on the West Coast of North America, you might hear some Russian broadcast stations in the same frequency slice, but there are very few.

For those living in Europe, particularly in the UK, you can start beacon chasing in winter and you would be surprised what you can log from Eastern North America and even from the Arctic area of Canada. While you are doing some monitoring in the beacon band, slide a bit higher in frequency and try to listen to the broadcasters in the m.w. band, but remember in North America the stations are at intervals of 10kHz, not 9 like in Europe!

### Common Condition

During DXpeditions, winter of 1998-99, I had the opportunity of hearing three North American 'lowfers' located between 300 and 350 miles away from the receiving site. There was one very interesting common condition to these intercepts, the three stations were all in the same area of the US, and a large portion of the path from transmitter to our receiving site was over the water of one of the Great Lakes! Remember this fact, because paths over water seem to be a common theme for other interesting intercepts discussed later.

During the same listening night in February 1999, we heard the Icelandic station on 189kHz, the BBC on 198kHz, Algeria on 153, and n.d.b.s (non-directional beacons) located in Venezuela, the Dominican Republic and Puerto Rico. The n.d.b.s do not operate with the same high power as the European broadcasters do, n.d.b. stations would use power between one and five kilowatts. Again, all these n.d.b. intercepts had

## ON SPECIAL PROPAGATION SPECIAL PROPAGATION

one thing in common: the largest portion of the transmission path was over water!

### Propagation Theory

The propagation theory for nocturnal signals in the 100 to 500kHz range is that one type of propagation mode is from a direct one hop skywave transmitted at a very low radiation angle from the transmitting antenna. A vertical antenna can launch its signals at a very low radiation angle and most transmitters use vertical polarisation at those frequencies. But, if we are looking at one hop using the ionosphere, what is the difference between one hop h.f. and one hop e.l.f./v.l.f./l.f. propagation modes?

It is believed that waves at these low and extremely low frequencies are not refracted like the h.f. waves from the 'F' layer, but actually reflected from the bottom of the 'D' layer as from a very clean mirror. The 'D' layer is always present, at night this layer becomes very diffuse but can still act as an efficient mirror for the low and extremely low frequencies, it is postulated that the more diffusion there is in the 'D' layer at night, the better mirror it becomes! This will partly explain the increase in signal quality and strength at night, when the noise level also tends to decrease.

If we 'need' to have more than one ionospheric bounce to reach the receiving site, we now have to consider at least one reflection on the ground/water to launch the second bounce. At e.l.f./v.l.f./l.f. frequencies the ground, and especially water, have a very low loss coefficient, so that a signal can 'bounce' around, lose very little energy on its way back to the 'D' layer. This would explain the 'unusual' reception from the 'lowfers', the Caribbean n.d.b.s and the European broadcasters discussed above: the path of the signals from the transmitters to the DXpedition site was significantly over water, thus very little loss was occurring in the signal strength.

In the 10 to 30kHz range, it is now believed that the reflecting bottom of the 'D' layer described above and the ground surface below form a conduit (waveguide) that will guide the signal day and night, without introducing much loss, from the transmitter to the receiver. This theory would partly explain why signals in that slice of the spectrum are heard as well day and night: the quality and the carrying capacity of the e.l.f. waveguide do not materially change from day to night.

From one end of the spectrum to the other, the propagation modes are in some cases similar and at other times completely different.



# The Tropical Bands

**T**he tropical bands are normally referred to as the 120, 90, 75 and 60m bands. The 75m band is used in Europe as a domestic band by at least France, Germany and the UK, even if these countries do not really qualify as tropical!

Originally the tropical bands were set aside, by international agreement and treaties, to be used by countries between the Tropic of Cancer and of Capricorn for 'domestic' services. Why domestic services in those particular bands? The area that has to be covered by a domestic station in the countries located in the tropics is geographically very large, much different to what we consider here as a domestic service on the normal m.w. band. We also have to remember that most tropical countries have a very lush and dense vegetation.

### Relies On Ground Wave

In the m.w. service, the broadcaster relies on the ground wave to cover his geographical market. If a normal m.w. band frequency, a regular transmitter/power combination and antenna system were used to cover the 'tropical domestic' area, the signal would not reach, via the ground-wave radiation, a very large portion of the intended market of each station.

The tropical vegetation has an attenuation of about 100dB/kilometre at 1MHz(!), increases the

absorption rapidly as the frequency increases. So, the power necessary to cover a suitable area around the station would be enormous and require an extremely large amount of electricity to operate the transmitter.

### NVIS

By transmitting on a frequency in the reserved tropical bands and loading an antenna that directs the energy mostly in the vertical plane, such as a simple half-wave dipole, will allow the local tropical station to cover its market (audience) with very low power and good reliability. This propagation mode called Near Vertical Incidence Skywave (see *Short Wave Magazine* May 1998) is what is normally used on the tropical bands. This propagation mode relies on the fact that the maximum usable frequency (m.u.f.) above the station will support such propagation mode without the signal getting lost in space and the signal will return to the ground mostly without major loss.

Some of the Australian stations, Alice Springs is a good example, are apparently using this propagation mode in the 2.3MHz band, but part of their power is refracted and we can hear these stations in Eastern North America during the winter time. The European stations transmitting in the 3.9-4.0MHz band are also well received in Eastern North America.



What are they and how are they used? A quick look with Jacques d'Avignon VE3VIA.

# NEVADA® GROWING BIGGER



### Bearcat UBC 120XLT

Perfect for long distance reception of Aircraft, Public Services, Land Mobile and much more! Outstanding value for money!

- 66 - 512 MHz (with gaps)
- AM/FM/WFM
- 100 memory channels
- TURBO SCAN 100 Channel/Second
- TURBO SEARCH 300 St/Second
- Data Skip facility
- 10 Priority Channels
- Programmable Search
- Channel Lockout Key

**£99.95**

### Bearcat UBC 9000XLT

#### High Performance Base Scanner

- 25 - 1300 MHz (with Gaps)
- 500 memory channels
- VFO Control
- Selectable Attenuator
- Selectable Delay
- Selectable Mode AM/FM
- TURBO SCAN 100 Channel/Sec
- TURBO SEARCH 300 St/Second
- Alpha Numeric Display
- Automatic Store
- Frequency Transfer
- Auto Tape Record
- Data Skip facility
- Programmable Search

**£249**

### AR 8200

- 530kHz-204MHz
- All Mode inc 8.33kHz AM
- 1000 Memories
- Plus LOTS MORE!

**PRICE MATCH**

We carry the **FULL RANGE** of accessories!

CT8200	CTCSS	£69.90
EM8200	External memory	£59.90
RUB200	Record/Play Back	£59.90
TE8200	Tone eliminator	£39.90
VIB200	Voice inverter	£59.90
CC8200	Computer lead + free PC Windows software & protocol listing on CD-ROM	£79.90
OS8200	ACC Connector + free end lead	£14.90
RT8200	Reaction tune lead for Opto Scout	£24.90
CR8200	Tape interface & Lead	£39.90
CO8200	Clone data lead	£39.00
SC8200P	Leatherette padded soft case	£19.95

**£369**

### ICOM IC-R2

**GO ANYWHERE SCANNER!**

**CHEQUE SPREAD**

**PRICE MATCH**

**OPTIONAL SOFTWARE AVAILABLE FOR CLONING**

- 500kHz - 1310MHz
- AM/FM/WFM
- 400 memories
- 10dB Attenuation
- Uses 2 AA Batteries (not supplied)
- Auto Squelch
- Tone Squelch for quiet operation

**£139.90**

### Bearcat UBC 220XLT

Uniden has built its reputation on reliability, ease of use and quality of reception with its most popular model, the 220XLT. Ideal for Aircraft, Public Service & UHF Communications.

- 66 - 956 MHz (with gaps)
- AM/FM
- 200 memories
- TURBO SCAN 100 Ch/Second
- TURBO SEARCH 300 St/Second
- Data Skip facility
- 10 Priority Channels
- Memory Backup
- Supplied complete with earphone, belt clip, charger and rubber duck antenna

**£119.95**

### UBC 860XLT

#### AIRBAND Base Scanner

A stylish low profile base scanner with TWIN TURBO scan and search facility!

Covers civil airband, marine, police, cellular plus more!

- 66-88, 108-174, 406-512, 806-956MHz
- 100 mems ● Turbo Scan - 300 steps/sec

**£129.95**

### Bearcat UBC 60XLT

A brand new low cost scanner that covers MARINE, POLICE, LAND MOBILE and more!

- 66 - 512 MHz (with gaps)
- 30 memories
- Channel or Frequency display
- Priority Channel
- Channel Lockout
- Scan Delay

**£79.95**

### USED EQUIPMENT

ALL SAFETY TESTED & GUARANTEED FOR 3 MONTHS

SHORTWAVE RECEIVERS		
DRAKE SWJ	HF Kit (500 kHz - 30MHz)	399
DRAKE PMS	HF Base Kit (with 30mhz Sec'd)	499
GRUNDIG YB500	500mhz - 30mhz	139
SONY	Portable Shortwave	89
ICOM	VHF/UHF	59
KENWOOD	ESK100	599
SCANNING RECEIVERS		
AOR 8270	Handheld Scanner	149
BEARCAT UB 3000	Base Scanner	105
BEARCAT UB 3000	Handheld Scanner	149
ICOM HT1	With Storage Handheld Kit	159
ICOM IRT-2	Handheld Scanner	100
SONY AIR 8	Handheld Scanner	125
TRIDENT TR 2000	Handheld Scanner	159
YUPIITERU YU7510	Handheld Scanner	99
YUPIITERU YU7510	Handheld Scanner	99
YUPIITERU YU7510	Handheld Scanner	25
YUPIITERU YU7510	Handheld Scanner	25
SCANMASTER	Handheld Scanner	49

**STOCK ARRIVING DAILY - CALL**

### EFW DELUXE SHORTWAVE ANTENNA

A deluxe SW antenna using super flexweave wire and an isolating balun for even coax feed & low noise/static pickup. ● 500kHz - 30MHz

- (Max) 20mtrs long

**£59.95** £4.75 p&p

### Palstar Shortwave Antennas

**NEW!**

Standard enamelled copper wire antenna up to 50 metres long with 10 metres of single feed wire. May be adjusted to suit garden.

- (Max) 50mtrs long

**£25.95** £4.75 p&p

### SCANMASTER Antennas

#### DOUBLE DISCONE SCANMASTER DD 1300

A high performance wideband antenna

- 25-1300MHz

**£59.95** £6.00 p&p

#### NOMAD PORTABLE

Fully portable flexible wire scanning receiving antenna. Covering both VHF & UHF it's compatible with all scanning receivers. Compact & lightweight, simply suspend it with the cord supplied. Length: 1.5Mtrs 4M coax & fitted BNC.

**£19.95** £4.75 p&p

### GOODMANS TRACKER

2-WAY BUSINESS & PERSONAL COMMUNICATIONS SYSTEM

**NEW!**

**SPECIAL OFFER!**

**PAIR £99**

**PMR 446 LICENCE FREE RADIOS**

Now you can keep in touch with -

- NO LICENCE FEE
- NO CALL CHARGES
- NO LINE RENTAL

Typical range: up to 3km

**COMPLETE PACK**

- PAIR TRACKER RADIOS
- DROP IN CHARGER
- NiCad BATTERIES

### ALINCO DJ-SR1

**PMR 446**

**NEW LOW PRICE!**

**£89.95 EACH**

**SPECIAL TWIN PACK**

- 2 X DJ-SR1 + NiCads
- 1 x Drop in Charger

**£199 - pair!**

Lightweight and small enough to fit in a shirt pocket! It has the performance to achieve max range on the new PMR 446 allocation with outstanding clarity on both received & transmitted signals

- 8 channels
- 39 CTCSS codes/ch
- 20 memories
- Memory scan
- Battery level indicator
- Switchable hi/low pwr
- Speaker/Mic jack
- Monitor (open squelch) key
- Selectable pwr output



# 023 9231 3090

e-mail: [info@nevada.co.uk](mailto:info@nevada.co.uk)  
 website: <http://www.nevada.co.uk>

• Unit 1 • Fitzherbert Spur • Farlington • Portsmouth • PO6 1TT

■ JACQUES D'AVIGNON VE3VIA ■ E-MAIL: jacques@pwpublishing.ltd.uk

PROPAGATION

# Propagation Forecasts

## 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.

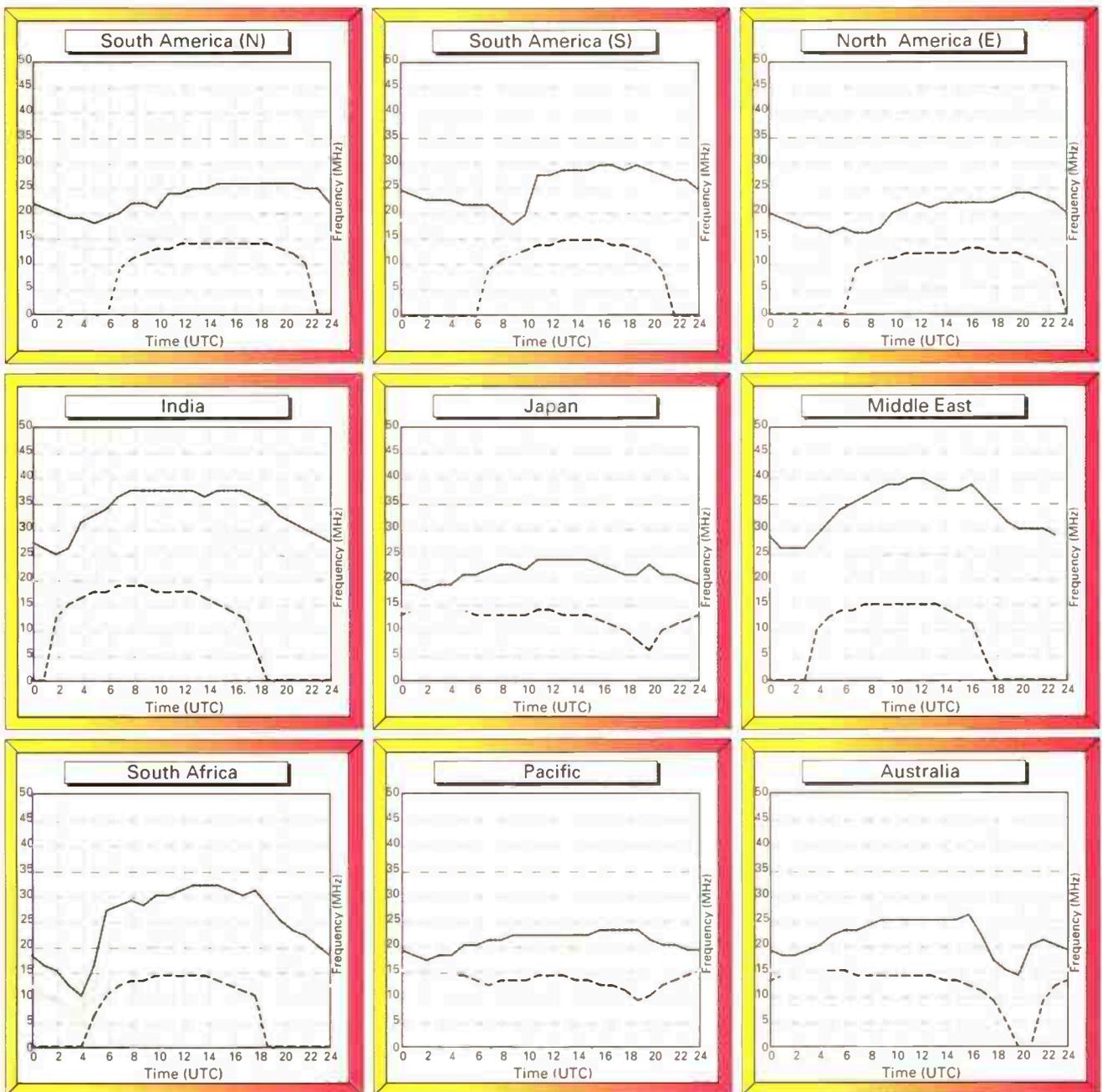
Lastly, the upper dashed line represents the maximum usable frequency (MUF) a 50%

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.

May 2000  
Circuits to London



SK9769

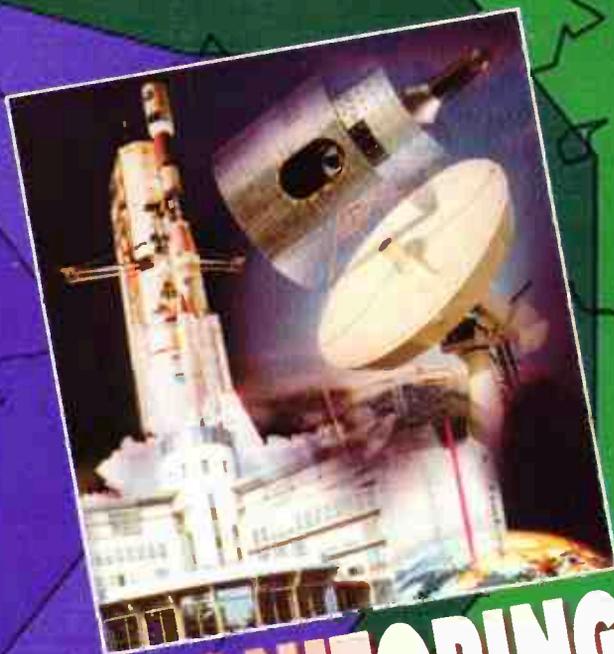
**short wave magazine**

**BRITAIN'S BEST RADIO MAGAZINE**

*Welcome to the World of Radio Communications*

# PROPAGATION SPECIAL

**JUST WHAT MAKES  
A GOOD RECEIVER?  
JW EXPLAINS**



**MONITORING  
METEOSAT**

May 2000 £2.99

**... AND ALL THE REST - LOOK INSIDE!**



[www.pwpublishing.ltd.uk/rwm](http://www.pwpublishing.ltd.uk/rwm)

World Radio History



# TRIDENT

## TRX-100XLT

Ultra Wideband Scanner with Computer Interface



A BRAND NEW attractively styled scanner packed with features. The TRX-100XLT continuously covers 100kHz to 2200MHz receiving NFM, WFM and AM modes.

### Features

- 500kHz to 2000MHz
- NFM, WFM & AM Modes
- 9 Channel Spectrum Bandscope displays
- Adjacent Channels de-scrambler built-in for audio inverted scrambled transmissions
- 10 dB Attenuator
- Computer monitoring via RS232 port with optional software and cable
- 1000 Memory Channels
- Turbo Scan 50 channels/second
- Turbo Search 30 channels/second
- Dual VFO's to quick switch any two frequencies
- Frequency steps switchable: 1kHz, 5kHz, 6.25kHz, 9kHz, 10kHz, 12.5kHz, 20kHz, 25kHz, 30kHz, 50kHz, 100kHz, 125kHz, 150kHz, 200kHz, 250kHz
- Clone facility
- Supplied C/W Antenna, NiCads & Charger

**NEW LOW PRICE**

**£179.00**  
£8 p&p



## AR 108

Palm sized Airband & VHF Scanner

A new dedicated handheld scanning receiver that has been optimised to give powerful long distance reception of Civil Airband and VHF. It is compact and small enough to fit comfortably in a top pocket.

### Features include:

- Frequency: Airband 108 - 136.975MHz VHF Band 136 - 180MHz
- Modes: AM or FM
- Memories: 99
- Selective Channel Steps: 5, 10, 12.5, 15, 25, 1MHz
- Dual Watch Function
- Key Lock
- Battery Save Function
- Battery Voltage Indicator
- Supplied C/W Earphone, Belt Clip, Carrying Strap

### Options:

- Mains Chargers .....£8.95

**£69.95**  
£6 p&p

# YUPITERU *probably the -* WORLD'S BEST SCANNER RANGE

## YUPITERU MVT 9000 EU

Yupiteru's flagship model, with a range exceeding 2000MHz, a real time bandscope.



- 531kHz - 2039MHz
- 1000 memory channels
- All modes: W-FM, FM, N-AM, AM, LSB, USB, CW
- Multiple scanning steps 50Hz-125kHz
- Alpha numeric display
- Band scope with marker function for direct access to displayed frequencies
- Duplex receive capability - hear split frequency signals easily with VFOs
- 20 search bands
- Fast tune facility gives 10 times function for quick tuning
- Built-in ferrite rod antenna for AM broadcast reception

**£369.00**  
£8 p&p

- OP90 Soft Case .....£17.95 + £2 p&p

## YUPITERU MVT 3300EU

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



- **FREQUENCY:** 66 - 88MHz, 108 - 170MHz, 300 - 470MHz, 806 - 1000MHz
- **MODES:** AM/NFM
- **STEPS:** 5, 6.25, 10, 12.5, 25kHz
- **MEMORIES:** 200
- **BAND MEMORIES:** 10 (user re-programmable)
- **PRIORITY CHANNELS:** 10
- **SCAN/SEARCH SPEED:** 30 per sec
- **POWER:** Requires 4 x AA batteries
- **SUPPLIED WITH:** Antenna, Earpiece, Carrying Strap and built-in Desk Stand

**£149.00**  
£8 p&p

## YUPITERU MVT 7100 EU

Probably the most popular high end Scanner. It's easy to use and can receive just about anything going!



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

- OP51 Soft Case .....£17.95 + £2 p&p

**PRICE PROMISE!**  
We GUARANTEE to MATCH our competitors prices!

We are proud to be authorised by **YUPITERU JAPAN** to distribute their **SCANNERS** in the United Kingdom

**DEALERS!**  
for further details contact our **TRADE DEPARTMENT**  
Phone: Int: +44 (0)23 9231 3095  
Fax: Int: +44 (0)23 9237 6565

• Friendly expert advice • Large Stocks • Same Day Despatch  
UK Distributors for Bearcat and Yupiteru products

We are one of Europe's largest Scanner Specialists

## contents

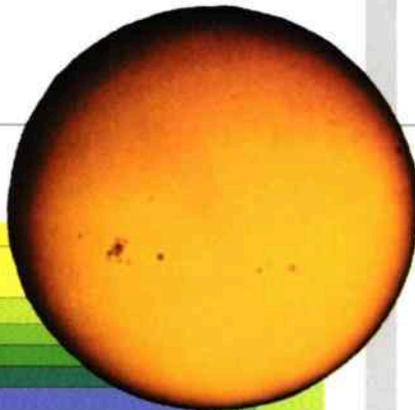
Vol. 58 Issue 05 May 2000  
ISSN 0037-4261  
ON SALE APRIL 27  
Next issue on sale May 25

### PROPAGATION SPECIAL



#### COVER SUBJECT

Wow, how can you possibly have missed this issue? Hindcasting plot from ASAPS propagation tool.



## features

### BROADCAST

- 11 Bandscan America
- 12 LM&S
- 17 World Wide Radio Guide

### 29 RADIO PROPAGATION 'HINDCASTING'

What is hindcasting and why would you want to use hindcasting? Jacques d'Avignon VE3VIA explains, giving an example of a hindcasting research project that he has been involved in for many months.

### 31 MONITORING & PROPAGATION MODES

Most listeners assume that the propagation modes of radio waves are the same in all parts of the electromagnetic spectrum. This is an easy assumption to make, but it is not totally correct. Jacques d'Avignon VE3VIA explains all.

### 33 THE TROPICAL BANDS

What are they and how are they used? A quick look with Jacques d'Avignon VE3VIA.

### 36 PROPAGATION FORECAST

### 38 PROPAGATION EXTRA

**SWM Author Info** To provide you with a ready reference here are the contact details of all our regular authors.

#### Airband

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

#### Amateur Bands

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

#### Attention 123!

Enigma, 17-21 Chapel Street, Bradford, West Yorkshire BD1 5DT.

#### Bandscan

##### Bandscan America

Gerry Dexter, c/o SWM Editorial Offices. E-mail: gdexter@pwpublishing.ltd.uk

##### Bandscan Australia

Greg Baker, PO Box 3307, Manuka, ACT2603, Australia. E-mail: greg.baker@pwpublishing.ltd.uk

##### Bandscan Europe

Peter Shore, c/o SWM Editorial Offices. E-mail: peter.shore@pwpublishing.ltd.uk

##### Decode

Mike Richards G4WNC, PO Box 1863, Ringwood, Hampshire BH24 3XD. E-mail: decode@pwpublishing.ltd.uk

##### DXTV

Keith Harmer and Garry Smith, 17 Collingham Gardens, Derby DE2 4FS

##### Info In Orbit

Lawrence Harris, 5 Burnham Park Road, Peverell, Plymouth, Devon PL3 5QB. E-mail: info.orbit@pwpublishing.ltd.uk

##### LM&S and Maritime Beacons

Brian Oddy G3FEX, Three Corners, Merryfield Way, Storrington, West Sussex RH20 4NS.

##### MilAir

Peter Bond, c/o SWM Editorial Offices. E-mail: milair@pwpublishing.ltd.uk

##### Off The Record

Andy Cadier, 28 Romney Avenue, Folkstone, Kent CT20 3QJ. E-mail: off.the.record@pwpublishing.ltd.uk

##### Propagation

Jacques d'Avignon VE3VIA. E-mail: jacques@pwpublishing.ltd.uk

##### Satellite TV News

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

##### Scanning

Dave Roberts, c/o SWM Editorial Offices.

E-mail: scanning@pwpublishing.ltd.uk

##### ShackWare

Jerry Glenwright, 23 Downland Avenue, Southwick, West Sussex BN42 4RF. E-mail: shackware@pwpublishing.ltd.uk

##### SSB Utilities

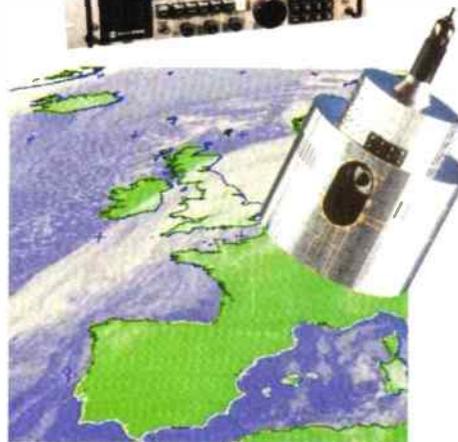
Graham Tanner, 64 Attlee Road, Hayes, Middlesex UB4 9JE. E-mail: ssb.utilis@pwpublishing.ltd.uk

##### World Wide Radio Guide

Paul Beam, c/o SWM Editorial Offices. E-mail: wwrgrg@pwpublishing.ltd.uk

# NEXT MONTH IN JUNE SWM

-  **Graham Tanner's SSB Utilities Special.**
-  **JW gets to grips with the Rockwell Collins' latest h.f. receiver.**
-  **Plus all those essential regulars to keep you abreast of all things radio.**



**EDITOR:**  
Kevin Nice, G7TZX, BRS95787

**NEWS AND PRODUCTION EDITOR:**  
Zoë Shortland

**ART DIRECTOR:**  
Steve Hunt

**ART EDITOR:**  
John Kitching

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

If you wish to send E-mail to anyone at SWM then our Internet domain name is: **pwpublishing.ltd.uk**  
Simply add the name of the person you wish to contact.  
For example:  
**kevin.nice@pwpublishing.ltd.uk**

**BOOKS, BACK ISSUES & SUBSCRIPTIONS (ALL ORDERS)**  
(01202) 659930  
(Out-of-hours service by answering machine)

**ADVERTISEMENT DEPARTMENT**  
(Broadstone)  
**ADVERTISING SALES:**  
Chris Steadman MBIM

**ADVERTISEMENT TYPESETTING & PRODUCTION:**  
Peter Eldrett  
**Telephone: (01202) 659920**  
**Facsimile: (01202) 659950**

**ADVERTISEMENT MANAGER:**  
Roger Hall G4TNT  
PD Box 948, London SW6 2DS  
**Telephone: 020-7731 6222**  
**Facsimile: 020-7304 1031**  
**Mobile: (07805) 051305**

## 22 IN MY EXPERIENCE

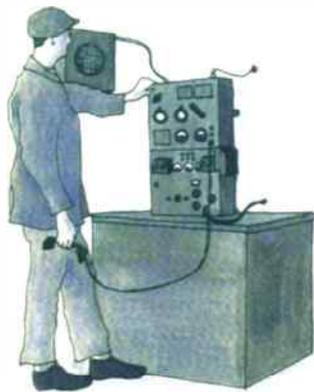
Having tried, tested and used a huge selection of top h.f. receivers, John Wilson G3PCY looks at the question "what makes a good receiver?"

## 40 MONITORING METEOSAT

Lawrence Harris investigates the Meteosat 'add-on' from Timestep for those wishing to expand the WXSAT station.

## 46 STRANGE TALES OF RADIO AT SEA

Tony Martin looks back at radio mysteries of yesteryear involving vessels at sea.



## regular columns



62



56



72



77

Airband .....	62	Propagation Forecast .....	36
Amateur Bands .....	76	QSL .....	5
Bandscan America .....	11	Rallies .....	7
Book Store .....	77	Satellite TV News .....	56
Communiqué .....	6	Scanning .....	61
Decode .....	50	ShackWare .....	81
DXTV .....	64	SSB Utilities .....	74
Editorial .....	4	Subscription Offer .....	37
Info In Orbit .....	69	Trading Post .....	83
LM&S .....	12	What's In PW .....	39
MilAir .....	54	World Wide Radio Guide .....	17
Order Form .....	84		
Propagation Extra .....	38		

*The quickest & most comprehensive radio-related book service in the UK!*

© PW PUBLISHING LTD. 2000

Copyright in all drawings, photographs and articles published in Short Wave Magazine is fully protected and reproduction or imitation in whole or in part is expressly forbidden. All reasonable precautions are taken by Short Wave Magazine to ensure that the advice and data given to our readers is reliable. We cannot, however, guarantee it and we cannot accept legal responsibility for it. Prices are those current as we go to press. Short Wave Magazine, USPS No. 006996, is published monthly for £33 (UK) per year by PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. Second Class Postage paid at South Hackensack. Postmaster: Send USA address changes to Royal Mail International, c/o Yellowstone International, 2375 Pratt Boulevard, Elk Grove Village, IL 60007-5937

**DISCLAIMER:** Short Wave Magazine wishes in no way to either condone, or encourage, listeners to monitor frequencies and services which are prohibited by law. We respectfully refer you all to both the Wireless Telegraphy Act 1949, and the Interception of Communications Act 1985. Some of the products offered for sale in advertisements in this magazine may have been obtained from abroad or from unauthorised sources. Short Wave Magazine advises readers contemplating mail order to enquire whether the products are suitable for use in the UK and have full after-sales back-up available. The Publishers of Short Wave Magazine wish to point out that it is the responsibility of readers to ascertain the legality or otherwise of items offered for sale by advertisers in this magazine.



## SWM Services

### Subscriptions

Subscriptions are available at £33 per annum to UK addresses, £40 in Europe and £44 (Airsaver), £50 (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 £55 (UK) £68 (Europe) and £74 (rest of world), £85 (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, **KANGA PRODUCTS, Sandford Works, Cobden Street, Long Eaton, Nottingham NG10 1BL. Tel: 0115 - 967 0918. Fax: 0870 - 056 8608.**

### Photocopies & 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 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 for SWM are £2.99 each and photocopies are £2 per article.

Binders are also available (each binder takes one volume) for £6.50 plus £1 P&P for one binder, £2 P&P for two or more, UK or overseas. Prices include VAT where appropriate.

A complete review listing for SWM/PW is also available from the Editorial Offices for £1 inc P&P.

### Placing An Order

Orders for back numbers, binders and items from our Book Store should be sent to: **PW Publishing Ltd., FREEPOST, Post Sales Department, Arrowsmith Court, Station Approach, Broadstone Dorset BH10 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, AMEX 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. The E-mail address is [bookstore@pwpublishing.ltd.uk](mailto:bookstore@pwpublishing.ltd.uk)

### Technical Help

We regret that due to Editorial time scales, replies to technical queries cannot be given over the telephone. Any technical queries by E-mail are very unlikely to receive immediate attention either. So, if you require help with problems relating to topics covered by SWM, then please write to the Editorial Offices, we will do our best to help and reply by mail.

# ed's comments

## Good Receiver

Just what makes a good receiver? This is a subject very dear to all of us. Well, this month John Wilson takes a pragmatic look at the picture he's built up over the many years he's been involved in radio. Take a look at page 22 and see what he's got to say.

Over the past two years or so, I've been utilising John Wilson's expertise to bring you an in depth look at some classic radios from the past. John's looked at both hobby and professional radios. He's done so from the point of view of innovation and effectiveness of the set under examination. I believe that even though many of these radios are out of reach of many SWM readers' pockets, they are still of major interest to many of you. I remember when I first started reading SWM and the many general electronics magazines of the time (1971), all the equipment featured was beyond my means, but that didn't stop me being interested in what was being written. Nor did it tame my interest in the advertisements, quite the contrary, it stimulated my interest and helped increase my knowledge. It's still the same when I read motoring magazine reports about Ferraris, Lamborghinis et al, I can't afford them, but I'm fascinated by the technical detail and performance.

Guy Denman (opposite) doesn't agree with me, specifically about the HF-2050, but I believe a review was in order. Especially as this radio represents an early implementation of d.s.p. As for the price of any second-hand radios, look hard and long and you'll be surprised at what bargains you can find.

John's article this month performs the comparison that Guy is looking for, so hopefully he'll be a little happier this month.

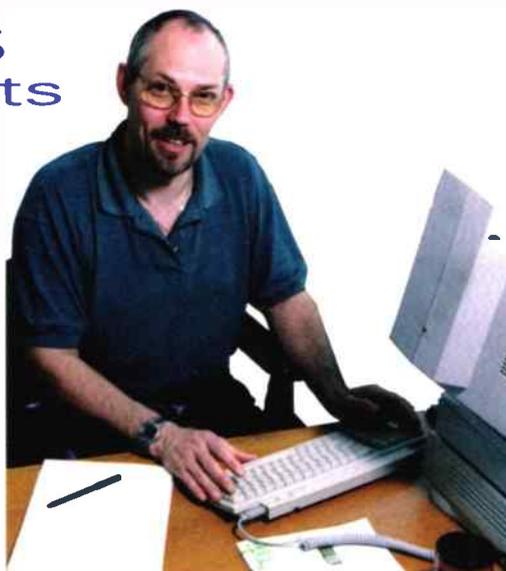
I had a letter from Michael O'Beirne who collects professional receivers and has been following JW's look at the American sets with interest. He prefers the British sets that he has spent many pleasant hours operating, but is dismayed with the last and very important stage of any radio - the audio. Michael reckons that the GEC BRT402E is a notable exception with a well designed audio stage.

## Portishead Radio

The following has been released by British Telecom:

"CQ DE GKE

BT regrets to announce the forthcoming closure of its coast radio station service. Portishead Radio and all UK v.h.f. coast stations will close at 1200 on Sunday 30



April 2000. All m.f. stations (GND, GKZ, GKR and GLD) will close at 1200 on Friday 30 June 2000. We send our thanks and best wishes to the maritime community which we have served for over 90 years. BT Maritime Radio Services London."

BT Maritime Radio Services have agreed to run a very special cross band maritime/amateur event on Saturday 29th April 2000 between 0800 and 2000UTC on the following frequencies;

Call Sign	Frequency (MHz)	Amateur Frequency (±5kHz)
GKB2	4.274	3.525
GKB4	8.5594	7.025
GKB5	12.8354	14.050
GKB6	17.113	18.025
GKB7	22.4487	21.050

There will be three stations operating at any one time - subject to the commercial requirements of the station.

BT has appointed the Radio Officers Association to handle the amateur side of this operation and the liaison officer is David Barlow G3PLE. All QSOs will receive a QSL via the RSGB bureau. Amateurs are asked to note that there will be **no** access to BT sites following closure and there will be no surplus equipment for sale.

Any enquiries from radio amateurs should be routed through **David Barlow G3PLE, PO Box 50, Helston TR12 7YQ**. E-mail for the event to [dbarlow@u.genie.co.uk](mailto:dbarlow@u.genie.co.uk) the event Website can be found at <http://you.genie.co.uk/dbarlow>

## Icom IC-R3

I've just got my hands on a leaflet for this new handheld scanner from Icom (pictured left) and it sure looks interesting. Although the launch date for the UK version is not yet known, and according to industry insiders, there may not be a version for other than the home (Japan) market. I most certainly hope there is, as the I.c.d. video screen to allow the monitoring of broadcast TV and other video transmissions is a very exciting prospect in a handheld scanner. I hear that the radio does not yet have either FCC or EU approval so far, but the possibilities are fascinating and I can't wait to get my hands on one.

## Radio Survey

After my mention of an equipment survey in last months 'Ed's Comments' I've had an encouraging start to our straw pole as to what the most popular radio gear in use is. Please keep those lists coming in.

*Kevin*

73



**Dear Sir**

I have just moved to Suffolk, to the old village town of Bungay (pronounced BUN-GEE). I have noticed that the Community Centre is hardly used apart from the 'Mums Club' on a Wednesday morning and the local WI on a Thursday morning, therefore the idea came to me to start a 'Listeners/Viewers Club'.

I say a 'Listeners/Viewers Club', as our amateur radio friends have their own clubs and meet both in Suffolk and Norfolk, whilst this new club will hopefully be for those people out there who are mainly interested in listening and viewing. I therefore would like to meet up with anyone local or in the wider area of Bungay interested in any form of reception on any bands or modes.

As for myself, I have been in the past and intend to restart here an active interest in TV and medium wave DXing, with a dabble into satellites, be it analogue or digital, so whatever your interest is, and let's not leave it just to the above topics, please get in contact.

I am therefore hoping that should this idea take off the meetings will be held either on a Friday or Saturday evening from 1930 to 2230 once a month, more frequently if the interest is there. The initial price of hiring the hall is £5 an hour, so to make the idea viable, a minimum of four interested people are needed to help with the costs.

With very little to do in Bungay of an evening apart from going to the pub, here is your chance to make life more interesting, meet new people and take up this opportunity to meet fellow enthusiasts with a view to exchanging ideas and interests no matter what they are.

To make initial contact please write stating your hobbies and interests to: **Mike Evans, 85 Hillside Road West, Bungay, Suffolk NR35 1RH** not forgetting to enclose an s.a.s.e.

**Mike Evans**  
Suffolk

Good luck with the new club Mike. - Ed.

**Dear Sir**

I was surprised that you awarded your 'Top QSL' in the March issue to a request for a review of some very obscure receivers. I do not think this would be of any interest to the majority of readers, as these receivers are not available to the general public and probably cost tens of thousands of pounds anyway.

I cannot agree with your statement of page 2, cover subject, that the HF-2050 is a worthwhile addition to any serious listeners' shack.

After reading John Wilson's review of it describing all the difficulties using it and the fact that, in ways, the AR7030 is a better receiver anyway, I certainly would not purchase one. There are other down points to it as well, very large size, requiring a 19in rack mounting, very few memories, only 30, runs on 115V requiring a step down transformer. It is also an old receiver and I should imagine very difficult to get spares and finally the price - I see they are advertised at £2000 which is a ridiculous price for a 10 year old second-hand receiver.

When John Wilson does a receiver review, I think it would be of use to compare it with several other receivers. There always seems to be a lot of technical information and not much as to how it receives signals. There are many regular signals on the bands that could be used to show how well a receiver performs.

**G.E.R. Denman**  
Hants

**Dear Sir**

As an active s.w.l., I was listening (on an AR7030 plus) at 1840 on the 4th March (Contest) on 15m. A Russian station running 1kW u.s.b. was on (national carrier) 21.44940MHz and was occasionally contacting some VE stations.

During his time on this frequency an unidentified station was an authoritative US voice (FCC?) kept repeating, "Sir, you are too close to the band edge" and "Sir, this frequency is in use". The Russian stated that he was permitted under the terms of his licence to transmit up to and including the band edge, even though, obviously, the upper sideband energy would be outside the band.

Can you tell me who and what is correct?

**Dan Arbib**  
London

**Dear Sir**

I was interested in your article 'Yesteryear Computers' in the March issue of *SWM* and was surprised that there was no mention of the British designed Nascom 1 computer, available in kit form from around 1978. It came with a full size QWERTY keyboard, two eight bit parallel input/output ports and a serial port for program storage on a standard

Short Wave Magazine, May 2000

audio cassette recorder. It was driven by the popular Z80 processor and Data and Address buses were brought out for external use and memory expansion. Video display required either a monitor or a television set.

The operating system was brilliant, although using only 2K of Eprom. A dozen commands were set up by a single press, the letter being appropriate to the function. It was an ideal computer for learning assembler code programming and the IoW Technical College bought and assembled several for training. Mine is still operational after 20 years and several modifications. It is due to end up in a local computer museum soon. I shall miss it!

**Tony Hall**  
Isle of Wight

*The focus on Jerry's article was older computers with a useful place in the listener's shack. There were many older machines omitted, this is due to no radio related software having been widely available. I entirely agree with you that the Nascom 1 was the landmark in computers for the hobbyist. - Ed.*

**Dear Sir**

With reference to the letter from Mr Smart in the March issue of *SWM*, I'd like to add some easy catches, frequencies that I listen to frequently:

8.930	Stockholm Radio
11.345	Stockholm Radio
8.906	
8.825	
11.309	
11.396	

These are all Major Air Route Area frequencies. Please forward this info to Mr Smart if possible.

Best regards and 73.

**Kjell-Ingvar Karlsson**  
Upplands-Väsby  
Sweden

**Dear Sir**

I just had to drop you a line to say what an excellent millennium *SWM* has made. I have a DX-394 and an AR1500 and am interested in pretty much all angles of this hobby/pastime/addiction. I'm not big on DXTV or satellite, so over the last year I haven't always enjoyed the magazine as much as I would like. How things have changed! MilAir Special - Brilliant, ShackWare Special - Fascinating, English broadcast schedule - Very useful, New scanner columnist - Big improvement.

Perhaps you could help me with a query? Despite frequent attempts, I have only ever heard one amateur that was not on h.f. It was on the 2m band 145.48 n.b.f.m. on 16 June last year, how come?

Thanks very much and keep up the good work.

**Quentin Cruse**  
Wales

*Thanks for the kind words Quentin, I'm glad you're enjoying *SWM*. As for not hearing amateurs on v.h.f. and u.h.f. frequencies, this could be due to your location or your antenna. It may also just be that you are not listening when there is any activity. Can you hear any of the repeaters in your area? - Ed.*

**Dear Sir**

Just a brief letter, regarding the radio set-up I have at home that may be of interest to some readers.

After a few years away from the hobby I am now back and read *SWM* - when I can get it! Things have changed a bit since 1993!

I run a Realistic DX-394 (which I have modified) via an MFJ-1045 preselector and 10m loft longwire and it is a fair receiver for the price. OK I would love a NRD-545 or Drake R8 - but alas I cannot afford it (all donations gratefully received!).

Also I have a UBC900XLT which is hooked up to a pre-amp and a discone in the loft, but best of all I have a home-brew 14MHz direct conversion receiver, from Maplin, which I built from a kit in 1988, this humble RX has only a 1.3m telescopic antenna plugged into the back and is run indoors.

Where I live reception is poor in general as the QTH is in a 'dip' - but I was shocked with the following results. The other day just before going to work at 0750UTC, I flicked the Maplin set on and there was VK3DN 5/3 chatting away to stations in Denmark 5/9+ and France 5/9+.

Later on that evening I heard VK6JC 3/3 working W1FDY on the same set at about 2330UTC - I have no idea what the frequencies were because the set has only a Vernier dial for tuning.

I also have a Vectronics audio filter in line with the speaker via a 3-way switch box which helps to clean up the audio. The Commtel 5A p.s.u. cost £1.50 at a car boot! The DX cost £55 and the Maplin about £60 in 1988. The portable is an unbranded Maplin set which I paid £15 in their sale, and that receives international broadcast (no s.s.b. though) with ease from just about everywhere.

I also receive a lot of RTTY/c.w. stations on the DX-394, using the PC, my point is do you have to spend £1600 or so on a radio to receive DX? I think not, I have a fair log of stations from all over the planet.

Also, being a female, I sometimes feel that I am in a minority as there are very few female DXers around - it must be a guy thing:-)

I would welcome your comments on the above.  
Regards and 73

**Carolyn Webb**  
Suffolk

P.S. I passed the RAE 'B' in 1992 - but have yet to get a callsign (I lost my C&G certificate).

*Carolyn, it just goes to show how much enjoyment can be had without having to spend a lot of money. As for being in a minority, I guess you are, but it doesn't matter, you obviously enjoy the hobby. - Ed.*

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 at QSL, Short Wave Magazine, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW.

THE BEST LETTER WILL RECEIVE A £20 VOUCHER TO SPEND ON ANY *SWM* SERVICE.

# Communiqué

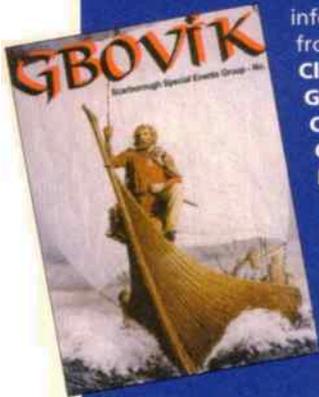
Compiled by Zoë Shortland - News & Production Editor

## The Vikings Are Coming

The resort of Scarborough was founded by the Vikings in 966 and to mark the Millennium year, the town is hosting a Viking Festival with Longboats in the harbour, parades of decorated floats and medieval activities on the Castle Headland, between 21-25th June.

The **Scarborough Special Events Group** will be active as **GBOVIK** during the festival on h.f. and v.h.f. and a commemorative QSL card will be issued to mark the occasion. Cards will be sent via the Bureau to all who make contact. Direct cards can be sent via the club call **G0000**. SWL reports are most welcome.

More information from **Roy Clayton G4SSH**, Chairman, 9 Green Island, Irton, Scarborough YO12 4RN, Tel: (01723) 862924.



## WRN Joins Sky Digital

**World Radio Network (WRN)**, Britain's second international radio broadcaster, is now part of the line up of premier UK radio stations on Sky Digital. WRN1 Europe, the company's English language radio network, will be available on Channel 936 under the radio section of the On-Screen Electronic Programme Guide (EPG)/Sky Guide.

WRN1 Europe will offer Sky Digital subscribers a rich and diverse mix of news, current affairs and magazine programming from over 20 of the world's most respected international and national public radio broadcasters, including Voice of America, Radio Canada International, Radio France International, Radio Austria International, RTE Ireland, South African Broadcasting Corporation, Radio Sweden, Israel Radio, Radio Netherlands and YLE Radio Finland. The network will attract subscribers interested in world news, direct from the source, as well as expatriates and foreign nationals living the UK who want to keep abreast of the news from their countries or origin.

Tim Ayris, WRN's Marketing and Rebroadcasting Manager said, "WRN on Sky Digital will provide subscribers with a unique window on the world by giving them access to the finest and most diverse international radio programming currently available. WRN1 Europe significantly strengthens the radio content available on Sky Digital".

WRN1 Europe joins more than 20 radio stations available on Sky Digital including BBC Radio 1-5, Sky News Radio, Classic FM, Virgin Radio, Talk Radio, XFM, Capital Gold and the Digital One/DAB stations: The Mix, Planet Rock and Core.

## Call For Callsign 2000

Now available from the SWM Book Store is **Callsign 2000**, the essential guide to civil and military aviation callsigns. This new 2000 edition has just over 3000 additions and changes to the databases, including the addition of what was almost a record number of new callsigns. Order your copy now, for **£9.95**, by telephoning our Book Store on **(01202) 659930**.



The Sky Digital platform is a major expansion for WRN's digital delivery of radio in the UK. WRN1 Europe is also available on Telewest's digital cable package that is being rolled out across the UK during 2000. The network was also on the air in London via DAB Digital Radio from November 1996 until December 1999.

WRN1 Europe is still available across Europe in analogue on **Astra 1B** (19°E, 22, 11.538GHz (V, on subcarrier 7.38MHz) and on many local TV cable systems.

Finally, news just in, WRN has signed an agreement with Radio Horizon, a community radio station based in the southern Dutch town of Heeze-Leende, near Eindhoven, to provide an overnight sustaining service. The inauguration of the WRN service will bring the history of international broadcasting full circle as Eindhoven was the site of the first international short wave radio transmission.

## New From UKHO

The **United Kingdom Hydrographic Office (UKHO)** has issued a new publication for 2000: **ALRS - Small Craft (NP289)**. NP289 has been designed to provide the small craft mariner with information on all aspects of maritime radio services and includes telephone and FAX numbers for all ports and marinas and a list of s.s.b., m.f. and v.h.f. coast radio stations. It covers the UK to the Mediterranean including the Azores and Canary islands.

The publication also contains information on weather services and Marine Safety Broadcasts, including NAVTEX and SafetyNet. The latest information on satellite communications is also included, in addition to GMDSS procedures and search and rescue instructions and listings of Beacons transmitting DGPS information.

Fully illustrated with full colour diagrams and photographs, NP289 is easily correctable from the weekly Admiralty Notices to Mariners and Admiralty Small Craft Notices to Mariners. It is available from appointed Admiralty Chart Agents at £15 UK RRP.

More information from the United Kingdom Hydrographic Office, **Public Relations, Admiralty Way, Taunton, Somerset TA1 2DN**, Tel: **(01823) 723358**, FAX: **(01823) 351945** or E-mail: **emma.gamlin@ukho.gov.uk**

## Quality Marine Product

**Icom (UK) Ltd.** have recently won a prestigious contract with the Maritime and Coastguard Agency (MCA) to supply approximately 3000 IC-M1EuroV v.h.f. hand portable radio transceivers. The IC-M1EuroV is the latest in a long list of quality marine products from Icom and is replacing MCA's previous hand-held as part of their standard replacement programme.

## On The Move

**Nevada**, after 30 years in their Portsmouth premises, have finally made the move to a huge new 1.056m<sup>2</sup> showroom and distributions centre. The new premises are conveniently located on the outskirts of Portsmouth, just two minutes from the Farlington exit of the M27/A27 South Coast Motorway.

Nevada will be stocking many new products for short wave, scanning and amateur radio enthusiasts previously unseen in the UK. You can now find Nevada at **Unit 1 Fitzherbert Spur, Farlington, Portsmouth PO6 1TT**.

**Nevada's new warehouse - being stocked with new products, the Sales Offices and the new warehouse logo and sign.**



## Marketing Change

Icom (UK) Ltd. has a new member of staff at the helm of its marketing department. **Ian Lockyer** will be taking the reins following the departure of its Marketing Manager Dale Blackman. Ian is no stranger to Icom, having worked for the past 18 months as Marketing Assistant.

Ian has been instrumental in developing the company's marketing activities over the last year, which has seen the launch of a new website. He

has further been tasked with co-ordinating the company's other marketing output, which will include advertising, public relations, sponsorship and merchandising. He is also charged with providing support to the Sales and Marketing Director, Bob Stockley.



Described as the world's smallest waterproof marine v.h.f. transceiver (the IC-M1EuroV is waterproof to 1m for at least 30 minutes), the IC-M1EuroV has been designed to withstand the most punishing of conditions found during search and rescue operations. It also combines the very latest radio and battery technology with a wealth of features including a Lithium Ion battery, waterproof microphone/accessory socket, ergonomic design and self test facility.

A custom case was also designed to fit the users utility belt, keeping the radio free from dirt and dust. The case's safety yellow will allow the radio to be easily retrieved in the dark.

The IC-M1EuroV is very simple to use, with an enlarged display, which includes a ten character, scrolling channel comment which users can program themselves. The display also shows the scan status and other conditions for added peace of mind. The keypad controls are clearly labelled and illuminated to ensure confident operation in all weather conditions, whilst their size and intuitive positioning allow use even wearing gloves!

Contact Icom (UK) Ltd. at **Sea Street, Herne Bay, Kent CT6 8LD, Tel: (01227) 741741, FAX: (01227) 741742** or check out their web site at **www.icomuk.co.uk**



## 'G'rab Your Callsign

Radio amateurs now have the opportunity to purchase 'G' prefix DVLA Select Registrations appropriate to their callsigns. Any vehicle that was first registered on or after 1 August 1989 will qualify to sport a previously unissued 'G' prefix personalised number.

The 'G' prefix registrations will be available through the DVLA's only telesales hotline number on **(0870) 6000 142** on a first come, first served basis, in order to offer all customers a fair chance to purchase a registration. They cannot be pre-ordered or reserved.

There are over 240,000 possible combinations available and all customers will also be able to log onto the DVLA Sale of Marks website at **www.dvla-som.co.uk** to check on availability and price of the 'G' registrations that they are interested in.

To tailor make a personal G number, customers simply choose the G prefix, followed by the number of their choice from 1 to 20. They then choose any three letters, except I, Q or Z. Prices start from £499 with certain registrations individually priced.

Bryon Roberts, Marketing Manager for DVLA Sale of Marks said "The DVLA has long since been aware of the desire of some radio amateurs to have a vehicle registration number to equate their radio callsign. We are pleased that we are now able to give them their opportunity".

The Select Registrations hotline is open from 0900 to 1700 weekdays.

## Buy Your Guides

Recently appearing on the SWM Newsdesk was a copy of *Military Air Scan 2000 HF/VHF/UHF/SATCOM Frequency Guide* and *Military Air Scan Network News 2000* from **MGT Publishing**. Classed as the UK military monitors bible, *Military Air Scan 2000* covers all the major listening areas, ranging from h.f. to satellites.

Over 4000 frequencies are included in this guide, in both alphabetical and reverse order directories. Professionally designed maps (which include Low Fly/Danger Areas, TACAN Routes, Air Refuelling Areas/Flamborough AR Track, Airfield Locations, Airways Crossing/Corridors AWACS Surveillance Areas, Altimeter Setting Regions, etc.) show where the action is taking place, while extensive data tables (inc. RAF Colour Codes, etc.) assist the newcomer with the basics. This is also believed to be the first guide to include a comprehensive listing of commonly heard NATO Codewords (400+).

*Military Air Scan 2000* is also the only UK guide with access to a regular update, courtesy of the respected *Military Air Scan Network News* quarterly journal. All frequency changes appear in *MASNN*, so monitors are always up-to-date with the latest frequency news. *MASNN* is not just an update either. All aspects of military monitoring are covered, including logs, news, radio reviews, SELCALs, mil air web sites, etc.

*Military Air Scan 2000* is priced at £8.99 (UK) or £10.99 (Europe/Rest of World), *Military Air Scan Network News 2000* is priced at £12.99 (UK) or £14.99 (Europe/Rest of World). Alternatively, if you order both guides, the cost is £20 (UK) or £24 (Europe/Rest of World) - making a saving of £1.98. All rates include inland/airmail postage and Sterling cheques should be made payable to MGT Publishing.

For those with Internet access, you can contact MGT Publishing at **www.mgtpublishing.com** or alternatively you can reach them at **PO Box S64, Norwich NR7 8DD**.



Send your news to Zoë Shortland at the Editorial Offices

## rallies

### Attention Please!

Would you like to have your Rally publicised? If so, all you have to do is put together as much information as possible about the Rally, i.e. date, location, times, who to contact, etc. and send it to the Editorial Offices.

**April 30:** The 14th Rainham Radio Rally is to be held at the Rainham School for Girls, Derwent Way, Rainham, Kent. Doors open 1000 (0930 for disabled visitors and items for Bring & Buy). Admission is £2, under 14s free. There will be a good mix of traders, selling new and used amateur radio equipment, electronic components, computers, etc. Many special interest groups will be represented also. Food and refreshments available. Talk-in on S22. Plenty of off-road parking. More information on **(01634) 365980** or E-mail: **martinm0aak@yahoo.co.uk**

**April 30:** The Lough Erne Mobile Rally (Northern Ireland) takes place at the Killyhelvin Hotel, Enniskillen, starting at 12 noon. There will be the usual trade stands plus a Bring & Buy, etc. Everyone welcome. More information from **Joe Maguire** on **(02866) 323196/324796**.

**May 1:** The Dartmoor Radio Rally is to be held at Pannier Market, Tavistock, Devon. In the same new location as last year giving much more space for traders and visitors than in the past, with access for disabled visitors. There is plenty of free public parking within five minutes walking distance. There will be trade stands, a Bring & Buy stand, refreshments, etc. Doors open 1030. Talk-in on S22. Beautiful views over Dartmoor, ideal for picnics - bring the family. **Ron G7LLG** on **(01822) 852586**

**May 7:** The Drayton Manor Radio & Computer Rally will be taking place at Drayton Manor Park, Fazeley, Tamworth, Staffs on A4091. Main traders in four marquees, large outside traders flea market, Bring & Buy stall, local clubs and special interest stands. Opens 1000 onwards. Trade information from **Norman** on **0121-422 9787**, other information from **Peter G6DRN** on **0121-443 1189**, evenings please.

**May 14:** Dunstable Downs Radio Club will be holding its 17th Annual National Radio Car Boot

Continued on page 9...

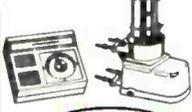
**£99.95**

**LOG PERIODIC MLP32**

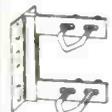
Freq. Range 100-1300MHz  
Length 1420mm Wide Band 16 Element directional beam which gives a maximum of 11-13Db Gain Forward and 15Db Gain Front to Back Ratio. Complete with mounting hardware. *(The Ultimate Receiving Antenna - a must for the Dedicated Listener.)*

**ROTATOR AR-300XL**

- Rotation Torque-222Kg
  - Vertical Load-45Kg
  - Mast Size - 28-44mm
  - Control Box-230v AC
  - Cable-3 core
  - Direct Compass Bearings
- (Ideal for Light to Medium Beams, i.e. LOG PERIODIC above.)*



**£49.95**



**6" STAND OFF BRACKET**  
Complete with 'U' Bolts  
**£6.00**

**MD37 SKY WIRE (LONG WIRE BALUN KIT)**  
25 METRES OF ENAMELLED WIRE & INSULATOR

FOR USE ON WITH RECEIVER 0 - 40 Mhz. ALL MODE NO ATU REQUIRED 2 "S" POINTS GREATER SIGNAL THAT OTHER BALUNS. MATCHES ANY LONG WIRE TO 50 OHMS

IMPROVED RECEPTION  
**£29.95**

**5' SWAGED POLES**

- Heavy Duty Ali (1.2mm wall)
- SINGLE 1 1/4"..... £6.00
- SET OF FOUR 1 1/4"..... £19.95
- SINGLE 1 1/2"..... £9.00
- SET OF FOUR 1 1/2"..... £29.95

**T&K BRACKETS**  
Complete with 'U' Bolts



- 12" - £10.95
- 18" - £14.95
- 24" - £16.95

**CONNECTORS**

- PL259/9..... 0.75 each
- PL259/6..... 0.75 each
- PL259/7 for mini 8 1.00 each
- BNC (Screw Type) 8 1.00 each
- BNC (Solder Type) 8 1.00 each
- N TYPE for NS8 .....2.50 each
- N TYPE for RF213 ..2.50 each
- SO239 to BNC .....1.50 each
- PL259 to BNC .....2.00 each
- N TYPE to SO239 ..3.00 each

**CABLE**

- RG213 MILITARY 0.85 per mtr.
- MINI RFB ..... 0.85 per mtr.
- RG58 STANDARD 0.35 per mtr.
- RG58 MILITARY 0.60 per mtr.

**MICRO MAG MTS42**

Freq. Range 25-2.1 GHZ  
Length 225 mm



Whips 73mm 700-2.1 GHZ  
225mm 23-1300 Mhz  
Complete with high specification coax and BNC plug  
*(The Ultimate small Magmount Antenna.)*

**WEATHER SATELLITE ANTENNA**  
**TURNSTILE 137**  
Freq. 137.5 MHz  
Length 1000mm

*(Simple and easy to install a must for the enthusiast who has it all.)*

This Antenna is designed for external use to receive weather satellite signals.

Complete with mounting hardware.

**£39.95**



**SUPER SCANAIR BASE (Airband)**  
(Stainless Steel)  
Freq. Range Receive 117-140MHz  
Transmit 117-140MHz  
Length 825mm  
Connector-N TYPE

This is a transmitting & receiving antenna designed for the aircraft frequency range.  
*(For the control tower & aircraft listener.)*

**£29.95**

**£29.95**

**SUPER SCAN STICK**  
Freq. Range 0-2000MHz  
Length 1000mm

It will receive all frequencies at all levels unlike a mono band antenna. It has 4 capacitor loaded coils inside the vertical element to give maximum sensitivity to even the weakest of signals. *(Ideal for the New Beginner and the Experienced Listener alike)*

**£49.95**

**£39.95**

**SUPER SCAN STICK II**  
Freq. Range 0-2000 MHz.  
Length 1500mm.

This is designed for external use. It will receive all frequencies. at all levels unlike a mono band antenna. It has 8 capacitor loaded coils inside the vertical element to give maximum sensitivity to even the weakest of signals plus there is an extra 3db gain over the standard super scan stick. *(For the expert who wants that extra sensitivity)*

**£49.95**

**£39.95**

**MULTISCAN STICK**  
Freq. Range Receive - 0-2000 MHz.  
Transmit 144 - 146 MHz  
gain 2.5 DBd  
420 - 430 MHz  
gain 4.5 DBd  
Length 1000 mm.

Although marginally compromising sensitivity the multi scan stick has within its transmitting capabilities plus gain makes it an excellent antenna for the amateur and expert alike. Comes complete with mounting hardware and brackets  
*(Ideal for the amateurs ham radio - user.)*

**£49.95**

**£89.95**

**IVX 2000**  
Freq. Range Receive - 0-2000 MHz.  
Transmit 50 - 52 MHz  
gain 2.00DBd  
144 - 146 MHz  
gain 4.00 DBh  
420 - 430 MHz  
gain 6.00 DBd  
Length 2.5 m.

For external use, but at a pinch can be used in the loft. It has been finely tuned to make this Antenna the best there is. It has stainless steel radials and hardware.  
**(THE BEST)**

**£49.95**

**£49.95**

**MULTI SCAN STICK II**  
Freq. Range Receive (0-2000MHz) Gain 4.00DBd (420-430 MHz)  
Transmit (144-146 MHz) Gain 6.00DBd Length 1500mm

Same as Super Scan Stick but with extra gain, makes it an even better antenna for the amateur and expert alike. *(Ideal for the Ham Radio user)*

**MWA-H.F. WIRE ANTENNA**

Freq. Range 1.1-30MHz Adjustable Length up to 60 Metres  
Internal or external use. The long wire is known to be one of the best antennas for shortwave (HF) receiving. Comes complete with con box and dog bones, wire etc. *(A must for the short wave listener.)*

**£29.95**

**SWP 2000 FREQ. 25 - 2000 MHz. Length 515mm.**

Multiband good sensitivity for its small size. Fitted with two suction cups for ease of fitting to any smooth surface (i.e. inside of car window) comes with 5 metres of mini coax and BNC connector. *(Good for the car user who doesn't want an external antenna.)*

**SWP HF30**

Freq. Range 0.05-30MHz Length 770mm  
Although small, surprisingly sensitive for the H.F. user. Fitted with two suction cups for ease of fitting to any smooth surface (i.e. inside of car window) comes with 5 metres of mini coax and BNC connector. *(Good for the car user who doesn't want an external antenna.)*

**TRI SCAN III**

Freq. Range 25-2000MHz  
Length 720mm  
Desk Top Antenna for indoor use with triple vertical loaded coils. The tri-pod legs are heically wound so as to give it its own unique ground plane. Complete with 5mts of low loss coax and BNC plug  
*(Ideal for Desk Top Use.)*

**£34.95**

**ROYAL DISCONE 2000**

(Stainless Steel)  
Freq. Range Receive 25-2000MHz  
Transmit 50-52MHz  
144-146MHz  
430-440MHz  
900-986MHz  
Length 1540mm  
Connector-N TYPE

The Ultimate Discone Design.  
4.5DB GAIN OVER STANDARD DISCONE!

**£49.95**

Highly sensitive, with an amazing range of transmitting frequencies, comes complete with mounting hardware & brackets  
*(The Best There is.)*

**£19.95**

**G. SCAN II**

Freq. Range 25-2000 MHz.Length 620 mm.  
Magnetic mount Mobile Scanner Antenna. 2 vertical loaded coils for good sensitivity complete with magnetic mount and 4mts of coax, terminated with BNC plug.  
*(Good for when you are driving about)*

**HF DISCONE**

Freq. Range 0.05-2000MHz  
Length 1840mm  
Internal or External use (A Tri-Plane Antenna). Same as the Super Discone but with enhanced HF capabilities, comes complete with mounting hardware and brackets. *(Ideal for the Short Wave H.F. Listener.)*

**£49.95**

**DISCONE**

Freq. Range 70-700MHz  
Length 920mm  
Internal or External use. (Classic Antenna Design. Comes complete with mounting hardware and brackets. *(Ideal for the Beginner.)*

**£29.95**

**SUPER DISCONE**

Freq. Range 25-2000MHz  
Length 1380mm  
Internal or External use (A Tri-Plane Antenna). The angle of the ground planes are specially designed to give maximum receiving performance within the discone design. The Super Discone gives up to 3Db Gain over a standard conventional discone. Comes complete with mounting hardware and brackets. *(Ideal for the Experienced Enthusiast.)*

**£39.95**

**UK SCANNING DIRECTORY**  
7th edition  
**£19.50**

**£19.95**

**CIVIL AND MILITARY RECEIVING ANTENNAS**  
A5101 (Length 1000mm) Gain 3.5 & 4.5 dB Price £19.95  
A5102 (Length 1000mm) Gain 4.0 & 5.0 dB Price £24.95  
A5103 (Length 1000mm) Gain 4.5 & 5.5 dB Price £29.95



... continued from page 7

# Communiqué

## From Flightdeck

**Flightdeck**, in conjunction with **Rainford Software**, is pleased to announce publication of a new edition of its SELCAL decoding book, *SELCALS 2000* compiled from the extensive database of Bernard Eccleston, priced at £6 including UK postage. *SELCALS 2000* sticks to the basic requirement that most listeners want, i.e. the identity of the aircraft's registration from the SELCAL code. Also given is the carrier and type of aircraft. As with previous editions, it has been fully revised and updated listing over 9000 current SELCALs.

With SELCALs in mind, Flightdeck is also an approved stockist of *AirNav Systems* Selcal Decoder computer program at £35 + £2 P&P. Also just published is Flightdeck's *Manchester Airport Flight Guide - Summer 2000* available at £4.95 inc. P&P.

Flightdeck can be reached at **252A Finney Lane, Heald Green, Cheadle, Cheshire SK8 3QD**, E-mail: [flightdeck@aol.com](mailto:flightdeck@aol.com) or visit their web site at [www.flightdeck.co.uk](http://www.flightdeck.co.uk)

## Rain On Radio Signals

A scheme to measure rainfall with unprecedented accuracy in a region of Lancashire prone to flooding has been awarded an additional £100K by the Radiocommunications Agency (RA) because of its relevance to communications problems. Scientists from CLRC Rutherford Appleton Laboratory (RAL) at Chilton will build two high precision microwave links that will detect in real time how much rain is falling in the area and whether it has reached danger levels.

In wet and snowy weather, microwave and radio signals can become severely weakened. This is bad news for anyone who wants to be able to guarantee a reliable service whatever the weather, such as mobile 'phone companies and radio stations. By measuring how badly the test microwave signals fade, however, scientists in the Radiocommunications Unit at RAL will be able to work out exactly how much rain or snow is falling and where.

The position of the Bolton equipment will also help scientists to discover how badly the signals from closely-spaced microwave links interfere with each other. This is a key concern for the RA and communications systems operators who are trying to cram more and more radio links into an increasingly overstretched infrastructure. As a result, there are strong commercial pressures to use the radio spectrum as efficiently as possible. For example, the current spectrum auction for third generation mobile 'phones is expected to raise £2 billion.

"The radio spectrum supports an enormous range of services and applications and is in increasing demand by many kinds of users," explained Dave Eden from the RA. "Using the spectrum in the most efficient way is vital for the future development of communications".

## Roberts Radios

Are you a radio addict? Do you regularly tune into your favourite radio stations? If so, the latest portable radio from **Roberts Radio's** lifestyle range, the **R9906**, is a must!

The R9906 is the first and only portable radio in the market to feature a scrolling text panel. Stations transmitting digitally can detail up to 64 characters on the screen to give you information on tracks that are currently playing, tracks that are coming up and details on interviews

and radio presenters.

Contemporary in design in a stylish silver colour with a distinctive 'V-line' black panel on the front, the R9906 not only looks good, it sounds good too. Roberts is renowned for its exceptional sound quality and the clarity on this model is no exception.

At £60, the R9906 is extremely easy to use. Once the radio is plugged in, it instantly scans the airwaves and will automatically locate radio stations which give a clear signal and the name of the station being listened to appears on the digital screen. To hear traffic news, simply activate the Traffic Information System by pressing the 'Traffic' button - this will interrupt the programme being listened to and will provide the latest traffic bulletins.

If you're in the mood to listen to a certain type of radio programme, a Programme Type Button (PTY) clearly displays the nature of the programme tuned into, for example, rock, pop, drama, education, science. Plus, at the push of the 'PTY' button, the radio will automatically select programmes of a similar type.

With 30 station presets, the R9906 is also an alarm clock radio that can be set to wake up to radio or buzzer alarm, together with a snooze function and a weekend cancel facility.

Also in this range are three additional radios with the same distinctive styling, offering differing features. Starting from £20 is the **R9903**, a three band battery portable radio, i.e., m.w., f.m. stereo wavebands, distinctive 'V' line styling, dial tuning system, i.e.d. power indicator, carrying strap, headphone socket and d.c. input socket. Then there is the **R9904** for £25. Optional extras on this little radio are: tone control, easy to read tuning dial with station names, tone control, i.e.d. wavebands indicators and an i.e.d. mains indicator. Finally, for £50, is the **R9905** with 25 station presets, display backlight, clock/alarm, sleep function and snooze function.

For stockists details, telephone **(01709) 571722**.

... continued on page 10



The R9906 portable radio with RDS from Roberts Radio.



The R9903 - available for £20.



The R9904 - available for £25.



The R9905 - available for £50.

## rallies

### Attention Please!

Would you like to have your Rally publicised? If so, all you have to do is put together as much information as possible about the Rally, i.e. date, location, times, who to contact, etc. and send it to the Editorial Offices.

Sale at Stockwood Country Park, Luton, Bedfordshire. Site will be open from 0900-1500. Leave M1 at Jnc J10a and follow signs for 'The Mossman Collection'. Talk-in on S22. For further details and booking form access:

[www.ddrcbootsale.freereserve.co.uk](http://www.ddrcbootsale.freereserve.co.uk) or write to **DDRC, PO Box 4053, Dunstable, Bedfordshire LU5 5ZJ** enclosing an s.a.e. **FAX** enquiries to **(01525) 383898** or E-mail: [ddrc@magstripe.demon.co.uk](mailto:ddrc@magstripe.demon.co.uk)

**May 21:** The Three Counties Radio & Computer Rally is to be held at Perdiswell Leisure Centre, Bilford Road, Worcester. There will be trade stands, radio and computer dealers, parts and accessories, refreshments, licensed bar and free car parking. Admission will be £2 and there will be a free raffle with good prizes. Trade stands available, contact **Eddie Cotton** on **(01905) 773181**.

**May 21:** The Mid Ulster ARC Rally will be held in the Silverwood Hotel, Lurgan, Co. Armagh at 1200. Trade stands, Bring & Buy, etc. Talk-in on S22. Further details from **Jim GIOOND** on **0283-885 1179**.

**May 28:** The Bury Radio Rally will be taking place at the Mosses Centre, Cecil Street, Bury, starting at 1100 and features include a trade show, special interest groups, Bring & Buy and refreshments. Admission costs £1.50, £1 for concessions. Enquiries to mailbox **(07946) 090773** or E-mail: [buryrally@hotmail.com](mailto:buryrally@hotmail.com)

**May 28:** The East Suffolk Radio Rally (the Ipswich Radio Rally) will take place at 'The Hollies', IACSSA, Straight Road, Foxhall, Ipswich. The ESWR is now principally a large car boot sale with indoor trader and special interest group support. Open from 0800 for traders and 0930 for buyers. In common with many rallies, the event will close mid afternoon. Talk-in will be provided on S22. Further details from **Sam Jewell G4DDK** on **(01394) 448495**

Rallies from June 4th onwards will be listed next month.

Send your news to Zoë Shortland at the Editorial Offices

... continued from page 9

# Communiqué

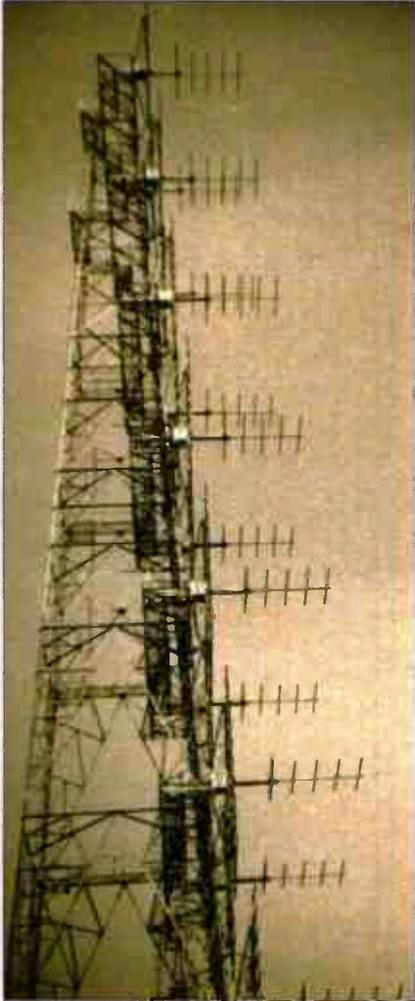


Fig. 1.

It appears that the TV antenna and satellite equipment wholesaler 'Satellite Solutions' (branches in Northampton (Head office), Wembley, Birmingham, Congleton, Edinburgh, Paisley, Poole, Manchester, Woolwich, Nottingham, Cheshunt, Sunningdale, Bradford and Hull) have an interesting antenna on sale at £12.99 + VAT for over the counter payment. The antenna is marketed as a DAB antenna - it's a 75Ω, 9-element log periodic for horizontal mounting with a quoted forward gain of 9dB, front/back 25dB, though the design bandwidth is in excess of Band 3 - 165-245MHz- suggesting an ideal use for an inexpensive TVDXing antenna!

Pictures this month, the impressive looking lattice mast dates back to the early 60s when tropo forward scatter was the in-word for long distance communications. The antenna shown here was sited at St. Lawrence, near to Ventnor, IoW atop the downs and the 16 x 6 element antennas cut to around 35MHz were aimed South and thought intended for tropo scatter comms with UK military bases in Malta. The installation played havoc with local TV receivers causing much breakthrough at i.f.! (see Fig. 1)

The transmitting mast, Fig. 2, is that of the TV and f.m. broadcast station at Gangtok, the capital town of Sikkim province in Northern India is a frame grab from a video tape. The large object picture left is a prayer flag, the wind apparently blows the prayers from the flag into the air. The mast and transmitter is constructed on the side of a deep valley and its possible therefore to go higher up the slope and look down on the transmitting mast, odd! Nick Cope who hiked in the region back in September '99 has promised other pictures of Sikkim's dishes and antennas!

## Radio & TVDX News

News expansion for the BBC World Service with the inclusion of news bulletins every hour on the hour within its English language programmes.

There is pressure from commercial radio interests for the government to set a date for analogue switch-off of the UK radio services and proceed with a digital only radio service after that date. The Capital Radio chief executive called for the closedown date to be decided which should encourage both broadcast and manufacturing interests to invest in the new technology.

The year 2015 has been cited as a possible shut down of analogue. At this time DAB (digital audio broadcasting) has been testing a couple of years, but public interest is nominal - if that - not helped by the cost of receivers. Currently the cheapest DAB Band 3 radio (Arcom) is approx. £800 and a new Band 3 (ch.E12) antenna is necessary for the 230MHz band.

The on-going problems with the American digital 8-VSB terrestrial digital TV and its lack of robustness when faced with ghosting and difficult reception areas has now been confirmed by the broadcaster NBC after tests in Dallas, LA, Washington and Philadelphia. The tests comparing both the American and European systems that there is a problem with 8-VSB which needs resolving and as witnessed by the FCC. Brazil, heeding the problems are recommending the government to opt for the proven CODFM European system of DVB-T (digital video broadcast-terrestrial system).

It appears that the TV antenna and

## Club Corner

**Roy Clayton G4SSH** has informed **SWM** of a special anniversary. May 2000 is the 60th anniversary of Dunkirk - when 338,000 men were evacuated by a flotilla of small ships. The **Scarborough Special Events Group** will be on the air over the weekend of May 20-21st as **GB6SS** to commemorate this occasion. Two of the few remaining rescue ships are based in Scarborough Harbour and a special QSL card will be issued featuring one of these vessels.

The main s.s.b. station will be active on the 40m band, around 7055kHz and listener reports are most welcome. These can be sent via the Bureau or direct to club call **G0000, 9 Green Island, Irton, Scarborough YO12 4RN.**

Members of the **Crystal Palace & District Radio Club** meet on the third Saturday of each month, starting at 1900 at All Saints Parish Church Rooms, Beulah Hill, Upper Norwood, London SE19 (opposite the junction of Beulah Hill and Grange Road) and on the first Wednesday of every month at their Technical Centre at Beechwood School, Leigham Court Road, Streatham (near to Streatham Hill BR station).

Visitors are always made welcome and experienced help is available for beginners. Further details from **R.F. Burns** on **(01737) 552170** or **V. Johnston** on **0208-653 2946.**

The **Dundee Amateur Radio Club** always warmly welcomes new members and all interests are catered for, whatever your specific interest in radio may be, such as amateur radio, short wave listening, scanning or CB. There is always someone on hand to answer a technical query or just to give some friendly information and advice. Meetings are held on a Tuesday evening at 1900 at the Graham Street premises of the Dundee College. Tutoring is available for those interested in sitting the RAE and Morse examinations. So, why not go along and meet some new friends? Contact **E. McPherson MMSAAU** on **(01821) 650298** if you would like to find out more.

On Wednesday 3rd May, the **Bangor & District Amateur Radio Society** are hosting a talk on kite antennas from Adrian Hanna G10SMU. Also, the club are holding their summer 2000 Radio & Computer Fair on **Sunday 25th June**. Meetings take place on the 1st Wednesday of every month in the Clondeboye Lodge Hotel, Bangor, at 2000. More information from **Mike G14XSF** on **0284-277 2383** or check out the club's web site at <http://welcome.to/bdars>



Fig. 2.

Send your news to Zoë Shortland at the Editorial Offices

■ **Gerry L. Dexter, c/o SWM EDITORIAL OFFICES, ARROWSMITH COURT, STATION APPROACH, BROADSTONE, DORSET BH18 8PW.**

■ **E-MAIL: [gdexter@pwpublishing.ltd.uk](mailto:gdexter@pwpublishing.ltd.uk)**

# Bandscan America

We can anticipate perhaps improved reception from the Solomon Island Broadcasting Corporation in the not too distant future. SIBC is in the process of installing a new 10kW transmitter. Although also rated at 10kW, the current unit is running only about half that much.

Bolivia continues to be one of the three most active short wave countries in South America (along with Peru and Brazil). Here are some of the stations reported in recent weeks:

MHz	Station
3.310	Radio Mosoj Chaski, Cochabamba
4.472	Radio Movima, Santa Ana de Yacuma
4.649	Radio Santa Ana, Santa Ana de Yacuma
4.7765	Radio Constelacion, Guanay
4.796	Radio Mallku, Uyuni
4.802	Radio Mamore, Guayamerin
4.845	Radio Fides, La Paz
4.875	Radio La Cruz del Sur, La Paz
4.926	Radio San Miguel, Riberatla
5.953	Radio Pio XII, Llallagua-SigloXX
5.975	Radio Nacional, La Paz
6.015	Radio El Mundo, Santa Cruz
6.055	Radio Juan XXIII, San Ignacio de Velasco
6.105	Radio Panamericana, la Paz
6.155	Radio Fides, La Paz
7.053	Radio Victoria, Villa Abecia

Frequencies are often slightly variable.

## E-Mail Address

Canadian broadcaster CHNX (6.130) in Halifax, Nova Scotia, has set up an E-mail address for reception reports:

**chnx@post.com** Regular mail reports can go to **PO Box 400, Halifax, Nova Scotia, B3J 2R2, attention Scott Snelham**. The 500W CHNX transmitter is actually running only between 40 and 50W, which makes the station an even better catch. CHNX is on the air 24-hours a day, relaying CHNS medium wave.

Activity from Ecuador of late includes the following:

MHz	Station
3.220	HCJB
3.280	La Voz del Napo, Tena
3.290	Radio Centro, Ambato

## Station News

Radio Nacional Archangel San Gabriel, Argentina's station in Antarctica, has begun broadcasts again, after its annual hiatus. The station is operating from 1630 to 2045 Monday through Friday. Apparently intentions to broadcast on Saturday and Sunday as well were dropped.

The frequency 15.820 continues to be active with various Argentine domestic station relays, such as Radio Rividavia, Aspen 102 FM, Radio Continental and others. These are relayed via Argentine government communication transmitters, but there doesn't seem to be any specific schedule involved. The broadcasts are in lower sideband.

A new Peruvian is Radio Bolivar, Bolivar, on 5.0605, closing at 0200. Another one is Radio Superior, 5.300, Bolivar, which signs on at 1050 and runs until 0300.

Colombia's FARC (Revolutionary

Armed Forces of Colombia) operate La Voz de la Resistencia, a clandestine station operating from within FARC-held territory. DXers located in the Eastern North American time zone are having some luck tuning this one in lately.

The station has two broadcasts per day on variable 6.261. Both can vary considerably as far as sign on and sign off times go. The morning airing runs from about 1130 to 1220 and the afternoon from around 2130 to 2220, all in Spanish. The power is unknown but it's unlikely to be very high. Although the station has been active for several years no workable address has ever turned up.

KSDA, Adventist World Radio's station in Guam, no longer issues QSL cards, a development that, at first look, seems completely at odds with AWR's reputation as one of the best in the world when it comes to audience relations. But, in fact, it's just that the process is being transferred to AWR's London

4.770	Radio Centinela del Sur, Loja
4.782	Radio Oriental, Tena
4.815	Radio El Buen Pastor, Saraguro
4.840	Radio Interoceanica, Santa Rosa de Quijos
4.870	La Voz del Upano, Macas
4.900	La Voz de Saquisilli, (aka Radio Libertador), Saquisilli
4.919	Radio Quito, Quito
4.950	Radio Baha'l, Quito
4.960	Radio Federacion, Sucua
5.040	La Voz del Upano, Macas

Again, consider most frequencies slightly variable (usually less than 1kHz).

HRMI, Radio Misiones Internacionales, in Honduras plans to upgrade their power from the current 360W to 5kW. They also plan to add transmitters which will operate in the 25 and 31m bands. At present they're using 5.890.

Reception reports go to: **Apartado Postal 20583, Comayaguela, or to: IMF World Missions, PO Box 6321, San Bernadino, CA 92412.**

Other Honduran short wave outlets currently being noted include:

MHz	Station
3.250	Radio Luz y Vida, San Luis
4.819	La Voz Evangelica, Tegucigalpa
4.931	Radio Ebenezer, San Pedro Sula

Radio Nacional, Paraguay, has been operating on 9.737 (slightly variable) for several years now - two kilohertz off its assigned 9.735. One assumes that is a transmitter fault. Now we're noting poor modulation as well, although the signal remains as strong as ever.

Recent receptions of US expanded medium wave band stations include:

MHz	Station
1.630	KKWY, Cheyenne, Wyoming
1.640	KPBC, Portland, Oregon
1.650	KBDJ, Denver, Colorado
1.660	WQSN, Kalamazoo, Michigan
1.660	KXOL, Ogden, Utah
1.670	WRNC, Macon, Georgia
1.680	WTTM, Princeton, New Jersey
1.690	WMDM, Lexington Park, Maryland

office. Reports for KSDA should now go to:

**Listener Mail Coordinator, Adventist World Radio, 39 Brendon St., London W1.**

In the Dominican Republic, Radio Barahona has been reactivated on 5.089 and was noted about 1040 (sign on is probably sometime around 1000). Evening reception of this station is impossible in North America due to strong signals from WGTG in Georgia, operating on 5.085. Radio Barahona would be better off back on their original 4.930 frequency! Their address is **Apartado 201, Barahona, Dominican Republic.**

Radio Transcontinental, XERTA, is apparently still trying to find its short wave legs. The station came on the air some two years ago and then was gone after a couple of months. It later returned and then vanished a second time! Now it is back once again (on 4.800), though we don't know for how long, or whether they are operating on the

24-hour schedule they originally intended.

Reception reports can go to **Apartado Postal 653, 06002 Mexico I, D.F.**, or try **Plaza de San Juan 5, Esquina con Ayuntamiento Primer piso, Despacho 2 Centro 06070, Mexico D.F.**

It appears that the Brazilian government has discontinued the broadcasts of both Radio Nacional de Amazonia and the Radiobras international service. Frequencies normally used for these transmissions are empty. Some months back there was talk of a financial squeeze affecting government broadcasts, coupled with confusion or disagreement over which department was really responsible for the broadcasts.

That covers things for this time. The sunspot cycle is at or reaching its peak now so take advantage of the much improved reception on the higher short wave frequencies! Until the next month, good listening!



**CKZU, 6.160 in Vancouver, British Columbia sent this card in 1996.**



**One of a great variety of QSL designs AWR used for its now closed outlet in Costa Rica.**

■ BRIAN ODDY G3FEX, THREE CORNERS, MERRYFIELD WAY, STORRINGTON, WEST SUSSEX RH20 4NS



# LM&S

The monthly 'Propagation Forecasts' prepared by Jaques D'Avignon VE3VIA and published in *SWM* have recently indicated a steep rise in the maximum usable frequency (m.u.f.). His charts show that the **25MHz (11m)** band is likely to be open to a number of areas during the day, yet most broadcasters seem to be reluctant to take advantage of the exceptional conditions which may now exist.

A report has just arrived here which confirms that the predicted path between Europe and Australia in the 11m band (see page 48, *SWM* March 00) is in fact wide open around mid-day. For the full details, please refer to the 25MHz section of the s.w. text herein.

## 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 February.

Reports from listeners in the UK indicate that reception of the broadcasts from Ríkisutvarpid (RUV) in Reykjavik via their outlet at Gufuskalar, W.Iceland, on **189kHz** can be quite a challenge. Despite repeated attempts, **George Millmore** (Wootton, IoW) has so far been unsuccessful. He says "This frequency is swamped by the backlash from Saarlouis on **183kHz** and Droitwich on **198kHz**".

Over in Co.Down, **Eddie McKeown** (Newry) has found the best time to listen for them is after 0045UTC, when Saarlouis has closed down. At 0050UTC he rated their 300kW transmission SINPO 25222. It was also logged at night by **Ernie Strong** (Ramsey, Cambs) as 21141.

## Medium Wave Reports

Unfavourable conditions for the reception in the UK of broadcasts from m.w. stations in Canada and E.USA were observed at night in February. During several nights **Robert Connolly** (Kilkeel, Co.Down) searched the band until about 0300UTC, but he found transatlantic m.w. DX non-existent. The only reported exception was on the 10th, when **Harry**

**Richards** (Barton-upon-Humber) heard WNRB in Boston, MA on 1510 at 0405UTC. He rated their transmission SINPO 24232.

The sky waves from some of the many m.w. stations in the Middle East, N.Africa, Europe and Scandinavia did reach the UK after dark - see chart.

During daylight, the ground waves from some local radio stations reached quite distant places - see chart. On March 2, **Bernard Curtis** (Stalbridge) noticed that the Guildford outlet of ILR County Sound was operating on **1566kHz**, having been moved there from **1476kHz**.

## Short Wave Reports

During February only three broadcasters were active in the **25MHz (11m)** band - Deutsche Welle (DW), Radio France International (RFI) and

Radio For Peace International (RFPI), Costa Rica. Just how well the broadcasts from DW and RFI reach Australia was ascertained by **Bill Griffith** (W.London) during a visit to Canberra from 4-10 February. Whilst at an hotel, he used a Sony SW-55A portable with a Sony AN-71 3m random wire erected on a small open-air balcony and logged DW on **25.740** (Ger to S & SE.Asia? 0800?-1400?) as SINPO 54544 at 1200UTC, also RFI on **25.820** (Fr to E/C.Africa 0900-1300) as 54554 at 1120.

Both transmissions have also been received in Cyprus by **John Parry** (Larnaca). He rated DW as 45554 at 1220 and RFI as 45554 at 1225. Unfortunately, there were no reports to indicate how well they reach the intended target areas. Reception in the UK is via backscatter and other modes and is unreliable. The following ratings were quoted in the reports:

DW on **25.740** SINPO 35132 at 0818 in Newry; 35343 at 1005 by **Fred Wilmshurst** in Northampton; 35533 at 1025 by **Vic Prier** in Colyton; 33333 at 1050 in Stalbridge; 25443 at 1100 by **Fred Pallant** in Storrington; 44444 at 1115 in Kilkeel; SIO 211 at 1120 by **Philip Rambaut** in Macclesfield; 35523 at 1240 by **Simon Hockenhill** in E.Bristol.

RFI on **25.820** SINPO 35343 at 0958 in Northampton; 34232 at 1010 in Newry; 34533 at 1030 in Colyton; 43334 at 1045 in Stalbridge; 25333 at 1100 in Storrington; 34443 at 1120 in Kilkeel; SIO 222 at 1126 in Macclesfield; 35423 at 1300 in E.Bristol.

RFPI on **25.930** (Eng [u.s.b] to Americas 1200-?) SINPO 23222 at 1805 in Colyton; 22222 at 2125 in Stalbridge.

An increasing number of broadcasters are taking advantage of the propagation conditions prevailing in the **21MHz (13m)** band. During the morning they include R.Australia via Shepparton **21.725** (Eng to Pacific areas 0200-0900), rated 23452 at 0600 in Cyprus; DW via Wertachtal? **21.600** (Eng to Oceania, Asia 0900-0950) 33323 at 0925 in Colyton; R.Prague, Czech Rep **21.745** (Eng to Asia 1000-1030) 54444 at 1008 by **Tom Winzor** in Plymouth; Vatican R, Italy **21.850** (It, Fr, Eng to Eur?, Asia?) 55444 at 1058 by **Thomas Williams** in Truro; R.Pakistan **21.460** (Ur to Eur 0800?-1100, Eng 1100-1105) 44444 at 1100 by **Sheila Hughes** in Morden; Swiss R.Int via Sottens **21.770** (Eng, Ger, Fr, It to Asia 1100-1330) 45554 at 1103 in Newry; UAER, Abu Dhabi **21.735** (Ar to Eur? 0800-1600) SIO 433 at 1136 in Macclesfield; RAI Rome **21.520** (It to Africa 0600-1300) 44444 at 1145 in Kilkeel.

After mid-day, R.Ukraine Int **21.510** (Eng to Australia 1200-1300) was 54544 at 1235 in E.Bristol; R.Prague, Czech Rep **21.745** (Cz, Eng to S.Asia? 1200-1257) 45544 at 1244 by **Martin Goodey** in St.Mary's, Is of Scilly; UAER, Dubai **21.605** (Eng to Eur 1330-1350) SIO 222 at 1330 by **Tom Smyth** in Co.Fermanagh; R.Australia via Shepparton **21.820** (Eng to Asia 0900-1400) 35343 at 1336 in Northampton; BBC via Cyprus **21.470** (Eng to E.Africa 1400-1700) 44444 at 1420 by **Stan Evans** in Herstmonceux; BBC via Ascension Is **21.660** (Eng to Africa 1100-1700) 25344 at 1547 in Storrington; R.Sweden, Stockholm **21.810** (Eng to N/C.America 1430-1500) 44454 at 1450 by **Robert Hughes** in Liverpool; HCJB Quito, Ecuador **21.455** (Eng [u.s.b. + p.c.]) 33333 at 1610 by **David Hall** in Morpeth; Voz Christiana, Chile **21.500** (Sp to N.America 1100-2100?) 24332 at 1953 by **Rhoderick Ilman** in Oxted; WYFR via Okeechobee, USA **21.525** (Fr, Eng to Eur, Africa 1800-2300) 33333 at 2225 in Stalbridge.

In the **18MHz (15m)** band good reception has been noted from R.Denmark via R.Norway **18.950** (Da to N.America 1230-1300), rated 55354 at 1246 in Newry; R.Sweden, Stockholm **18.960** (Eng to N.America 1230-1300) 45444 at 1250 in Northampton; Christian Science BC via WSHB Cypress Creek **18.910** (Fr, Eng to E/C.Africa 1600-2000) 44444 at 1802 by **Vera Brindley** in Woodhall Spa.

Good reception over long distances has been noted in the **17MHz (16m)** band. R.New Zealand's broadcast to Pacific

## Long Wave Chart

Freq (kHz)	Station	Country	Power (kW)	Listener
153	Donebach DLF	Germany	500	B,C,D,E*,G,H
162	Allouis	France	2000	B*,C,D,E*,F,G,H*
171	Nador Medi-1	Morocco	2000	E*,G*
171	B'shalkovo etc	Russia	1200	B*,C,E*,H
171	Sasnovy	Belarus	1000	G
177	Oranienburg	Germany	500	B*,C,D,E*,G*,H*
183	Saarlouis	Germany	2000	B*,C,D,E*,F,G,H*
189	Gufuskalar	W.Iceland	150	C*,G*
198	Droitwich BBC	UK	500	B,C,D,F,G,H
207	Munich DLF	Germany	500	C,D,E*,G,H
207	Azilal	Morocco	800	E*,G*
216	Roumoules RMC	S.France	1400	A,B*,C,D,E*,F,G
225	Polskie R-1	Poland	?	A,B*,C,D*,E*,G*,H*
234	Beidweiler	Luxembourg	2000	B,C,D,E*,G,H*
243	Kalundborg	Denmark	300	A,B,C,D*,E*,G,H*
252	Tipaza	Algeria	1500	D*,G*
252	Atlantic 252	Eire	500	C,D,E*,F,G,H
261	Burg(R.Ropa)	Germany	85	C*,D,E*,G,H*
261	Taldom Moscow	Russia	2500	G*
270	Topolna	Czech Rep	1500	A,C,D*,E*,G,H*
279	Sasnovy	Belarus	500	C*,D*,E*,G*,H*

Note: Entries marked \* were logged during darkness. All other entries were logged during daylight or at dawn/dusk.

Listeners:-

- (A) Simon Hockenhill, E.Bristol.
- (B) Sheila Hughes, Morden.
- (C) Eddie McKeown, Newry.
- (D) George Millmore, Wootton, IoW
- (E) Fred Pallant, Storrington
- (F) Tom Smyth, Co.Fermanagh.
- (G) Ernie Strong, Ramsey, Cambs.
- (H) Fred Wilmshurst, Northampton.

areas on **17.675** (Eng 1650-0605) has been received quite well in the UK. They then move to **17.690** (Eng to Pacific areas 0605-1005), rated 22222 at 0800 by **Clare Pinder** in Glasgow & 33333 at 1000 in Truro. A special broadcast to NZ Troops in E.Timor on **17.690** then follows (1005-1205 daily). It was rated 44444 at 1045 by **Tony Hall** in Freshwater Bay, IoW.

R.Australia may also be heard in this band during the morning. Their broadcast to Asia via Shepparton on **17.750** (Eng 0000-0500, 0600-0830, 0830-1100) was rated 24552 at 0735 in Larnaca, Cyprus & 43433 at 0905 in Herstmonceux. Also noted during the morning were R.Romania Int **17.720** (Eng to Africa 0700-0800) 44333 at 0705 in Morden; Africa No.1, Gabon **17.630** (Fr to W.Africa 0700-1600) 35443 at 0721 in St.Mary's, IoS & 35343 at 1534 in Storrington; BBC via Skelton & Woofferton, UK **17.640** (Eng to E.Eur, M.East, E.Africa 0700-1500) SIO 555 at 0900 in Co.Fermanagh; DW via Rwanda **17.800** (Eng to Africa 0900-0950) 35433 at 0935 in Colyton; R.Pakistan, Islamabad **17.835** (Ur 0900?-1100, Eng 1100-1105 to Eur) 44343 at 1100 in Newry.

After mid-day, R.Bulgaria, Sofia **17.500** (Eng to Eur 1200-1300) was 54434 at 1243 in E.Bristol; Voice of Turkey **17.815** (Eng to ? 1330-1425) 44444 at 1400 in Kilkeel; Israel R, Jerusalem **17.535** (Eng to Eur, N.America 1500-1530) 54444 at 1503 in Plymouth; WHRI via Maine, USA **17.650** (Eng to Eur, M.East, Africa 1600-2300) 44344 at 1635 in Liverpool; BBC via Sackville, Canada **17.840** (Eng to W.America 1700-1900) 24332 at 1702 in Oxted & 44444 at 1800 by **Bill Griffith** while in Los Angeles; HCJB Quito, Ecuador **17.660** (Eng to Eur 1900-2200) 4444 at 1903 in Morpeth & 54434 at 2130 in Stalbridge; R.Nederlands via Bonaire, Ned Antilles **17.605** (Eng to Africa 1830-2025) 45544 at 1942 in Northampton.

Some of R.Australia's early morning broadcasts in the **15MHz (19m)** band were mentioned in the reports. Their transmission from Shepparton on **15.515** (Eng SW/SC.Pacific, N.America 0200-0900) was rated 43334 at 0600 in Canberra, Australia & 43333 at 0800 in Morden, UK. **15.240** from Shepparton (Eng to Pacific areas 0000-0800) was 35453 at 0606 in Larnaca, Cyprus. **15.415** from Shepparton (Eng to Asia 0100-0400, 0600-0900) was 44433 at 0745 in Herstmonceux.

The occupants of this band during the afternoon include RFI via Allouis? **15.195** (Eng to Eur, Africa 1200-1257), rated SIO 222 at 1200 in Co.Fermanagh; R.Bulgaria **15.700** (Eng to W.Eur 1200-1300) 54434 at 1243 in E.Bristol; Voice of Hope via Julich, Germany **15.715** (Eng to S.Asia? 1330-1630) 55555 at 1330 in Newry; Swiss R.Int via Sottens **15.185** (Eng, Ger, Fr to Asia 1400-1600) 32222 at 1410 in Truro; BBC via Masirah Is, Oman **15.310** (Eng to S.Asia 1400-1700) 33333 at 1420 in Kilkeel; WWCR Nashville, USA **15.685** (Eng to N.America, Eur 1300-2200?) 34333 at 1446 in Woodhall Spa; VOA via Morocco? **15.205** (Eng to Eur, N.Africa, M.East 1400-1700) 43333 at 1513 in Plymouth; Africa No.1, Gabon **15.475** (Fr to W.Africa 1600-1900) 33442 at 1712 in Storrington.

Later, they include WYFR via Okeechobee **15.695** (Eng to Eur, Africa 1600-1845), noted as 22122 at 1845 in Liverpool; WEWN via Vandiver, USA **15.745** (Eng to Eur 1100-2100?) 34433 at ? by **Gerald Guest** in Dudley; V of Indonesia, Jakarta **15.150** (Eng to Eur, Africa 2000-2100) 44434 at 2015 in Colyton; KTBN Salt Lake City, USA **15.590** (Eng to N.America 1600-0000) 33233 at 2045 in Morpeth; WYFR via Okeechobee **15.565** (Eng to Eur?, Africa 2000-2200) 45434 at 2050 in Freshwater Bay, IoW; RCI via Sackville **15.325** (Fr, Eng to Eur, Africa 2000-2300) 44434 at 2116 in Oxted; VOA via Greenville, USA **15.580** (Eng to Africa 1800-2200) 45444 at 2120 in Northampton; BBC via Ascension Is **15.400** (Eng to Africa 0800-1130, 1500-2300) 43334 at 2255 in Stalbridge.

Noted in the **13MHz (22m)** band were Swiss R.Int via Sottens **13.685** (Eng, It, Ger, Fr to Australasia 0830-1030), rated 55555 at 0835 in Herstmonceux; R.Australia via Shepparton **13.605** (Eng to Pacific 0800-1200) 24222 at 0849 in Newry; R.Austria Int via Moosbrunn **13.730** (Ger to Eur) 54434 at 0955 in Stalbridge; R.Austria Int via Moosbrunn **13.730** (Eng to Eur 1330-1400) 54444 at 1330 in Plymouth;

R.Kuwait via Kabd **13.620** (Ar to Eur, N.America 0930-1605) 55544 at 1425 in Northampton; AIR via Bangalore **13.710** (Eng to SE.Asia 1330-1500?) 33333 at 1430 in Kilkeel; AWR via Guam? **13.720** (Eng to Asia 1430-1458) 22222 at 1430 in Truro; R.Sweden **13.800** (Eng to Pacific, Asia 1430-1500) 45444 at 1430 in Freshwater Bay, IoW; VOA via Selebi-Phikwe, Botswana **13.710** (Eng to Africa 1600-2000) 33343 at 1825 in Liverpool; R.Nederlands via Flevo **13.700** (Eng to Africa 1830-2025) 45433 at 1845 in Colyton; RCI via Sackville, Canada **13.650** (Fr, Eng to Eur, Africa 2000-2200) 55545 at 2000 in E.Bristol; WEWN Vandiver, USA **13.615** (Eng to N.America 2000?-0000) 24333 at 2110 in Oxted; R.Havana Cuba **13.750** (Eng to Eur 2030-?) 33343 at 2121 in St.Mary's, IoS; WWCR Nashville, USA **13.845** (Eng to Africa 1400-0100) 44333 at 2300 in Morden.

There is a high level of activity in the **11MHz (25m)** band. Before noon the Voice of Greece, Athens **11.645** (Gr, Eng to Eur, Australia 0600-0800) was 44434 at 0741 in St.Mary's, IoS; R.Prague, Czech Rep **11.600** (Eng, Cz to Eur 0800-0857) SIO 545 at 0800 in Co.Fermanagh; BBC via Skelton & Woofferton, UK **12.095** (Eng to Eur, N/W.Africa 0700-1900) 44444 at 0900 in Canberra, Australia; R.Nederlands via Irkutsk [via Petropavlovsk from 26/3] **12.065** (Eng to Asia, F.East 0930-1125) 32222 at 0930 in Stalbridge; R.Australia via Shepparton **11.880** (Eng to E.Asia 0900-1100) 33443 at 1020 in Kilkeel.

During the afternoon R.Jordan via Al Karanah **11.690** (Eng to W.Eur, E.USA 1100-1730) was 54544 at 1300 in



Continued  
on page 15.

## Local Radio Chart

Freq kHz	Station	ILR BBC	e.m.r.p (kW)	Listener	Freq kHz	Station	ILR BBC	e.m.r.p (kW)	Listener
558	Spectrum, London	I	0.80	E,F,H,I	1170	1170AM,High Wycombe	I	0.25	E,I
585	R Solway	B	2.00	A	1242	Capital G,Maidstone	I	0.32	E,F
603	Capital G,Litt'brne	I	0.10	A,B*,E,F,H,I	1251	C.G Amber,Bury StEd	I	0.76	E,H,I
630	R Bedfordshire(3CR)	B	0.20	B,C*,E,F,H,I	1260	Brunel CG, Bristol	I	1.60	F
630	R Cornwall	B	2.00	A,F	1260	SabrasSnd,Leicester	I	0.29	E,H,I
657	R Clwyd	B	2.00	A,E,F,H	1260	R York	B	0.50	A
657	R Cornwall	B	0.50	A,F,J	1278	Cl.Gold 1278 W.York	I	0.43	H
666	Cl.Gold 666, Exeter	I	0.34	B,E,F,H,I	1296	Radio XL,Birmingham	I	5.00	A,E,F,H,I
666	R York	B	0.80	A,E,H	1305	Premier via ?	I	0.50	E,F,H,I
729	BBC Essex	B	0.20	E,H,I	1305	Touch AM, Newport	I	0.20	F
738	Hereford/Worcester	B	0.037	A,B,E,F,H,I	1323	Capital G, Southwick	I	0.50	E,F,I
756	R,Cumbria	B	1.00	A,E,H	1323	SomersetSnd,Bristol	B	0.63	H
756	The Magic 756,Powys	I	0.63	E,F,H,I	1332	Premier, Battersea	I	1.00	E,F
765	BBC Essex	B	0.50	E,F,H,I	1332	Cl.Gold 1332,Pt'bo	I	0.60	E,H,I
774	R Kent	B	0.70	E,C,F,H,I	1332	Wiltshire Sound	B	0.30	F
774	Cl.Gold 774, Glos	I	0.14	F	1359	Breeze, Chelmsford	I	0.28	E
792	Cl.Gold 792,Bedford	I	0.27	E,F,H,I	1359	Cl.Gold 1359, C'try	I	0.27	E,H,I
792	R Foyle	B	1.00	A	1359	R.Solent	B	0.85	F
801	R Devon	B	2.00	A,B,E,F,H	1368	R.Lincolnshire	B	2.00	E,H,I
828	Cl.Gold 828, Luton	I	0.20	C,E,H,I	1368	Southern Counties R	B	0.50	E,F
828	Magic 828, Leeds	I	0.12	A	1368	Wiltshire Sound	B	0.10	F
828	CG828, Bournemouth	I	0.27	F	1377	Asian Sd, Rochdale	I	0.10	A,E*
837	R,Cumbria/Furness	B	1.50	A	1413	R.Gloucester via ?	B	?	H,I
837	Asian Netwk Leics	B	0.45	C,E,F,H,I	1413	Premier via ?	I	0.50	E,F,H
855	R Devon	B	1.00	F,J	1413	Fresh AM, Skipton	I	0.10	A,H
855	R Lancashire	B	1.50	H	1431	Breeze,Southend	I	0.35	E,H
855	R.Norfolk, Postwick	B	1.50	C,E,F,H	1431	Cl.Gold, Reading	I	0.14	E,F,I
855	Sunshine 855,Ludlow	I	0.15	B,E,I	1449	R.Peterboro/Cambs	B	0.15	E,G,H,I
873	R.Norfolk, W.Lynn	B	0.30	C,E,F,H,I	1458	R.Lancashire	B	0.50	A
936	Brunel CG, W.Wilts	I	0.18	E,F,H,I	1458	R.Devon	B	2.00	A,F
936	Fresh AM, Hawes	I	1.00	A,E	1458	Sunrise, London	I	5.00	E,F,H,I
945	Cl.Gold GEM, Derby	I	0.20	H,I	1458	Asian Netwk Langley B	I	5.00	H
945	Capital G, Bexhill	I	0.75	E,F	1476	CountySnd,Guildford	I	0.50	C,E,F,H
954	Cl.Gold 954 via ?	I	?	H	1485	Cl.Gold, Newbury	I	1.00	E,H*,I
954	Cl.Gold 954,Torquay	I	0.32	E,F	1485	R.Humberside (Hull)	B	1.00	H
954	Cl.Gold 954, H'ford	I	0.16	B,E,I	1485	R.Merseyside	B	1.20	A,F,G
963	Liberty R, Hackney	I	1.00	B,C,E,H,I	1485	Southern Counties R	B	1.00	E,F
972	Liberty R, Southall	I	1.00	B,C,E,F,H,I	1503	R.Stoke-on-Trent	B	1.00	A,E,F*,G,H,I
990	R.Devon, E.Devon	B	1.00	A,B,E,F	1521	Breeze, Reigate	I	0.64	E,F,H,I
990	Magic AM,Doncaster	I	0.25	H	1530	R.Essex, Southend	B	0.15	E,F,H*
990	Cl.G, Wolverhampton	I	0.09	E,I	1530	Cl.Gold W.Yorks	I	0.74	A,H
999	C.Gold GEM Nott'ham I	I	0.25	E,H,I	1530	Cl.Gold Worcester	I	0.52	B,F,I
999	Magic 9-99 P'stn	I	0.80	A	1548	R.Bristol	B	5.00	G
999	R.Solent	B	1.00	E,F	1548	Capital G, London	I	97.50	A,E,F,H
999	Valley R, Aberdare	I	0.300	E	1548	Forth AM, Edinburgh	I	2.20	E
1017	Cl G, Shrewsbury	I	0.70	B,E,H	1557	R.Lancashire	B	0.25	A
1026	R.Cambridgeshire	B	0.50	B,D,E,H,I	1557	Cl.Gold 1557,N.hant	I	0.76	D,E,H*,I
1026	Downtown R, Belfast	I	1.70	A,G	1557	Capital G, So'ton	I	0.50	D,E,F
1026	R Jersey	B	1.00	B,E,F	1584	London Turkish R	I	0.20	E,F,H
1035	RTL Country 1035	I	1.00	E,F,H,I	1584	R.Nottingham	B	1.00	E,H*
1035	R.Sheffield	B	1.00	H	1584	R.Shropshire	B	0.50	E
1035	N Sound 2, Aberdeen	I	0.78	A	1584	Tay, Perth	I	0.21	E
1116	R Derby	B	1.20	A,E,H,I	1602	R Kent	B	0.25	C,E,F,H
1116	R.Guemsey	B	0.50	E,F					
1152	Cl G Amber, Norwich	I	0.83	H					
1152	LBC 1152 AM	I	23.50	E,F,G,H,I					
1152	Pic'ly 1152,Manch'r	I	1.50	A					
1152	PlymSnd AM,Plymouth	I	0.32	J					
1152	Cl.G, Birmingham	I	3.00	I					
1161	R.Bedfordshire(3CR)	B	0.10	E,H,I					
1161	Brunel Cl.G,Swindon	I	0.15	E,F					
1161	Magic AM,Humberside I	I	0.35	A,G					
1161	Southern Counties R	B	1.00	E,F					
1170	Cl G Amber, Ipswich	I	0.28	H					
1170	Magic 1170,Stockton	I	0.32	A,H					
1170	Capital G,Portsm'th	I	0.50	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) Simon Hockenhill, E.Bristol.
- (C) Sheila Hughes, Morden.
- (D) Rhoderick Illman, Dxted.
- (E) Brian Keyte, Bookham.
- (F) George Millmore, Wootton, IoW.
- (G) Tom Smyth, Co.Fermanagh.
- (H) Ernie Strong, Ramsey, Cambs.
- (I) Fred Wilmshurst, Northampton.
- (J) Tom Winzor, Plymouth.

# SRP TRADING

1086 Bristol Road South, Rednal, Birmingham B45 9TZ

★ ★ TRADE AND EXPORT ENQUIRIES WELCOME ★ ★

**new**



214W x 128H x 38.5D mm

## SANGEAN ATS-505

FM-STEREO/MW/LW/SW/PLL SYNTHESISED RECEIVER

- Professional digital multi-band world receiver.
- Continuous AM coverage 150-29999kHz.
- Five tuning methods - direct frequency access, auto scan, manual tuning, memory recall and rotary tuning.
- 45 presets.
- ATS (auto tuning system) - auto scan and preset, SSB.
- Short wave dual conversion. 1kHz/step fine tune.
- Memory scan.
- Tone control, etc.

**£99.00** + P&P



## AKD HF3S

SHORT WAVE RECEIVER

30kHz-30MHz. USB/LSB/AM. Included in this package:- The popular HF3 short wave receiver with NEW 10 memory facility, data output on the receiver and data lead to your computer. Software JFAX7.1 & Hamcomm 3.1 UK power supply & long wire aerial.

**£159.95** + P&P



## SANGEAN ATS-909

QUALITY PORTABLE SHORTWAVE RECEIVER

153kHz to 30MHz (AM, SSB). 87.5MHz to 108MHz (FM). AM/FM/USB/LSB.

Features (RDS) Radio Data System: 307 memory channels: World clock. 3 timers: LCD display: Signal strength meter, etc.

**£129.95** + P&P



## BEARCAT UBC9000XLT

AM/FM/WFM SWITCHABLE BASE SCANNING RECEIVER

25-550MHz and 760-1300MHz.

Features: Headphone socket, speaker socket, backlit orange LCD display, squelch control, rotary tuner, sound squelch, scan delay, auto sorting, RF attenuator, 500 memories, scan rate of 100/300 channels/sec.

**EPHONE FOR BEST PRICE** + P&P



## UNIDEN BEARCAT UBC220XLT

AM/FM hand-held scanner 66MHz-956MHz (with gaps) Features: 200 memories, scan rate 100/300 channels/sec, 10 priority channels.

lock out, headphone socket, etc

**EPHONE FOR BEST PRICE** + P&P



## UNIDEN BEARCAT UBC3000XLT

AM/FM hand-held scanner 25-550MHz and 760-1300MHz. Features: 400 memory channels, scan rate 100/300 channels/sec, 10 priority channels, headphone socket, backlit LCD display etc.

**EPHONE FOR BEST PRICE** + P&P



## SRP 3BR

Extension speaker. Quality filtered speaker with noise filter.

**£12.95** + P&P

## QS-300

Desk top stand for hand-helds includes BNC to SO239 adaptor.

**£13.99** + P&P

## SILVER DIAMOND

Four band discone. TX 6m, 2m, 70cm & 23cm. 200W. RX 25-1300MHz. Stainless steel construction. ~~£49.95~~

**£29.95** + £5 P&P

## UNIDEN BEARCAT UBC860XLT

60-88, 108-174, 406-512, 806-956MHz. 100 channels with twin turbo. Covers airband, marine, police + much more.

**EPHONE FOR BEST PRICE** + P&P



## PROFESSIONAL POLICE STYLE EARPIECE

**£8.99** + P&P



## PORTABLE SHORT WAVE ANTENNA

Compact portable short wave longwire antenna on a reel.

**£7.99** + P&P



## WIDEBAND PRE-AMP

Variable gain and bypass facility. Boosts weak

signals adding clarity to let you listen with ease. ~~£49.95~~

**£29.95** + P&P



## QS-200

In-car dashboard grill fitting hand-held mount to fit a mobile phone or hand-held scanner into your car.

**£4.99** + P&P

Opening times: Mon-Sat 9.30am to 5.15pm. We are Kenwood, Yaesu, Icom, & Alinco dealers.

**Call Mary (MOBMH) or Dave on**

**0121-460 1581, 0121-457 7788 FAX: 0121-457 9009**



## Tropical Bands Chart

Freq (MHz)	Station	Country	UTC	DXer
2.310	ABC Alice Springs	Australia	1925	C,D,M
2.325	ABC Tennant Creek	Australia	2015	C,D
2.485	ABC Katherine	Australia	1245	D
3.210	REE via Costa Rica	Costa Rica	0123	H
3.240	TWR Shona	Swaziand	1856	M
3.255	BBC via Meyerton	S.Africa	1940	I,M
3.270	Namibian BC,Windhoek	Namibia	2255	B
3.290	Namibian BC,Windhoek	Namibia	1941	B,I,M
3.315	AIR Bhopal	India	1729	I
3.316	SLBS Goderich	Sierra Leone	2100	I
3.320	SABC (RSG) Meyerton	S.Africa	1912	B,I,M
3.335	CBS Taipei	Taiwan	2131	I,M
3.355	R.Simbu	Pap.N.Guinea	1300	D
3.365	GBC R-2	Ghana	2310	B
3.365	AIR Delhi	India	1751	I
3.915	BBC via Kranji	Singapore	2133	A,B,M
3.955	BBC via Skelton	England	2105	A,B,C,F,G,N,O
3.965	R.Taipei via Skelton	England	1800	A,C,K,N
3.965	RFI Paris	France	1918	A,F,O
3.975	R.Budapest	Hungary	2200	C,F,G,L,N,O
3.980	R.Korea via Skelton	England	2200	A,C,G,K,L,N,O
3.980	Nexus, Milan	Italy	2233	N,O
3.985	Nexus, Milan	Italy	2025	A,B
3.995	DW via Julich	Germany	2234	A,B,O
4.500	Xinjiang BS, Urumqi	China	2335	B
4.735	Xinjiang, Urumqi	China	2345	B
4.760	Yunnan PBS, Kunming	China	2310	B
4.760	AIR Port Blair	India	1629	D,I,M
4.760	ELWA Monrovia	Liberia	1925	M
4.770	FRNC Kaduna	Nigeria	2105	A,I,K
4.775	AIR Imphal	India	1731	I
4.783	RTM Bamako	Mali	2127	A,G,I
4.785	Caiari Porto Velho	Brazil	2335	B
4.790	Azad Kashmir R.	Pakistan	0134	A,H
4.800	AIR Hyderabad	India	1726	I
4.800	LNBS Maseru	Lesotho	1712	H
4.815	R.diff TV Burkina	Quagadougou	2132	B,I
4.820	R.Botswana, Gaborone	Botswana	1958	E,I
4.820	R.Paz Y Bien	Ecuador	0800	A
4.820	AIR Calcutta	India	1733	O,I
4.825	R.Cancao Nova	Brazil	0657	A
4.830	R.Tachira	Venezuela	0315	A,B,E,H
4.835	ABC-Alice Springs	Australia	2132	I
4.835	RTM Bamako	Mali	2131	A,B,G,I,O
4.840	AIR Bombay	India	1658	A,I
4.845	ORTM Nouakchott	Mauritania	2131	B,G,I,M
4.850	R.Yaounde	Cameroon	2106	B,C,G,H,I,O
4.860	AIR Delhi	India	1734	A,O,I
4.875	R.Roraima, Boa Vista	Brazil	2355	B
4.885	R.Clube do Para	Brazil	0310	A,E
4.885	R. Difusora Acreana	Brazil	0010	B
4.885	KBC East Sce Nairobi	Kenya	1738	I
4.890	RFI Paris	via Gabon	0421	A
4.890	R.Port Moresby	Pap.N.Guinea	2013	O,I
4.905	R. La Oroya	Peru	0658	A
4.910	Tennant Creek	Australia	2133	I

Freq (MHz)	Station	Country	UTC	DXer
4.915	R.Anhanguera	Brazil	0102	A
4.915	GBC-1, Accra	Ghana	2049	A,B,I,M,O
4.920	R.Quito, Quito	Ecuador	0510	E
4.920	AIR Chennai	India	1644	D,I
4.925	R.Difusora, Taubate	Brazil	2355	B
4.927	RRI Jambi	Indonesia	1235	D
4.930	Namibian BC,Windhoek	Namibia	1724	H
4.940	AIR Guwahati	India	1640	B,I
4.945	R.Illimani, La Paz	Bolivia	0020	B
4.950	AIR Srmagar	India	1643	I
4.950	VOA via Sao Tome	Sao Tome	2056	A,F,I,J,M
4.955	R.Nac. de Colombia	Colombia	0512	B,E
4.960	VOA via Sao Tome	Sao Tome	7777	J
4.965	Christian Voice	Zambia	1855	C
4.975	R.Uganda, Kampala	Uganda	1947	I,J,M,O
4.980	PBS Xinjiang, Urumqi	China	1640	A
4.980	Ecos del Torbes	Venezuela	0150	A,B,G,H
4.985	R.Brazil Central	Brazil	2320	B
5.010	R.Garoua	Cameroon	2250	B
5.010	Guangxi 2, Nanning	China	2119	I
5.010	AIR Thiru'puram	India	0154	B,H
5.025	ABC Katherine	Australia	2136	I
5.025	R.Rebelde, Habana	Cuba	0156	A,B,C,E,H
5.025	R.Uganda, Kampala	Uganda	2056	I
5.030	AWR Latin America	Costa Rica	2310	B,E,O
5.030	RTM Kuching	Sarawak	2058	I
5.035	R.Aparecida	Brazil	0005	B
5.035	R.Educacao Rural	Brazil	0210	B
5.035	R.Bangui	C.Africa	2122	I
5.047	R.Togo, Lome	Togo	2112	B,H,I,M
5.050	Haixia 1, V of Strait	China	2114	H,I
5.050	AIR Aizawl	India	0205	B
5.050	R.Tanzania	Tanzania	1949	I,M,O
5.055	RFO Cayenne(Matoury)	French Guiana	2300	B
5.060	PBS Xinjiang, Urumqi	China	0200	B
5.100	R.Liberia, Totota	Liberia	2055	A,I,M
5.320	CNR 1	China	2115	I

### DXers:-

- (A) Michael Casey, NE,Manchester.
- (B) Robert Connolly, Kilkeel.
- (C) Martin Goodey, St Mary's, IOS
- (D) Bill Griffith, while in Canberra, Australia
- (E) David Hall, Morpeth.
- (F) Robert Hughes, Liverpool.
- (G) Sheila Hughes, Morden
- (H) Rhoderick Illman, Oxted.
- (I) Fred Pallant, Storrington.
- (J) John Parry, Lamaca, Cyprus
- (K) Clare Pinder, while in Appleby.
- (L) Clare Pinder, Glasgow
- (M) Vic Prier, Colyton.
- (N) Tom Smyth, Co.Fermanagh.
- (O) Fred Wilmshurst, Northampton.

R.Australia via Shepparton **9.500** (Eng to Asia 1430-2130) 34343 at 2040 in Storrington; V of Armenia via Kamo **9.965** (Eng to Eur 2055-2120) 44333 at 2055 in Newry; China R.Int via ? **9.535** (Eng to Eur 2100-2200) 44444 at 2100 in Dudley; AIR via Aligarh? **9.910** (Eng to Australia 2045-2230) 45444 at 2125 in Northampton; RCI via Sackville **9.770** (Fr, Eng to Eur, Africa 2000-2200) 44444 at 2155 in St.Mary's, IoS; R.Mediterranean Int, Morocco **9.575** (Ar, Fr to N.Africa, S.Eur 0500-0100) 54444 at 2205 in Liverpool; AIR via Bangalore **9.950** (Eng to Eur 2045-2230) 44444 at 2205 in Canberra, Australia; R.Taipei Int via WYFR Okeechobee, USA **9.355** (Eng to Eur 2200-2300) 34333 at 2248 in Woodhall Spa; V of Turkey, Ankara **9.655** (Eng to N.America 2300-0000) SIO 333 at 2348 in N.Bristol.

In the congested **7MHz (41m)** band there are a number of broadcasts intended for listeners in Europe. Some originate from R.Japan via Woofferton, UK **7.230** (Jap, Eng 0500-0700), rated 33222 at 0600 in Glasgow; WYFR via Okeechobee, USA **7.355** (Eng 0600-0800, also to Africa) 44444 at 0600 in Morden; V of the Mediterranean, Malta via Russia? **7.150** (Eng 0700-0730) 55555 at 0715 in Newry; Christian Science via WSHB Cyprus Creek, USA **7.535** (Eng 0400?-1000?) 54445 at 0935 in Stalbridge; WEWN Birmingham, USA **7.465** (Eng 1000-1100) 32323 at 1000 in Dudley; AIR via Bangalore **7.410** (Hi, Eng 1745-2230) 33333 at 1802 in Plymouth & 44444 at 2200 in Canberra, Australia; V of Greece, Athens **7.450** (Gr, Eng 1800-2050) 55544 at 1915 in Northampton; R.Bulgaria, Sofia **7.535** (Eng 2000-2100) 45544 at 2000 in Colyton; R.Budapest, Hungary **7.165** (Eng 2000-2030) SIO 333 at 2004 in N.Bristol; Sudwestfunk via Rohrdorf **7.265** (Ger 24hrs) 54344 at 2020 in Liverpool; V of the Mediterranean, Malta via Russia **7.440** (Eng 2000-2100) 44444 at 2020 in Morpeth; RCI via Skelton, UK **7.235** (Fr, Eng 2000-2300) 33343 at 2114 in Oxted; V of Russia, Moscow **7.300** (Eng) 54444 at 2152 in Freshwater Bay, IoW;

R.Sweden **7.325** (Eng 2230-2300, also to Africa) 33333 at 2240 in Truro.

Whilst beaming to other areas R.Bulgaria, Sofia **7.535** (Eng to N.America 2200-2300) was 44444 at 2231 in Woodhall Spa; V of Russia **7.180** (Eng to Americas) 54545 at 0340 in E.Bristol; V of Nigeria, Ikorodu **7.255** (Eng to W.Africa) 33453 at 0636 by **Michael Casey** in Manchester.

The **6MHz (49m)** band carries many broadcasts for listeners in Europe. Those noted in the reports came from R.Japan via Skelton, UK **5.975** (Eng 0600-0700), rated 43443 at 0655 in Herstmonceux; R.Vlaanderen Int, Belgium **5.985** (Eng 0800-0830) 44333 at 0800 in Appleby; R.Prague, Czech Rep. **5.930** (Eng 1800-1827) 54444 at 1806 in Plymouth; Sri Lanka BC via Skelton, UK **6.010** (Eng to Eur 1900-2000 Sun) 44544 at 1900 in Colyton; RAI Rome **5.970** (Eng 1935-1955) 44544 at 1950 in E.Bristol; R.Yugoslavia, Belgrade **6.100** (Eng 1930-2000) 54454 at 1950 in Liverpool; R.Finland via Pori **6.135** (Eng 2000-2030) 54354 at 2017 in Newry; R.Sweden via Horby **6.065** (Eng 2030-2100) 55555 at 2030 in Dudley; R.Polonia (Polish R), Warsaw **6.095** (Eng 2030-2125) 43543 at 2101 in Manchester; R.Canada Int via Skelton, UK **5.995** (Fr, Eng 2000-2300) 55544 at 2135 in St.Mary's, IoS; R.Taipei Int via WYFR **5.810** (Eng 2200-2300) SIO 444 at 2200 in Co.Fermanagh; R.Budapest, Hungary **6.025** (Eng 2200-2230) 54544 at 2157 in Northampton; R.Sweden via Horby **6.065** (Eng 2230-2300) SIO 444 at 2253 in N.Bristol.

Noted to other areas were the BBC via Antigua, W.Indies **5.975** (Eng to C/N.America 2100-0800), rated 43333 at 2300 in Morden & 33333 at 0230 in Los Angeles, USA; WEWN Birmingham, USA **5.825** (Eng to N.America 2200-0900?) 44444 at 0034 in Kilkeel; R.Habana, Cuba **6.000** (Eng to N.America 0100-0500) 44433 at 0442 in Morpeth; WWCR Nashville, USA **5.935** (Eng to USA 0000-1400) 54445 at 0745 in Stalbridge; WHRI South Bend, USA **5.745** (Eng to N.America 2100?-1000) 44434 at 0819 in Oxted.





# SHORT WAVE (continued from page 17)

Time (UTC)	Station	Country	Day	Frequency (MHz)
1630-1700	R Slovakia Int	Slovakia		7.345
1630-1700	V of Vietnam	Vietnam		7.145
1630-1700	V of Vietnam	Vietnam		9.730
1700-1727	R Prague	Czech Republic		5.920
1700-1730	V of Azerbaijan	Azerbaijan		9.165
1700-1759	R Phoenix	Philippines		6.000
1700-1759	R Phoenix	Philippines		7.265
1700-1800	BBC World Service	UK		12.095
1700-1800	BBC World Service	UK		15.485
1700-1800	R Japan (Gen Service)	Japan		12.000
1700-1800	R Romania Int	Romania		15.250
1700-1800	R Romania Int	Romania		15.390
1700-1800	R Romania Int	Romania		17.725
1700-1800	R Romania Int	Romania		17.805
1700-1800	V of America	USA		9.700
1700-1800	V of America	USA		9.760
1700-1800	V of America	USA		15.255
1700-1800	V of Russia	Russia		9.775
1700-1800	V of Russia	Russia		9.820
1700-1800	WYFR Family R	USA		17.565
1700-1800	WYFR Family R	USA		21.465
1700-2200	RRS Shortwave	Italy		3.980
1700-2200	RRS Shortwave	Italy		3.985
1715-1800	V of Africa	Libya		15.235
1715-1800	V of Africa	Libya		15.415
1715-1800	V of Africa	Libya		15.435
1730-1800	R Georgia	Georgia		11.910
1730-1800	R Sweden	Sweden		6.065
1730-1800	R Sweden	Sweden		13.800
1730-1800	R Vatican Int	Vatican		5.910
1730-1800	R Vatican Int	Vatican		9.925
1730-1800	R Vatican Int	Vatican		13.710
1745-1900	R Bangladesh	Bangladesh		7.185
1745-1900	R Bangladesh	Bangladesh		9.550
1745-1945	All India Radio	India		7.410
1745-1945	All India Radio	India		9.950
1745-1945	All India Radio	India		11.620
1800-1830	V of Vietnam	Vietnam		7.145
1800-1830	V of Vietnam	Vietnam		7.400
1800-1830	V of Vietnam	Vietnam		9.730
1800-1830	BBC World Service	UK		9.410
1800-1830	BBC World Service	UK		12.095
1800-1830	Merlin Network 1	UK	Thu-Fri	6.010
1800-1830	R Taipei Int	China Rep. Of Taiwan		3.965
1800-1830	RAE	Argentina	Mon-Fri	15.345
1800-1830	V of America	USA		9.750
1800-1830	V of America	USA		9.770
1800-1830	V of Russia	Russia		7.330
1800-1830	V of Russia	Russia		9.720
1800-1830	V of Russia	Russia		9.775
1800-1830	V of Russia	Russia		9.820
1800-1830	Radiobras	Brazil		15.265
1800-2000	WSHB	USA	Sun	15.665
1800-2000	WYFR Family R	USA		17.565
1800-2100	R Kuwait	Kuwait		11.950
1800-2100	R Kuwait	Kuwait		13.620
1830-1845	R Tirana	Albania		7.110
1830-1845	R Tirana	Albania		9.510
1830-1900	R Georgia	Georgia		11.760
1830-1900	R Slovakia Int	Slovakia		5.920
1830-1900	R Slovakia Int	Slovakia		6.065
1830-1900	R Slovakia Int	Slovakia		7.345
1830-1900	R Yugoslavia	Yugoslavia		6.100
1830-1930	V of Turkey	Turkey		9.765
1830-1930	V of Turkey	Turkey		11.765
1900-1910	V of Greece	Greece		7.475
1900-1910	V of Greece	Greece		9.375
1900-1925	Israel Radio Int	Israel		11.605
1900-1925	Israel Radio Int	Israel		15.650
1900-1925	Israel Radio Int	Israel		17.535
1900-1930	R Budapest	Hungary		6.025
1900-1930	R Budapest	Hungary		9.750
1900-1930	R Finland	Finland		6.135
1900-1930	Swiss Radio Int	Switzerland		6.110
1900-1930	V of America	USA		7.260
1900-1930	V of America	USA		9.760
1900-1930	V of America	USA		9.770
1900-1930	V of Vietnam	Vietnam		7.145
1900-1930	V of Vietnam	Vietnam		9.730
1900-1945	R Iraq Int	Iraq		9.665
1900-1945	R Iraq Int	Iraq		11.765
1900-2000	BBC World Service	UK		6.195
1900-2000	BBC World Service	UK		9.410
1900-2000	BBC World Service	UK		12.095
1900-2000	R Bulgaria	Bulgaria		9.400
1900-2000	R Bulgaria	Bulgaria		9.420
1900-2000	R Bulgaria	Bulgaria		11.700
1900-2000	R Korea Int	South Korea		5.975
1900-2000	R Korea Int	South Korea		7.215
1900-2000	R Pyongyang	North Korea (DPR)		4.405
1900-2000	R Pyongyang	North Korea (DPR)		6.575
1900-2000	R Pyongyang	North Korea (DPR)		9.335

Time (UTC)	Station	Country	Day	Frequency (MHz)
1900-2000	R Pyongyang	North Korea (DPR)		11.710
1900-2000	R Pyongyang	North Korea (DPR)		13.760
1900-2000	R Thailand	Thailand		7.195
1900-2000	R Thailand	Thailand		9.655
1900-2000	R Thailand	Thailand		11.905
1900-2000	NBC	USA	Sat	5.710
1900-2000	V of Mediterranean		Sat	12.080
1900-2000	V of Russia	Russia		9.775
1900-2000	V of Russia	Russia		9.810
1900-2000	V of Russia	Russia		12.070
1900-2000	WSHB	USA	Tue-Thu	15.665
1900-2000	WSHB	USA	Tue-Thu	17.680
1930-1945	V of America	USA		7.200
1930-1945	V of America	USA		9.700
1930-1945	V of America	USA		9.770
1930-1945	R Belarus Int	Belarus	Tue-Thu	7.165
1930-2000	R Belarus Int	Belarus	Tue-Thu	7.210
1930-2000	R Belarus Int	Belarus	Tue-Thu	6.065
1930-2000	R Belarus Int	Belarus	Tue-Thu	5.990
1930-2000	V of Mongolia	Mongolia		11.790
1930-2000	V of Mongolia	Mongolia		12.085
1930-2000	R Poland	Poland		6.035
1930-2000	R Poland	Poland		6.080
1930-2000	R Poland	Poland		7.185
1930-2000	R Poland	Poland		9.515
1930-2000	R Romania Int	Romania		7.190
1930-2000	R Romania Int	Romania		9.022
1930-2000	R Romania Int	Romania		11.765
1930-2000	RAI Int	Italy		5.910
1930-2000	RAI Int	Italy		7.290
1930-2000	RAI Int	Italy		9.150
1945-2000	V of America	USA		7.260
1945-2000	V of America	USA		9.700
1945-2000	V of America	USA		9.730
1945-2000	V of America	USA		9.750
1945-2000	V of America	USA		9.760
1945-2000	V of America	USA		9.770
1945-2000	V of America	USA		9.780
1945-2000	V of America	USA		9.790
1945-2000	V of America	USA		9.800
1945-2000	V of America	USA		9.810
1945-2000	V of America	USA		9.820
1945-2000	V of America	USA		9.830
1945-2000	V of America	USA		9.840
1945-2000	V of America	USA		9.850
1945-2000	V of America	USA		9.860
1945-2000	V of America	USA		9.870
1945-2000	V of America	USA		9.880
1945-2000	V of America	USA		9.890
1945-2000	V of America	USA		9.900
1945-2000	V of America	USA		9.910
1945-2000	V of America	USA		9.920
1945-2000	V of America	USA		9.930
1945-2000	V of America	USA		9.940
1945-2000	V of America	USA		9.950
1945-2000	V of America	USA		9.960
1945-2000	V of America	USA		9.970
1945-2000	V of America	USA		9.980
1945-2000	V of America	USA		9.990
1945-2000	V of America	USA		10.000
1945-2000	V of America	USA		10.010
1945-2000	V of America	USA		10.020
1945-2000	V of America	USA		10.030
1945-2000	V of America	USA		10.040
1945-2000	V of America	USA		10.050
1945-2000	V of America	USA		10.060
1945-2000	V of America	USA		10.070
1945-2000	V of America	USA		10.080
1945-2000	V of America	USA		10.090
1945-2000	V of America	USA		10.100
1945-2000	V of America	USA		10.110
1945-2000	V of America	USA		10.120
1945-2000	V of America	USA		10.130
1945-2000	V of America	USA		10.140
1945-2000	V of America	USA		10.150
1945-2000	V of America	USA		10.160
1945-2000	V of America	USA		10.170
1945-2000	V of America	USA		10.180
1945-2000	V of America	USA		10.190
1945-2000	V of America	USA		10.200
1945-2000	V of America	USA		10.210
1945-2000	V of America	USA		10.220
1945-2000	V of America	USA		10.230
1945-2000	V of America	USA		10.240
1945-2000	V of America	USA		10.250
1945-2000	V of America	USA		10.260
1945-2000	V of America	USA		10.270
1945-2000	V of America	USA		10.280
1945-2000	V of America	USA		10.290
1945-2000	V of America	USA		10.300
1945-2000	V of America	USA		10.310
1945-2000	V of America	USA		10.320
1945-2000	V of America	USA		10.330
1945-2000	V of America	USA		10.340
1945-2000	V of America	USA		10.350
1945-2000	V of America	USA		10.360
1945-2000	V of America	USA		10.370
1945-2000	V of America	USA		10.380
1945-2000	V of America	USA		10.390
1945-2000	V of America	USA		10.400
1945-2000	V of America	USA		10.410
1945-2000	V of America	USA		10.420
1945-2000	V of America	USA		10.430
1945-2000	V of America	USA		10.440
1945-2000	V of America	USA		10.450
1945-2000	V of America	USA		10.460
1945-2000	V of America	USA		10.470
1945-2000	V of America	USA		10.480
1945-2000	V of America	USA		10.490
1945-2000	V of America	USA		10.500
1945-2000	V of America	USA		10.510
1945-2000	V of America	USA		10.520
1945-2000	V of America	USA		10.530
1945-2000	V of America	USA		10.540
1945-2000	V of America	USA		10.550
1945-2000	V of America	USA		10.560
1945-2000	V of America	USA		10.570
1945-2000	V of America	USA		10.580
1945-2000	V of America	USA		10.590
1945-2000	V of America	USA		10.600
1945-2000	V of America	USA		10.610
1945-2000	V of America	USA		10.620
1945-2000	V of America	USA		10.630
1945-2000	V of America	USA		10.640
1945-2000	V of America	USA		10.650
1945-2000	V of America	USA		10.660
1945-2000	V of America	USA		10.670
1945-2000	V of America	USA		10.680
1945-2000	V of America	USA		10.690
1945-2000	V of America	USA		10.700
1945-2000	V of America	USA		10.710
1945-2000	V of America	USA		10.720
1945-2000	V of America	USA		10.730
1945-2000	V of America	USA		10.740
1945-2000	V of America	USA		10.750
1945-2000	V of America	USA		10.760
1945-2000	V of America	USA		10.770
1945-2000	V of America	USA		10.780
1945-2000	V of America	USA		10.790
1945-2000	V of America	USA		10.800
1945-2000	V of America	USA		10.810
1945-2000	V of America	USA		10.820
1945-2000	V of America	USA		10.830
1945-2000	V of America	USA		10.840
1945-2000	V of America	USA		10.850
1945-2000	V of America	USA		10.860
1945-2000	V of America	USA		10.870
1945-2000	V of America	USA		10.880
1945-2000	V of America	USA		10.890
1945-2000	V of America	USA		10.900
1945-2000	V of America	USA		10.910
1945-2000	V of America	USA		10.920
1945-2000	V of America	USA		10.930
1945-2000	V of America	USA		10.940
1945-2000	V of America	USA		10.950
1945-2000	V of America	USA		10.960
1945-2000	V of America	USA		10.970
1945-2000	V of America	USA		10.980
1945-2000	V of America	USA		10.990
1945-2000	V of America	USA		11.000
1945-2000	V of America	USA		11.010
1945-2000	V of America	USA		11.020
1945-2000	V of America	USA		11.030
1945-2000	V of America	USA		11.040
1945-2000	V of America	USA		11.050

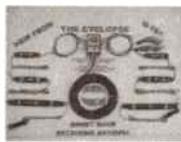
# HAYDON

## COMMUNICATIONS



NEXT DAY DELIVERY TO MOST AREAS, £10.00.

MAIL ORDER: 01708 862524



### Q-TEK WIRE CYCLOPSE

Your eye-in-the-sky. The ultimate short wave receiving antenna. Doesn't your short wave receiver deserve something better than just a simple long wire? Well, here it is - the wire Cyclops. A unique ready to go antenna system that works from 0-30MHz. The antenna is centre fed with coax (supplied) and incorporates six tuned coils for optimum reception. The system also incorporates an anti-interference balun and comes ready assembled for immediate use. At only 15.5mtrs (51ft) long it will certainly fit most gardens. (Mounts horizontally down garden).

INTRO PRICE **£59.95** P&P £8.50  
(Coax has PL-259 fitted)



### THE VERTICAL CYCLOPSE

This new short wave listeners antenna was initially made specifically for one of our commercial customers but we felt the general public would find it of great interest. At only just over 7 feet high this vertical short wave receiving antenna will give amazing results from 0.2-30MHz and thanks to its commercial construction you simply erect it and away you go. Length 7'6". Coax supplied: 20m with PL-259 fitted. SSP £129.00.

INTRO PRICE **£69.95**  
P&P £8.50



### Q-TEK HF-30

An amazing new design concept in compact HF antennas. Thanks to its six-stage multi-resonant coil system stacked vertically utilising a magnetic balun at the base you can obtain better results than ever experienced from a compact-vertical HF antenna. (SO-239 fitting: 4' high - clamps to any mast up to 2" dia). 0-30MHz.

Send SAE for review

ONLY **£84.95**  
(Del £10.00)



### ROYAL DISCONE

(Stainless steel)  
Frequency range: receives 25-2000MHz, transmit 6/2/70/23cm, connector N type. High sensitivity with an amazing range of transmitting frequencies. Comes complete with mounting hardware & brackets. SSP £49.99.

SPECIAL OFFER **£29.95**  
P&P £8.50



### Q-TEK APOLLO 2000MHz

A brilliant new compact indoor antenna that covers 0-1650MHz and is just 20" tall (collapsed). Supplied with coax and BNC plug fitted.

ONLY **£49.95**  
P&P £5

### REGULAR-GAINER RH-770

BNC 21cm flexible whip that is ideal as replacement

OUR PRICE **£14.95** P&P £1.50

### SUPER-GAINER RH-9000

BNC 40cm flexible model for the ultimate in gain.

OUR PRICE **£19.95** P&P £1.50



### AIR-44

(Airband base)  
Prof quality base antenna for AIRBAND. (Civil & military). With SO-239 fitting (1.7m long). Gain 4.5/7dB.

**£69.95** P&P £8.50

AIR-33 (As above) 1m long. Gain 3/6dB. £44.95 P&P £5.50



### VECTRONICS AT100

Active SW antenna. Covers 0.3-30MHz with adjustable sensitivity. Simply connect to a receiver and away you go.

SUPERB VALUE **£69.95**  
P&P £5

(includes pre-selector)

### NEW SP-1 SPYWIRE

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

**£29.95**

+ £3 P&P HOOK



### QS-300

A fully adjustable desk top stand for use with all hand-helds. Fitted coaxial fly (FAI) with BNC & SO239 connectors.

ONLY **£14.95** P&P £2

QS-200 Air vent h/held holder.....£9.99 P&P £1  
MA-339 Mobile h/held holder .....£7.99 P&P £1  
EP-300 Deluxe over-the-ear earpiece .....£9.95 P&P £1



### GLOBAL AT-2000

Deluxe SW ATU 0-30MHz. SO239 fittings.

ONLY **£85.00** P&P £5

(Probably the best ATU around)



### HD-1010

Deluxe padded headphones. Ideal for SW portable and hand-held scanners.

SPECIAL OFFER

**£7.99** P&P £2

### RECHARGEABLE ALKALINE CELLS



Starter kit includes charger & 4 x AA cells.

**£13.99**

+ £2.50 P&P.

Please note that only the special cells can be recharged with this charger.

Extra cells available @

8 x AA pack £10.99 £1 P&P Rechargeable Alkaline. No memory effects. 1.5V cells.  
4 x AA pack £5.99 £1 P&P 3 x capacity of nicads.  
4 x AAA £6.25 £1 P&P NO QUIBBLE WARRANTY

### INTERFERENCE STOP IT!



Rectangular snap-fixing ferrite cores suitable for :- Radio coax/TV/mains/telephone/PC & data cables. Plastic teeth

prevent it from sliding on cable. Simply snap close onto cable and job is done!

BULK PURCHASE hence

**2 for £7.50**

(P&P £2.50). HURRY - LIMITED STOCK



### SCANMASTER SP-55

Boost reception of your scanner with this pre-amp. 25-1500MHz, variable gain, band pass filters. £69.95

SPECIAL OFFER

**£49.95**

P&P £3.50



# HAYDON

## COMMUNICATIONS



NEXT DAY DELIVERY TO MOST AREAS, £10.00.

**MAIL ORDER:  
01708 862524**

## WELCOME TO THE FASCINATING

### REALISTIC DX-394



The DX-394 is a modern, dual conversion receiver featuring phase locked-loop technology for tuning accuracy and stability plus a comprehensive range of memory functions. The frequency coverage provided is 150kHz through to 30MHz with no breaks. This wide range, combined with SSB, CW and AM receive modes, makes this receiver ideal for a wide range of listening styles. Keeping track of all those favourite frequencies is helped by the 160 internal memories. The steps available are 100Hz, 1, 5 and 10kHz, which should suit just about everyone. The internal processor includes some presetting of tuning steps to align with correctly displayed frequency. This is very helpful and greatly speeds up tuning operation. This is the best communications receiver under £350.00. ~~SSP £299.95~~ **OUR PRICE £149.95**



FREE SOFTWARE WORTH £130

The AR-5000 advances the frontiers of performance providing excellent strong signal handling, high sensitivity and wide band coverage. Covers 10kHz-2600MHz.

### AR5000

SPECIAL OFFER  
**£1269.00**

WITH SPECTRUM MASTER SOFTWARE WORTH £130.00

### ICOM IC-8500



FREE SOFTWARE

"Next generation" technology brings you super wide band, all mode coverage from 0.1-2GHz. It's a professional quality communications receiver with versatile features from high speed scanning to computer control.

2 YEAR GUARANTEE

SALE PRICE **£999.00**  
SUBJECT TO AVAILABILITY

### FAIRHAVEN RD-500VX+



INCL'S 8.33KHz

0-1750MHz, all mode, fully featured. We have had this unit independently tested & compared to other radios priced at around £1500 and in our opinion this is the best there is. Incl's optional PC control kit. Buy yours before the price increases. New RRP ~~£899.00~~

OUR PRICE **£799.00**  
Optional remote keyboard £15.00 P&P £4.00

### BEARCAT BC-9000XLT



WHILE STOCKS LAST

We have just secured a small quantity of this amazingly high performance desk-top scanner. The unit covers from 25-1300MHz and has nearly every facility available including 500 memories, alpha-numeric display, switchable modes and even a scan rate of 100 channels per second. WHATS EVEN BETTER IS THE PRICE. Was ~~£299.00~~.

WHILE STOCKS LAST NOW ONLY  
**£219.00**



### AOR AR8200

FREE CASE

State of the art wideband scanning receiver. • Covers 500kHz-2040MHz • All mode

- 1000 memory channels
- Band scope facility
- Computer compatible
- Includes nicads / charger antenna + car charger

£399.00.

SPECIAL OFFER  
**£339.00**  
+ free case worth £20.00

AR8000 wideband hand-held.....£269.00



### MVT-7100EU

UK MODEL

Wideband hand-held scanner covers 500kHz-1650MHz. (All mode). Includes nicad / car charger / charger / antenna. Extremely user-friendly hand-held receiver with outstanding performance unmatched by its rivals.

SPECIAL OFFER  
**£195.00**

MVT-9000MkII Flagship hand-held scanner .....£319.95

Soft case for 7100EU/9000 - specify.....£19.99  
HD-010 deluxe stereo / mono headphone for hand-held scanners.....£7.99 P&P £2.00



### YAESU VR-500

All mode scanning receiver covers 100kHz-1300MHz. Huge memory capacity: 1091 channels. A simple to operate yet fully featured all mode communications receiver. (AM/FM/WFM/SSB).

ONLY **£279.00**

Optional barometric pressure unit.....£32.95



### ICOM IC-R2

Miniature wideband hand-held scanner covers 0.5-1300MHz (AM, FM/WFM). Search banks memories and many more features.

**£129.00**

We've sold 100s



### AR108

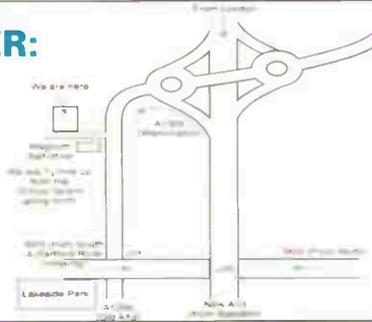
SALE PRICE

Palm sized dedicated airband scanning receiver. Covers airband 108-136.975MHz VHF 136-180MHz with 99 memories.

ONLY **£59.95**  
Optional batteries + charger £13.99.

## SHOWROOM & MAIL ORDER:

Unit 1, Thurrock Commercial Park,  
Purfleet Industrial Estate, London Rd,  
Nr. Aveley, Essex RM15 4YD  
TEL: 01708 862524  
FAX: 01708 868441  
Open Mon - Fri 8am - 4.30pm.  
Sat 8am - 1.00pm



## W. MIDLANDS SHOWROOM

Unit 1, Canal View Ind. Est.,  
Brettel Lane,  
Brierley Hill  
W. Mids. DY5 3LQ  
Open Mon-Fri 9.30-5pm.  
Sat 9.30-2pm  
NO MAIL ORDER TO  
MIDLANDS BRANCH

# ING WORLD OF RECEIVERS

## SONY SW-100E



Award winning miniature portable all mode SW receiver. ★ Station presets for 50 frequencies (with station names) ★ Single side band system ★ Multi-function LCD display ★ FM stereo via headphones ★ Synchronous detector ★ Sleep function ★ Short wave tuning in 50Hz & 1kHz steps ★ Includes compact antenna/stereo earphones/carrying case/comprehensive short wave handbook. Due to over stocking at Sony UK we are able to offer for a limited period the Sony SW-100E at £100 off retail price. RRP ~~£229.95~~.

SPECIAL OFFER **£129.95** P&P £10

## ICOM PCR-1000



Bring another world to your computer. The PCR-1000 connects externally to your computer and offers exceptional receiver performance. 0.5-1300MHz (all mode). Includes SSB. ~~£349.00~~.

2 YEAR GUARANTEE

UK's LOWEST PRICE

**£249.00**

UT-106 Optional DSP unit .....£79.95

## YAESU FRG-100



This is a high performance communications receiver providing general coverage reception in CW, SSB, AM and FM modes from 50kHz-30MHz. Micro processor control of major functions permit ease of operation and features that both new and seasoned short wave listeners will appreciate, at an affordable price.

ONLY **£369.00**

(Optional FM unit £35.00)

## ICOM IC-R75



The short wave receiver for the true enthusiast. ● 0.03-60MHz (all mode).

- Synchronous AM detection
- PC control capability

★★★★ WRTH gave it 4 star rating

OUR PRICE **£609.00**

Plus free PSU\*

UT-106 Optional DSP unit .....£79.95

## SANGEAN ATS-909



A superb performance portable/base synthesized world receiver with true SSB and 40Hz tuning for ultra clean reception.

The same radio is sold under the Roberts name at nearly twice the price. Other features include RDS facility, 306 memories and FM stereo through headphones. The ATS-909 represents superb value for money.

ONLY **£129.95**

Optional deluxe stereo/mono headphones for short wave portables.....only £7.99 P&P £2



## GARMIN STREET PILOT

This unit contains a reference basemap covering all of Europe, showing motorways, roads, railways, rivers and shorelines. Down-load data from Garmins metro guide, map source CD ROMs for street level map details and access to business listings and points of interest (such as restaurants, hotels, petrol stations, banks, shopping areas, etc.).

Street Pilot £419.00

Street Pilot Colour £549.00

Garmin GPS Plus.....Special offer £329.95  
Garmin GPS-12 Navigator.....£129.95  
New Garmin Etrex.....£115.00  
Soft case for GPS-III Plus.....£20.00  
Cigar power lead.....£20.00  
Active magmount antenna.....£39.95



## LICENCE FREE RADIO

## MOTOROLA TA-200

★ Typically up to 3Km range dependent upon terrain  
★ Large, easy to read LCD screen with user-friendly icons  
★ You choose who to talk to and select from 300 channel settings  
★ Rugged and stylish design - choose from yellow or blue  
★ One button operation - easy for adults and children to use, simply push to talk.

ONLY **£69.95**

or 2 for £129.00



## OPTO CD-100

The multi-counter combines a frequency counter and tone decoder in one hand-held package. It also reaction tunes many radios.

OUR PRICE **£349.95**

Opto Scout MkII down in price .....£299.95



## BA-928

WEATHER CLOCK.

- Weather forecast
- Atmospheric pressure (+ 24 hour history)
- Moon phase
- Wireless outdoor temp sensor
- Time/date/alarm
- Table & wall mount
- Incl's batteries + 1 outdoor sensor

**£89.95** P&P £2



## RM-913

RADIO CONTROLLED CLOCK.

- 12/24hr alarm function
- Auto clock from "Rugby" RF signal
- Alarm function
- Backlight & more
- Incl's batteries

**£11.99**

P&P £2

# Old Lessons, often repeated for the beginner

Having tried, tested and used a huge selection of top h.f. receivers, John Wilson G3PCY looks at the question "what makes a good receiver"?

**Fig. 1: Short wave spectrum from 5-15MHz, at 1930UTC, from a 10m end-fed wire.**

I first started listening to short wave radio about 50 years ago, and having spent my entire working career involved in (mainly) h.f. radio, it could be said that I have listened to most signals on a wide variety of receivers, including those in which I had a hand in producing, such as the 'HF' series when I was one of the owners of Lowe Electronics.

However, during the last few months, I have been privileged, thanks to the generosity of several private owners, to have tested and used a selection of the top h.f. receivers available today to hobby users. As I ploughed through the sometimes lengthy measuring sessions, I began to think again on the subject of 'What makes a good receiver?', because it became clear that the 'best' in terms of measured performance were not necessarily the 'best' when it came to settling down to use them on real signals.

## The Classic Series

My measurements on receivers are the classic series starting with r.f. sensitivity measured at different frequencies throughout the h.f. and l.f. range, in different reception modes and with different i.f. bandwidths. Straight sensitivity measurements are almost unnecessary these days, because most receivers will achieve at least -117dBm (0.3µV p.d.) for 10dB S+N/N (12dB SINAD) in s.s.b. mode with a 2 to 3kHz i.f. bandwidth.

In any case, at frequencies below 20MHz, the natural atmospheric noise will be higher than the noise floor of the receiver, and raw sensitivity will be unusable. In fact, for other reasons, excess sensitivity can be a drawback even though it is still the parameter most often quoted by the manufacturers of amateur radio transceivers. For the short wave listener therefore, take it that almost any receiver likely to be encountered on the

new or second-hand market will have adequate sensitivity for his or her needs.

## Third Order Intercept

A great deal has been said and written about the concept of defining the strong signal handling performance of a receiver in terms of the third order intercept point, and I think I have mentioned before that this is a theoretical extrapolation of measurements made at lower signal levels than the quoted intercept point itself. The basis of the measurement is that if you subject a receiver (or any other device, but we'll keep with receivers at the moment) to high level r.f. signals which are close together in frequency, any non linearity in the system being measured will cause intermodulation between the input signals and produce unwanted spurious signals which can themselves be received.

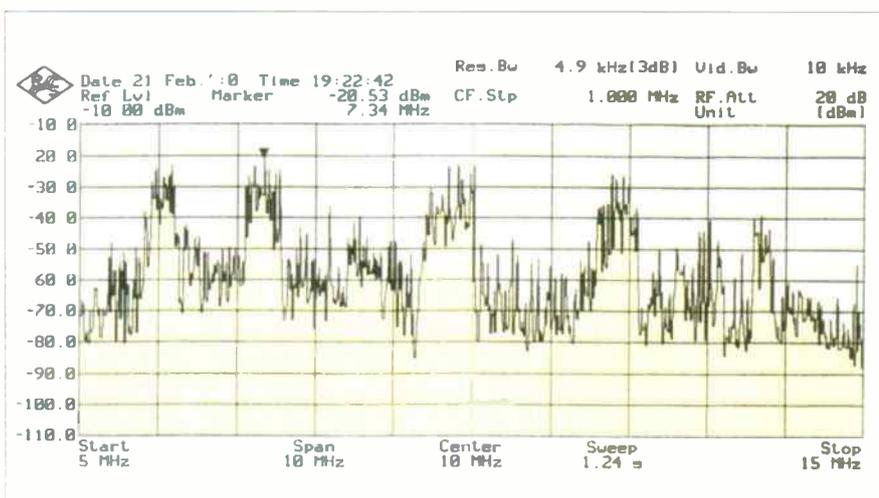
The two unwanted signals usually of interest to receiver users are the second order and third order products, and these are the two which I measure in my reviews. The second order products appear as the sum and difference of the two original test signals, and these products will appear at frequencies far removed from the original test frequencies.

The third order products are troublesome because they appear close to the frequencies of the originating signals, which in real life means that if you are trying to wrinkle out a weak signal in the close presence of very strong signals, the third order products from the strong signals may be of sufficient amplitude to mask the signal you wish to hear.

As a practical example, let me tell you what happens in my own measurements of third order effects. I use two very clean crystal oscillators spaced by 20kHz at frequencies of 14.038 and 14.058MHz. There's nothing magic about these frequencies except that they happened to be readily available off the shelf, and allow me to measure both general coverage and amateur band only receivers using the same crystals.

The third order products appear at  $2F_1 - F_2$  and  $2F_2 - F_1$ , where  $F_1$  and  $F_2$  are the crystal oscillator frequencies. You can work it out for yourself that the unwanted products appear at 14.018 and 14.078MHz, which are 20kHz above and below the two test frequencies. In other words, with a 20kHz spacing of the test frequencies, third order products will appear at  $\pm 20$ kHz. That's why the test is sometimes described as 20/40kHz.

Now take a real case - if you are listening on a short wave broadcast band where the stations are spaced by 5kHz, say 9.590 and 9.595MHz and the stations on those frequencies are very strong, a receiver with



poor third order performance will produce signals at 9.585 and 9.600MHz which may well cause problems for you if you are wanting to listen to genuine stations on those frequencies. In severe cases, you may well wonder why you can apparently hear two or three stations at the same time all on the same frequency. Now you know one possible cause.

## The Importance

All this preamble brings me to the crux of the matter: just how important is this in real life? It's all very well for owners of RA1792s to be safe in the knowledge that their receiver has a third order intercept point of +28dBm, but what does that really mean?

In testing third order performance you apply the two test signals combined and increase the level into the receiver until a third order product appears (and you know where it will be) at the same level as the noise floor of the receiver. The third order intercept point is then calculated from this and the dynamic range of the receiver.

In a 'good' receiver the third order product will appear with input test signals of something like -20dBm which means that real signals from an antenna of this level will begin to produce spurious products above the noise floor of the receiver. Do such signals exist in the real world?

Take a look at Fig. 1 which is a spectrum analyser plot taken at 1930 from a 10m long wire and a Martin Lynch balun, and shows the 49, 41, 31 and 25m broadcast bands in full swing, with signals approaching the -20dBm level - so, yes, the signals do exist, and they will cause unwanted signals to appear in your receiver.

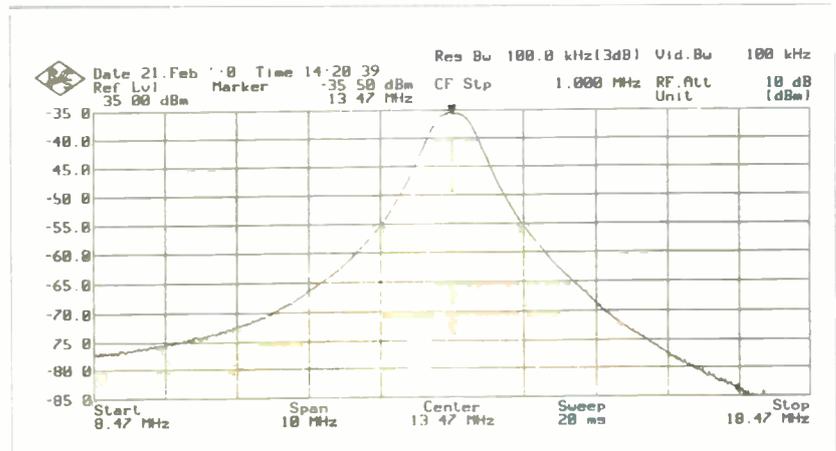
Is this important? Well, less important than you might think, because if the unwanted products of these strong signals are only just above the noise floor of your receiver, you ain't going to hear them anyway amidst the big ones. The other thing to remember is that being third order products, their amplitude changes at three times the rate of the original signals, so if you put a 6dB attenuator between the antenna and your receiver, the signals you want will only reduce by that amount, whilst the third order products will go down by 18dB and vanish underneath the noise floor.

That's why I stress the value of a 6dB stepped attenuator in the front-end of receivers, and it's also why my dear old Collins 515-1 with a measured third order intercept point way below that of the RA1792 will still perform like a dream providing I put in some front-end attenuation.

## My Interpretation

So what is important to the general coverage listener? Regular readers will know that I also measure the second order intermodulation performance, not as some professional receiver manufacturers do, but using my own interpretation of what happens in real life when you connect an antenna.

I use test signals roughly in the 49 and 41m bands (actually 6.5 and 7MHz) and look for the sum of these (the second order product) in the



22m band at 13.5MHz. Looking at Fig. 1 again you should be able to see why I do this, because the signals are massive at 49 and 41m, but much lower at 22m where the products appear and where they would cause reception difficulties.

Someone out there is already saying 'Oh here he goes again, banging on about preselectors', but I'll repeat what I have told you so many times. If you want to listen in a relatively quiet band but find loads of signals which shouldn't be there, it's

**Fig. 2: RF-590A preselector passband, 13.5MHz.**



**Rockwell Collins HF-2050**

quite likely you are suffering from second order intermodulation and all you have to do to cure the problem is to stop the big out of band signals from getting into your receiver in the first place - enter the preselector.

But beware! All devices called preselectors are not necessarily the same, and the units you see advertised as 'antenna tuners' do not even come close to doing a preselection job so forget them for now. If you take a second look at last month's review of the RF-590A receiver, you will see that I mentioned the presence of a preselector in the receiver I tested and also a reference to the 'white buffalo' effect - don't worry if you haven't a clue what I'm talking about, *Short Wave Magazine* regulars will explain.

## Signals Rejected

Imagine the preselector as a narrow gate which allows the signals you want to get to the receiver,

# Old Lessons, often repeated for the beginner



Harris RF-590A

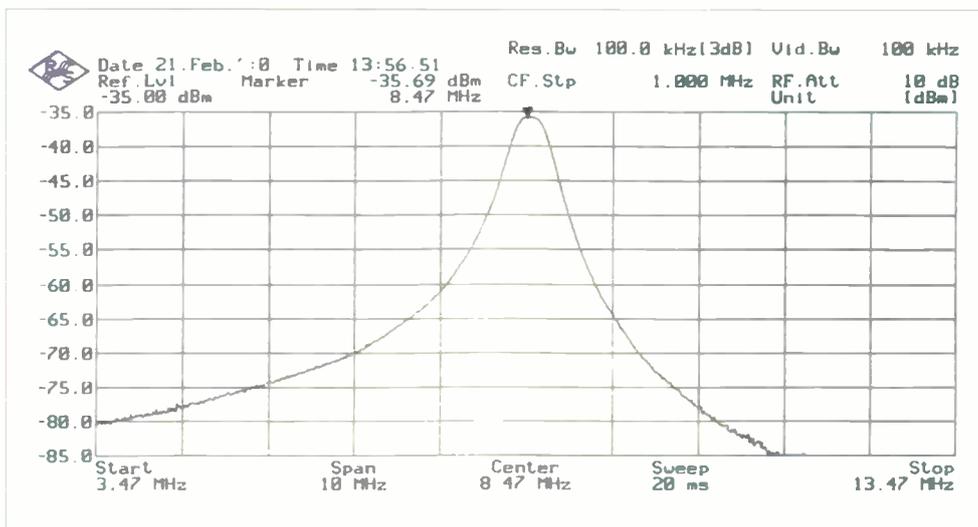
but which rejects the signals you don't want. The Collins HF-2050 (no preselector) had a second order intercept point of +50dBm, whilst the Harris RF-590A (preselector fitted) produced a figure of +85dBm. Putting that into real terms, intermodulation products audible at 13.5MHz were produced from signals at 6.5 and 7MHz with a level of -37dBm in the HF-2050, whilst the same signals had to be at a much higher level of -19dBm in the RF-590A to produce the same intermodulation.

Now take another look at **Fig. 1** and you will see that with typical signal levels from a modest antenna in the 6.5 and 7MHz region, the HF-2050 would be badly affected at 13.5MHz, whereas the RF-590A would be virtually unaffected. All because of preselection.

## Magic Gate

Just to prove that the 'magic gate' analogy is reasonable, I plotted the characteristics of the front-end selectivity of one or two receivers for your information. **Figure 2** and **Fig. 3** show the passband of the Harris RF-590A centred on 13.5

**Fig. 3: RF-590A preselector passband, 8.5MHz.**



and 8.5MHz, whilst **Fig. 4** and **Fig. 5** show the same passband plots for the Collins 51S-1.

It's obvious that the Collins has better front-end selectivity, and that is borne out by the fact that the 51S-1 outperforms the RF-590A in measured second order performance. Keep in mind that a plot for the front-end of the HF-2050 would be a straight line across the top of the graph, because there is no front-end selectivity.

Am I suggesting that second order performance is more important than third order? It all depends what you use the receiver for, and the background of receiver measurements starts around the time of an article in *QST* magazine in the 1930s entitled 'What's wrong with our

receivers?'. This of course was written from an amateur radio point of view and it seems to me, and I could be entirely wrong, that the whole history of performance measurement is tied up with the idea that digging out weak DX amateur signals in a band which is also populated with 'Californian Kilowatts' is the prime requirement, whereas this is not necessarily the case for receivers used for other types of listening.

It's also true that early receivers prior to the advent of the synthesised local oscillators appearance all had front-end selectivity ahead of the first mixer stage, so second order performance was always acceptable. The appearance of the electronically controlled digital synthesiser represented a step forward in ease of oscillator design, but I contend that it may have produced an accompanying backward step in overall receiver characteristics, because it meant the abandonment of front-end selectivity which is not so easy to obtain if you have a microprocessor driving the system rather than a mechanical rotating shaft through a capacitor.

There's more to it than that, but you see my point, and I remind you of my experiences with the Lowe HF-150 for which we had to design an outboard preselector because of second order

intermodulation problems in the wide open front-end of the original receiver.

## Reciprocal Mixing

This leads me to another aspect of receiver testing which is done under the heading of 'Reciprocal Mixing', and really concerns the spectral purity of the local oscillators used in the superhet receiver. If you apply two signals to a mixer (i.e. an antenna input and a local oscillator) in order to take out the intermediate frequency for processing, and one of the signals is spectrally clean but the other one carries noise with it, the noise will appear at the i.f. and hence degrade the performance of the receiver overall.

It doesn't matter which of the two signals is the noisy one, the effect is the same, so if we assume that the signal coming from the antenna is spectrally pure as the driven snow, but the receiver first local oscillator is noisy, the listener will hear the pure antenna signal with the local oscillator noise superimposed on it, and wrongly assume that it is the BBC who are guilty of radiating a dirty signal.

An experienced receiver user can often detect a noisy local oscillator by the simple act of slowly tuning to a clean unmodulated signal, such as the one generated by a typical 100kHz marker generator always found in older receivers for dial accuracy checking. If the signal suddenly appears and disappears as the receiver is tuned across it, there is a good chance that the receiver local oscillator is spectrally clean, whereas if you start hearing noise long before the marker signal came into the i.f. filter passband, it is an equally good bet that the local oscillator is noisy.

## Clean Crystal

When I test for third order intermodulation effects I use, as I said earlier, two very clean crystal oscillators at high levels and tune to the third order product. It's very noticeable that when I am testing a synthesised receiver, and it doesn't matter how expensive a receiver it may be, finding the low level third order product itself can sometimes be tricky because there are numerous squeaks, whistles and gurgles down there with it, whereas when I test a receiver with a crystal controlled first conversion oscillator, these ugly-gurglies are not there.

Last month in my review of the excellent RF-590A I included a couple of spectrum plots comparing the close-in noise of the RF-590A first conversion oscillator and the Collins 51S-1 crystal controlled first conversion oscillator. The differences are there for all to see, and to add to the information, I have this month included **Fig. 6** which shows the 5kHz spurs at each side of the RF-590A oscillator signal.

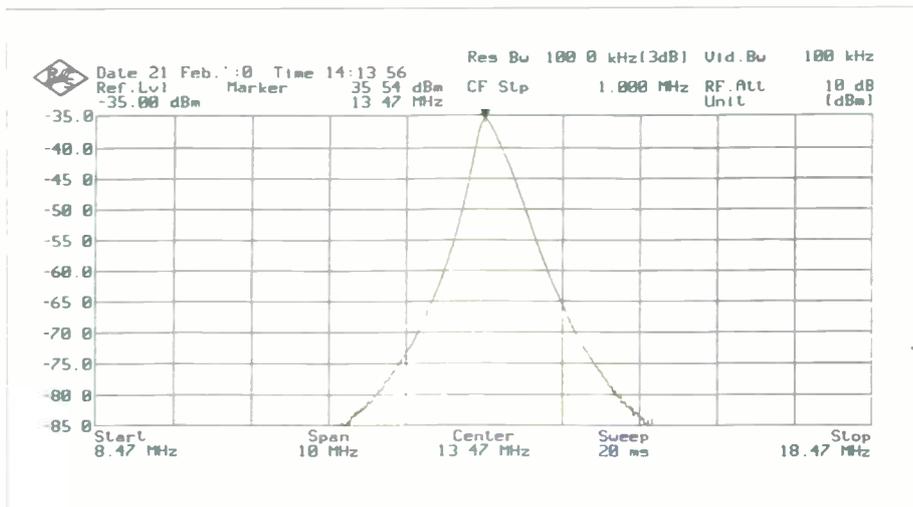
Another of my favourite receivers is still the Kenwood R-820, and **Fig. 7** shows the same close-in spectrum from the first oscillator on that venerable receiver - not bad, is it? I am sure that there may be those of you who consider this a bit nit-picking, but the human ear is a very fine measuring instrument, and noise at 60 to 80dB down on a signal can almost certainly be heard by the average listener, and certainly by the keen enthusiast.

Also as a tribute to the benefits of crystal oscillators in receivers, a bit more study of the graphs from last month will show that the 51S-1 oscillator noise is down by 100dB at just 300Hz from the signal whilst the RF-590A oscillator noise is only 70dB down at the same point and never gets better than 90dB down even further away.

## Joy To Own & Use

Lets have a summary: there are some receivers around which every

knowledgeable user, and not necessarily highly technical users, all agree are a joy to own and use. The RA1792 is one, almost anything from Collins prior to about 1970 falls into the category, even the 60 year old AR88 is a great receiver to use, providing you want a receiver which sits in front



**Fig. 4: 51S-1 preselector passband, 13.5MHz.**

**Fig. 5: (Below) 51S-1 preselector passband, 8.5MHz.**

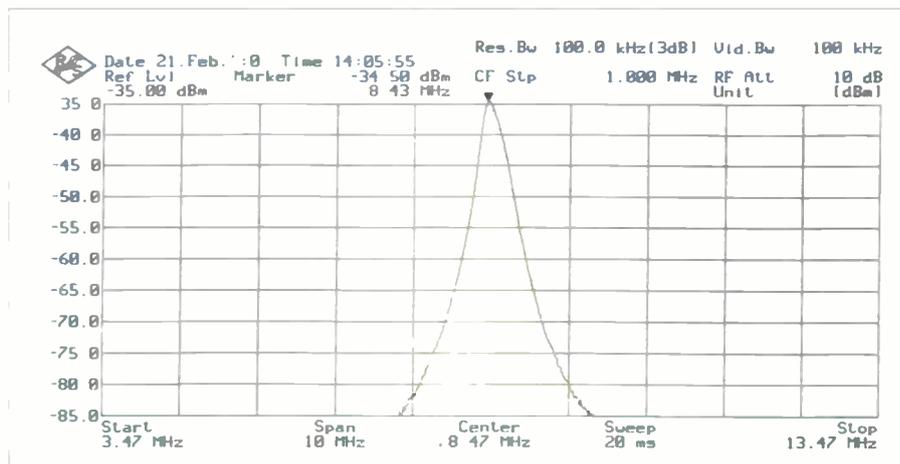


**Low HF-150**

of you and responds to skilful driving.

All such receivers feel 'right' to the human hand and produce good quality audio from the signals belting at them down the antenna line. I can only describe the overall effect of using these receivers (and of course there are more in the same category) as 'Smooth'.

**Continued on page 28...**



**FIRST IN  
Amateur  
Radio**

# Waters & Stanton PLC

Fax: 01702 205843

Enquires: 01702 206835  
01702 204965

22 Main Road, Hockley, Essex, SS5 4QS

For the very best Bargains & Secondhand Listings,

Visit: Our large Web Site [www.waters-and-stanton.co.uk](http://www.waters-and-stanton.co.uk)

Retail Mon-Sat 9.00 - 5.30pm

Secure e-mail order: Via our web site

General e-mail: [Info@wsplc.demon.co.uk](mailto:Info@wsplc.demon.co.uk)

Orders only

Freephone 0500 73 73 88

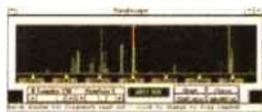
All OFFERS subject to availability



## Scancat Has Arrived!



Virtual Receiver



Spectrum Scope

Nothing Else  
Comes Close!

Control your radio from your PC. With virtual receiver (illustrated) your handheld becomes a base station receiver. Supports all data port receivers from AOR, Icom, Yaesu, Kenwood and some Bearcat. And you get the following exciting features.

- \* Unlimited memories
- \* Logging File
- \* Spectrum scope
- \* Personal data base
- \* 100 scan bands
- \* Access import
- \* CTCSS & DCS mode
- \* Voice recording
- \* Direct keyboard entry
- (SE version only)

**Scancat Gold** £99.95  
**Scancat Gold SE** £159.95  
Programmes for PC Windows  
Send for details

The latest version of this software is now available for immediate shipment.

### UBC-3000XL 25MHz - 1.3GHz



It has 400 channel memories, Automatic store and automatic sorting, Ultra fast scan rate, LCD backlight, 300ch per sec. scan rate, Data skip function. Supplied with AC adapter/charger and AA ni-cads.

£199.95



### VR-500 100KHz - 1300MHz



A true all-mode scanner offering great performance on VHF and UHF as well as the short wave bands with SSB coverage. 1000 memories, alphanumeric display, band scope, and PC programmable option.

Phone

NEW

### ATS-818 Short -Wave Portable



£129.95

#### SSB AM & Broadcast

A compact portable station that will pull in signals from around the world. SSB reception will let you hear radio amateurs and aircraft from the far corners of the world. There are 54 memories in which to store your favourite stations. Power is via 6 AA cells (not supplied).

### Super Searcher Auto Tunes Your Receiver

This frequency counter covers 10MHz - 3GHz and has the added ability to auto tune receivers with data ports. It will work with AOR 8200 and IC-R10 models. As soon as it finds a signal it tunes the receiver in a flash. Can also be used as a stand-alone unit. Supplied with ni-cads, charger and antenna.

£99.95



### Hunter Frequency Counter



Super Value

This is one of our most popular counters - and rightly so at the price! Supplied with rechargeable battery pack, AC charger and telescopic antenna. It has a range of several hundred feet (for handhelds) and sniffs out any local transmission, displaying the exact frequency. You then simply key that frequency into your scanner.

£59.95

### FC-130 Frequency Counter



1MHz - 3GHz

This frequency counter functions in a similar way to the "Hunter" above. However, it offers a wider frequency range down to 1MHz and has a 10 digit display. It also offers a 16 digit bargraph field strength meter. Supplied with ni-cad pack, AC charger and antenna.

£79.95

### AOR-5000 Receiver 10kHz - 2.6GHz

Covering an extremely wide frequency range and offering USB, LSB, CW, AM, FM. It features 1,000 Alphanumeric Memories \* 45 Channels per sec Scan Speed \* 2,100 programmable Pass Frequencies \* DTMF Decoder \* RS-232 Port \* 1Hz tuning steps \* 6 switchable bandwidths \* Preamplifier \* Duplex monitoring \*



£1395

### ICOM ICR-8500 Receiver 100kHz - 1.99GHz

Icom's wide range receiver has all the performance and engineering qualities you expect from this company. Features include USB, LSB, CW, AM, FM, WFM \* Wide dynamic range \* RS-232C interface \* 1000 alphanumeric memory channels \* Comprehensive scanning \* Sleep function and Timer \* IF Shift control \* 3 Antenna connectors \* Voice synthesizer option \* Keypad frequency entry \* Analogue S-meter \* Large LCD readout etc. Send for brochure.



£1395

### AOR-3000A Receiver 100kHz - 2036MHz

The AOR-3000A goes on and on. It offers a wide frequency range at a very competitive price. Features include USB, LSB, CW, AM, FM \* Fast 50 channels per sec search, \* GaAsFET RF amplifier \* Wide range of tuning steps from 50Hz \* RS-232 port \* 400 memory channels \* Built-in clock \* Channel pass feature \* Back illumination \* Rear whip antenna etc. Ask for leaflet



£699

### NEW 30kHz - 30MHz NASA HF-4E Receiver Computer Compatible FREE Software Disk



£199

This new receiver covers 30kHz to 30MHz and is designed for SSB, CW and AM reception. A much improved version of the Target HF-3, it is fitted with 2.6kHz SSB filter, advanced mixer design, backlit display, active antenna facility, and computer output. Included in the package is a software disk and 12V AC mains adapter. Optional self-powered active antenna £59.95

### IC-R75 Receiver 30kHz - 60MHz

FREE AC PSU & DSP Unit



The IC-R75 has received rave reviews in the Amateur Radio Press. It's a very serious short wave receiver with coverage right up to the exciting 6m Ham Band. Features include USB, LSB, CW, AM, FM \* 101 Memories \* Super High Dynamic Range \* Synchronous AM detection \* Twin Pass band Tuning \* Digital Signal Processing \* Automatic Notch Filter \* 101 Alphanumeric Memories \* RF Gain/Squelch \* Clock \* Numenc keypad \* Attenuator \* 2-level Pre-Amp \* Scanning.



£629

### YAESU FRG-100 Receiver 50kHz - 30MHz

The FRG-100 has stood the test of time. It offers full coverage of the short wave bands plus long wave and medium wave. It features, \* USB, LSB, AM, CW, \* 50 memories \* 2 stage attenuator \* Noise Blanker \* Band Scanning \* Memory Scanning \* Dual Speed AGC \* High and low impedance antenna inputs \* Programmable steps from 10Hz - 1kHz \* Optional Narrow Filters, PSU and FM board \* BFO reverse for CW \* Twin Clocks. Ask for leaflet.



£389

### 0kHz - 32MHz AOR-7030 Receiver

Needing little introduction, this receiver has become a classic of design. Features USB, LSB, CW, AM, FM, \* 100 Memories \* Dual VFOs \* Resolution to 10Hz \* Clock and Timer \* Variable Bandwidth \* Wide Dynamic Range \* Seamless Tuning using Single Loop DDS \* Clear LCD Readout \* Infrared Remote Controller \* AC Power Supply. Send for leaflet.



Phone

### Fairhaven RD-500VX 20kHz - 1.75GHz



Phone

This very wide range receiver offers a complete listener station in one package. Features include USB, LSB, CW, AM, FM, Video out \* 5Hz step accuracy \* Over 13,000 memories with 20 Alphanumeric Characters \* Noise Blanker \* Text Search \* Pass Band Tuning \* Stereo CW Reception \* Notch & Peak Filter etc.

# We Will **BEAT** Competitor's Prices

Match or **Phone** **wspic.com** is coming **CHECK IT OUT!**

On genuine UK Stock

## Yupiteru MVT-9000EU Mk2

100kHz - 1.99GHz

**Phone**

**Latest MK2 Version**

Here's your chance to purchase the latest scanning receiver from Yupiteru at an unbelievable price. Covering the complete radio spectrum from long wave to UHF, you have a complete station in your pocket. Features include NFM, WFM, NAM, WAM, LSB, USB, CW, \* 7 Frequency steps \* 1,000 Memones in 20 banks \* 500 Pass channels \* 10 Priority channels, \* Band Scope display \* Duplex receive function lets you hear both sides of the conversation \* Fast tune function, \* Built-in AM antenna \* Dual frequency display \* Fast keypad entry, \* Rechargeable batteries, AC charger and helical antenna.



**Phone**

## Yupiteru MVT-7100EU

100kHz - 1.65GHz

Probably the best value for money, it has stood the test of time and is very sensitive. Offers USB, LSB, CW, AM, FM, WFM, \* 1,000 memones \* 500 Pass channels \* 12 Tuning steps \* Fast scan speed \* Rechargeable batteries, AC charger and telescopic antenna.

## Yupiteru MVT-7000EX

100kHz - 1.3GHz

The ideal scanner for those who are mainly interested in VHF and UHF listening. Features include, FM, WFM, AM reception \* 200 memories in 10 banks \* 20 steps per sec scanning \* 6 Tuning steps \* Good sensitivity \* Supplied with rechargeable ni-cads and AC charger. Telescopic antenna included.



## AOR-8200

500kHz - 2040MHz

This wide range scanner is fitted with a data port for computer control. Features include USB, LSB, CW, FM, WFM \* Programmable steps \* 1000 memories in 20 banks \* Alphanumeric display \* Built-in AM antenna \* 8.33kHz steps for air band \* Rechargeable ni-cads, AC charger and helical antenna.

**Phone**

## IC-R10E

500kHz - 1300MHz

USB, LSB, CW, AM, FM, WFM \* 1,000 Memories \* Bandscope \* Noise Blanker \* Wide range of tuning steps \* alphanumeric Display \* Real Time Band Scope \* Voice scan feature \* Data output port \* Programmable scanning \* Ni-cad pack, AC charger and helical antenna.



## IC-R2

500kHz - 1309MHz

This palm size handy offers great performance. Offers FM, WFM and AM \* Auto squelch \* 400 Memories \* 11 Tuning steps \* CTCSS decode \* Duplex monitoring feature \* PC Programmable \* Built-in attenuator \* Priority watch \* Needs 2 x AA cells (extra). Antenna included.

**£129**

## ICOM New ICR-3E Scanner WITH TV RECEPTION!

**Phone**

- \* NISTC/PAL TV Receive.
- \* Wideband AM & FM Receive (No SSB)
- \* 496 KHz - 2450 MHz frequency coverage.
- \* Memory: Extensive Storage.
- \* Display: Detailed data control display.
- \* Dual Receive.
- \* AC charger and batteries included.

Icom have launched a new scanner with a built-in TV receiver. So when there is nothing to listen to, you can watch the pictures. You will need to be in a good signal area to get best results.



## UBC - 220XLT Handheld Scanner

**£119.95**

Ideal for general listening, this scanner covers all the major bands from 66MHz - 956MHz AM and FM. 200 memories and a very fast scanning speed make this a very attractive buy. You also get the flexible short antenna, AC charger and batteries. Very popular with Airband listeners.



## Double Your Life!! NiMH Cells

These Nexcell Ni-MH cells have around twice the capacity of ni-cads and no memory effect. The AA size are 1350mAh. Ideal for handhelds and digital cameras. As supplied to the police.

- 4 x AA cells £9.95
- 4 x AAA cells £9.95
- Charger for above £9.95

Carriage £2 maximum. Quantity discounts - phone.



## ICOM PCR-1000 Computer controlled Receiver

10kHz - 1300MHz

Mode: USB, LSB, CW, AM, FM, WFM.

Connect this up to your PC and enjoy high quality reception with an amazing station data base and memory log. Can be used remotely from PC. Requires PC not included.



**£279.95**

## Hoka Gold-3 Decoding Software



**THE SECRETS OUT!**

We are now the UK distributors. As used by governments, it can decode just about any form of data transmission on HF and VHF. Simply connect between PC and Rx audio. Can be loaded on any number of PCs. This is very advanced programme. **£349.95**

## NEW Route Finder (Europe) Software

Route Finder Europe

Route Finder United Kingdom & Ireland

**£9.95**

- \* Optimum route between start location and destination in seconds
- \* Details the distance and time for a planned route
- \* Covers 26,798 locations and 328,982 miles of road
- \* Provides two levels of route information
- \* Provides five levels of map detail
- \* Includes a ZOOM facility on the map section

## FB1 - 9 Skin Coloured Earpiece **£9.95**

The FB1-9 is a brand new design that is skin coloured to make it far less obvious when worn. The cable and cable exits will take a strain of 12kg so it won't break in commercial applications.



## W-LWB MkII Long Wire Balun



Just attach any length of wire and feed back to radio with coax cable. Reduces interference and improves matching to receiver. **£22.95**

## AT-100 Active Antenna

Intended for indoor use, the unit has a telescopic antenna. Dramatically improves reception. Adjust controls for maximum signal. Powered by internal 9V cell or external supply. **£79.95**



## Ant-60 Wire antenna

This 7m long shortwave antenna coils up like a tape measure. Pull it out and attach the input end to your receiver socket or whip antenna. Idea for portable or vacation use. **£14.95**



## WS-Desktop

The answer to those who want to improve the scanner performance using an indoor antenna. Covers 25 - 1300MHz and includes coax cable terminated with BNC plug. **£49.95**



## WS-Mobile Antenna

Just 0.9m high with magnetic base and 4m cable terminated with BNC plug. Covers 25 - 1300MHz and is the ideal choice for scanner users. **£24.95**



## SWL DX-1 HF Ant.



Covers 1.5 - 30MHz and is 50m long. With 10m feeder wire back to receiver. An ideal general purpose antenna. **£25.95**

## Global AT-2000

The classic wire antenna tuner for short wave listening. Covering 1.8 - 30MHz, it includes our exclusive Q-switch, which improves front-end selectivity. Just connect a random length of wire and connect a coax cable from ATU back to receiver. **£89.95**



## Angler HF/UHF Antenna



Ideal for scanners, this antenna is 14m long and covers the range 100kHz - 1300MHz. It includes coax cable terminated with BNC plug. **£19.95**

## QS-300 Desk Stand

Designed for all handheld scanners. Your scanner sits on the adjustable holder and a short BNC cable runs to an SO-239 socket, ready for you to plug your external antenna into. A really smart device. **£13.95**



## WS-Base Discone

The classic antenna covering 25MHz to 1300MHz. Ideal for all scanners. Height is 1.2m. Just connect coax cable to the SO-239 socket. Suitable for indoor or outdoor use. **£49.95**



## Leather-Look Holder

This leather-look holder is machine stitched and will take your medium sized scanner or handy and offers you wallet storage space with a separate zipped compartment and dividers. Includes belt loop and carry strap. **£9.95**

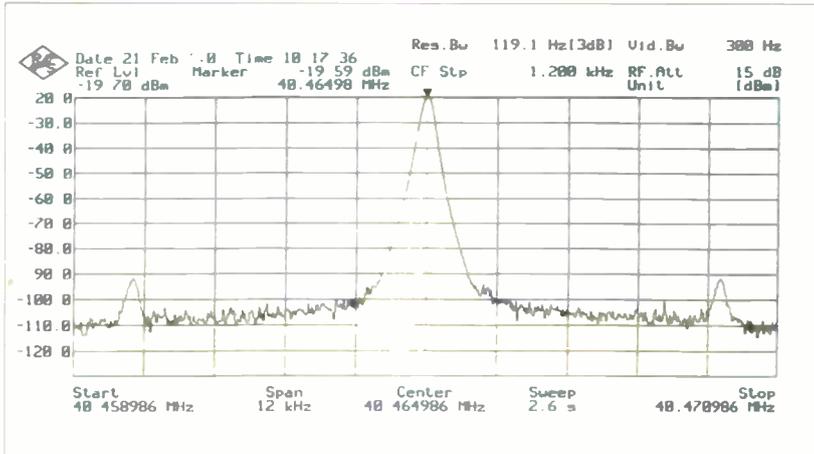


## QS-400

This new mount clips on to the dash grill. The sprung fingers, and bottom support, secures any size of handheld firmly in place. Features quick release grip for easy removal of handheld and also includes angle adjustment. **£9.95**



# Old Lessons, often repeated for the beginner



...continued from page 25

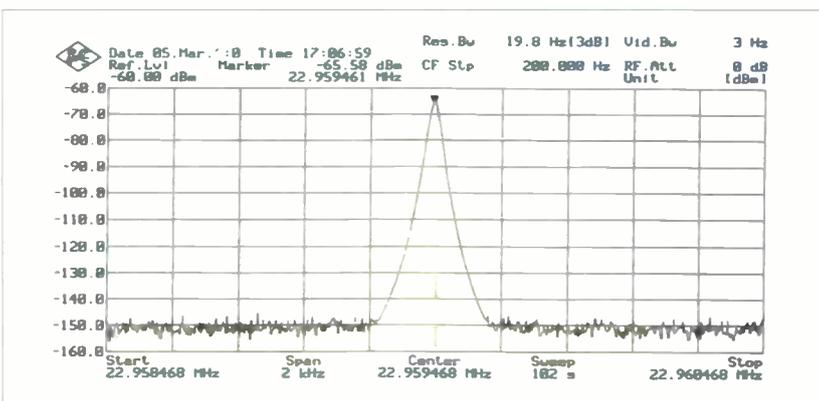
Receivers like this are ideally suited to the person who likes to sit down and actually drive them, and could well not be right for the more up-to-date (and probably younger) person who wants control from a keyboard or who prefers to have a huge bank of frequencies in memory channels which the receiver itself, or an accompanying

Racal RA1792



Fig. 6: (Top) RF-590A spurious signals at  $\pm 5$ kHz on synthesiser.

Fig. 7: R-820 bandwidth 14MHz, local oscillator spectral purity.



to poor control layout. I can quote one or two examples, but should perhaps be reticent in the pages of a magazine...

## Second Before Third

For my own listening, I would put second order performance before third order, which inevitably means good front-end selectivity, spectral purity of conversion oscillators before fast frequency hopping and traditional i.f. filtering before digital signal processing (d.s.p.). The RF-590A is the closest I have come to in recent receivers, but for sheer pleasure and certainly for low noise in the signal conversion path, I keep going back to a receiver with crystal controlled first conversion - the Collins 51S-1.

The one thing I do miss is fully variable i.f. selectivity of the type found in the Kenwood R-820 or some Icom receivers. I know that this is one of the features which d.s.p. can bring, but frankly, the d.s.p. receivers I have tried out for myself have not provided easy listening and lead to 'ear fatigue' after a while. I, and many real aficionados, also want a receiver front panel which is big enough to accommodate control knobs fit for human beings to use, and have a dedicated control for every function. It's just got to be an RA1792 until I find something better, but I'm still looking and am open to persuasion.

## Hallicrafters Resurrected

Finally, I have just resurrected a Hallicrafters SX-117 dating from about 1962, about the same era as the 51S-1, but this was a receiver aimed at the top end of the amateur market. I used one of these in conjunction with a matching Hallicrafters SR-150 transceiver when I lived in Lagos and operated as 5N2AAC, so I have a particular affection for it.

The reason for my taking it down from the shelf is that it too uses crystal controlled first conversion, so I'm going to do some measurements on it and see how it matches up to the super receivers of forty years later. First impressions reminded me of a comment I read in a review of the SX-117 which called it 'eerily quiet', and it certainly is. Connect it to an antenna however, and all the signals are there.

Dial calibration is a joke by today's standards, and this is one receiver you have to spend time 'tuning around' to find the signal you want to hear, but once on frequency it stays put, and it's already giving me a great deal of nostalgic pleasure. I'll tell you more later, if the editor allows me to keep looking back at these veteran high performance receivers.

## Finally, Finally

I took a closer look at the dealer's advertisement which offered some lovely Collins receivers and noticed that the Collins 32S-3 described as 'the most desirable receiver - super rare'. It ought to be super rare because the 32S-3 is an h.f. transmitter with a pair of 6146 valves in the p.a. and not a receiver at all. Happy listening. **SWM**

# Radio Propagation 'Hindcasting'

What is hindcasting and why would you want to use hindcasting? Jacques d'Avignon explains the technique, by using an example of a hindcasting research project that he has been involved in for many months.

If it is possible to prepare fairly accurate radio propagation forecasts to help the users of the short wave spectrum manage their resources at peak efficiency, is it possible to do some 'hindcasting'? The answer is 'Yes'. I can hear the next questions: 'what is hindcasting?' and 'why would you want to use hindcasting?'.

Hindcasting is taking a look back at what the radio propagation conditions were during a certain period from the past, and using the actual recorded geophysical indices, (10cm solar flux, SunSpot Number or T-index) to derive some conclusions as to the maximum usable frequency (m.u.f.), the OWF (Optimum Working Frequency) that could have been present on those days.

The actual 10cm solar flux value or SSN for days in the past months or years is much more accurate than the values used for forecasting. The forecasting values are normally extrapolated fairly accurately, but are never 'right on'.

So, why would you do hindcasting? The best way to explain what uses hindcasting has is to use an example of a hindcasting research project that I have been involved in for many months.

## Research Project

In early 1990, a series of coded broadcasts, similar to broadcasts destined to various embassies and/or operatives, were being regularly intercepted in North America as they had for many years previously. The ultimate recipients of these broadcasts were not only unknown, but the actual location of the receiving sites was also elusive.

The callsigns of the receiving/destination stations did not conform to the normal ITU (International Telecommunications Union) format or to the international allocation listing for callsigns. Some receiving site locations were suspected, but their exact location could not be confirmed by any normal interception and/or by attempting to decode the messages.

Some of the parameters of these transmissions were known. The transmissions to a specific terminal station were always done at the same times of day and the frequency sets seldom varied. In some cases, two sets of frequencies were being used each day, but at different times of day.

Because of the apparent content of the traffic exchanged and the few comments made by the operators between themselves, comments that were not encoded, the suspected destination sites were presumed to be embassies in North, Central and South America.

## Location Known

One fact that was known with a certain amount of reliability was the location of the main transmitting station that acted as the hub of this elaborate radio network. According to the freely available literature at

```
-----
ASAPS V4.0 AREA PREDICTION ----- 17 Feb 2000
-----
Area 1: london to Europe
Tx: london 51.50 -0.19
FSet: broadcast
Bandwidth: 3 kHz
Required S/N: 30 dB
Best Usable Frequency UT 17
Path: Short Path
Noise: -145 dBW/Hz
Power: 100 kW
Date: May 1995
T-index: 3
TxAntenna: HLP
RxAntenna: HLP
Min.Angle: 3 deg.
-----
```

the time and other reliable sources of information, this central transmitting site was located in the Caribbean.

The suspected terminals of the various circuits were: Buenos Aires, Montevideo and Lima in South America; Managua in Central America; Washington, New York, San Francisco, Ottawa and Montreal in North America. In addition three other sites have, to this day (this network is still operational),

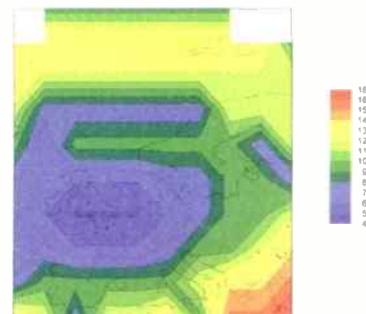


Fig 1.



```

-----
ASAPS V4.0 AREA PREDICTION ----- 17 Feb 2000
Area 1: London to Europe              Date: September 1958
Tx: London      51.50  -0.19          T-Index: 108
FSet: broadcast                               TxAntenna: HLP
Bandwidth: 3 kHz                             RxAntenna: HLP
Required S/H: 30 dB      1Days: 90         Noise: -145 dBW/Hz
Best Usable Frequency  UT 17              Min.Angle: 3 deg.
-----

```

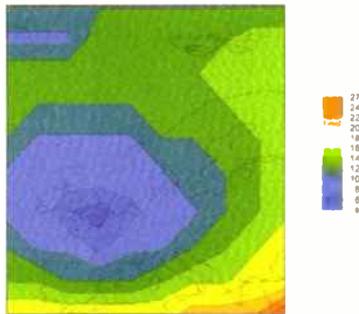


Fig. 2.

eluded all sleuthing efforts and their possible location is still shrouded in mystery. Could these last three sites be mobile units?

A comprehensive and voluminous log of intercepts that included the following information: date, time, frequency set(s), had been accumulated and was used to prepare some hindcasting. A large set of propagation hindcasts were prepared using the known frequencies, date and time

and using the suspected hub of the network as the transmitting centre and inputting the suspected locations of the destinations as the receiving terminals of these circuits. It was then possible to arrive at a best fit of the time and frequencies set for each possible circuit and also to eliminate with certainty certain impossible circuits.

### Original Assumptions

This exercise allowed us to confirm most of the original assumptions as to the locations of the receiver terminals, and it also confirmed the assignment of a callsign to a specific receiving site. In one case, this research was able to confirm that the presumed receiving terminal of a circuit was definitely not Washington, as originally suspected, but instead possibly New York City.

When you do some hindcasting, for example, it becomes very clear that it would be impossible to communicate reliably on a specific circuit using a frequency of 19MHz, if on that date and at that particular time, the m.u.f. on that particular circuit is only 8MHz!

A good example can be found in Fig. 1 computed at the lowest part of the 10cm flux cycle in May 1995. The transmitter is located in London and it would be futile to try to pinpoint a receiving site in the Scandinavian countries if the frequencies transmitted were in the 16 or 18MHz slice, but it would be conceivable that the receiving station could be located in the Eastern part of the Mediterranean and could be using a frequency set in the range of 14 to 18MHz.

In Fig. 2 calculated for September 1958, if the frequency set is in the 8 to 14MHz slice, the receiving station(s) could be located practically anywhere in Europe, but in this case we could probably exclude the Eastern part of the Mediterranean.

Thus hindcasting provides multiple answers that become pieces of a puzzle where you fit the pieces

### Web Sites

Anyone interested in learning more about some of these elusive stations and some of the traffic that they handle should consult the following web site: <http://www.dxing.com/intrigue.htm> - and others dealing with these fascinating stations/circuits.

using the best fit possible. After achieving the best possible fit for many time/day combinations, a pattern hopefully will emerge and it then becomes clear that one of the receiving sites is located in a specific area and not somewhere else.

The larger your collection of 'best fit pieces' grows, the more reliable your pinpointing of the receiving site becomes by reducing substantially the size of the possible area where this receiving station could be located.

### Interesting Finds

You can come up with some 'interesting' finds when you proceed to do more and more hindcasting calculations. During the 1993 exercise, it was originally assumed that the receiving terminals were all located in North or South America. While processing the data it became clear that one receiving site might have been outside this hemisphere.

A larger net was cast and an area in Western Africa showed up as a possible area where a receiving station could have been located. By doing the same exercise today with more current data, this West Africa area has been eliminated, but a doubt still subsists in my mind that there might have been a circuit terminal located in that part of the world during the early 1990s.

There are still many stations today whose locations elude the listeners. Some 'number stations' and the single letter beacons are but two examples. No one really knows with great assurance where they are located nor what is their real use.

I would venture a guess that there is hindcasting being presently done to try and pinpoint their exact location, but this can be a very labour intensive exercise due to the large amount of data required for analysis. In the 1993 project, we had a very good idea where the hub of all these circuits was located, this fact made our work much easier.

### Pinpoint Location

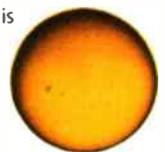
Hindcasting is probably used by many armed services and intelligence establishments around the world today to try and pinpoint the location of these elusive stations. The difference between the numbers stations and the single letter beacons and the project that I was involved in back in 1993 is that very little is known with certainty as to where the single letter beacon transmitters are located, and we had very good information as to the location of 'our' transmitter.

The receiving stations for the number stations can be located anywhere in the world making it very difficult to make assumptions as to their locations. Hindcasting in these conditions becomes a very large puzzle with an extremely large number of 'best fit' possible.

### Last Question

The last question that some readers will probably be asked is the following: 'Is it possible to do hindcasting of weather related phenomena?'. Yes!

For example, historical weather maps and records can be consulted to help find out what has been the worst wave height that occurred at a specific point on the coast and then postulate what will be the worst 100 year wave height at the same location. This knowledge will be taken into account if you decide to build a seawall or a wharf. Again, the more data that you have at your disposal the more accurate your results will be.



# R-BY BEING BETTER!

Our new 11,500 sq ft distribution centre and showrooms, dedicated to **SHORTWAVE, SCANNING & AMATEUR RADIO** are now open. We have packed the warehouse full of new products with a huge selection of opening offers. We are just 2 minutes from the motorway - with a massive car park, so why not pop in and say hello. Remember we use Amateur Radio on the air everyday - your guarantee of expert, impartial and friendly advice.

**- SEE YOU SOON!**



**ROBERTS R828**  
with cassette media + cassette records

**£199**

- 150kHz - 30MHz
- Rec SSB & CW
- 5 Tuning methods
- Time recording from radio
- S Meter & Battery indicator

**FAIRHAVEN RD-5000**  
NEW UPDATED MODEL - 20kHz - 1.7GHz

**£799**  
~~£829~~

**IN STOCK**  
READY TO SHIP

**NEW! ICOM IC-R75**

The LATEST HOT Receiver from ICOM

**£699**  
~~£749~~

- 0.03 - 60MHz
- Twin PBT built-in
- Synchronous AM detection
- PC control capability

**GRUNDIG YB400**

**PORTABLE SW RADIO**

"Best performance for price size category, and among the choicest portables of any size, at any price"

"The 400's FM performance is right up there with the very best among world band radios"

Passport to World Band Radio

- General coverage receive (144kHz - 30MHz)
- SW: 1.711-26.1MHz
- FM Stereo: 87.5-108MHz
- MW/LW/SSB reception (both USB/LSB) (± 1kHz fine tuning)
- 40 station preset
- Fine tuning
- Dual alarm clock
- Narrow/Wide bandwidth
- DX/Local sensitivity
- Auto Search
- Sleep timer
- Snooze timer
- Mains or Battery powered (with optional mains adaptor)
- Supplied c/w
- SW Handbook
- Carrying case
- Ext Wire Antenna
- Carry Strap

**£120**  
~~£130~~

**ROBERTS R861**

**£199**  
~~£179~~

**Synthesised Receiver**  
FM Stereo/MW/LW/SW PLL

- 307 memories
- ATS auto scan
- E2 PROM for mem
- FM stereo via earphones
- 29 pages SW stations memory
- 8 characters for editing station name

**PRICE MATCH**

**YAESU FRG-100**

This receiver provides solid coverage from 50kHz to 30MHz with all mode reception of AM, SSB and CW. The set requires 12V DC.

**£399**  
~~£429~~

**ICOM IC-R8500**

YES, we've got them IN STOCK!

This receiver is everything we hoped it would be, covering 100kHz - 2GHz and lots of features including computer control. PAY BY 3 POST DATED CHEQUES!

**£1599.99**  
~~£1699.99~~

**ROBERTS R881**

**£79.95**

- FM/MW/SW
- 45 Station Pre-sets
- Automatic preset system
- Direct keyboard tuning
- Alarm/timer
- 12/24 hr clock
- Keypad
- FM thru earphones
- Carry pouch

**ICOM PCR 1000**

- 100kHz - 1300MHz
- ALL MODE RECEPTION
- PLUS LOTS MORE!

**£349.95**  
~~£320.00~~

PCR OPTION DSP UNIT UT 106  
~~£82.00~~

**5A VEGAN AT5909**

ULTRA COMPACT  
Digital Multiband  
Radio with SSB

- Covers: FM Stereo MW/LW/SW
- 307 memories
- Auto Tune System
- RDS (Radio Data System)
- Plus LOTS MORE!

**£169**  
~~£200~~

OPTIONAL MAINS ADAPTOR **£9.95**

**GRUNDIG YACHT BOY 218**

WORLD BAND RECEIVER

- MW/FM stereo
- SW 7 broadcast bands 16/19/21/25/31/41/49 Mtr
- Auto frequency control
- Clock with many features
- Supplied c/w leatherette carrying case & earphones
- Mains or Battery (Optional AC adaptor)

**£47.50**  
~~£50.00~~

**ROBERTS R809**

- PLL multi-band digital preset stereo world radio
- 5 tuning methods & 54 preset stations
- Dual time display
- Clock/alarm
- Complete with soft carrying pouch
- Cont. AM coverage 150kHz - 29.999MHz

**£100**

**JRC VRD-545**

TOP OF THE RANGE WITH DSP

- LSB/USB/CW/RTTY/AM
- 100kHz - 30MHz
- Noise Reduction
- Notch Filter

**£1,599**

VHF CONVERTER 30 - 2000MHz  
**£299**

**SANGEAN AT5818**

UNBEATABLE VALUE FOR MONEY!

SW WITH SSB

- 150kHz - 29.99MHz
- 87.5MHz - 108MHz
- 54 memories
- AM/FM/SSB
- AM Wide/Narrow filter
- RF gain control

**£129**  
~~£149~~

OPTIONAL MAINS ADAPTOR **£9.95**

**GRUNDIG PORSCHE P2000**

A stylish radio designed by F.A. Porsche

- FM Stereo
- AM/FM/MW 13 SW bands from 2.3MHz-26.1MHz
- 20 station presets
- Auto search
- Clock, alarm, sleep function, world times
- Supplied c/w leather cover & in-ear stereo headphones
- Mains or Battery (Optional AC adaptor)

**£89.95**  
~~£99.95~~

**ROBERTS R876**

- FM/MW/LW
- SW: 1.711 - 30MHz
- Auto tuning system
- Clock/alarm
- Complete with adaptor, antenna, stereo headphones, soft carrying pouch

**£130**

**AOR AR 5000**

**IN STOCK**  
READY TO SHIP

**£1,445**  
~~£1,395~~

- 10kHz - 2.6GHz
- All mode top class receiver and scanner packed with features

**AOR AR 5000+3**

**IN STOCK**  
READY TO SHIP!

**£1,699**  
~~£1,599~~

- 10kHz - 2.6GHz
- The Plus 3 has factory fitted options, noise blanker, synchronous AM & automatic frequency control pre-installed

**KENWOOD TS 570 DGR**

Kenwood's latest 'HOT' transceiver modified to receive only - with DSP, large display, CW auto tune. One of the most impressive receivers on the market. Covers 1 - 30MHz

**£749**  
~~£999.95~~

**SCANMASTER SP55**

WIDEBAND PREAMP

Improve the reception of your scanner!

- 24 - 1500MHz
- Variable gain (-3dB to +20)
- 3 bandpass filters
- Battery or 12V operation

**£59.95**

**AOR AR 3000A**

**SHIPPED TODAY!**

**£799**  
~~£749~~

- 100kHz - 2036MHz
- Classic receiver as used by Government, Military etc

AR 3000A + ..... ~~£259~~ **£799**

**AOR AR 7030**

**SHIPPED TODAY!**

**£799**  
~~£749~~

- 0kHz - 32MHz
- High dynamic range short wave receiver HAD MANY RAVE REVIEWS WORLDWIDE!

AR 7030 + ..... ~~£949~~ **£849**

**AKD HF3 5**

**SHORTWAVE RECEIVER**  
30kHz - 30MHz

**£159.95**  
~~£189.95~~

**Palstar AM30**  
Active Antenna/Preamplifier

- ACTIVE ANTENNA
- SHORTWAVE PRE-AMPLIFIER
- ACTIVE ANTENNA/TUNER
- Freq: 100kHz-30MHz
- Power: 12V DC/battery (supplied)
- Antenna: Telescopic whip, included for use as an active antenna

**£69.95**



## ITS EASY TO PAY - Pay by three post dated cheques!

- Simply divide the price into 3 equal payments. (ON ANY ITEM OVER £100)
- Write 3 cheques dated in consecutive months starting with today's date.
- Write your telephone No, cheque card No & expiry date on the back of each cheque.
- Post them to us, enclosing your name & address & we will (subject to status) send your goods immediately.



# TAKE OUT A NEW ONE YEAR SUBSCRIPTION TO SWM AND RECEIVE A £5 GIFT VOUCHER\* (TO SPEND ON ANY SWM SERVICE)

Whether you're brand new to the hobby of radio monitoring, or a seasoned DXer, there is something in *Short Wave Magazine* for you every month!

By subscribing to *SWM* each month, you also get the extra benefits of:-

- ★ Seeing your copy before it gets to the Newsagents.
- ★ Ensuring that you're right up-to-date with all the latest news and reviews.
- ★ Checking out all the 'Trading Post' bargains first.
- ★ Having *SWM* delivered direct to your door every month.
- ★ And when you subscribe this month, you will also receive a **£5 gift voucher** to spend on any *SWM* service.

Taking out a subscription to your favourite magazine couldn't be easier! All you have to do is fill in the Order Form on **page 84** of this issue, or call the **Credit Card & Order Hotline** on **(01202) 659930** and quote **500/SWM**.

**Crammed full of essential information for any radio enthusiast - can you really afford to be without your monthly *SWM*?**



### Subscription Rates (single year)

	SWM	PW	Joint
UK	£33	£28	£55
Europe Airmail	£40	£35	£68
Rest of World Airmail	£50	£45	£85
Rest of World Airsaver	£44	£38	£74

\* OFFER EXPIRES 25 MAY (UK), 22 JUNE (OVERSEAS).

# MONITORING TIMES

2 issues

# FREE

Subscribe to *Monitoring Times* and get 2 issues absolutely FREE

For the true state-side perspective on the world of radio monitoring, *Monitoring Times* is a must for your shack with its variety of topical articles, news, views and extensive English language short wave broadcast guide. Incorporating *Satellite Times* exploring all aspects of satellite communications and covering commercial, military, broadcasting, scientific, broadcast, personal communications and private satellite systems. Published monthly.

**P W Publishing Ltd.**  
**Arrowsmith Court**  
**Station Approach**  
**Broadstone, Dorset BH18 8PW**

**Tel: (01202) 659930**

**Fax: (01202) 659950**

**E-mail: bookstore@pwpublishing.ltd.uk**



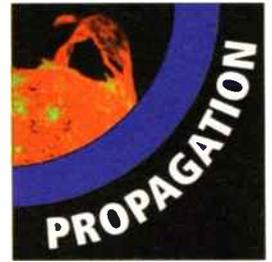
Subscription rates (14 issues)	
£38.00	.....UK
£42.00	.....Europe (Airmail)
£49.00	.....Rest of World (Airmail)

Offer ends May 31, 2000

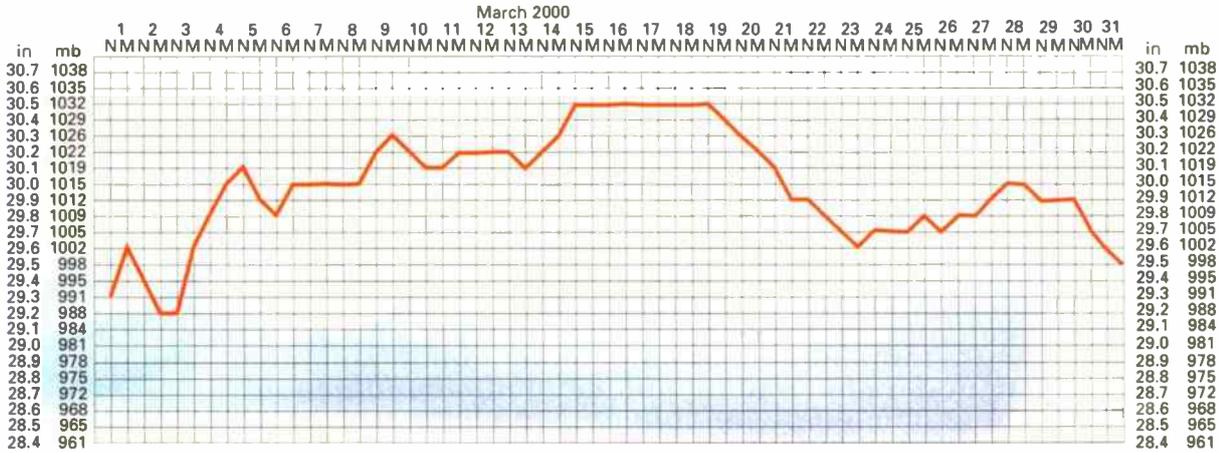
■ KEVIN NICE G7TZC, SWM EDITORIAL OFFICES, BROADSTONE ■ E-MAIL: kevin.nice@pwpublishing.ltd.uk

# Propagation Extra

Ron Ham's barometric pressure chart, taken at Storrington, W. Sussex, March 2000.

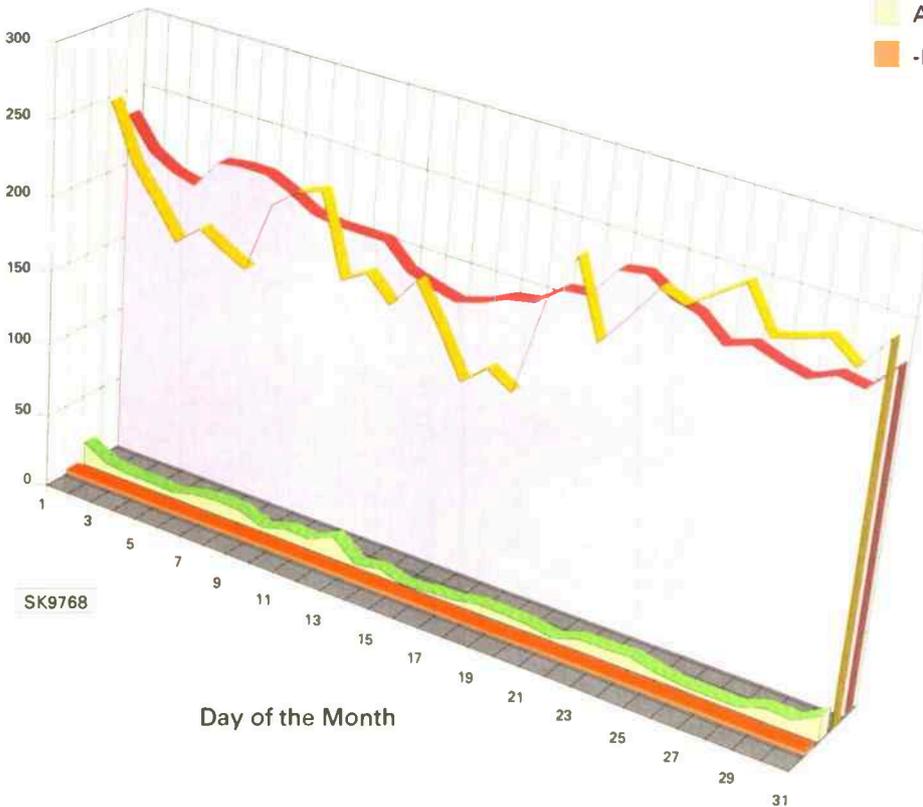


PROPAGATION SPECIAL PROPAGATION SPECIAL PROPAGATION SPECIAL PROPAGATION SPECIAL



March Data

- 10.7cm Flux
- Eff. Sunspot No.
- AP Index
- Log X-Ray



## 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.

# Aerial Techniques

## UNIVERSAL DIGITAL VIDEO SYSTEMS CONVERTERS

"We specialise in multi-standard TV's & VCR's PAL-SECAM-NTSC"



8M bit memory, two sets of S-VHS inputs & outputs, NTSC

to PAL and PAL to NTSC, 500 lines dynamic & static resolution, full line & frame conversion, time base correction, AC operation.....**£599.00**



4M bit memory, two inputs & outputs, NTSC to PAL and PAL to NTSC also SECAM, 500 lines static resolution, dynamic 300 lines, full line & frame conversion, time base correction, AC operation ..**£449.00**



4M bit memory, one input and output, NTSC to PAL and PAL to NTSC + PAL M, PAL N. Full line and frame conversion, time base correction, AC operation ..**£399.00**



2M bit memory, single input & output, NTSC to PAL and PAL to NTSC also SECAM, 420 lines static resolution, dynamic 250 lines, full line & frame conversion, time base correction, AC operation...**£299.00**



## THOMSON 14" MULTI-SYSTEM TV + VCR COMBINATION WITH TELETEXT

Covers VHF/UHF PAL/SECAM L for use in UK France & Europe.

- Twin tuners
- 14" screen multi-standard
- PAL/SECAM (NTSC via scart)
- VHF-UHF hyperband tuner
- 59-channel memory
- Fastext teletext
- S-VHS (via scart)
- 240V AC operation

**£399.00**

## FULLY COMPREHENSIVE 35 PAGE CATALOGUE

Available by return of post for only £1.50 or ring with your credit card (fully refundable on first purchase over £20).

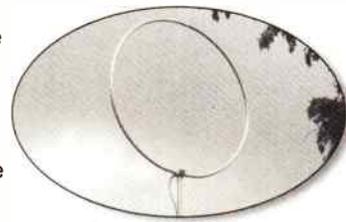
11 Kent Road, Parkstone, Poole, Dorset BH12 2EH  
Tel: 01202-738232 Fax: 01202-716951 E-mail: atech@dirron.co.uk

(All prices are inclusive of VAT, delivery by courier £10.00)

# ALA 1530 LOOP ANTENNA

As reviewed in the May '99 SWM

This active loop sets new standards for the listener. For the first time it is possible to reject locally radiated and mains borne noise and still provide improved sensitivity compared to larger antennas. 1m dia. Aluminium loop is designed for outdoors, even at ground level. The loop has a frequency range from **150kHz** to **30MHz** and matches directly to the receiver. With 30dB nulls to reduce interference, LW, MW and SW its reception is outstanding. Technical spec. is excellent with 2nd and 3rd order intercept points of +70dBm and +40dBm respectively.



SUPPLIED COMPLETE WITH ANTENNA INTERFACE AND A PSU.

**£119.95** incl. postage. Add **£20** overseas

## WELLBROOK COMMUNICATIONS

Wellbrook House, Brookside Road, Bransgore, Hants BH23 8NA

Tel: (01425) 674174

E-mail: sales@wellbrook.uk.com

Visit our web site: [www.wellbrook.uk.com](http://www.wellbrook.uk.com)

Also from The Shortwave Shop (01202) 490099

# PRACTICAL WIRELESS

Next Month in *Practical Wireless*, the magazine that brings you Amateur Radio & So Much More

THE UK'S BEST SELLING INDEPENDENT AMATEUR RADIO HOBBYIST MAGAZINE

### REVIEWED!

With the 2000 *PW* 144MHz QRP Contest just around the corner, **Richard Newton GORSN** reviews two mobile rigs from Icom - The **IC-2800** and the **IC-2100!**



### WIN!

Tickets to visit the **2000 Royal International Air Tattoo (RIAT)!** *PW* have **15** pairs of tickets to give away next month - don't miss out!

Plus all your regular favourites including:

Radio Basics, Bargain Basement, Carrying on the Practical Way, Keylines, **What Is A7**, News, Radio Scene, Valve & Vintage, **Antenna Workshop**

The magazine that brings you Amateur Radio & So Much More

**CAN YOU AFFORD TO MISS IT? - JUNE 2000 ISSUE ON SALE 11 MAY - PLACE YOUR ORDER TODAY!**

### BUILD!

A simple antenna test kit courtesy of **Dave Coomber G8UYZ!**

The 2000 *PW* 144MHz QRP Contest is fast approaching and next month **Neill Taylor G4HLX** brings you the QRP Rules for this year. He also reviews a very useful **antenna rotator and inverter** (thanks to **SRP Trading**) which will be a big help if you take part in the contest every year.

### ELECTRONICS-IN-ACTION

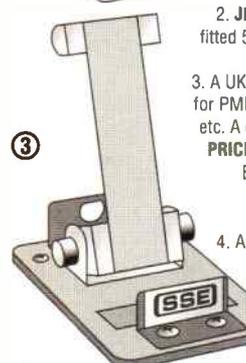
**Tex Swann G1TEX** has more electronics-related news, reviews and projects for you next month.

## SSE HIGH QUALITY ACCESSORIES

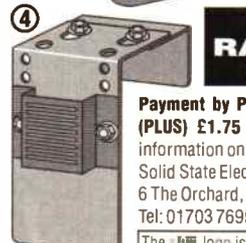
Solid State Electronics (UK) FOR SCANNING · MONITOR RECEIVERS · CB · AMATEUR RADIO



1. **JIM PSU-101A Mk5.** UK manufactured 230V AC professional PSU with adjustable Radio Base Holder combined. For Pocket Scanners, LPD's, PMR 446, etc. Two DC output sockets, one for the Radio, one for accessories. **12 VOLT DC** output. A 9 volt version is available. CE approved. **PRICE: £26.95**



2. **JIM PSU-101AC Mk5.** As above but includes a 12" fitted 50 ohm cable BNC to BNC socket. **PRICE: £29.95**



3. A UK manufactured adjustable **DESK HOLDER STAND** for PMR 446, Pocket Scanners, CB, Ham, PMR, Marine, etc. A choice of two models. **BHA3A** - NO coaxial cable. **PRICE: £13.95**. **BHA3AC** - Includes 50 ohm cable with BNC to BNC with a 'right angle' BNC plug. **PRICE: £15.95**

4. A unique Radio Holder by SSE for use with Pocket Scanners and Handheld Transceivers fitted with 'BELT CLIPS'. For use in Cars, Trucks, Boats, etc. Keep your valuable radio secure and NOT on the floor. NO risky tape or Air Vent fittings. **JIM RHM-2000**. **PRICE: £7.95**

## PMR 446 FAMILY RADIO ACCESSORIES Contact SSE (UK)

Payment by **POSTAL ORDER** or **CHEQUE**. Standard postage is **(PLUS) £1.75** per order within the UK. NOTE: For further information on SSE products send a A4 SAE to: Solid State Electronics (UK) SWM 6 The Orchard, Bassett Green Village, Southampton SO16 3NA Tel: 01703 769598 - Fax: 01703 768315

The **JIM** logo is a registered trade mark of Solid State Electronics (UK)



# Monitoring Meteosat

I first heard about the launch of *METEOSAT-1* as I came off shift one evening in 1977. This was the first European geostationary weather satellite, so media coverage was fairly comprehensive. I had spent the day processing data from an American

scientific satellite, so the news of the launch of 'one of our own' was of particular interest.

Because of work commitments, it was to be several years before my interest developed to try building or buying the hardware needed to 'tune into' weather satellites (WXSATs). Remember, there was no such thing as a 'domestic' computer.

Cost was a significant consideration and during the following years - when later *METEOSATs* were launched - many electronic specialists set-up receiving stations to monitor either the polar orbiting *WXSATs* or *METEOSAT*.

There were no clubs to provide advice - you were on your own.



Fig. 2: Active feed.

## Options & Cost

As with most technical hobbies, before spending money, one needs to study the options and costs of a project carefully. However, no matter how careful you are, it is too easy to budget for new equipment, only to find, perhaps after spending hundreds of pounds, that some piece of essential hardware was assumed to be already available!

To guide those who may be wondering about the possibility of upgrading, this review includes a description

of the total set-up required to receive *METEOSAT* images, the specific items included in this new product from RIG/Timestep, and of course the cost.

Three items are discussed in this article: a small offset-feed dish, an active feed and a down-converter - total cost £195. Economical? Read on!

The three items in this review form the 'METEOSAT' add-on components that are required to convert a polar orbiting *WXSAT* receiving system into a full polar-and-geostationary *WXSAT* system. On their own they cannot achieve much (although I suspect that they could be used for setting-up a radio telescope - but that is another story). For those with fully operational polar *WXSAT* equipment, they form probably the lowest cost add-on available for *METEOSAT* reception.

## The Essentials

To explain how these three components connect and to understand what they do, we need to first review a typical polar *WXSAT* system because this is required before these components can be used. People monitoring automatic picture telemetry (a.p.t.) from the NOAA, *METEOR* and *RESURS WXSATs* already have most of the equipment required for *METEOSAT* monitoring.

Such (polar) systems probably comprise a v.h.f. antenna of the turnstile, crossed-dipole or quadrifilar helix type, mounted either in a loft or on the roof, where the best all-round visibility is available. Physical obstructions, such as tall buildings, limit v.h.f. reception from satellites.

The signal from the antenna needs to be propagated as efficiently as possible to feed the *WXSAT* receiver. The cable should be a good impedance match (50Ω is common) and of good quality (low loss), rather than the cheap, thin earth-braid types sometimes seen. The receiver provides a demodulated signal that can be processed by the computer, using either an interface card or some comparable facility.

The receiver, whether home-built or commercial, should be properly designed for *WXSAT* reception. It has a connector for the input 137MHz band v.h.f. signal from the download, and with any luck, might also have an extra input - possibly labelled *METEOSAT*.

This extra connector would be for the down-converter, saving the need to swap antenna inputs. If not, the receiver can still be used, but the input needs to be changed as required.

## Software For METEOSAT

Both *WEFAX* and a.p.t. employ compatible methods of picture modulation. Both utilise the amplitude modulation of image data on to a 2.4kHz sub-carrier, followed by frequency modulation of this signal onto the main r.f. carrier. Software for processing images from polar orbiting satellites is therefore likely to include an option for *METEOSAT* - and probably *GOES* data as well.

The *WXSAT* image is displayed on the monitor, and the software probably has numerous facilities for scheduling passes, and perhaps some image processing

Lawrence Harris looks at a new low-cost 'add-on' system from Timestep.

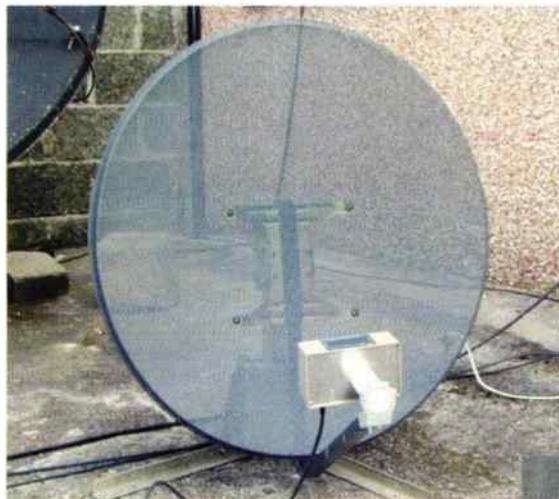


Fig. 1: Offset *METEOSAT* dish.

Fig. 3: Close-up of active feed.





**Fig. 4: Down-converter.**

functions. Our new components can now be discussed in context.

### Possible Upgrades

A polar WXSAT receiving system can be upgraded to receive METEOSAT WEFAX in various ways. A dish or multi-element Yagi is required to receive the 1691.0MHz signal. Suitable Yagis cost something over £100. The dish option requires a feed of some form, and both the latter are discussed shortly.

The output signal (from the dish/Yagi) can feed either a down-converter (discussed shortly) or a direct 1691.0MHz METEOSAT receiver. If the latter is used, a high quality, low-noise pre-amplifier (referred to as an LNA) is essential.

### The Offset Dish

The falling price of dishes is one of the amazing stories of the last ten years. When I first decided to expand my polar orbiting WXSAT system to include METEOSAT WEFAX reception - sometime around 1985 - there was a very limited market for 1m dishes. Television broadcast satellites were just starting, and dishes could cost hundreds of pounds. I was keen, but perhaps not that keen!

After spending (I think it was) £150 on a down-converter from Microwave Modules, I needed a pre-amp for 1691.0MHz and, of course, a dish. A reference to a few published articles suggested self-build was an option at this relatively low frequency, so I bought a low-cost dipole feed,

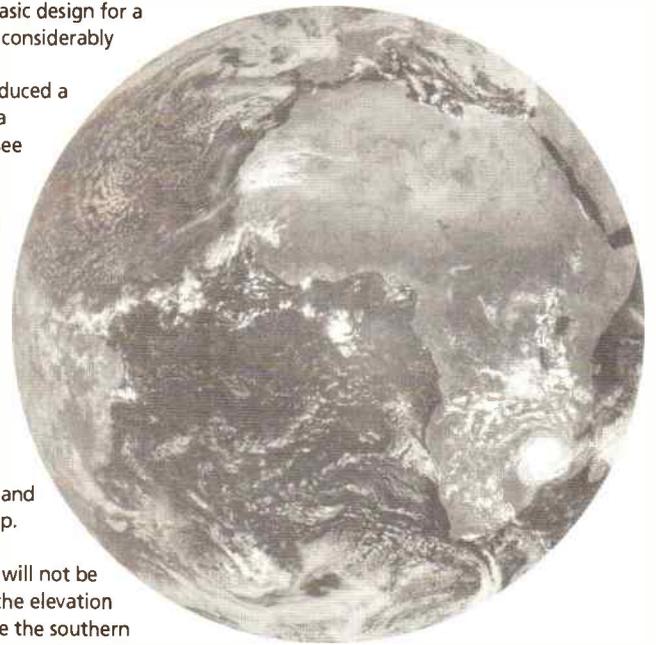


**Fig. 5: Connectors for down-converter.**

with which came a basic design for a dish. Dishes are now considerably cheaper!

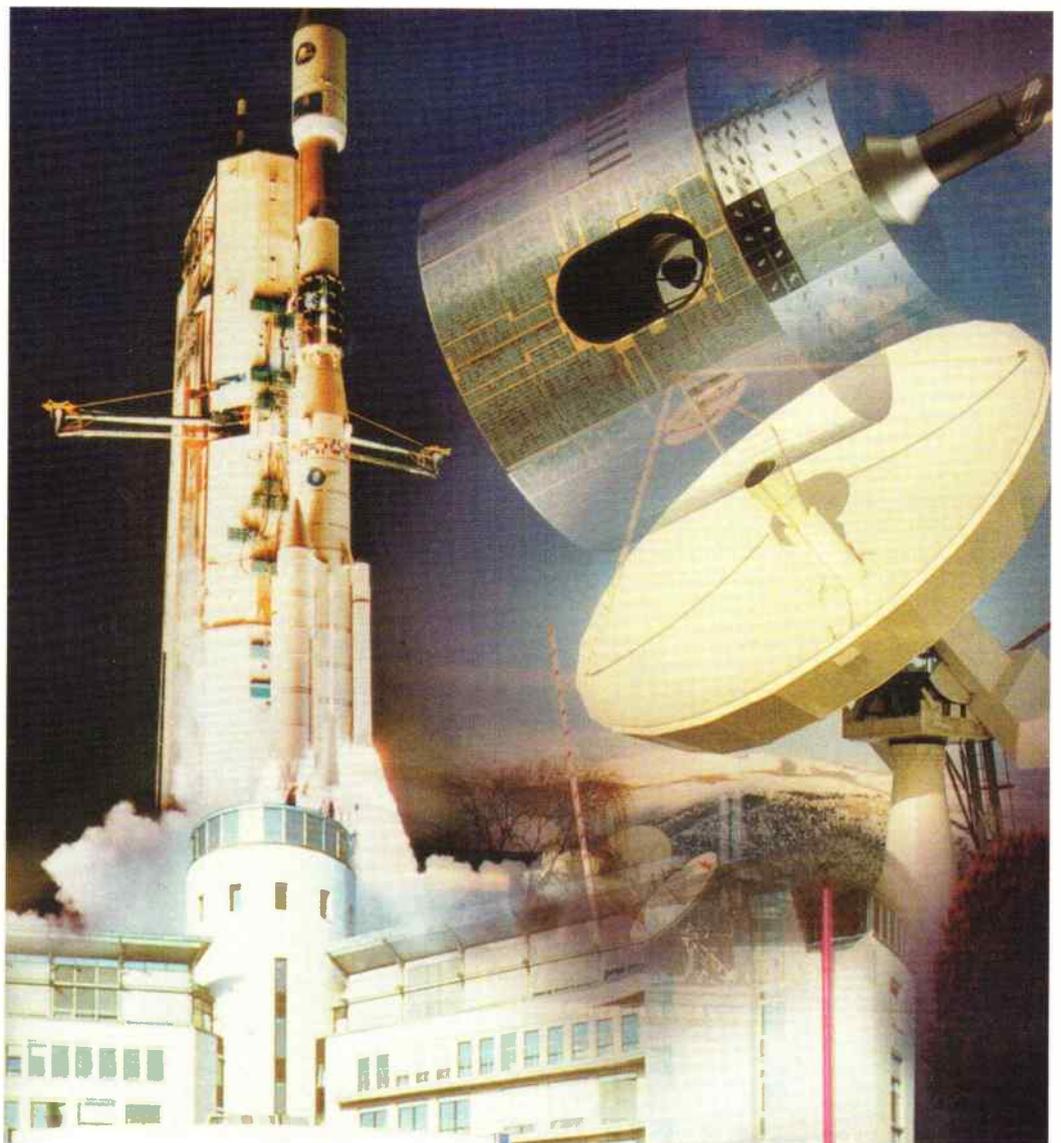
Timestep has produced a small dish for use in a METEOSAT system - see **Fig. 1**. Two sizes are available - 600 and 800mm - but I would recommend the 800mm as being the size most likely to provide consistent high quality signals. There are many variations for dish support. Fittings are available to use the dish at ground level, and this is where I set it up.

Being offset, the elevation of the dish will not be the usual 32° or so - the elevation of METEOSAT-7 above the southern horizon. The dish only requires tilting about 10° off vertical. More on alignment later.



**Fig. 7: Primary Data image METEOSAT-722 February 1213UTC.**

**Continued on page 44...**



**Fig. 6: METEOSAT graphic courtesy EUMETSAT.**

# STOP PRESS!

**ML&S Appointed Official UK distributor for JRC Ham products.**

Continuing the success of ML&S for short wave & Scanning equipment in the U.K., we are proud to announce our appointment by JRC U.K. Ltd. All products purchased from ML&S will therefore be backed by the UK importer.

Internationally accepted as the benchmark receiver throughout the world, the NRD-545 is still the professional's choice.

## Specifications

- Frequency Range .1 - 29.9999MHz
- Type of reception USB, LSB, CW, RTTY, AM, FM, WFM (When CHE-199 installed)
- Memories 1000 channels
- Receiving system Triple superhetrodyne
- Image rejection 70dB or more
- IF rejection 70dB or more
- Dimensions 330W x 130H x 285D (mm)
- Weight Approx. 7.5kg

## Features

- Digital Signal Processing by One-Chip DSP
- Wide Band 30-2000MHz
- Converter option (CHE-199)
- Remote control by PC

SEE THE NEW 'SHOPPING BASKET' ML&S WEB SITE AND



**The JRC NRD 545 Deluxe Receiver**

**Save almost £500 off the package deal & pay nothing until September 2000**

**RRP £1699 ML&S £1299.**  
Also available on finance,  
**NO DEPOSIT & 48 payments**  
of only **£39.53 p/m**

**Special Package Deal**  
A new NRD-545 with matching Deluxe Speaker NVA-319 & optional VHF/UHF converter CHE-199 allowing coverage on AM/FM/WBFM up to 2000MHz.  
Total RRP £2197.00 ML&S £1649.  
Also available on finance, NO DEPOSIT & 48 payments of only **£57.63 p/m**

## NEW Icom ICR-3e

It seems Icom have done it again, with the far eastern release of the worlds first handheld scanner receiver, with something extra special to keep you interested even if the waves are dead: a fully functional, built-in multi mode colour TV! This breathtaking achievement has had everyone at Northfield Avenue gasping all day, and we haven't even seen a full spec yet! however, we've managed to gather the following tidbits from our friends at Icom...

- **NSTC/PAL TV**  
Receive: audio and video at full scan rate!
- **Wideband All mode Scanner Receiver**
- **.495 KHz -2450MHz Frequency coverage.**
- **Full Range of accessories**
- **Dual Receive.**



**coming soon!!**



## Icom IC-R75E

AVAILABLE ON FREE FINANCE - **ZERO APR**  
ONLY £99 DEPOSIT, THEN 12 x £50 p/m.

**FREE**  
**DEL AT-2 Antenna Tuner**  
worth **£69.95**



## Yaesu VR-500 Pocket Scanner

100kHz - 1.3GHz  
AM/FM/WFM/SSB/CW  
BAND SCOPE  
PC PROGRAMMABLE  
**CALL FOR BEST PRICE**



## AOR AR-5000A

RRP £1445  
AVAILABLE ON FREE FINANCE - **ZERO APR**  
ONLY £245 DEPOSIT, THEN 12 x £100 p/m.

Also the AR-5000+3 including AFC, Synchronous AM & noise blanker.

RRP £1699 **£379 deposit** then 12 x £110 p/m.  
**ZERO APR**

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

● **TEL: 0208 566 1120** ● **FAX: 0208 566 1207** ●

Martin Lynch can also offer finance terms up to 48 months with no deposit. We welcome your part exchange against any



...continued from page 41



**Fig. 8 (above):** Dishes for METEOSAT PDUS and WEFAX telemetry.



**Fig. 9 (above right):** METEOSAT-7 D2 format 12 January 2000UTC (with added artificial colour!).

## The Active Feed

You have your dish - now you need a feed. This receives reflected radiation in a frequency band dependent on the characteristics of the dish; a suitable feed placed at the focus acts as a collector. The term 'active' refers to the inclusion of a built-in amplifier.

My original METEOSAT dish had a passive dipole cut for the 1691MHz band, producing a signal that needed to be amplified before feeding it along the cable and into the next processing stage. By incorporating an active circuit right at the beginning, the system's noise level is largely defined; this active circuit has a quoted noise figure less than 0.5dB for a total gain of the feed and pre-amplifier of 20dB.

The unit is fitted to the dish's feed support using clips, and the supplied 5m coaxial cable can then be connected to the down-converter. Power for the active feed is provided along this output cable.

During alignment, the distance of the feed's surface from the dish will be adjusted for best position. When all three units are correctly connected, the process of feed/dish alignment can be completed.

The signal output from the active feed is the raw 1691.0MHz, so its subsequent processing could take different forms. Direct receivers for this frequency are available, so that is one option for completing a METEOSAT system. However, we are about to examine the other option - down-converting the signal.

## The Down-converter

This 1691.0MHz signal (from the active feed) requires a good quality, low-loss, matching cable and a 5m length is fitted. The output is connected to the N-type input socket on the down-converter. This unit provides a nominal 33dB gain with a noise figure of 2dB. As with the active feed, current requirements are low, about 40mA.

The voltage applied to the down-converter determines its precise mode of operation. A supply voltage between 10 and 16V d.c., tunes the input channel to 1691.0MHz (METEOSAT channel 1); between 6 to 9V d.c., channel 2 is selected. A 2.1mm d.c. input jack is provided on the unit, though it can be supplied via the coaxial feed - a standard practice.

So there we are! Three components that convert an average polar WXSAT system to a full-blown METEOSAT WEFAX system - all-in for less than £200. Is such an expansion worth it? Let us look at METEOSAT WEFAX.

## What Is METEOSAT?

METEOSAT is Europe's geostationary WXSAT. There are many similar WXSATs: GOES, GMS, GOMS, FENGYUN - and even INSAT (an Indian communications satellite)

could be included (although its transmissions are not the standard WXSAT format). From its position above the longitude of Greenwich, METEOSAT appears stationary because satellites take 24-hours to orbit the earth - the same time that the earth takes to rotate once. Most of these satellites provide a near-constant stream of image data, usually in two forms - Primary Data (high resolution) and WEFAX (low resolution).

METEOSAT carries an imaging telescope sensitive to

a wide spectrum of radiation. The image produced by the radiometer is detected by a visible-light sensor, a near-infra-red sensor and a thermal infra-red sensor. The design of the radiometer and the distance of the spacecraft above the earth determine image resolution - the amount of detail available from the images.

Every 'original' image produced by METEOSAT therefore includes a vast amount of data - and there are three - one per spectral component. One channel exclusively devoted to transmitting this data would not be able to keep pace with the acquisition rate - so not all data is actually transmitted to users.

The images that are transmitted form the two types mentioned - Primary Data and WEFAX. To what the appetite, see Fig. 5 - a Primary Data image.

Primary Data is transmitted on 1694.5MHz, as are several WEFAX formats, but requires an expensive receiver and very large dish - see Fig. 6. There is also an added complication. Almost all 'home-produced' PDUS images are encrypted by EUMETSAT before transmission. In my view, this is an extremely regrettable limitation that adds a large expenditure to the cost of monitoring this side of our planet.

The METEOSAT satellite operators sectorise Primary Data 'whole disc' images, and degrade the resolution so that small sectors can be transmitted within short time slots. In each four minutes slot, an individual WEFAX image occupies a few seconds short of four minutes, allowing for other data transmissions to take place during the remaining seconds of each slot.

I obtained a selection of WEFAX images using the components under review, including Fig. 7, the evening infra-red D2 format image of Europe.

## Comments & Conclusions

The dish was operated for several weeks between December and March. The only problem that arose, resulted from my not bolting down the dish to the ground. Gales and persistent rain affected the signal at one point, causing me to wrongly assume a system failure.

After the gales subsided, I had a look outside and realised that the dish had simply been blown through several degrees, causing signal loss. Rotating the dish back towards METEOSAT brought the full strength signal back, leaving me embarrassed that I had contacted Timestep before checking more carefully. The speed of E-mail needs to be tempered with patience!

It is encouraging to see such a low-cost 'add-on' system available, even though of course you do need to already have a polar WXSAT system operational. If you never upgraded before due to the cost of assembling the necessary components, that excuse has just vanished. The dish is environmentally friendly, and your family will love the pictures. At £195 or so I believe it is unbeatable.

SWM

## Costs

### Dish and bracket:

£20 for 600mm and £30 for 800mm.

### Active feed:

£65 from the RIG shop.

### Down-converter:

£99 from the RIG shop

### Post and packing:

for latest prices, please contact supplier listed below.

### Availability:

Contact Timestep on (01440) 820040 for dish details. RIG (Remote Imaging Group) either [rigshop@rig.org.uk](mailto:rigshop@rig.org.uk) or write to:

**RIG shop,**  
PO Box 436, Guildford,  
Surrey GU4 7ZJ.

RIG products are only available to RIG members, so these prices involve joining RIG if you are not already a member.

# ASK ELECTRONICS LTD

248/250 TOTTENHAM COURT ROAD  
LONDON W1P 9AD

Tel: 0171-637 0353/0590

Fax: 0171-637 2690

PLEASE MAKE ALL  
CHEQUES PAYABLE  
TO: ASK ELECTRONICS  
All products are  
subject to a posting &  
packaging charge

## YOUR SONY SPECIALIST

All products covered by a total  
manufacturers guarantee

### NEW FROM SONY

ICF-SW1000T RRP £449.....ASK price **£360.00**

As reviewed in Short Wave Magazine April '96 issue

ICF-SW77150-29995kHz, usb/lb cw, 160 mem-ories &  
labelling facility, 5 event timer, world timer  
RRP £429.95.....ASK price **£330.00**

ICF-SW07 New inc PSU &

ANLP-1 antenna.....ASK price **£250.00**

ICF-SW55 RRP £299.95.....ASK price **£225.00**

ICF-SW100E RRP £219.95.....ASK price **£145.00**

ICF-SW100S Includes AN-100 & dual voltage mains  
adaptor.....**£199.95**

ICF-SW7600G RRP £199.95.....ASK price **£120.00**

ICF-SW30 RRP £79.95.....ASK price **£69.95**

ICF-SW10 RRP £49.95.....ASK price **£39.95**

ICF-SW40 RRP £119.95.....ASK price **£84.95**

AN1 Active SW antenna RRP £74.95.ASK price **£59.95**

AN-71 Wire antenna.....**£7.99**

AN-100 Active antenna for

ICF-SW100 or ICF-SW7600G.....**£49.95**

AN-102 Compact active antenna.....**£59.95**

AN-71 antenna.....**£59.95**

## ROBERTS

R-862.....**£30.00**

R-881.....**£70.00**

R-809.....**£90.00**

R-876.....**£115.00**

R-827.....**£140.00**

R-861.....**£175.00**

RC-828.....**£189.00**

## GRUNDIG

Yacht Boy 500..**£79.95**

Yacht Boy 400..**£89.95**

**We also stock a range  
of books for frequency  
scanning**

## SANGEAN

ATS-909.....**£160.00**

ATS-818ACS..**£165.00**

ATS-818.....**£120.00**

ATS-808.....**£85.00**

ATS-606.....**£105.00**

ATS-404.....**£60.00**

ATS-305.....**£60.00**

## GARMIN GPS SYSTEMS

**Street Pilot UK** - in car navigation system with street level mapping includes Atlantic international database, UK Metroguide Mapsource CD, 8mb datacard, PC interface and cigar lighter adaptor, dashboard mount.....**£Phone**

**Street Pilot** - as above but no Metroguide and datacard.....**£Phone**

**Street Pilot Colour Map UK** - as Street Pilot UK but colour.....**£Phone**

**Street Pilot Colour Map** - as Street Pilot but colour.....**£Phone**

**EMAP UK** - as Street Pilot UK but hand-held and no cigar lighter adaptor.....**£Phone**

**EMAP** - as Street Pilot but no cigar lighter adaptor.....**£Phone**

**GPS III plus** - car or portable GPS with Atlantic international database,

display switch able from landscape to portrait, removable antenna, accepts down loaded map data from various map source CDs.....**£Phone**

**GPS 12 Map** - as above except display is not switchable.....**£Phone**

**GPS III Plus** - European city point data switchable display.....**£Phone**

**GPS 12CX** - hand-held GPS with colour display, city point data.....**£Phone**

**GPS 12XL** - hand-held GPS with city point data.....**£Phone**

**GPS 12** - hand-held GPS.....**£Phone**

**Etrex** - smallest hand-held GPS.....**£Phone**

**GPS 48** - includes city point and marine database.....**£Phone**

**MAP SOURCE CD'S, DATA CARD AND ACCESSORIES IN STOCK**

## SCANNERS & TRANCEIVERS

### YUPITERU

MVT-9000MkII 100kHz-1.99GHz, all mode.....**£319.95**

MVT-7100 100kHz-1.65GHz all mode.....**£195.00**

VT-225 Civil and military air band receiver.....**£199.95**

VT-125 Civil airband receiver.....**£159.95**

MVT-8000 Base/mobile receiver, 200kHz-1.3GHz..**£294.95**

### ICOM

IC-R2 500kHz-1300MHz, AM, FM, WFM, 400 ch, hand-held communications receiver.....**£135.00**

IC-R10 100kHz-1300MHz, all mode, 1000 channels hand-held communications receiver.....**£270.00**

IC-PCR100 100kHz-1300MHz, AM, FM, WFM, PC communications receiver.....**£185.00**

IC-PCR1000 100kHz-1300MHz, all mode PC communications receiver.....**£325.00**

IC-R75 30kHz-60MHz, AMS, AM, FM, USB, LSB, RTTY, CW.....**£645.00**

### AOR

AR7030 High quality short wave receiver with remote control.....**£675.00**

AR7030 Plus an enhanced version of the above..**£750.00**

AR5000 10kHz-2600MHz all mode receiver.....**£1295.00**

AR5000+ An enhanced version of the above.....**£1460.00**

AR3000A 100kHz-2036MHz all mode.....**£695.00**

AR3000A+ An enhanced version of the above.....**£780.00**

AR8000 Handy 530kHz-1900MHz all mode.....**£289.95**

AR8200 Handy 530kHz-2040MHz all mode.....**£340.00**

ARD2 ACARS and Navtex decoder and display.....**£295.00**

SDU5000 Spectrum display unit SRP £799 now only.....**£480.00**

SDU5500 New version of SDU5000 including PSU.....**£770.00**

ALL AOR ACCESSORIES ARE AVAILABLE

### YEASU

VR-500 Compact handy 500kHz-1300MHz all mode...**£???.??**

### License free transceivers

FOR COMMERCIAL AND LEISURE USE

Motorola TA200.....**£130.00** for 2

TA288.....**£190.00** for 2, rechargeable battery included

Handiepro.....**£320.00** for 2, rechargeable battery included

Icom IC-F4SR.....**£160.00** (PMR-446 or SRBR)

Kenwood TK-361.....**£160.00** (PMR-446 or SRBR)

Cobra PMR-250.....**£115.00** (rechargeable battery included)

PMR-300.....**£125.00** (rechargeable battery & vibracall)

Multicom PRO.....**£115.00**

For the best prices give us a call on: **0171-637 0353**

# Strange Tales Of Radio At Sea

Tony Martin looks back at radio mysteries of yesteryear involving vessels at sea.

In 1912, the loss of the *Titanic*, callsign MGY, placed tremendous pressure on maritime authorities to insist that sea-going vessels were equipped with adequate radio facilities. By the 1920s it might have seemed that the days of mysteries, such as the *Mary Celeste* were over, with radio then commonplace in ships. This was not to be the case however, and in several strange incidents at sea, the presence of radio equipment has often served only to deepen the mystery.

## Strangest Incident

One of the strangest incidents involving radio at sea was that of MZUW, the callsign of the yacht *Teignmouth Electron*, found with no-one on board on July 10th 1969 in the mid-Atlantic.

The yacht was in good order, but the radio equipment on board was much disturbed and showed signs of considerable modifications having been done. It was the tragic end to the voyage of MZUW, an entry in the 1968 single-handed round the world race. Donald Crowhurst had not attempted to circumnavigate because he had insufficient confidence in his yacht's ability to withstand the seas of the Southern Ocean.

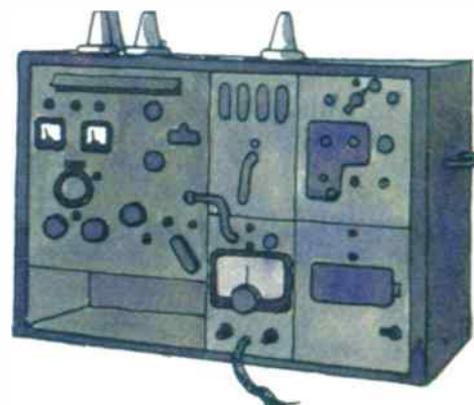
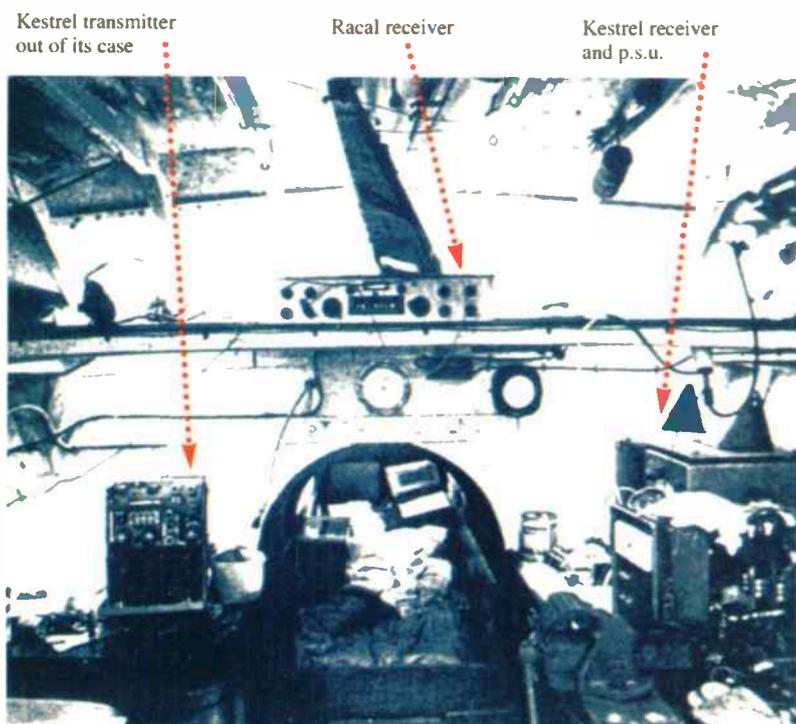
Instead, MZUW transmitted misleading and vague position reports, but this deception finally placed Crowhurst under intolerable strain when his yacht became the only one left in the race and therefore bound to become the winner by default as long as he arrived back at Plymouth. Thus were the circumstances set for his disappearance overboard.

## Crucial Role

In this tragic sequence of events, the radio equipment on board was to play a crucial role. The radio system

**Fig. 1: The radio equipment on MZUW when found abandoned.**

(Photo from *Yachts In Distress* by Joachim Schult, published by Adlard Coles Nautical 1997).



**Fig. 2: A marine emergency radio of the 1950s.**

installed in MZUW is shown in Fig. 7, and being before the widespread use of marine v.h.f., consisted of m.f. voice for short range, and h.f. Morse/voice for longer ranges. The only remarkable thing was perhaps the large amount of radio/electronic spares that Crowhurst was carrying, for he was an electronics engineer and the yacht was, to some extent, a test bed for his ideas.

Early on, minor repairs to the Onan generator and the Racal receiver had been necessary. The problems in reporting deceptive positions by radio were not so easily overcome, however, strength of his signals would be self-evidently too high at Atlantic shore stations, whilst MZUW would probably not be heard by stations that should have been worked during an actual circumnavigation.

The solution would be to announce impending failure of his generator - and hence the radio equipment. Thus MZUW went off the air until position reporting would no longer have to be avoided.

## Failure Struck

But then, as MZUW sailed northward off the coast of South America, real failure struck, the power supply to the Kestrel h.f. transmitter began to fail and eventually the transmitter failed completely. Crowhurst was unable to repair it, and decided that he would modify the Shannon short range m.f. voice transmitter for longer range h.f. Morse.

He managed to do this, an incredible feat in a yacht's cramped cabin, and worked Portishead Radio, but he subsequently attempted to modify it for voice operation, badly needing to speak personally to his family and associates. This proved impossible for time was running out, and aware that his deception must now be uncovered if he returned to Plymouth, he disappeared - the end to a very sad story indeed.

## Never Solved

Unlike *Teignmouth Electron*, the incident of the motor vessel *Joyita*, found abandoned in the Pacific in 1955, was

The Marconi Kestrel equipment had been popular with yacht skippers since Francis Chichester and Robin Knox-Johnstone had used them on their famous solo voyages. They were crystal controlled for operation in the 2, 4, 8 and 12 MHz marine bands with an output of 50W. The receiver was tuneable to 4MHz and then to preset frequencies above this.

never satisfactorily solved. MV *Joyita*, callsign WNIM, was a 21m wooden hulled vessel, and was found with her three life rafts missing and a transmitter tuned to 2.182MHz on board, the frequency for short range distress working in those days. Subsequent enquiry found that the radios, like other equipment on the boat, had been neglected.

The Pacific Ocean, with its vast distances was not the place to depend on a radio working on 2.182MHz, its characteristic surface wave and skip distance would have given a very patchy coverage. However, in the event, it seems the antenna was not even connected as the feeder had a break in it. No survivors were ever found from the 25 people on board.

## Epic Voyage

Just after the end of World War II, there was another strange incident involving radio equipment aboard ship in the Pacific. In what was a truly epic 16,000km voyage, an ocean going tug attempted to tow four small wooden minesweepers across the Pacific from Panama to Manila.

Half way across, low on fuel, a decision was made to cast off the tow and for the tug to re-fuel at one of the Pacific Island bases. The four 'sweepers' were left to drift on the end of a sea anchor, with the tug's radioman, an RT set and skeleton crew aboard one of them. The 'sweepers' had been decommissioned with their engines, etc. all mothballed and nothing much of use had been left on board.

Radio schedules were agreed and the tug, callsign HPVD, and its tow parted company. No radio contact was made between the tug and the 'sweepers', and only when the tug reached the island base did they discover that only one weak Morse signal had been heard from the drifting 'sweepers'.

Aboard the 'sweepers', an unbelievable series of misfortunes had struck. Firstly, the radioman had forgotten to take any headphones aboard - so his receiver was useless. Then, just before the first of the schedules and the chance to explain the receiving problem, disaster struck. A large piece of timber broke away and fell right down onto the set and its lead acid battery.

Over the next few days, the radioman patiently rebuilt the transmitter and managed to find a replacement battery aboard. Eventually, they were able to transmit again, but only on Morse and at low power.

## Back At Base

Meanwhile, back at the island base, apart from the tug's captain, the entire crew had been taken seriously ill with sea food poisoning. Fortunately, further weak transmissions from the 'sweepers' were picked up, bearings taken and an air/sea rescue launched. The 'sweeper' crew were saved and the tug and two remaining 'sweepers' eventually reached Manila.

Another epic of the Pacific was the solo 10,700km balsa raft voyage made by William Willis in 1954. Raft *Seven Little Sisters*, named after the seven balsa logs making up the raft, was graced with the callsign 7HTAS, though in truth there was precious little radio equipment on board. Willis had not wanted to take a transmitter at all, just a receiver to take time signals, but his wife had insisted and in the end he took a Marconi Salvita III emergency set.

During the voyage Willis fell ill, and cranked out an SOS on 500kHz using the *Salvita III* - it was never heard and neither were the cancellation signals he spent considerable time sending out the next day. Incredibly, Willis survived this solo voyage, but in 1968 he was lost

at sea after his small yacht was found abandoned in the North Atlantic. Willis had been rescued once before, from a sailing ship SOS drama and had certainly led a charmed life.

## Still Equipped

In 1918, most ships were still equipped with spark transmitters and crystal detector receivers (without any amplification) and this is just the equipment that operator H.L. Tredree had to use when sending an SOS from the S.S.

*Normandier*, a battered old tramp steamer with callsign EXH, drifting in mid-Atlantic. EXH had left Dakar, on the African coast, bound for Montreal, and even before leaving several members of the crew, were down with Blackwater fever, which was at epidemic levels ashore.

Although only a young man, Tredree was rated a First Class Radio Officer, and had already distinguished himself on EXH by recognising the Morse touch of a German U-boat operator faking an SOS to lure them to their doom.

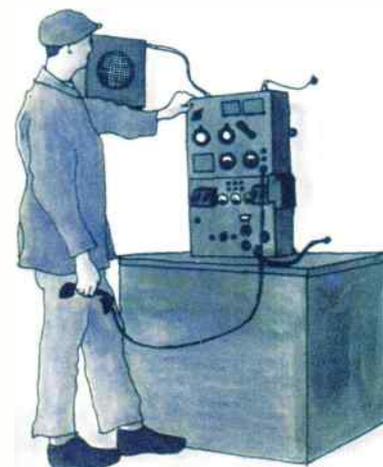


Fig. 3: Fishing vessels and coastal traffic often depended on 2.182MHz.

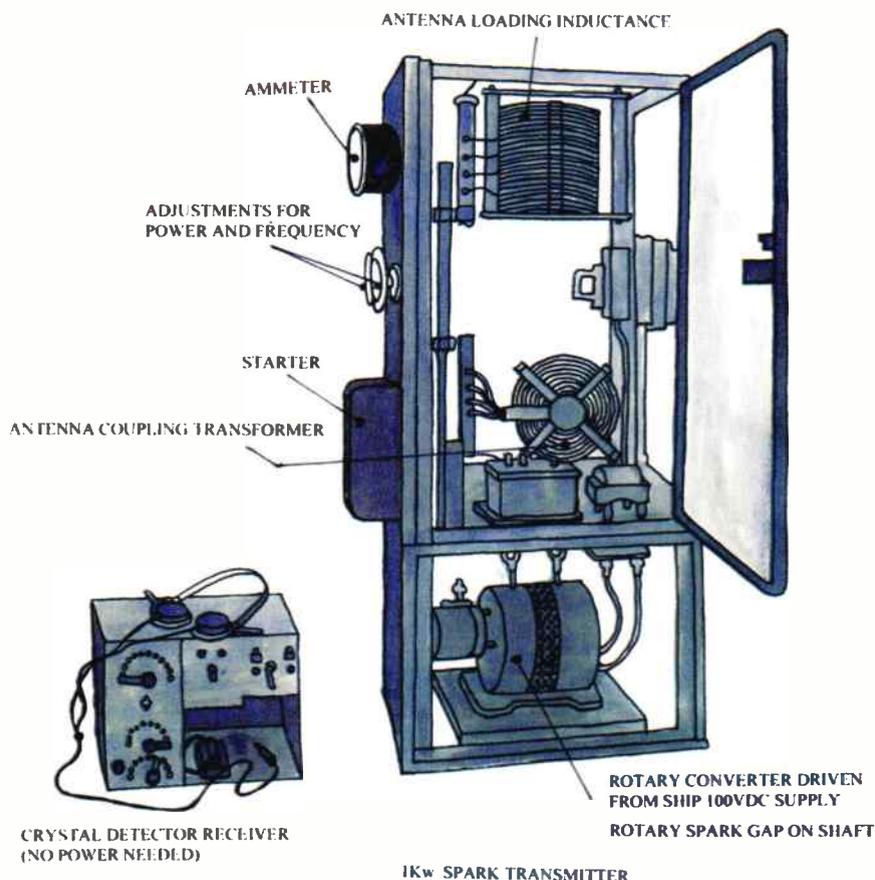


Fig. 4: Equipment typical of that provided on EXH.

The fever gradually spread through the ship, and by the time they had reached mid-Atlantic, every single man on board had got it. In those days, even under hospital care, it was often fatal.

## Serious Problem

The radio equipment on board EXH was deficient, even by the primitive standards of the day, for there was no emergency set provided. This was to prove a

Continued on page 48...

## Strange Tales Of Radio At Sea ...continued from page 47



**Fig 5: A weak Morse signal had been picked up...**

this took about eight hours before steam pressure was adequate.

They managed to get the donkey boiler going and Tredree was able to transmit an SOS and receive an acknowledgement from three ships, but the position given for EXH was inaccurate, for they were now drifting under storm conditions. These exertions took their toll and Tredree went into the second coma of his fever,



**Fig 6: Installing a Salvita III lifeboat transmitter.**

Apart from a 'Mayday' or an SOS call, the TR system has often been the first indication that a ship has been lost.

The TR system was introduced to provide information to maritime authorities about the positions of ships at sea.

Ships usually called the nearest coast station to pass their TR which consisted of the ship's name, distance and bearing from the coast station or other landmark or position in Lat/Long and the next port of call.

The TR was normally authorised by the ship's master and sent as a matter of routine.

recovering to find that he and the mate were the only ones aboard able to get to their feet.

Tredree was able to hear on his crystal detector receiver that the searching ships were about to give up, so steam had to be raised in the donkey boiler yet again. They managed to get through with a corrected position and were eventually found.

**The Marconi Salvita III was set to transmit on either 500kHz or 8.364MHz with a maximum output of 3.5W and to receive only on 500kHz. It was housed in a cylindrical water-tight case, the m.f. and h.f. transmitters being at the top. The hand-driven generator and power supply unit were at the bottom and had to provide a 420V d.c. supply since it was still the valve era.**

Conditions on the S.S. *Normandier* were appalling, with bodies rolling about in the engine room. The boarding party was horrified at what they found. It had been a very close call indeed - the fever, the storm and the lack of an emergency transmitter.

### Ten Years After

In 1928, ten years after the incident with the S.S. *Normandier*, there were still some ships equipped with spark transmitters. One such was

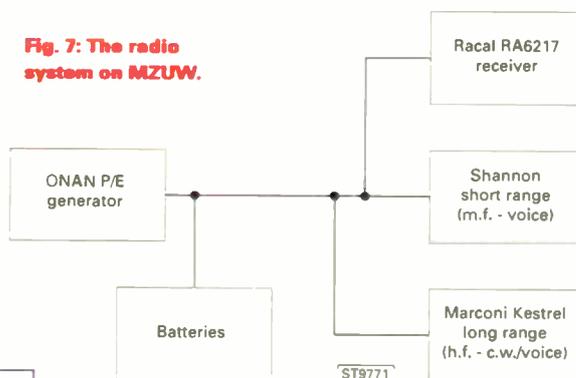
the S.S. *Tashmoo*, an American-registered cargo vessel, also carrying a few passengers, on passage between San Francisco and New York.

Under the legislation of those days, there being less than fifty people aboard, she did not have to carry radio. But indeed, she did have a radio and her callsign was KOXD. There was however a snag, for there had previously been a fire in her radio room and no remedial work had been done, also she did not have an operator aboard (indeed the vessel had not carried an operator even before the fire).

Unfortunately, the radio was not the only equipment in poor condition, for their engines were continually breaking down and in gale conditions they finally stopped altogether. The engineers were unable to restart them, two sea anchors were lost in succession and the *Tashmoo* began drifting out of the shipping lanes.

Under the circumstances, the Captain's thought,

**Fig 7: The radio system on MZUW.**



perhaps not surprisingly, turned to the radio, and a couple of the passengers expressed interest, for there was no one else aboard with any knowledge of the equipment. But it was to no avail, and the passengers lost interest.

However, the Captain found out that a temporary crewman, working his passage as a steward, had been a signalman in the war, although not connected with radio in any way. The steward was persuaded to have a look at the radio equipment. It looked a mess and subsequent enquiries revealed no plans, instructions or papers to do with the equipment at all.

The steward found the motor generator down in the engine room and somehow, after the trial and error, he got it working. Back in the radio room, over the engine room, there was still no power to the transmitter, and it seemed as if the problem was at the switchboard in the radio room.

Eventually, with help from a passenger, the steward managed to fire up the transmitter and, knowing nothing of receiver or operating procedures, he sent SOS signals out blind, using random settings of the transmitter adjustments. They were heard and eventually towed into port.

### Recent Mysteries

One thing remains certain, the sea will continue to throw up its mysteries for as long as there are ships upon it, regardless of whatever systems may be in place. The most recent of such mysteries have been the loss of the huge bulk carrier *Derbyshire* off Japan in 1980 and in 1974 the loss of the deep sea trawler *Gaul* in the Arctic.

Very little trace of either of these ships was ever found on the surface, and no emergency radio traffic was ever logged, though both ships carried the normal complement of modern radios: medium, high and v.h.f. sets, each with the ability to work on the emergency 24V batteries on board.

SWM

IC-PCR100 & 1000

# CALLING ALL SERIOUS LISTENERS - HEAR ALL THAT'S GOING ON... ON YOUR PC!

- An exciting new radio receiving idea!
- For today's listener who doesn't want to miss a thing!
- Not a knob in sight, just use your PC keypad and mouse.
- A choice of interface screens showing all you need, as on a real receiver.
- Bandscope functions for easy location of busy frequencies.
- PCR1000: All-mode Rx - 100kHz~1300MHz
- PCR100: AM/FM/WFM, 100kHz~1300MHz
- \*Optional UT-106 DSP Digital Filter Unit for Automatic Notch Filtering and Improved Noise Reduction, for IC-PCR1000 only.

**You now have a choice!**  
 The IC-PCR1000 and the NEW budget IC-PCR100 (without SSB) are versatile receivers that let you listen to the exciting world of communications via your computer. Long before the Internet even existed, the airwaves have been filled with communications of all kinds - broadcast radio and television, Ham, special services and aviation to name just a few. These two PC-based receivers offer a new and sophisticated way to listen to what's going on.



Icom (UK) Ltd. Sea Street Herne Bay Kent CT6 8LD. Telephone: 01227 741741. Fax: 01227 741742.  
 URL: <http://www.icomuk.co.uk> E-mail: [info@icomuk.co.uk](mailto:info@icomuk.co.uk)

■ MIKE RICHARDS G4WNC, PO BOX 1863, RINGWOOD, HANTS BH24 3XD

■ E-MAIL: decode@pwpublishing.ltd.uk ■ Web: <http://www.biinternet.com/~mikespace>

# Decode

## Making The Link

Ian Forrest E-mailed me with a basic enquiry that I don't think I've covered for a while so I thought I'd kick-off with that. Having bought a PC for the kids at Christmas, Ian decided he would take advantage of the new PC to try a bit of decoding. As a starter, he decided to try some ACARS decoding using his Yupiteru MVT-7100 receiver. After a bit of trouble getting to grips with Windows, he got the software up and running and connected his receiver.

However, he really didn't get much luck. He suspected that he had the volume turned up too high and worries whether or not he may have

damaged his soundcard. This question raises a few points that need covering. First of all the connection.

Wherever possible it is always best to use a tape output or line out connection between your receiver and the

computer. Two main reasons - 1) you are unlikely to overload your soundcard because the signals levels are restricted and 2) you can still monitor the signal through the speaker or headphones and use the volume control without effecting the signal going to the PC.

If you don't have a line or tape output then you really have no choice but to use the external speaker jack - but this should always be the last option. When using the external speaker jack, one trick that's worth doing is to buy or make a 'Y' connector.

This is a very simple device that just comprises a 3.5mm jack with two 3.5mm sockets wired in parallel. To make it work, you plug the 3.5mm jack into the external speaker socket of your radio then connect another lead between one of the 3.5mm sockets and your PC soundcard.

The other socket is then connected to an inexpensive external speaker. Using this system, you can make the connection to your PC, but still listen to the signal via the external speaker.

It really is important that you listen to the signal you're trying to decode so that you can tell if the signal is distorting, drifting out of tune or whether or not the transmission has stopped.

Without this facility you can get very frustrated trying to

decode noise because you weren't aware the signal had disappeared!

As far as whether or not the soundcard has been damaged, I can't really tell from the information supplied, but I suspect it's unlikely that the card has been damaged.

Another point that Ian made was the high level of interference he was suffering. This is probably the single biggest disadvantage of using a PC to decode signals. With modern PCs operating at radio frequencies, they are a potential source of quite severe interference.

This was recognised at an early stage and the FCC regulations on radiation limits have gone a long way to bring this down to manageable levels. However, the fact remains that you will always suffer a degree of radio interference when operating near a computer.

The simple trick is to get the antenna as far away as possible from the PC or any other sources of interference such as TVs and electrical wiring. One other point to watch is switch-mode power supplies. These are used extensively in computing and you may find one powering your printer and you will almost certainly have one if you're using a laptop PC.

In my experience, these power supplies are far noisier than most modern PCs and will cause you interference even if you're using an external antenna. If you're using a laptop, I suggest you make sure the batteries are fully charged and turn-off the mains supply whenever you can.

## Marine Antenna

Tony Shapiro has written with a few questions about receiving weather FAX pictures on his boat. The first query concerns antennas. I don't have the size of Tony's boat, but assuming it's not long enough for a decent long wire then some form of compromise has to be made.

The problem of finding an effective antenna for use in a restricted space has been with us since the earliest days of radio and considerable development work has gone into this area. One of the basic problems is, if you want an antenna to cover a very wide frequency range but remain small, it is always going to be considerably shorter than any conventional antenna system. This generally causes the antenna to present a really difficult matching problem with the receiver.

The solution to this is to introduce some electronics between the antenna and receiver to improve the matching and maybe even add some amplification. This type of antenna is generally known as an active antenna, simply because it contains active circuitry.

Although you can work wonders with modern electronics, there is always a snag, and in this case, it comes in the form of added noise and distortion. As a result, most of these antennas offer some sort of compromise over a conventional 'passive' wire antenna.

However, when you're dealing with the sort of space restriction you find on a small boat, these miniature antennas are a real blessing and can put in quite amazing performances. One of my favourites, which is not really that small, is the magnetic loop systems such as those produced by **Wellbrook Communications - (01425) 674174**.

Not only do they provide a very wide coverage and decent signal strength, but they can be very good at rejecting man-made noise. When I reviewed one of these a while back I was so impressed with the results that I bought one for myself.

## Digital Insight

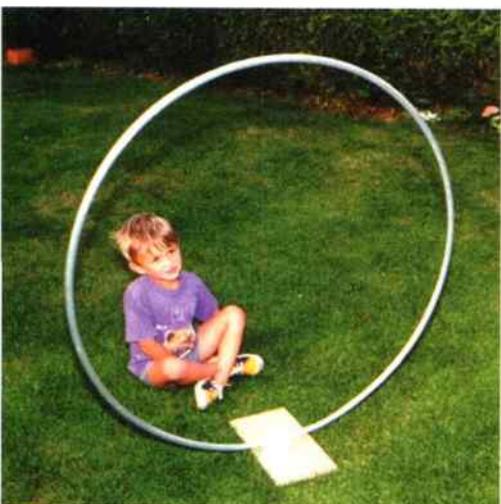
Readers often write asking where to go for more information on all the various modes that are used on the h.f. bands. This is a difficult one because the people that designed the various



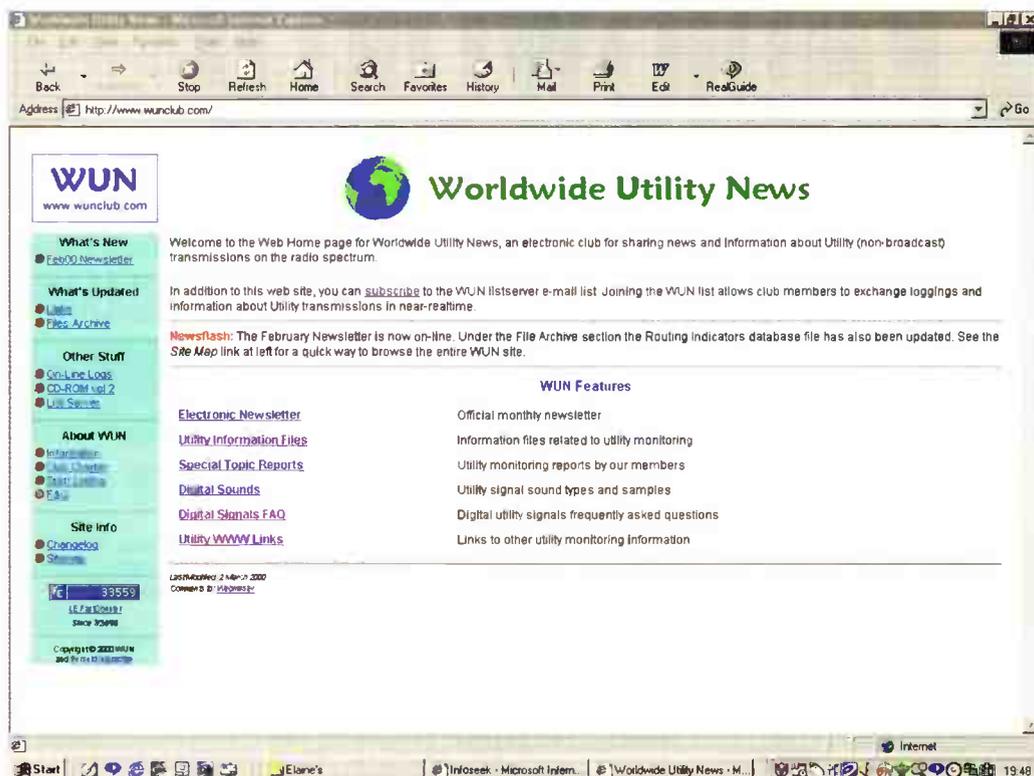
USAF C17 - ALE Spot?



Wellbrook Loop Antenna.



Loop Antenna Control Box.



WUN Web Site.

transmission systems tend not to make the technical details widely available.

With some of the more obscure systems you will find they were custom designed to meet the needs of their client. These are often modifications to established systems which then become difficult to resolve.

However, all is not lost, because the enthusiasts in the World Utility Network (WUN) have what is probably the most comprehensive listing available in their Digital FAQ (Frequently Asked Questions). This excellent document is available from the WUN website at:

<http://www.wunclub.com/archive/files/faqv50.zip> It is a ZIP file so you will have to uncompress it and then you will be able to read it with just about any text editor.

Although stored on the WUN Web site, the FAQ is looked after by Mike Chace and Stan Scalsky. It really is a well put together document that has been put together by enthusiasts for enthusiasts. The range of signals covered is truly remarkable and most are backed-up with some good descriptions covering how the data is put together. One of the really useful sections is the table that correlates baud rate and shift with signal types. This is probably the single most powerful tool for identifying the type of signal as there are many combinations of baud rate and shift which are unique to particular signal types.

## Just a Bit More Ale!

Following-on from last month's feature, **Graham Tanner** of 'SSB Utilities' fame contacted me with some really useful information that will add some extra interest to those monitoring these links. However, before we get into that, here's just a quick update for those that are wondering what on earth I'm talking about.

ALE is a relatively new system that uses computers to control and monitor the performance of radio links. The idea being that the computer will keep a record of the quality of the links and then be able to automatically route any traffic/messages to the most appropriate link taking into account the propagation conditions at the time.

This used to require a highly skilled operator so you can see that commercially this automated system is very powerful. *Windows* based software for monitoring these

links is available from: <http://www.chbrain.dircon.co.uk>

This ease of monitoring makes the system of great interest to 'Decode' listeners. If you want to find out more, either take a look at last month's 'Decode', or for a detailed explanation, try the ALE info on the WUN page which can be found at: <http://www.wunclub.com/files/aleinfo.html> You will also find an interesting article on how to improve your ALE scanning techniques here:

<http://www.wunclub.com/newsletter/v06/n02/digital.html>

Now back to Graham's information. As a keen monitor of military aircraft information, Graham has been able to combine his knowledge with the output from ALE logs to work out the link between the ALE callsign and the USAF aircraft type and tail number.

Here's a sample output from a log so you can see how it works.

```
[17:41:34][FRQ 23337000][TO][RIC][TIS][260008][AL0] BER 30 SN 12
[17:41:38][FRQ 23337000][TO][260008][TIS][RIC][AL0] BER 29 SN 12
[17:41:41][FRQ 23337000][TO][RIC][TIS][260008][AL0] BER 30 SN 12
[RX][CH 17][TO ?][TO ?][AMD RCHT1 ETB ETAR 2130Z A1 ][TIS 260008][E]
[17:41:51][FRQ 23337000][TO][?][TIS][260008][AL0] BER 30 SN 12
```

What you need to look for is the TIS callsign number, which in this case, is 260008. The first digit refers to the aircraft type as shown to the right.

The second digit shows the year of manufacture with the 6 translating to 1996. This is a bit misleading as you really need more than one digit to identify the year as some of the aircraft have been around a while. The 3rd through to the 6th digits are the final four digits of the aircraft's tail number, i.e. 0008.

Putting this all together the aircraft contacted in the log was a C17A built in 1996 with a tail number of 96-0008. So you can see that this really starts to bring otherwise tedious ALE logs to life.

**If you've picked-up any more gems like this please drop me a line or E-mail me with the details.**

## TIS Callsign Numbers

- 1 = C5
- 2 = C17A
- 3 = C141B
- 4 = KC-10
- 5 = KC-135
- 6 = C9
- 7, 8, 9 are reserved for later use
- 0 = All other aircraft types.



# RADIOWORLD

(WEST MIDLANDS)

42 BROOK LANE  
GREAT WYRLEY, WALSALL  
WEST MIDLANDS WS6 6BQ  
WE ARE 5 MINS AWAY FROM J11 M6

SALES & SERVICE TEL: 01922 414796  
FAX: 01922 417829  
**SERVING THE WEST MIDLANDS!**

NEW

Email: [radio.world.world@virgin.net](mailto:radio.world.world@virgin.net)  
Visit our website at <http://freespace.virgin.net/radio.world>

TELEPHONE  
SALES ON:

01  
922

41  
47  
96

Ask for Dave  
(G1LBE)

Open Mon-Fri  
9.30 - 6.00pm.  
Sat 9.30 - 4.00pm

WEB SITE

<http://freespace.virgin.net/radio.world>

E-mail

[radio.world@virgin.net](mailto:radio.world@virgin.net)



There is NO CHARGE for  
using credit cards

**WANTED**  
**USED**  
**EQUIPMENT**  
**PX WELCOME**  
**BEST PRICES**  
**PAID!**



AR5000



AR3000A



PCR1000



PCR100

Model	Description	£ RRP inc VAT
<b>AR5000</b>	High performance full featured wide band all mode base receiver 10kHz - 2600 Mhz. IF selection as standard 220kHz, 110kHz, 30kHz, 15kHz, 6kHz, 3kHz (500Hz optional). Supplied with mains power supply.	<b>£1228.00</b>
<b>AR5000+3</b>	High performance base receiver with three enhanced options factory fitted: noise blanker, synchronous AM, automatic frequency control.	<b>£1445.00</b>
<b>AR3000A</b>	Unique all mode extremely wide band base-mobile receiver 100kHz - 2036mhz with no gaps. RS232 port fitted.	<b>£679.00</b>
<b>AR3000A + (plus)</b>	Customised AR3000A with switchable narrow SM & SAT filters, Tape relay, SDU ready and discriminator output.	<b>£764.00</b>
<b>AR8200</b>	New advanced wide band all mode hand-held receiver with enhanced microprocessor facilities, slot card options available, multi-function display.	<b>£339.00</b>
<b>AR8000</b>	The New Concept. Wide band all mode hand-held receiver with many microprocessor facilities, dot matrix display and computer compatibility.	<b>£296.00</b>
<b>ICOM R2</b>	0.1300mhz Handie. Fits in the palm of your hand. AM/FM, FM Narrow - 450 memory channels	<b>£139.00</b>
<b>IC R8500</b>	100kHz - 2GHz Continuous. All mode no gaps. 1000 Memories. 4IF band widths	<b>£1440.00</b>
<b>IC-R75E</b>	Excellent all round for the professional listener 0-60MHz. High Stability receiver circuit 100 DB Dynamic range. Twin bandpass Tuning. Optional digital processor. Best selling receiver	<b>£629.00</b>
<b>IC-PCR1000 &amp; PCR 100</b>	ICOM PCR1000 - 0-1300mhz. All modes. Computer driven. On screen programming. Band scope. Instant band scope access via mouse. List of features, call for brochure.	<b>PCR 1000 £299.00, PCR 100 £199.00 (SAME SPEC WITHOUT SSB)</b>

**THIS IS JUST A SMALL SELECTION OF OUR STOCK!!!**

**FINANCE NOW AVAILABLE. PHONE DAVE FOR DETAILS!**

## GARMIN GPS (GLOBAL POSITIONING SYSTEMS) & ACCESSORIES

GPS-12 GPS receiver (no external antenna) 12 parallel	124.95
GPS-12XL GPS receiver c/w carry case 4 x AA alkaline batteries 12 parallel	189.95
GPS-12CX GPS receiver Europe city point database 4 colour screen	259.95
GPS-11PLUS GPS receiver rotatable screen c/w velcro mount 12 parallel	215.95
GPS-111 GPS receiver c/w velcro mounted international base map 12 parallel	289.95
GPS-48XL GPS receiver good for marine use 12 parallel	249.95
GA-26 Active low profile antenna c/w 8' cable BNC mag/suction for 2/2+3/45	54.95
GA-27 Active low profile antenna c/w 8' cable MCX mag/suction for 12XL/40	54.95
GA-28 Active low profile antenna c/w 30' cable BNC for GPS-2/2+.3.45XL	79.95
010-10121-00 MCX to BNC adaptor for GPS-12XL/40/	14.95
010-10117-00 Carrying case for GPS-2/2+3/12/12XL38/40	9.95
010-10051-00 PC4X/6X software & PC interface cable 2/2+3/12/12XL/38/40/45XL	69.95
101-10048-00 Adjustable swivel/surface mount for GPS-12/12XL/38/40/45XL	17.95
101-10111-00 Dash/surface mount for GPS-2/2+3	17.95
101-10122-00 Bicycle/handlebar mount kit for GPS-2/2+3	11.95
010-10156-00 Swivel mount bracket for GPS-2/2+3	13.95

**We also stock all makes of antennas:- Cushcraft, Diamond, Sirio, Watson, Pro-Am, etc.**

PHONE FOR DETAILS



# NEW SHOP OPEN!



**Main dealers for Alinco, AOR, Icom, Kenwood & Yaesu**  
**We Buy and Sell Used Equipment**

**ICOM**

**YAESU**

**KENWOOD**

**ALINCO**

**AOR**

## YUPITERU

### YUPITERU MVT 9000 EU

Yupiteru's flagship model, with a range exceeding 2000mhz, a real time bandscope.



- 531 kHz - 2039 Mhz
- 1000 memory channels
- All modes: W-FM, FM, N-AM, AM, LSB, USB, CW
- Multiple scanning steps 50Hz - 125kHz
- Alpha numeric display
- Band scope with marker function for direct access to displayed frequencies
- Duplex receive capability - hear split frequency signals easily with VFOs
- 20 search bands
- Fast tune facility gives 10 times function for quick tuning
- Built-in ferrite rod antenna for AM broadcast reception
- OP90 Soft Case

### YUPITERU MVT 3300EU

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

- FREQUENCY  
66 - 88MHz  
108 - 170MHz  
300 - 470MHz  
806 - 1000MHz
- MODES: AM/NFM
- STEPS:  
5, 6.25, 10, 12.5, 25kHz
- MEMORIES: 200
- BAND MEMORIES: 10 (user re-programmable)
- PRIORITY CHANNELS: 10
- SCAN/SEARCH SPEED: 30 per sec
- POWER: Requires 4 x AA batteries
- SUPPLIED WITH: Antenna, Earpiece, Carrying Strap and built-in Desk Stand



**Probably the most popular high end Scanner. It's easy to use and can receive just about anything going!**



- 530kHz - 1650mhz
- AM/FM/WFM/SSB/CW
- 1000 Memories
- C/W N/Cads & charger
- OP51 Soft Case £17.95 + £2 p&p

**£££...phone for details**

## USED EQUIPMENT PRICE LIST

MAKE	MODEL	PRICE	MAKE	MODEL	PRICE	MAKE	MODEL	PRICE
AEA	PIC 232 MBX TERMINAL.....	£169.00	KENWOOD	V7E DUAL BANDER.....	£350.00	YAESU	FC-757 AUTO ATU.....	£175.00
ALINCO	DR-140 2M FM.....	£159.00	KENWOOD	TM-V7E 2 AND 70 DUAL BAND TRANS.....	£395.00	YAESU	FT-2700RH DUAL BAND TRANSCEIVER.....	£175.00
ALINCO	DR-M06 SX 6M FM.....	£159.00	KENWOOD	TS-811E TRANSCEIVER 70cm BASE / AC.....	£395.00	YAESU	FT-290R 2m Multi Mode.....	£195.00
ALINCO	DR-M06 6M.....	£180.00	KENWOOD	TS-140S HF/0-30MHz TRANSCEIVER.....	£400.00	YAESU	FT-790R 70CM TRANSCEIVER.....	£200.00
ALINCO	DX-70T 6M HF.....	£499.00	KENWOOD	TM-255E 2M MULTI MODE.....	£500.00	YAESU	FT-3000M 2 METER 70W.....	£200.00
AOR	AR-3000 BASE SCANNER.....	£395.00	KENWOOD	TS-440 SAT TRANSCEIVER.....	£525.00	YAESU	FT-8000R DUAL BANDER.....	£225.00
DRAKE	SW8 RECIEVER WORLD BAND.....	£275.00	KENWOOD	TS-850 TRANSCEIVER 0-30MHz.....	£695.00	YAESU	FT-51R DUAL BAND HANDIE.....	£249.00
ICOM	PS-15 PSU 20 amp.....	£120.00	KENWOOD	TS-690SAT TRANSCEIVER HF +50MHz.....	£725.00	YAESU	FT-8100R DUAL BANDER.....	£250.00
ICOM	AT-150 AUTO ATU FOR THE IC-735.....	£175.00	KENWOOD	TS-690 AT HF/50MHz.....	£725.00	YAESU	FT-8100 USED.....	£275.00
ICOM	IC-X21ET DUAL BANDER 23/70CM HANDIE.....	£225.00	KENWOOD	TL-922 HF AMP.....	£850.00	YAESU	FT-6200 DUAL BANDER 23/70 CM.....	£295.00
ICOM	IC-T8E 2 m 70m & 6m HANDIE.....	£230.00	KENWOOD	TS-850SAT TRANSCEIVER 0-30MHz.....	£895.00	YAESU	G 1000SDX ROTATOR.....	£295.00
ICOM	PCR-1000 PLUS DSP.....	£285.00	KENWOOD	TS-790 BASE DUAL BAND.....	£900.00	YAESU	FT-290R MK11 INC AMPLIFIER 25WATTS.....	£325.00
ICOM	AT-500 ATU.....	£295.00	KENWOOD	TS-870 SAT 0-30 DSP.....	£1,200.00	YAESU	FT-8500 Dual Band.....	£325.00
ICOM	IC735 General Coverage.....	£425.00	KENWOOD	TS-950SDX 2 YEARS AS NEW.....	£2,250.00	YAESU	FRG-100 MINT CONDITION WITH PSU.....	£350.00
ICOM	IC-725 TRANSCEIVER PLUS FM.....	£450.00	MFJ	784B DSP FILTER.....	£140.00	YAESU	FRG-100 FM KEY PAD.....	£350.00
ICOM	IC-735 TRANSCEIVER.....	£450.00	MFJ	784 TUNABLE DSP FILTER.....	£150.00	YAESU	FT-747 TRANSCEIVER.....	£350.00
ICOM	IC-275E 25W MULTI MODE.....	£550.00	NETSET	PRO-2032 BASE SCANNER.....	£95.00	YAESU	FT-757GXMK11 TRANSCEIVER.....	£450.00
ICOM	IC-706 Mk1.....	£599.00	REALISTIC	DX-394 AS NEW HF.....	£90.00	YAESU	FT-840 0-30MHz TRANSCEIVER.....	£495.00
ICOM	IC-737 BASE TRANS, INC TUNER 0-30MHz.....	£600.00	REALISTIC	PRO-2045 BASE SCANNER.....	£120.00	YAESU	FT-840.....	£500.00
ICOM	IC-275H 100W 2M MULTI MODE.....	£650.00	SGC	230 SMART TUNER.....	£200.00	YAESU	FT-890 HF Gen "as new".....	£600.00
ICOM	IC-706MK 11 DSP TRANSCEIVER.....	£650.00	SGC	2020 10W MULTI MODE HF.....	£325.00	YAESU	FT-736 2/70 AC TRANSCEIVER.....	£695.00
ICOM	IC-821 DUAL BAND BASE.....	£750.00	UNIVERSAL	M-8000 TERMINAL.....	£500.00	YAESU	FT-990AC.....	£895.00
ICOM	IC-2KL AMP + PSU 0-30MHz SOLID STATE.....	£895.00	WELZ	SD 400 SWR METER.....	£49.95	YAESU	FT-920 AF TRANSCEIVER.....	£999.00
ICOM	IC-746 HF/VHF.....	£999.00	YAESU	SP-8 SPEAKER for 1000MP etc.....	£80.00	YAESU	FT-1000 MP DC AS NEW.....	£1,400.00
ICOM	IC-970H P/S WIDE RECEIVE 900MHZ.....	£1,495.00	YAESU	FT-10 HANDIE 2M.....	£100.00	YAESU	FT-1000MP AC.....	£1,500.00
KANTRONICS	KPC-4 DUAL PORT TNC.....	£130.00	YAESU	FT-11 HANDIE 2M.....	£100.00	YAESU	FT-757GXMK11 TRANSCEIVER.....	£400.00
KANTRONICS	KAM PLUS TNC.....	£220.00	YAESU	FT-10 2M HANDIE.....	£125.00	YUPITERU	MTV-9000 AM/FM/USB/LSB CW SCANNER.....	£245.00
KENWOOD	AT-230 ANTENNA TUNER 0-30MHz.....	£140.00	YAESU	FT-11 2M HANDIE.....	£140.00			
KENWOOD	TH-G71 LATEST DUAL BAND HANDIE.....	£200.00	YAESU	FC-20 ATU FOR FT-847.....	£175.00			

■ PETER BOND c/o EDITORIAL OFFICES, BROADSTONE

■ E-MAIL: milair@pwpublishing.ltd.uk

# MilAir

## Lakenheath

I am sorry to once again mention Lakenheath, but all the recent changes to frequencies and Studs has evoked one of the largest mailbags I have ever had on one specific subject. It does go to prove that Mildenhall and Lakenheath are one of the most, (if not the most), popular destinations for aviation/radio enthusiasts in the UK.

The original changes to the Radar frequencies last Autumn were followed by a re-arrangement of the studs early in the New Year. Having compiled all the correspondence, what follows is, I hope, the current listing of the Primary Studs.

## Lakenheath Primary Studs

Channel	MHz	Description
01	300.8	NATO Low Fly
02	397.975	Ground
03	358.675	Tower
04	242.075	Radar/Departures
05	263.075	London Military East
06	299.975	London Military East
07	275.475	London Military West
08	249.475	Scottish Military
09	362.125	SOF (Ramrod)
10	337.6	Approach (RAPCON)
11	309.075	Radar/Talkdown
12	259.05	Radar/Talkdown
13	290.825	Radar/Talkdown
14	367.325	Radar/Talkdown

Channels 15 to 20 are variable and can be changed to suit each individual mission. RAPCON is the US term for Radar Approach Control. SOF is the Safety Officer Flying.

The only outstanding query is that five reports noted Stud 08 as per the listing and one report that it was the ATIS on 249.7 - any comments? Each of the three Squadrons at Lakenheath, 492 FS, 493 FS and 494 FS also all have an auxiliary set of Studs and Frequencies allocated to the rear seat of the F-15s. Each of these Auxiliary listings has 13 channels which varies for each squadron, channels 14 to 20 are allocated to the USAF 'Have Quick' frequencies.

## Mildenhall/RIAT 2000

My cautious comments regarding the aircraft participants at Mildenhall Air Fete this year appear to have been justified. The appearance of the F-22A Raptor seems unlikely as reports from different US sources indicate that it cannot be released from its test programme for Airshow appearances except for a couple in the USA. Also, the appearance of the V-22A Osprey seems doubtful as is likely to go direct to Boscombe for trials before appearing at RIAT 2000.

Having mentioned RIAT 2000, I have gleaned the following information from their website at [www.airtattoo.com/RIAT2000/index.html](http://www.airtattoo.com/RIAT2000/index.html) With space limited at Cottesmore, it seems that quality rather than quantity

is the plan, so a few interesting items that appear on an early list are as follows: 3 Finnish F-18s, a Singapore A-4, US Navy F-18 Super Hornet (from Patuxent River), USAF C-27 (G-222), USAF C-32 (Boeing 757), 2 V-22 Ospreys (yes two), French Navy E-3, Austrian Skyvan and Turbo Porters.

From the former Eastern Block countries, the Ukraine seems to have pulled out all the stops, their contribution includes: TU-22 Backfire, 2 SU-27s, 7 Mig-29s, TU-134, IL-76 and an IL-78. Plus several USN P-3s and the usual collection of C-130s/C-135s. To be honest, for varying reasons, I wasn't going to go this year, but it would be nice to see my fifth Backfire!

## Colour Codes

Two pieces of correspondence received over the past three months have asked if I know what the relevant weather states are, connected to the Colour Codes broadcast via Royal Air Force, ATIS's, (Automatic Terminal Information Service), i.e. weather broadcasts. The breakdown of the Colour Codes is as follows:

Colour Code	Min Visibility (m)	Min Cloudbase a.g.l. (ft)
Blue	8000	2500
White	5000	1500
Green	3700	700
Yellow	1600	300
Amber	800	200
Red	800	>200

Black can also be used and this indicates that the airfield cannot be used for a specific reason other than visibility or cloud minima. It is broadcast in conjunction with the other colour states.

## Culdrose

Jim and Terry from Penzance report that the new Merlin HM.1 Helicopter is now well and truly in service with 700M Squadron at Culdrose. The 10 based helicopters are now a regular sight around the coasts of Devon and Cornwall. They have a question for 'MilAir' readers and hope that someone can come up with an answer.

Despite living locally and try as they might, they have not managed to find out an Operations frequency for the new squadron. They have heard a couple of calls on

336.4MHz, which according to me is a 849 Squadron Operations frequency, but cannot isolate a frequency for 700M Squadron. Any suggestions?

## Low Level LOTA/OTA

A restructuring of the six UK Low Level Operational Training Areas has taken place with an additional seventh area being added. The areas have also had the 'L' removed from the title, now being called just Operational Training Areas, (OTA). Over recent years these areas have not only been used for military low level operations, but also for other operational missions, such as Combat Air Patrol, (CAP), this more variable range of operations may consequently explain the change of name.

The areas OTA A to F are still located in similar locations within the UK, but have all had their boundaries re-designed. The new area is OTA G which covers the Bristol Channel and parts of Southwest counties. Assuming they haven't changed, the frequencies for areas OTA A to F are as follows:

OTA A	Thurso	337.85
OTA B	Dumfries	306.65
OTA C	Borders	300.55
OTA D	Lakes	277.2/369.05
OTA E	Flamboro	364.975
OTA F	Wales	279.25

At present no frequency has been identified as in use for OTA G. Two sources have suggested that it may be 342.675, but this is doubtful as this was reported as a frequency only heard during an exercise in the Southwest during January. Any ideas anybody? Lastly, no photograph this month, but a map of the new OTA's, kindly supplied by Photavia Press.





## The UK Scanning Directory

**New 7th edition**

Tens of thousands of frequencies are listed in over 600 pages which continue to amaze everybody. Included are Civil and Military Aviation, Army, Navy, the largest Police list ever published, DSS Snoopers, GCHQ, Eye-in-the-Sky Links, Baliffs, Prisons, Outside Broadcasting, Motor Racing, Universities, Railways, Couriers and many more we dare not mention. And there is more! Civil Aviation Band listing alphabetically every airport in the UK and Ireland, new articles on scanning for beginners, how to monitor the military and the civilian aviation bands, PMR, European frequency list plus a scanning log to note your new frequencies.

Price £19.50 plus £2 postage. Overseas post to Europe add £5 or £12 elsewhere.



## North Atlantic Flight Communications

**New 2nd edition**

Plot trans-Atlantic flights with your HF radio and computer. Enter the flight details and watch in real time as the program plots the flight's progress across the North Atlantic on high resolution charts. The accompanying large book clearly explains all the procedures from filing the flight plan right through to landing at the destination, and describes the radio communications system in depth. Software requires IBM/PC and runs on Windows 95 & 98. See demo at [www.interproducts.ukf.net](http://www.interproducts.ukf.net)

Price £16.50 plus £1.75 UK post. Postage for Europe add £2.25 or £5 airmail elsewhere.

Scanner Busters 2.....	£5.00	Shortwave Eavesdropper CDROM.....	£12.00
World Airline Fleet and SECAL Directory.....	£19.00	Fax, Satellite and RTTY Weather Reports.....	£11.50
Scanning the Maritime Bands, 2nd Edition.....	£10.75	Weather Reports from Radio Sources.....	£7.50
UK Scanning Chart.....	£3.00	Mobile Phones - The Trunks of the Trade.....	£15.00

THE ABOVE BOOKS INCLUDE UK POSTAGE

Ask for free catalogue. Allow 14 days delivery

## INTERPRODUCTS (SW50)

8 Abbot Street, Perth PH2 0EB, Scotland

Tel: (01738) 441199 Fax: (01738) 626953

E-mail: [interproducts@ukf.net](mailto:interproducts@ukf.net) Web site: [www.interproducts.ukf.net](http://www.interproducts.ukf.net)

# JAVIATION

Carlton Works, Carlton Street,  
Bradford BD7 1DA

**AOR AR8200**  
**£349.00**  
including  
overnight delivery.

**ICOM IC-R2**  
**£149.00**  
including  
**RS-232 Interface**

**MVT-7100's**  
**£189.00**

**MVT-9000 MkII**  
For the best price on this  
new model, give us a call.

If you would like a printed  
catalogue, please feel free  
to contact us or send a  
large S.A.E. (40p).

Thanks.

Telephone: (01274) 732146

[www.javiation.co.uk](http://www.javiation.co.uk)

## Computer Interfaces

**RS-8200**  
Housed in DB-25 the RS-8200 allows  
computer control of the AR8200 and  
supports both software and hardware  
squelch detect. £39.99.

**RS-2700/8000**  
Housed in DB-25 this interface is  
compatible with both the AR7200 &  
AR8000. Supplied with a Flat Flexible  
Cable for use with both these models.  
Now available for just £34.99.

**JAV-232**  
Not only compatible with the AR8200  
but many other receivers also including  
the AR8000, AR2700, Alinco DJ-X10,  
Icom IC-R10 and IC-R2 to name a few.  
When used with the AR8000 or AR8200  
the JAV-232 also provides a squelch  
activated tape recording circuit and  
audio. The AR8200 connections also  
provide a FM Discriminator output for  
DATA decoding. The JAV-232 costs  
£69.99 but for connection to the AR8200  
an optional OS-8200/DIN lead is  
required at £15.00.

Other interfaces for the Icom IC-R2,  
IC-R10 Trident TRX-100XLT and Alinco  
DJ-X10 also available.

# C.M. HOWES COMMUNICATIONS

[www.howes-comms.demon.co.uk](http://www.howes-comms.demon.co.uk)

Mail Order to: Eydon, Daventry,  
Northants. NN11 3PT  
☎ 01327 260178



### SSB & CW Filter - £29.80!

Clean up your reception!

- Reduce noise and interference! • Sharp SSB/ Speech filter with faster roll-off than IF crystal filters!
- 300Hz bandwidth CW filter • Printed and punched front panel • All aluminium case • Simply connects between radio and external 'speaker' or 'phones'
- Suits all general coverage receivers & transceivers
- ASL5 Kit plus HA50R hardware: £29.80



DC2000 built in HA22R hardware option

**HOWES DC2000 Electronics kit: £22.90**  
(includes either standard 80M, or your choice of band module).  
**HA22R Hardware (pictured): £18.90**  
Extra band module kits: £7.90 each.

## SSB/CW RECEIVER KIT

**HOWES DC2000 Kit - only £22.90!**

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

Matching Transmitter/Hardware



## Great Projects for Home and Holiday!



### Multiband SSB/CW Receiver Kit

The DXR20 covers 20, 40 & 80M bands as standard. You can add any other SW band with optional plug-in band modules (same type as DC2000). Versatile and popular!

DXR20 Kit: £39.90. DCS2 "S meter" Kit: £10.90. HA20R hardware pack: £28.90

### EX ACCESSORY KITS

CSL4	Internal SSB & CW Filter for our RXs	£10.50
DCS2	"S Meter" for direct conversion RXs	£10.90
SPA4	Scanner Preamp 4 to 1300MHz	£15.90
RA30	HF RX Rotary Attenuator 0/15/30dB	£3.90

### DIGITAL READ-OUT KITS

CBA2	Counter Buffer (fit to Rx to feed DFD5)	£5.90
DFD4	Add-on Digital Readout for superhets	£49.90
DFD5	Digital Frequency Counter/Readout	£54.90
PMB4	Adds 5 extra frequency offsets to DFD4	£9.90

Most kits can also be supplied as assembled PCB modules. Optional hardware packs are also available for most kits - please see our website or send for more details.

### ACTIVE ANTENNA KITS

AA2	150kHz to 30MHz active ant. amplifier	£8.90
AA4	25 to 1300MHz wideband, compact	£19.90
AB118	DX reception on VHF air-band	£18.80
MB156	DX reception on VHF Manne	£18.50

### TRANSMITTER KITS

AT160	80 & 160M AM/DSB/CW 10W PEP	£39.90
TX2000	QRP CW with plug-in band module	£24.90
LM2000	Links DC2000/TX2000 for transceive	£16.30



### TOP VALUE RECEIVING ATUs

**CTU8.** Covers 500kHz to 30MHz. Matches antenna impedance and helps reduce spurious signals and interference with extra front-end filtering for the receiver. SO239 sockets. For coax fed and longwire antennas. Built: £49.90. Kit (inc. hardware): £29.90.

**CTU9.** As CTU8 plus balun, bypass switch and terminal posts. The fully featured Rx ATU! Built: £69.90. CTU9 Kit (inc. hardware): £39.90.

Please add £4.00 P&P. or £1.50 P&P for electronics kits without hardware.

HOWES KITS contain good quality printed circuit boards with screen printed parts locations, full, clear instructions and all board mounted components. Sales, constructional and technical advice are available by phone during office hours. Please send an SAE for our free catalogue and specific product data sheets, or you can browse this information on our Internet Website (address at top). UK delivery is normally within seven days.

73 from Dave G4KQH, Technical Manager.

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

# Satellite TV News

A disastrous fire at the home of the Romsey/Test Valley area MP - Michael Colvin - claimed both his life and that of his wife Nichola in the early hours of February 24th. The blaze was intense and his large manor house - at Tangley, near Andover - was completely gutted down to standing walls and large chimney stacks.

A prominent and stalwart MP - described as one of the last 'True Blues' - of many years, the tragedy naturally created intense media interest and by mid-morning **Roy Carman** (Dorking) reported at least four satellite uplink trucks were on site providing live coverage, reports and interviews back into network. 'SISLink 14, UKI-33' was feeding material back into the local TV company Meridian TV (11.684GHz-H, SR 5632; FEC 3/4), the BBC regional truck 'UKI-534 BBC DSN' (11.583GHz-H) plus others at 11.039GHz-H and 11.078GHz-H.

All of these feeds were carried via *Eutelsat II F3 @ 36°E*. Towards early February, Roy also saw several other news packages being sent out ex Moscow. Both were seen over *Eutelsat W2 @ 16°E* - one at 12.568GHz-H merely replayed part of a news programme from the HTB network showing Russian military in Chechnyan action, a scruffy news reporter with shots of soldiers (many with the Russian Star Badge in hats, heavy noise from the 'Hind' helicopter gun ships as they overflew.

Another *W2* feed (12.507GHz-H for Enex) a few days later reported on the fall of Grozny, a completely devastated landscape, rubble and a dejected column of Russian soldiers. A new weapon was spotted - one carried an AK47 rifle fitted with variation of the 'Inerga' throwaway anti tank weapon, in the distance were T74 tanks with tiled armour over their 'soft' areas!

Meanwhile in Western Europe at the same time of the Chechnyan agony, *W2* was running footage of a snow machine spraying snow onto a ski-jump to replace patches of melted snow. Lorries had been carrying in snow which was piled high ready for the sprayer - 11.131GHz-H.

All the above digital feeds were running SR 5632; FEC 3/4. Chechnya was the content of a Moscow feed into the UK via the usual BBC-TV 11.600GHz-H lease but in use by 'RTV Moscow 4', 0700 hours on February 25th. And to another problem - 'The Dome'! February 17th and the Queen of Denmark then visiting the UK decided to pop into the 'Dome' and give it the once-over. A live report via *36°E @ 11.087GHz (5632+3/4)*. I'm advised that she actually works for a living - I wonder if she queued to gain entry?

Back to Roy Carman for an interesting note - early February and *W2, 16°E* carried international tennis out of Zurich with English commentary on the Australia v. Switzerland tournament - this at 11,124GHz-H. This frequency is used by the Sainsbury grocery chain for their corporate TV programming that's viewed by their UK staff detailing

training, news on the latest products and general company news.

If you're passing by a Safeways' supermarket you will see a largish white dish, perhaps 1.5m offset adorning more stores - even the petrol station is apart from the main store - which are used for feeding the Safeway TV service back to their staff.

All of the early morning weekday breakfast show live outside broadcast feeds

A Reuters circuit feeding a CBS news report from Bedford, New Hampshire, via their Washington bureau, *NSS-K*.



now seem to be carried via *II-F3 @ 36°E*, this after the demise of the infamous UKI-149 analogue vehicle that once frequented 21.5°W. A disturbing trend however is a tendency to encrypt.

The current practice seems to be establishing the uplink feed from the remote site which once confirmed as technically OK then scrambles during rehearsal prior to transmission. Certainly SISLink have been encrypting the past few weeks - perhaps this practice has been encouraged by satellite enthusiasts receiving (or this article reporting) the broadcast activities!

February 15th and the 0720 uplink 'SIS 32, UKI-486 ITN LINKS' carried several test card idents including the 'phone no. of the 'Station Engineer' and 'GMTV OB UNIT 1' (11.079GHz-H), meanwhile down the band a little carried 'SIS 38 UKI-507' @ 11.071GHz-H - this a serious item concerning the activities within the building (behind the reporter) - the Erlas Centre which previously was known as the 'Colditz of Care' and now a training centre.

The sad news that broke February 24th told that 'The Wizard of the Dribble' - Sir Stanley Matthews - had passed away and SIS-33, UKI-493 (11.079GHz-H) arrived at the Britannia Stadium that evening for a live insert into the 'Central' evening magazine programme to speak on the life and times of Sir Stanley.

March 3rd and the funeral cortege travelled 18km around the Stoke area, to the Victoria Ground and then the Britannia Stadium where the horse circuted the football pitch. That evening an interview from the board room at the Stadium was fed live into Central by SISLink 25 UKI-253 (11.675GHz-H).

Sports of course features heavily in satellite OB coverage. More PGA (Professional Golf Association) action was carried over the Globecast digital bouquet on *NSS-K, 21.5°W (11.590GHz-V, SR 20145; FEC 3/4)*. This is a favourite for weekend and evening golf coverage ex USA. The 25th featured PGA action in the 'Touchstone Energy Tuscon Open' tournament, ch.2, with general coverage out of Tuscon and ch.3 with a dedicated CNBC feed including commentary.

The previous weekend featured the 'Nissan Open', another PGA series offering on the Globecast *NSS-K* bouquet from LA, South California. But if you're into horse racing, then check out an Italian digital bouquet on *W2 @ 16°E, 12.609GHz-H* includes 'Snaisat', SR 27500; FEC 3/4. This seems to be a channel devoted to the subject. On the 23rd, video coverage included the Lingfield, Surrey, meeting amongst other European race meetings.

All of the above sightings have been in digital, this now tending to take over from analogue coverage, but analogue is still alive and well - if you can find it! Many of the German early evening regional links still use analogue and a favourite is the NDR Hamburg studio.

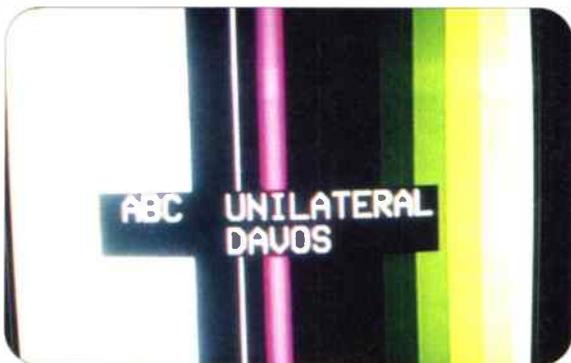
DFS *Kopernikus-2 @ 28.5°E* is worth checking and although the footprint is tightly spotted into Germany, it's possible to resolve pictures in South/SE UK. A typical example was at 1800 on February 14th, a fashion parade somewhere in Hamburg, sparkle, models, cleavage and glitz. And at the end of the broadcast up came the FUBK test card with 'SATKA NDR Hbg' - 11.590GHz-V - and unlike other uplink operators that slowly wind down the output (and in analogue the signal gradually disappears into noise),



At the base of the Goghtuk TV transmitting mast, Sikkim Province, North India stands their satellite link dish.



BBC VT package 'count down' sequence via an ABC news circuit over a Swedish uplink.



American feed outbound from Switzerland for the 'States on *NSS-K*

the NDR crew just instantly switched off and hurried back to the studio!

It appears that the only analogue BBC satellite truck still operating is the 'BBC UK1-230 BELFAST'. She appeared late February over the *Telecom 2B/D* slot @ 5°W, 11.574GHz-H with audio @ 6.60MHz. And **Stefan Hagedorn** reports that *Eutelsat II F4*, 10°E often carries APTN Moscow news feeds around 1730CET @ 11.163GHz-H with audio 6.60MHz.

The ever increasing move into digital has meant that Reuters Washington might have taken yet a further step and are using fibre optic (terrestrial) on the North Atlantic path. This offers both security and cost advantages and usage of fibre is likely to increase between the important population centres, e.g. New York to London, etc., though satellite will remain as a main linking technology - fibre cannot link every point of the earth together. Reuters on NSS-K have it seems dropped the use of both 11.558 and 11.566GHz-V, they can still be located at 11.566GHz-H though much of their output is encrypted - thus we see only a blank screen!

Both BT Washington and Starbird are prolific at 21.5°W so fortunately all is not lost. But *Telstar-12*, the recent arrival at 15°W has dropped its analogue caption 'Welcome to Telstar' on 11.546GHz-V NTSC and is now fully digital.

Finally, the digital 'NTL Winchester Teleport' colour bars carried at 16°E, 11.012GHz-H, SR 5632; FEC 3/4 has been updated to a promotional montage on a video loop showing their coverage of news, sports and entertainment.

In my *Television* magazine column I expressed an interest in hearing from readers on early satellite receptions. To my delight a letter arrived from **Brian Lewis**, a retired BBC engineer now living in Pembrokeshire. He worked at the Tatsfield monitoring centre and one October evening in 1958 Caversham (near Reading) sent a report to Tatsfield that the TASS News Agency, Moscow, was reporting the Russians had launched a satellite - *Sputnik-1* - transmitting at about 20.80MHz. Brian on duty that night tuned in his AR88 and soon heard signals, not the 'bleep-bleeping' tone that is usually played out as the Sputnik signal, but a pulsating carrier. The tone was obtained by switching in the b.f.o. of the AR88s that were in use then at Tatsfield.

*Sputnik-1* was audible for under two minutes confirming the low earth orbit - but looking out of his cubicle window he could actually see the craft pass over just after earth nightfall (when the satellite was still illuminated by the sun). The Americans first became aware of Sputnik when the BBC's General Overseas Service included the news plus a 'bleep-bleep' recording at 0600 hours! A fascinating story of early satellite monitoring from Brian.

Incidentally, vintage readers (like me) will recall the R208 'communications' receiver, an ex government mains powered apparatus selling at £6.19.6d from the likes of Relda Radio (early forerunner of Laskys) and marketed as 'Listen to the satellites, the Sputnik Special! I've now covered from 20MHz to 12.750GHz in one satellite article yet I guess the 20MHz experience was the more pioneering of the pair.

## Orbital News

There's a new sports channel arriving covering Central/Eastern Europe - that of 'Fox Sports International' - opening May 5, 2000 and airing 11 hours daily from 1700UTC onwards from the *Hot Bird* 13°E slot. Content will be that of international and regional sporting items both conventional and 'extreme' with one hour of local sports news nightly.

Another soon to launch channel and rivalling Discovery is the 'Einstein Channel' which will offer a similar programme format. Initially launching across Germany mid April 2000, Einstein intends to enter the Italian market next and currently are in discussion with UK broadcaster Sky seeking access onto the 28.2°E digital platform later. And the ITN/NTL group are launching their own 24-hour news channel in opposition to Sky News and BBC News 24. The news offering will air over cable, DTV and satellite in the Autumn 2000.

The EBU (European Broadcasting Union) are supporting a move to air programming made by independents and other groups that wouldn't normally gain access to air space. 'Night Trade' will air late at night and will include features, docs and 'video art'. Already support has come from the alliance of NOS Holland, SVT Sweden, YLE Finland, ERT

Greece, MTV Hungary and ZDF in Germany. The regular late night slot will include co-production members of said alliance and the EC will finance the subtitling into appropriate languages.

The Dutch Canal+ variant channel - Canal Digitaal - will introduce the Seca Mediaguard interface module soon and dedicated smart cards will be available to their subscribers on request. Due to the high levels of pirate hacking of the encryption system - particularly in the UK - Canal Plus is seeking legal action to terminate the pirate card/decoder sales which is currently big business. Interesting to note that the Geneva based EBU are seeking companies to develop a new method of 'watermarking' digital broadcasts to protect copyright of digital broadcasts since copies will be as good as the transmitted original.

Despite the expressed concerns over the large solar storm/flare February 17/18th and the possibilities of 'a massive cloud of hot electrically charged gas ejected by the Sun towards the Earth' threatening various utilities and space craft, it appears that all survived and no damage to or loss of communications from the Clarke Belt satellite fleet has been experienced.

Eutelsat is providing a free-to-air (FTA) digital TV bouquet on *Hot Bird*, 13°E @ 12.149GHz-V @ SR 27500; FEC 3/4. 'Sitcom' will consist of four Luxembourg generated channels - Nuvolari (motor sports); Alice (living styles/domestic); Espresso (culture/travel) and Leonardo (Italian life style) - by the time this hits the bookstalls they'll all be on-air. Programme languages will cover English, Italian, French and German.

Intelsat have ordered another satellite from Matra-Marconi - this the NI-*Alpha-2* will be slotted at 1°W and serve the Americas, Africa and Europe, an in-orbit delivery date hasn't been advised.

Confident of growth in satellite comms despite the expansion of undersea fibre optic, BT Broadcast Services have just opened a new teleport at Marina del Rey, near Los Angeles, serving the Americas and trans Pacific Ocean at both C and Ku-band.

Mid 2000 should see the Alcatel/Loral satellite 'Europe\*Star-1' open for Ku-band communications with a single hop coverage into Europe, Africa, the Middle East and SE Asia. Anticipating a sell out of onboard capacity within 18 months of launch, the 'Europe\*Star-2' will then be launched with an estimated 30% sell out prior to orbit. The 'Europe\*Star' slots are already allocated at 43, 45 and 47.5°W which will provide optimised coverage spanning Europe into SE Asia, controlled from the Alcatel French base at Toulouse, France.

Previously I detailed the projected Pacific Islands service via the French Canal+/RFO service, now 'Tele Fanua' based in French Polynesia is testing reaction for a rival service from *Intelsat 802* @ 174°E in C-Band to establish reaction for a Pacific Island TV Pay-TV service.

Meanwhile, back at the ranch, 'Tahiti Nui TV' intends to open in Ku-band via *Intelsat 701* @ 180°E with an 11 channel pay-TV package this coming June. Interesting to note that the Canal+/RFO service also illuminates from the same satellite.

For radio anoraks checking out *Astra 2A* then look for GWR output, they've recently gained carriage for five digital channels - Classic FM, Classic Gold, Core, The Mix and Planet Rock. The World Radio Network have also signed up for digital transmission of their English language 'WRN1 Europe' over *Astra 2A*.



SISLink identification via 36°E.



Kurdish TV - analogue - seen on Eutelsat W2 @ 16°East.



The NTL promotional video appears on Eutelsat W2 @ 16° in a continuous loop.



Coverage of Sir Stanley Matthew's funeral, March 3rd, report from the beard room of Stoke City Football Club.





# AR8200 SERIES-2

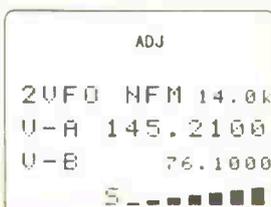
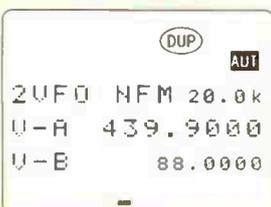
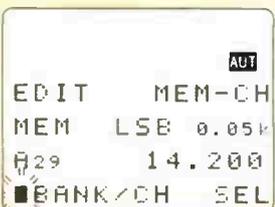
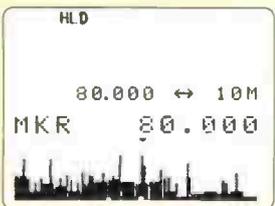
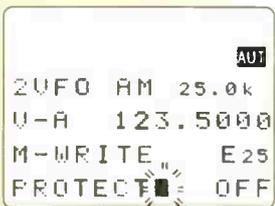
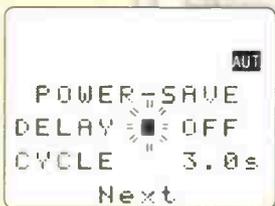
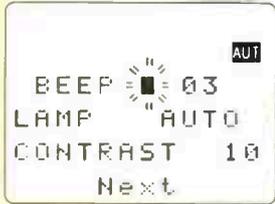


## NEVER BEFORE HAS ONE HAND PORTABLE OFFERED SO MUCH

The AR8200 represented a beacon when first released, technology marches forward with the NEW AR8200 SERIES-2 keeping the innovative concept and forward thinking alive and bright. It has not been easy improving on what many thought to be the ultimate, however the NEW AR8200 SERIES-2 does provide even more with nothing taken away. A Temperature Compensated Crystal Oscillator (TCXO) now forms the heart of the NEW AR8200 SERIES-2, this ensures **high stability** with **minimal internal spuri...** the TCXO replaces a crystal reference as commonly employed in other receivers and is usually only seen in top of the range (more expensive) table-top models such as the AR5000 and AR7030. Performance too has seen the AOR R&D team fine tuning the design for **best sensitivity and strong signal handling** over the extremely wide coverage of 530kHz to 2040MHz (all mode receive without gaps).

The aerial has also been replaced by a **telescopic whip** on a swivel base, this ensures the best results, a medium wave bar aerial is also provided as standard. The design team have certainly been taking account of customers wishes, the keyboard ZERO key has been swapped in position with the DECIMAL to match the telephone layout, LCD illumination has been increased (for improved visibility) and following requests for longer operation between charges, the **4 x AA size NiCads have been increased in capacity**, again reflecting improvements in modern technology. The obvious change has been left for last... the **cabinet colour** has been changed from green to **black!**

The list of features is vast, large multi-section backlit LCD, side mounted navigation keys and rotary tuning control, alpha-numeric text comments for memory channels, banks and search. The all mode receive features Wide, Standard and Narrow AM with Wide FM, Narrow FM and Super Narrow FM bandwidths provided, tuning step sizes are programmable in all modes down to 50Hz with comprehensive step adjust and correctly implemented 8.33kHz for the new VHF airband spacing. Connection to a computer is possible with the optional CC8200 lead/interface with free PC software available from the AOR web site. Unique optional slot cards further enhance features offering CTCSS, Tone Eliminator, Record / Playback, Voice Inverter, External Memories (backup for 4000). Other options include the RT8200 for 'reaction tune' with the Opto Scout and other compatible devices, clone lead, soft case, option lead, record interface. Even the operating manual reflects the careful design being 140 pages of ENGLISH language with plenty of illustrations.





★★★☆☆ AR5000+3 awarded four stars by both the authoritative Passport To World Band Radio and World Radio & TV Handbook

#### AR5000

True base receivers are few and far between, some have simply evolved from the hand held equivalents with little tangible improvement in performance or facilities over their smaller counterparts - *the AR5000 is not like this!*

High performance, top quality build and true wide coverage all mode receive. The "+3" version offers even more with synchronous AM, AFC and Noise Blanker. Popular with government agencies throughout the world.

#### AR5000c

When making critical measurements, the frequency coherence is very important whether a single or multiple unit is employed. This involves the use of a single reference for all oscillators employed throughout the receiver. The AR5000C now provides this commercially required capability. The "C" version may be provided to order in either the standard AR5000 format or with two of the +3 additions of AFC and NB. If you are a commercial operator with this application in mind, please request the separate specification leaflet for the AR5000C.

#### AR5000+3 - Sync AM, AFC, NB

The "+3" version offers even more with synchronous AM (upper side band, lower side band and double side band with excellent lock range), AFC (Automatic Frequency Control for accurately tracking moving transmissions or unusual band plans) and Noise Blanker.

#### Passport to World Band Radio'99.

*"Front-end selectivity, image rejection, IF rejection, weak-signal sensitivity, AGC threshold and frequency stability all superior".*  
*"Unlike virtually every other receiver we have tested over the past 21 years, the frequency readout is unfailingly accurate to the nearest Hertz. This should make the AR5000+3 of exceptional interest to broadcast engineers".*

#### World Radio TV Handbook'99.

*Speaking of the AR5000+3 in conclusion... "Compared with the ICOM ICR-8500 it offers considerably more features, better strong-signal handling, wider coverage and decidedly superior filters".*

#### AR5000+3

- ✓ Wide frequency coverage 10 kHz - 2600 MHz
- ✓ All mode reception: USB, LSB, CW, AM, Synchronous AM, NFM, WFM with automode tuning (any mode and bandwidth on any frequency is possible)
- ✓ Automatic Frequency Control
- ✓ Noise blanker
- ✓ High stability TCXO reference, 1 Hz NCO tuning
- ✓ 1,000 memories, 10 memory banks, 20 search banks, 5 VFOs (all twice!), alpha tag, EEPROM chip storage
- ✓ Multiple IF bandwidth 3 kHz, 6 kHz, 15 kHz, 30 kHz, 110 kHz, 220 kHz with an option position for 500 Hz CW. (30 kHz is ideal for WEFAX).
- ✓ High sensitivity and excellent strong signal handling assisted by a preselected front end from 500 kHz - 1 GHz
- ✓ Extensive RS232 control list
- ✓ SDU ready with IF output for spectrum display unit

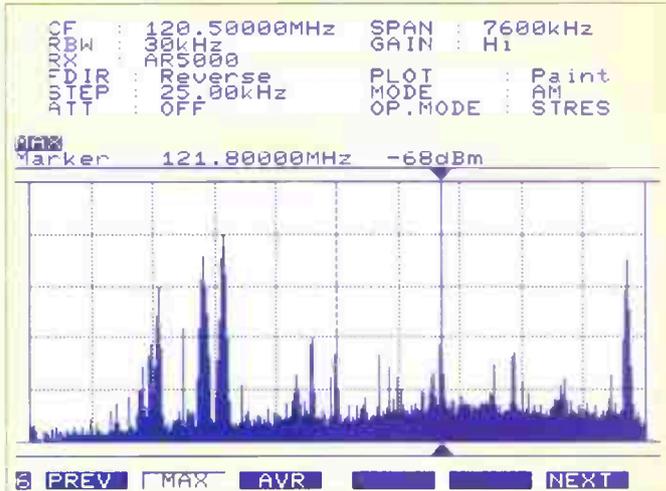
## Setting new standards, SDU5500 Spectrum Display Unit

The SDU5500 is an 'all new' Spectrum Display Unit and a worthy successor to the SDU5000 (which offered practical and cost effective monitoring). Coupled to the AR5000 receiver, it provides a spectrum display of 10 MHz bandwidth anywhere between 10 kHz and 2600 MHz.

Already pressed into commercial usage by the government, the professionalism of the unit has truly been grasped. The SDU5500 has a high resolution monochrome (white/blue) LCD with improved status read-out on the top-half of the display with a spin wheel tuner controlling the marker position, similar to a dedicated high-priced spectrum analyser.

#### Receiver

```
AR5000 IC-R8500
AR5000A IC-R9000
IC-R7100 Other
```



The SDU5500 supports a number of AOR and ICOM receivers, see above. In addition, the SDU5500 may be used with other receivers which offer a 10.7 MHz I.F. output with suitably wide bandwidth, please refer to the colour leaflet for details. Various enhancements have been implemented over the earlier SDU to provide even greater functionality and professionalism. **Free internet download software** for the PC Windows operating system is available from our UK web site <http://www.aoruk.com/firm5500.htm>

*Commercial and government organisations are selecting the AR5000 and SDU5500 every month. The combination is so successful that in many cases it is being singled out for implementation or consideration as their 'standard kit'!*



As reviewed in the December '99 edition of *Short Wave Magazine*

FOR FURTHER DETAILS, PLEASE VISIT YOUR DEALER,  
 CALL FOR A LEAFLET OR VISIT THE AOR UK WEB SITE AT  
[www.aoruk.com](http://www.aoruk.com)

**AOR (UK) LTD** 4E East Mill, Bridgefoot,  
 Belper, Derbyshire, DE56 2UA England  
**Tel: 01773 880788** Fax: 01773 880780  
 info@aoruk.com www.aoruk.com E&OE

## JAYCEE ELECTRONICS LTD

20 Woodside Way, Glenrothes, Fife, Scotland KY7 5DF

Tel: (01592) 756962 • Fax No. (01592) 610451

Opening hours: Tues-Fri 9am to 5pm. Sat 9am to 4pm. Closed Sun & Mon.

**KENWOOD, YAESU & ICOM APPROVED DEALERS**  
A good stock of new and secondhand equipment always in stock.

Check out our web site. See our secondhand list that is regularly updated.  
<http://members.aol.com/jayceecom>

## NORTHERN SHORTWAVE CENTRE

BLACKDYKE RD, KINGSTOWN IND EST., CARLISLE, CUMBRIA CA3 0PJ

Phone/Fax: 01228 590011

David Brown G4KFN

New and used short wave receivers, scanning radios, amateur radio equipment and accessories plus books and magazines.

## DEMODULATORS FOR JVFAX HAMCOMM SKYSPY RADIORAFTH DL4SAW & POCSAG AND NOW JVCMM32 + PSK31 TRANSMIT

All Demods have 25 way female 'D' type - ORIGINAL RECEIVE ONLY £16.99  
**NEW** RECEIVE ONLY with SoundCard Cable (saves cable swapping) £19.99  
 POCSAG RECEIVE version (as Rx only with variable hysteresis) £19.99  
**NEW** POCSAG RECEIVE with SoundCard Cable (saves cable swapping) £22.99  
 Original TRANSMIT version (Pocsag Rx + Fax/SSTV/HamComm Tx) £24.99  
 JVCComm/PSK31 Tx (Pocsag Rx + Fax/SSTV/HamComm/JVC32/PSK21 Tx) £29.99  
 Adaptors 25m/Bf £3.00 25m/25m £3.00 25m/Bf Cable (ATX/Laptop) £6.00  
 4-way RS232 Switch Box £17.50 1m 25-way Cable £6.00 Shareware on 3.5" disks  
 JVFAX7 + HamComm 3.1 + Pktmon12 + Pocsag (PD2.05) + Wxgraph + Freqs £2.50  
 RADIORAFTH V3.20 £2.50 DL4SAW SSTV (V1.2) £2.50 JVCComm32 V1.0 (3 disks) £4.50

### REGISTERED VERSIONS OF SOFTWARE

SkySpy V2.0 £24.99 DL4SAW/GSHPC SSTV V2.3 £34.99 JVCComm32 V1.0 £49.99  
 HamComm 3.1 £19.99 Pocsag (PD2.05) £19.99 RadioRaft V3.20 £24.99  
 All prices UK/Eire inc VAT + P&P. For non-EU deduct 17.5% VAT.  
 All products (except software) carry a full money back guarantee.  
 Minimum Credit Card order £15.00. Outside British Isles add £2.00.

Pervisell Ltd, 8 Temple End, High Wycombe Bucks HP13 5DR

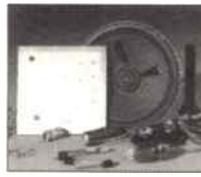
Tel: (01494) 443033 Fax: (01494) 448236

[www.pervisell.com](http://www.pervisell.com) e-mail: [ham@pervisell.com](mailto:ham@pervisell.com)



## 3 THREE NEW KITS for Novices!

Ideal for the NRAE Course - or just for fun!



Send SAE for kit brochure

Two very simple AM receivers - for either Short or Medium Wave. Both kits include the variable capacitor and a crystal earpiece.

Price? Just £8.00 each.

Using the 'NOVICE' Audio Amplifier will give modest loudspeaker output from these or any other simple receivers. Including the loudspeaker, the price is again just £8.00.

Postage is only £1 for any one or all three.



**Lake Electronics**



7 Middleton Close, Nuthall, Notts NG16 1BX

Tel: (0115) 9382509

Callers by appointment only

# FLIGHTDECK

## AVIATION EMPORIUM

Scanners, Books, Models, Videos, Charts, Apparel, Software and more.

Send £2.00 (credited against order) for our illustrated catalogue or visit our web site at:  
[www.flightdeck.co.uk](http://www.flightdeck.co.uk)

Flightdeck, Dept SW, 252A Finney Lane  
Head Green, Cheadle, Cheshire SK8 3QD  
Tel: 0161-499 9350. Fax: 0161-499 9349  
E-mail: [FlightDek@aol.com](mailto:FlightDek@aol.com)



**RIG**  
Remote Imaging Group™

Do you know that there are weather satellites passing overhead right now?

With fairly simple equipment YOU could be receiving their weather pictures at home!

The Remote Imaging Group is an international group of over 2000 enthusiasts who are interested in receiving weather satellite transmissions from all over the world. We publish a 100 page quarterly journal that contains articles and information related to the reception of weather satellite meteorological transmissions. The journal includes regular articles on meteorology, and understanding weather satellite images, it also contains reviews and constructional articles as well as lots of images, some in colour! RIG maintains a large shareware and image library for members' use and provides comprehensive helplines for those that need it. RIG also endeavours to provide all the equipment required to receive weather satellite images directly, and also carries adverts from manufacturers that give generous discounts ONLY to RIG members! In short the benefits of membership are too good to miss so why not join our 2000 plus international membership NOW?

Membership rates are for a FULL year's journals (x4):-  
£11 (UK) £13 (EU outside UK) £15 (Outside EU).

For more information visit our internet website at:-

<http://www.rig.org.uk>

For a free information pack send a large SAE to:-

**RIG - S3D, 34 Ellerton Road, Surbiton  
Surrey KT6 7TX, England**

## The SHORTWAVE Shop

18 FAIRMILE ROAD, CHRISTCHURCH, DORSET BH23 2LJ  
Phone/Fax 01202 490099 SHORTWAVE HOTLINE: 07000 QDXCQ (273927)

## THE COMMUNICATION SPECIALISTS

Receivers - Scanners - Transceivers

Call & discuss which part of the radio spectrum you wish to operate and we will advise you on the most cost effective way achieving it.

● Full range of new & secondhand equipment available.

● We stock all leading brands:-  
Airband Amateur CB, Marine Shortwave  
Licence-Free Family Radio

● Business and security radios



## LARGER SHOWROOM

For Year 2000

More receivers,  
scanners, transceivers,  
books and accessories.



SHORT WAVE ADVICE LINE  
01202 490099

ALINCO, AOR,  
AKD, BEARCAT,  
COMTEL, DRAKE,  
FAIRHAVEN,  
ICOM,  
KENWOOD,  
JRC, LOWE,  
MAYCOM, MFJ,  
OPTO,  
WELLBROOK,  
YUPITERU,  
YAESU



Call for latest second-hand list or visit our website <http://www.shortwave.co.uk>

4 MILES FROM BOURNEMOUTH INTERNATIONAL AIRPORT ON B3073  
300 YARDS FROM CHRISTCHURCH RAILWAY STATION. FORECOURT PARKING FOR DISABLED

■ DAVE ROBERTS c/o SWM EDITORIAL OFFICES, BROADSTONE

■ E-MAIL: scanning@pwpublishing.ltd.uk

# Scanning

Hello again. Well firstly a bit of feedback. Neal contacted me via E-mail and says that he was getting reasonable reception from his Realistic PRO-2036 with a discone mounted inside the loft and wondered whether he could achieve better results. I replied advising that the antenna will work appreciably better when mounted outside - he has done this and, of course, found reception has improved.

The PRO-2036 is identical, I believe, to the COM215 by Commtel. There is nothing wrong with this set, but I believe that the COM215 is made primarily for the American/Canadian market. Sets made for the Transatlantic folks differ in some ways from other sets.

The first thing that you may notice on such a radio is that there are buttons which really mean nothing to you. They may well have WX and ALERT on a couple of them. These controls are used in conjunction with broadcasts that are sent to radio users in the US and Canada to warn of extreme weather conditions.

The transmissions are in the 161-162MHz band and receive circuits were originally fitted to marine band radios and CB radios and so on to warn that a hurricane or tornado or something equally horrid was inbound. Eventually, scanners were fitted with the pre-programmed channels.

Of course, we don't have any such service in this country, so if you run that facility on your scanner in the UK, you will hear a mixture of marine band and p.m.r. stuff. The main difficulty with scanners intended for the users on the other side of the Atlantic is that at the lower end of the market they generally will not have selectable a.m./f.m. This is not a problem over there, but in the UK, we have a.m. signals popping up in parts of the v.h.f. spectrum that in the USA and Canada are reserved for f.m. use only.

The bottom line on this is that if you want to hear a signal in mid band v.h.f. that is on a.m., then your US market scanner may not allow you to, it may only receive f.m. at these frequencies.

## Long Distance

Simon from High Wycombe also contacted me. He has a good range of kit and has been listening to some long distance stuff on the lower bands, but no American emergency traffic as yet. He has an impressive selection of antennas which are driving his girlfriend bananas. I think that you are doing the right thing, Simon - it's a good test of her suitability isn't it...

## New Website

And now a quick plug for a new website whose webmaster has E-mailed me. Take a look at [www.frequencyuk.co.uk](http://www.frequencyuk.co.uk) They tell me that they are working on it all the time so by the time you read this it probably will have even more information.

## CallFree

PMR446 licence free radios are becoming more popular with companies adding more features to improve sales. The manufacturers Ross have now come up with a new idea for their range. Called 'CallFree', the sets incorporate a polling circuit so that sets contact each other automatically.

The idea is that should you be keen on keeping tabs

on a child or a vulnerable person, then all you do is select one of two ranges available and should the child's radio go out of range, then the other set beeps and you know that junior may need locating. So, if you hear tones other than the droning of CTCSS, then you'll know what they are.

## No Change

Now...how long have you been scanning? OK it may not seem too long, but when you work it out, I bet that you will have been listening for a lot longer than you first imagined. Until recently, most radio systems hadn't changed that much. The basic u.h.f. police frequencies were established about 40 years ago, and although small changes are being made, the fact remains that a receiver that would pick up these transmissions then, will still pick them up.

Do you remember when the Home Office sold off the ex-police Pye Pocketfone PF1 sets. Dealers at all the rallies were flogging them to the punters at about a pound apiece for a receiver. Most were marked up with the channels that they were on and I bet a fair few of those receivers are still in use by hobbyists today. Amazing...

The transmit units were supposed to have had the crystals crushed, but at least one pallet load escaped unsmashed. There was the trader at a rally. He popped a red battery into the PF1 transmitter and looked at the frequency counter. "Yep, this one's on channel 9" he said. A police foot patrol was walking by. It was just a question of time before all of a sudden the policeman had someone new to matter with on his channel. Talk about communications security.

Anyhow, if you have an interest in older type sets or ex-government equipment and you think it has all been destroyed or just lost, then you are wrong. There are collectors about who have taken a great deal of time and trouble and who have spent a bit of cash here and there to ensure that these interesting bits of kit remain.

For instance, the 'Mould' system mentioned in the March SWM used some Pye Pegasus equipment. A selection of Pegasus types has been saved by David Hicks who runs his private 'Museum of Pye Telecom'.

If you remember the old Cambridge sets (I had one on 2m and one on 70cm, until it caught fire) - yes, Dave has these plus the export equivalent, the Continental, which could be seen in use in isolated communities in Canada until recent years. If you remember the v.h.f./u.h.f. Whitehall/Westminster repeater sets and their control boxes and you thought they had all long gone, you would be wrong.

Every Pye set is represented and some other specialist equipment from other manufacturers as well. He sent me two Mitre covert sets which I hadn't seen in a long time. It really is a valuable resource and I never tire of chatting to Dave about radio types on the 'phone. I guess I should get out more...!

I think that it's important for this gear to be preserved as until the advent of mobile 'phones, these sets were the primary means of communication for people on the move and their use has been instrumental in life saving events all over the world. If you have any Pye gear or old p.m.r. equipment that you are considering clearing, then Dave may well be grateful for it. You can contact me via SWM and I shall pass on any messages.



## Rescue Teams

Now for a change of subject (trust me - I could go on about the Pye Museum until all the SWM readers were asleep). As it's now almost summer, you may be considering a trip to the great outdoors or a hiking or climbing holiday. If you get in deep trouble you can rest assured that in the UK there is a fine tradition of mountain rescue.

The armed services and some police forces have mountain rescue teams, but the majority are staffed by volunteers who give their time and expertise. You will not be surprised to know that they use radio.

Some marine band channels are used and I have heard operations on 156.650 and 156.675MHz f.m. There is a military air frequency of 282.80 a.m. which can also be utilised and I have also heard operations on the following frequencies:

MHz	Mode	Channel
158.650	f.m.	53
158.600	f.m.	53A
123.100	a.m.	
169.175	f.m.	

Other search and rescue frequencies include 138.700 a.m. and a Nationwide channel consisting of 167.950 f.m. (Base TX) and 172.750 f.m. (Mobile TX).

Coastguard cliff rescue teams will operate in conjunction with other coastguard units on channel 16 156.800MHz f.m. and Channel 0 156.000 f.m., but the coastguard channel used by such units to chatter with their base is often 160.600 f.m.

There are h.f. frequencies in use which are used together with the v.h.f. channels in time of emergency. Monitoring all these comms is dramatic stuff indeed.

OK that's it for now ... stay covert!

# Airband

My memories of the third UK FIR (see March 'Airband' page 55) are shared by **Jim Durnett G4RGA** (Wellington). The Manchester sub-centre was individually addressed as 'Preston Centre' for the purpose of radio calls and its airspace was correctly known as the Northern FIR. ICAO locators for Preston Centre were EGNN (civil) and EG00 (military). The Centre was at Barton Hall, on the A6 road north of Broughton, near Preston.

What a detailed memory you have, Jim! Which is no surprise, as he worked there at the Air Defence Notification Centre at the end of the 60s (it closed in 1971). Within the Centre was found an auto-triangulation system that located the source of emergency transmissions on 121.5MHz.

More recently, LATCC has only just acquired auto-triangulation on 121.5, but already had it for military distress signals on 243MHz. Up until recently, individual bearings had to be plotted, often involving the LATCC Distress & Diversion (D&D) Cell controller telephoning individual aerodromes, asking them to take a bearing and report back. The telephone system is a dedicated aeronautical one, not the Public Switched Telephone Network, of course.

## Your Local Airport(?)

Jim reminds me that Manchester Airport itself was, at that time, known by the local name of Ringway. How times change. They reckon that Luton (local name) is now a London airport! I'm based on the north-west fringe of London's outermost suburbs and it's still 32km to Luton by car, the train doesn't quite reach the airport itself. I've known visitors buy a cheap flight to London and then try to understand why they end up in Bedfordshire or Essex (Stansted).

Personally, to make a success of our airways system, I recommend that far more investment be put into surface communications. If you live in London, you want to fly from a London airport. If it's policy to persuade you that Luton, Bedfordshire, fits the bill then you should be able to board a train in a wide variety of useful places in and around London and step out again in the terminal building.

I know that cars are now politically frowned upon and, anyway, it's inconvenient, expensive and insecure to leave a car at an airport while away on a long trip. Before advertising Luton as a London airport, they should at least have brought the Thameslink line direct to the terminal (with a lift or escalator connection from platform to check-in hall). What about Heathrow? No long-distance main-line train service at all (as far as I am aware)!

No wonder the Europeans want to dominate our skies with hub airports. Once in the airline system, you can fly anywhere in the world by just a simple transfer between flights. And no traffic jams. Both Zürich and Amsterdam have train-to-'plane layouts, as Chris and I discovered last year. In the UK, so does Gatwick. Any others?

Perhaps our skies are now so crowded that market forces prevail and there is no incentive to attract more passengers. Otherwise, they'd have to spend a fortune getting the new air traffic control centre to work. Am I just being cynical? What are your views, and which airports do you recommend for easy access?

Other atmospheric (nostalgic?) local names are: Aberdeen (Dyce), Bristol (choose between Lulsgate and Filton), Edinburgh (Turnhouse), Glamorgan (Rhoose), Glasgow (Abbotsinch), Londonderry (Eglinton), and, over in France where Chris and I often fly for holidays, Rennes

(St. Jacques). There are plenty more and I'm not offering any prizes for naming them!

## Distress & Urgency

I mentioned the D&D Cell and its auto-triangulation equipment, above. If something went wrong while in the air, what radio call should you make?

If the situation is desperate then you want to say 'Help me.' For some reason, the French word for this has been adopted both in the air and at sea. It's actually 'M'aider' but we pronounce it 'Mayday.' Such a call could be made to the air traffic unit currently being worked, or, if this fails (or you are not in contact with anyone to start with) then D&D are there to take your call on 121.5 (243MHz if military).

Mayday mayday mayday, Golf Alpha Sierra Whiskey Mike, Cessna 150, engine fire, intend immediate forced landing, 5 miles north of Bedford, 1000 feet QNH 1023, heading 270, student pilot.

That woke you up! The callsign and aircraft type are stated, nature of emergency plus intentions, followed by position, altitude (with QNH, the barometric altimeter setting) and heading. Confusingly, this is different to normal position reports where position, heading and altitude are stated in that order. It helps to say the pilot's experience ('tyro' is accepted as meaning inexperienced).

Sometimes things aren't life-threatening, but might become so without some speedy help. In this case, substitute 'Pan Pan' for 'Mayday' but otherwise the message is the same.

If lost, it won't make sense to give position. Last known position (and how long ago it was when passing that position) will help. Nature of emergency is 'Am lost.' This is especially critical if high ground or controlled airspace are nearby. Those helpful controllers at D&D will attempt to fix your position and guide you to safety.

Should the radio fail, your s.s.r. transponder might still be showing a return on radar. Squawk code 7700 will alert a radar controller to an emergency, 7600 indicates a radio failure and, should you be hijacked, surreptitiously selecting 7500 will send the message silently to anyone watching your progress on radar.

## Frequency & Operational News

From the CAA comes *GASIL 1* of 2000 where I read that we have gained an aerodrome at Chalgrove (AFIS 125.4). Filton's radar is now 124.95 (was 127.975MHz). Scampton, currently the location of *Red Arrows* practice airspace, is re-opening as an aerodrome complete with ATZ/MATZ and controlled by Waddington 127.35MHz. Shipdham was believed to have closed; it has lost its ATZ and become unlicensed, so

presumably has not completely closed in fact. Perhaps a local reader could report on activity from there?

Heathrow already has ATIS on 123.9, it's now dedicated to arrivals as departure information is on 'new' frequency 121.85MHz. Actually, it's not new as I remember them doing the same thing in the late 1980s. Can't see the



## Abbreviations

AFIS	Aerodrome Flight Information Service
AIP	Aeronautical Information Publication
ATIS	Automatic Terminal Information Service
ATZ	Aerodrome Traffic Zone
CAA	Civil Aviation Authority
FIR	Flight Information Region
FL	flight level
GASIL	General Aviation Safety Information Leaflet
ICAO	International Civil Aviation Organisation
LATCC	London Area & Terminal Control Centre
MATZ	Military Aerodrome Traffic Zone
MHz	megahertz
QNH	altimeter pressure setting, reads height above sea level
s.s.r.	secondary surveillance radar

*Continued on page 65*

Luscombe. Christine Mlynek.



# WINRADIO®

**TAKING THE EUROPEAN RADIO MARKET BY STORM**

**FREEPHONE 0800 0746263 TO PLACE A CREDITCARD ORDER**

*Receive a FREE Mini-Cone Antenna With Every WR-3100 order!\**

**JOIN THE TRUNKED RADIO REVOLUTION WITH YOUR WINRADIO RECEIVER!**

1. Enjoy multiple, major trunk tracking modes
2. Automatic traffic following & sophisticated control panel
3. Take comfort in the automatic volume control
4. Single & dual receiver modes
5. Convenient inbuilt electronic logger and database
6. Comes complete with an inbuilt traffic recorder
7. Full XRS™ - compliant technology

**The WINRADIO Trunking Option\***

Trunking systems are used by public safety, transportation, business, law enforcement, government, military and other organisations. This software includes major trunking modes: Motorola SmartNet™ and MPT1327.

**ONLY £81.07 inc vat**



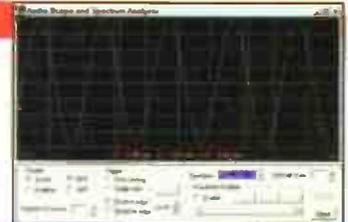
**TAKE A LOOK AT WINRADIO'S DIGITAL SUITE**

1. WEFAX / HF Fax
2. Packet Radio for HF and VHF
3. Aircraft Addressing and Reporting System (ACARS)
4. Audio Oscilloscope, real time Spectrum Analyzer with calibration cursors
5. Squelch-controlled AF Recorder
6. DTMF CTSS decode and analyse

The DSP applet provided with the WR3100i spectrum monitor ISA card (£995+VAT) allows continuous control of audio bandwidth and other signal conditioning functions.

**ONLY £81.07 inc vat**

(requires SoundBlaster 16 compatible sound card)



**WINRADIO® PC RECEIVERS**

Available as either an internal ISA card that slips inside your PC, or as an external (portable) unit. WinRADIO combines the power of your PC with the very latest in synthesised receivers.

**YOU CAN USE WINRADIO™ SCANNING PC COMMUNICATION RECEIVERS FOR:**

Broadcast, media monitoring, professional & amateur radio communications, scanning, spot frequency, whole spectrum monitoring, instrumentation surveillance and recording.

If you're after the ultimate receiver-in-a-PC with full DSP then smile and say, "Hello" to the new **WR3100i-DSP** with its hardware for real-time recording, signal conditioning and decoding applications. It's all you need.

**NEW EXTERNAL MODELS**

**EXTERNAL WINRADIO™**

We are now able to offer you a complete range of stand-alone WinRADIO comms systems

- WR1000e - £359 inc vat
- WR1550e - £429 inc vat
- WR3100e - £1169 inc vat

Each stand-alone unit connects to your PC through either the basic RS232, or through an optional PCMCIA adapter (for high speed control).

The units are powered through either your existing 12v supply, or through an (optional) NiMH rechargeable 12v battery pack.

"It's software is excellent.. more versatile and less idiosyncratic than that of the Icom IC-PCR1000"

WRTH 1999 Review

"Five stars for its mechanical design"

WRTH 1999 Review

"Most Innovative Receiver"

WRTH 1998 Awards



**Model Name/Number**

Construction of internals

Construction of externals

Frequency range

Modes

Tuning resolution

IF bandwidths

Receiver type

Scanning speed

Audio output on card

Max on one motherboard

Dynamic range

IF shift (passband tuning)

DSP in hardware

IRQ required

Spectrum Scope

Voice tone

Published software API

Internal ISA cards

External units

**WR-1000i & WR-1000e**

WR-1000i/WR-1550i/3100i-DSP - Internal full length ISA cards

WR-1000e/WR-1550e - 3100e - external RS232/PCMCIA (optional)

0.5-1300 MHz

AM,SSB/CW,FM-N,FM-W

100 Hz (5 Hz BFO)

6 kHz (AM/SSB),

17 kHz (FM-N), 230 kHz (W)

PLL-based triple-conv. superhet

10 ch/sec (AM), 50 ch/sec (FM)

200mW

8 cards

65 dB

no

no - use optional DS software

no

yes

yes

yes

£299 inc vat

£359 inc vat

**WR-1550i & WR-1550e**

WR-1000i/WR-1550i/3100i-DSP - Internal full length ISA cards

WR-1000e/WR-1550e - 3100e - external RS232/PCMCIA (optional)

0.15-1500 MHz

AM LSB,USB,CW,FM-N,FM-W

10 Hz (1Hz for SSB and CW)

2.5 kHz(SSB/CW), 6 kHz (AM)

17 kHz (FM-N), 230 kHz (W)

200mW

8 cards

70 dB

±2 kHz

no

no

yes

yes

yes

£369 inc vat

£429 inc vat

**WR-3100i & WR-3100e**

WR-1000i/WR-1550i/3100i-DSP - Internal full length ISA cards

WR-1000e/WR-1550e - 3100e - external RS232/PCMCIA (optional)

0.15-1500 MHz

AM,LSB,USB,CW,FM-N,FM-W

10 Hz (1Hz for SSB and CW)

2.5 kHz(SSB/CW), 6 kHz (AM)

17 kHz (FM-N), 230 kHz (W)

200mW

6-8 cards (please ask)

85dB

±2 kHz

YES (ISA card ONLY)

yes (for ISA card)

yes

yes

yes (also DSP)

£1169 13 inc

£1169 13 inc (hardware DSP only internal)

PCMCIA Adapter (external):

£59.00 inc. vat when bought with 'i' series unit (otherwise: £99 inc vat)

PPS NiMH 12v Battery Pack & Chrg:

£89 inc vat when purchased with 'i' series unit (otherwise: £139 inc vat)

The WINRADIO Digital Suite:

£74.92 inc vat when purchased with a WINRADIO receiver (otherwise: £81.05 inc vat)

For your free (no obligation) info pack & WinRADIO demo disk go to: <http://www.broadercasting.com>. If you don't have access to the internet then by all means feel free to phone/fax us. \*Trunked radio transmissions should only be received & decoded with permission of the originator of the transmission.

Please send all your enquiries to: [info@broadercasting.com](mailto:info@broadercasting.com) or Telephone: 0800 0746 263 or +44 (0)1245 348000 - Fax: +44 (0)1245 287057 Broadercasting Communication Systems, Unit B, Chelford Court, Robjohns Road, Chelmsford, Essex, CM1 3AG, United Kingdom

©2000 Broadercasting Communication Systems Ltd. All rights reserved. Broadercasting Communication Systems Ltd. is a registered company in the United Kingdom. Registered Office: Broadercasting Communication Systems Ltd, Unit B, Chelford Court, Robjohns Road, Chelmsford, Essex, CM1 3AG, United Kingdom. Tel: +44 (0)1245 348000. Fax: +44 (0)1245 287057. E-mail: [info@broadercasting.com](mailto:info@broadercasting.com). Website: [www.broadercasting.com](http://www.broadercasting.com)

■ KEITH HAMER & GARRY SMITH, 17 COLLINGHAM GARDENS, DERBY DE22 4FS

# DX Television

**F**2 reception conditions during February fell below expectation with only one reported incident of the m.u.f. (maximum usable frequency) reaching the Channel E2 vision frequency.

An early evening Sporadic-E opening to the Iberian Peninsula brought in colour pictures with sound on the 7th.

Tropospheric reception throughout the month was reasonable, but not spectacular, bringing in the usual crop of Benelux stations.

## Reception Reports

A tropospheric lift on the 5th brought in reasonable quality reception for **Stephen Michie** (Bristol) from several Benelux transmitters. Of particular interest was the reception of Dudelange, the Luxembourg E7 'RTL PLUS' outlet.

**Simon Hockenhull** (Bristol) reports Sporadic-E activity from the South on the 7th shortly after 1900UTC, with the Spanish news programme 'Telediario' received on Channels E2 and E3. Simon finds it reassuring that the Madrid E2 transmitter is still on-air! In Coventry, **Peter Barber** identified Portuguese signals on E3 during the same opening.

Peter Barber regularly listens to Radio Netherlands' *Media Network* programme which provides a useful propagation indicator. It is broadcast on Thursdays between 1055 and 1125 on 1512kHz and towards the end of the programme, Mike Bird includes a solar weather forecast. **Ian Moody** (Sutton, Surrey) noted that F2 conditions would be moderate for February 11th, so 48.25MHz (Channel E2 vision carrier) was monitored between 0730 and 1130UTC. Shortly after 0900UTC, a weak vision carrier was heard using a Yupiteru MVT-7000 scanner.

The m.u.f. struggled to attain 30MHz most days apart from the 10th and 19th when p.m.r. was heard up to 37MHz by Simon Hockenhull around 1300UTC. **Tim Bucknall** (Congleton, Cheshire) has heard

Greek and Russian cordless telephones during recent openings between 30 and 40MHz.

On the 18th, Russian military communications were encountered up to 38.125MHz with weird pulsing noises at 41.650MHz. Tim also identified the fourth harmonic of ERT Athens (Greece) at 37.680MHz during the same opening.

## VHF TV Interference Sources

Baby alarms operating close to the Channel R1 vision frequency of 49.75MHz are a menace world-wide. Alarms of Chinese origin have recently been on sale in the United Kingdom outputting on 48.27 and 48.8MHz which directly affects the Channel E2 vision carrier at 48.25MHz. Simon Hockenhull comments that the DTI have not authorised the use of frequencies around E2 for these devices to operate, so these particular alarms are illegal to use. Hopefully the units were a one-off import with no further supplies entering the country.

Voice-activated Band I alarms, where the carriers should only be present for a short while, should ease the interference problem, unless the screaming little brat is ignored, which is all too often the case having regularly listened to these carriers!

Simon also mentions that the proposed p.m.r. allocations in Band I may not materialise after all. Apparently, p.m.r. users are deserting the existing networks in droves, resorting to the convenience of using mobile telephones instead. Let us hope that the exodus continues and that Band III becomes clear once again!

From Italy there is comforting news from **David Bocca Corsica Piccolino**. Apparently, the availability of interference-free u.h.f. baby alarms means that Band I devices are now fast losing favour. However, the outlook is not so rosy regarding devices known as 'Video Senders'.

The lack of space at u.h.f. and in Band III (Channel E12) has prompted some manufacturers to change the output frequency to Channel A or B in Band I. Although these devices are low-power, we wonder who will be the first to claim reception from one of these units via Sporadic-E!

In many UK cities, pirate f.m. stations use studio-to-transmitter links within Band I. Although illegal (just like the Italian Band I links, incidentally) the authorities tend to turn a blind eye.

## HTV Caption

The Harlech TV caption we featured in the March 2000 column was actually in use before colour broadcasts commenced. The exact introduction date is not known, although it was sometime in 1968, nearly a year before the ITV network went colour. Stephen Michie thinks that the caption was used only at the start and end of transmissions in addition to broadcasts for schools. The caption was in use until March 1970.

## FM Reception Reports

During tropospheric lift conditions, Stephen



**Figs. 1, 2 & 3: Examples of slow-scan TV (SSTV) reception. These were supplied by Dennis Heaton (G3YSV) of Bradford. He has been interested in s.w.l. and other radio-related hobbies ever since 1934! These photographs were sent as JPG files stored on a PC disk. We'll be seeing more examples of SSTV from Dennis in future columns.**

## DX Log For February

This month's reception reports have been supplied by Simon Hockenhull, Stephen Michie and Peter Barber. All times are shown in UTC.

Day	Log
2	Tropospheric reception on the f.m. band from UK stations.
4	Tropospheric reception on the f.m. band from UK stations.
5	Tropospheric reception from the Netherlands (NED-1 E4 and E29, NED-2 E27 and E32, NED-3 E30); Luxembourg (RTL PLUS E7); Belgium (RTBF-1 E8 and VRT TV1 E10); France (Canal Plus L5 and L10). French and UK f.m. stations heard.
6	1011 E3 Unidentified Meteor-Shower (MS) 'ping'.
7	1905 E2 and E3 TVE-1 (Spain) news via Sporadic-E; 1932 E3 RTP-1 (Portugal) programmes via SpE.
10	1034 E3 TVE-1 programme via MS; 1300 F2 reaching 37MHz.
13	1111 E3 Unidentified MS.
19	0757 E3 Unidentified PM5534 test card (probably Norway) via MS; 1310 30.670MHz Radio Rumania second harmonic via F2; p.m.r. heard up to 37MHz as late as 1400.
20	Tropospheric reception from Belgium (RTBF-1 E8 and VRT TV1 E10).
23	0742 E3 DR-TV (Denmark) PM5534 test card via MS.
24	0718 E3 Unidentified 'Breakfast TV' show via MS (multiple 'pings'); Tropospheric reception from France (Canal Plus L5).
26	Tropospheric reception from the Netherlands (NED-1 E4).
27	0721 E3 DR-TV PM5534 via MS.
28	0728 E3 DR-TV PM5534 via MS.
29	Tropospheric reception from the Netherlands (NED-1 E4).



**Fig. 4: The test card rediated by 'tv three' in Éire during promotional test transmissions prior to the station's opening on September 20th, 1998.**



Michie regularly logs broadcasts from the Mendlesham and Croydon transmitter sites. Croydon regulars include 'Magic 105.4', 'Virgin 105.8' and 'Heart 106.2'. 'Vibe 106.4' from Mendlesham is also a frequent visitor and its presence could pave the way for Dutch or German stations.

On February 5th, several strong but unidentified French stations were heard on 87.8, 97.2, 99.8, 102.7, 103.7, 104.6, 105.2 and 106.1MHz.

Tim Bucknall has now fitted 110kHz filters to his Sony f.m. receiver i.f.s to improve its selectivity and signal threshold. The filters have been fitted after the RDS information is taken off in order to retain this useful facility. The results are impressive with the following transmitters detected on demand:-

MHz	Station
90.40	VRT-3 (Egem, Belgium)
94.30	BBC Radio Scotland (Black Hill)
95.10	BBC Radio Norfolk (Tacolneston)
95.30	BBC Radio 4 (Meldrum, Scotland)
95.70	BBC Radio Cymru (Llanfyllin)
96.90	The Wave (Blackpool)
103.10	Manx Radio (Jurby)
103.80	BBC 3 Counties Radio (Luton)

Tim is using a rotatable VF-1205 array covering 45-110MHz, mounted on the chimney of his bungalow. The following frequencies are clear, but so far nothing has been heard under flat conditions - 88.2, 89.2, 91.4, 92.8, 93.2, 98.8, 104.8 and 105.3MHz.

Tim tells us that **John Faulkener** (Sutton-in-Ashfield) has fitted 50kHz filters and can detect distant transmitters such as Divis 94.5MHz (BBC Radio Ulster), North Hessary Tor 100.0MHz (Classic FM) and Black Hill 95.8MHz (BBC Radio 4).

An 'out-of-spec' pirate station called 'Passion FM', is thought to be operating from the centre of Bristol during the evening. Its main frequency is 106.2MHz but spreads over onto 105.8 and 106.6MHz.

## Service Information

**Lazslo Kozari** (Hungary) advises that within the next two years, NICAM stereo and digital TV will be available from all Hungarian u.h.f. transmitters.

In the Ukraine, 'STB', a private TV network, is operating throughout the country, mainly on u.h.f., but with some v.h.f. outlets too. A logo resembling 'WT6' (the Cyrillic equivalent of 'STB') is displayed in the lower right-hand corner of the picture.

## Keep On Writing!

We would like to thank everyone who has written in with information and photographs (some images being stored on PC disks as JPG files). Please accept our apologies if you have not yet received a personal reply to your letter. Please keep your reports and other news items coming in. Many thanks for your support.



**Fig. 6: This month's visit to the popular 'Down Memory Lane' spot. The logo used in the Seventies by London Weekend Television.**

# Airband

Continued from page 62



**Pulsar 582.** Christine Mlynec.

point, if frequencies are in short supply. Both broadcasts carry almost the same information! If you want to listen to Luton's ATIS but are out of range of 120.575MHz, telephone (0906) 4744474 (but I've no idea as to the cost).

My other CAA source is **Martin Sutton** who sends AIP amendments. I endeavour to summarise those aspects that enthusiasts would find helpful, but pilots should remember that the original document is a much longer text that should be referred to directly. Here are this month's amendments.

LATCC frequency 118.775MHz is now re-allocated to the Manchester sub-centre (see above). I doubt if it makes any operational difference as it applies to airways such as A1 north of Manchester.

On airways (UB)1, there are new reporting points at NATKO (just north of Valley, Anglesey) and ROLEX (just north of the east tip of Anglesey). Airways UB3 has new point KELLY, not surprisingly just south of the Isle of Man.

Remember that UK airspace is split vertically into two regions. The Flight Information Region extends from the surface up to FL245 and contains lower airways such as B1. The Upper Information Region is from FL245 upwards and contains upper air routes, designated with U (for Upper) such as UB1. So B1 and UB1 follow the same route but are defined and controlled as if they were separate airways.

The AIP also now shows the following. Barra gets an ATZ. Liverpool now has a new visual reference point at Oulton Park, a clear landmark used as a reporting point when the controller is bringing Visual Flight Rules traffic into the controlled zone. At Manchester, the Visual Reference Points at Carrington, Sandbach and Warburton Green are no longer used.

## Information Sources

How can you find out where the airways and reporting points are? They are shown on radio navigation charts, available for sale to the public by mail order. There are various sources but I personally buy the indigenous offering from RACAL (was Aerad).

Would you like some? Compared to a typical 'scanner guide' book, they're not particularly expensive (and some RACAL charts even have frequency lists on their backs!).

First, then, send a reply-paid self-addressed envelope, marked *Airband Factsheet*, to the editorial offices at Broadstone, (not to me, I haven't got a photocopier!). You will be sent a free copy of *Factsheet*, Issue 11, which comprises two A4 sheets and has had some minor updates since Issue 10. Look at the lists of suppliers on the *Factsheet* and contact them directly to determine price and availability.

I also include a supersonic routes chart on the *Factsheet*. However, there are now alternative sources in books aimed at the hobbyist and so I won't be keeping this up-to-date. However, the information rarely changes.

All letters received up to March 9 have been answered. The next three deadlines (for topical information) are May 8, June 5 and July 10. Replies always appear in this column and it is regretted that no direct correspondence is possible.



# LOWE ELECTRONICS

## LOWE BOOKSHOP



- Air Traffic Control Table £8.99
- Air Traffic Control Table and Timetable £8.99
- Aerial Radio Handbook 2nd Ed. £7.99
- Air Traffic Control £10.95
- Airwaves '99 £19.95
- Colour Handbook £10.95
- Callers '99 £8.95
- File, Satellite and RTTY Weather Reports by Philip Mitchell £11.50
- Friendly Confidential Frequency Guide £19.95
- Flight Routes 1999 £7.99
- Monitoring the World's Emissions £5.00
- Out of This Air £16.95
- South Atlantic Guide £16.50
- Emergency to World Band Radio 70-134.99
- Pooley's Flight Guide '99 £3.00
- Receiving Airwaves Handbook £17.50
- Scanners £19.95



- Scanning the Maritime Bands 2nd Ed. £9.75
- Short Wave Propagation Handbook £15.95
- Shortwave Listening Guidebook Harry Holmes £14.95
- Shortwave Miniatures Communications £14.50
- Shortwave Radio Listening for Beginners - Anna McCannick £10.99
- UK Scanning Directory 2nd Ed. £19.50
- UK Scanning Frequency Chart £3.00
- Understanding Frequency List £4.95
- Understanding A-ARS £9.95
- Weather Radio - Tony Gault £14.99
- Weather Reports from Radio Stations by Philip Mitchell £7.50
- World Airline Times and Schedules Directory £16.00
- World Radio and TV Handbook 2000 £19.95
- Worldwide Aeronautical Communications Frequency Guide £14.99

## Pooley's Flight Guide '99



Last year's Pooley's now available for all aviation enthusiasts. Airport timetables, maps and loads of frequencies and other really useful data inside. Countries are limited this year so get yours now before we run out!  
Just £3.00 plus £3.00 p&p.



## NRD545

A superlative short-wave receiver, designed to fulfil the needs of professional monitoring stations, the NRD545 is equally at home with the serious hobby listener.

The DSP implementation starts at IF frequencies so don't confuse this with lesser DSP receivers that simply process the recovered audio. You can therefore control the IF bandwidth from 10kHz down to just 40Hz allowing total control for AM, SSB, CW or data signals, really helping to reduce interference. Heterodynes and noise can also be removed and the notch filter will automatically track changes in the frequency of the interfering tone. As you would expect from a top-flight receiver, computer control is fully integrated and there are 1000 memory channels, with memory and programmable scan features.

NRD545  
£1195.00

## NRD345

### SPECIAL MILLENNIUM OFFER



The NRD345 continues to be a popular option for listeners with a keen eye (and ear!) for quality. Easy to use and with great specification, the NRD345 is a great choice if you have a limited budget but want the best. Terms available.

- Frequency range 100kHz to 30MHz
- Dynamic range 100dB, 500kHz bandwidth
- Image rejection 70dB
- RS232 interface
- Modes AM, CW, SSB, Synchronous AM
- Noise blanker
- Clock & timer functions

NRD345 Offer price £399.00

## Icom PCR100 & PCR1000



Icom PCR100 & PCR1000  
For those of you that like to combine scanning and computing, these two Icom receivers are for you!

The PCR100 offers 100kHz to 1300MHz with AM, FM and WFM reception, it covers all popular broadcast and communications channels, including TV sound. There is a choice of operating screens

including a multi-function control panel, with bandscope, memory list and scan controller screens just some of the options. There are multiple scanning functions too as you would expect and the software can store multiple files of 1000 memory channels giving unlimited choice

The original PCR1000 offers a similar specification but adds SSB reception and IF shift so is able to monitor the many utility stations to be found in the short-wave bands. An option DSP processor can also be added for improved performance.

Prices £199.00 for PCR-100 & £349.00 for PCR-1000.

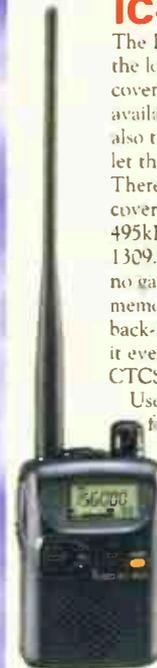


## ICOM IC-R2

The Icom IC-R2 is the lowest priced full coverage scanner available today. It's also tiny but don't let that fool you! There's frequency coverage from 495kHz right up to 1309.995MHz with no gaps, 400 memories, clear back-lit display and it even includes a CTCSS tone scan.

Uses 2 x AA cells for power, contributing to the small size.

Price £149.00



### GENERAL ENQUIRIES

All catalogue requests to Matlock address or fax please or by e-mail to: info@lowe.co.uk.  
NB Carriage extra on most items.

Orders also to Matlock address or fax or e-mail to orders@lowe.co.uk  
Check our website out for latest product information www.lowe.co.uk

Chesterfield Road, Matlock, Derbyshire DE4 5LE  
Fax: 01629 580020 Tel: 01629 580800

## GARMIN GPS Receivers

Selected  
Garmin receivers  
down in price!  
Phone for details!



If you walk, sail, ride or drive, there's a Garmin GPS just for you! As a Garmin main distributor, you'll find a complete range of GPS receivers and accessories to suit your outdoor activities, including some of our

own custom-made items like our world-famous low-cost magnetic mount GPS antenna!

Pop in to one of our showrooms now to see the latest models and get a full demonstration of their accuracy and capabilities.

Check out how you can combine your computer with a GPS receiver and Personal Navigator Professional software to give you full route

planning and tracking with local hotels, restaurants, pubs, places of interest and even filling stations.

GPS3+ £349.00  
Mono Street Pilot £419.00  
Colour Street Pilot £619.00



## Low Cost GPS Accessories



Our world-famous Active GPS Antenna continues to lead the market! We've sold thousands of these all over the world - a testament to it's high-performance and great value! It is complete with magnetic base and 4m lead with BNC connector. We also offer an adaptor to MCX for more flexibility.

GPSANT, Magnetic mount GPS antenna .....£39.95  
GPSLEG, GPS leg strap .....£8.00  
GPSCAB, Power data and computer lead for Garmin GPS receivers .....£29.95  
GPSCAR, Cigar lighter lead for Garmin 12V receivers .....£15.00  
MCXADAPT, MCX to BNC adaptor lead .....£15.00

## Short Wave Accessories



AT300, Short wave receiver's ATU ..... £99.95  
QTU, Short wave receiver's ATU ..... £100.00

RF Systems - World leading antenna for short wave for short wave stations



AA1, Antenna adaptor for portable

receivers ..... £31.00  
AA10, Active antenna ..... £149.00  
AA15M, Marine active antenna ..... £97.00  
AA2, Antenna adaptor for portable  
receivers ..... £31.00  
DX10, Active antenna ..... £125.00  
DX100, High quality active antenna ..... £295.00  
DX1000, Portable SW antenna ..... £49.00  
MPS1, INDOOR, indoor window antenna ..... £33.00  
MLB, Magnetic Looping Filter ..... £33.00  
MLBAMRT, MLB Antenna for 12.5m ..... £54.00  
MLBAMRT, MLB Antenna for 20m ..... £60.00  
MTA, Magnetic Transfer Antenna  
Vertical antenna for short wave use ..... £125.00  
SPL, Antenna splitter / combiner ..... £49.00  
GPS, Antenna splitter / combiner with precision  
structure and stainless steel body ..... £95.00  
SPAS, Antenna splitter / combiner ..... £69.95  
TCHY, Tilted Termination Folded Dipole  
Low loss RX antenna 3 - 30MHz ..... £135.00



## Scanner Accessories



ARE25, Real Time Reference filter ..... £24.90  
LEPAN, High quality ear piece ..... £9.95  
FC100, 10 to 25 frequency control ..... £59.95  
LAW1, Scanner antenna 25-300MHz ..... £12.95  
LAW2, Scanner antenna 25-300MHz  
Enhanced gain ..... £19.95  
LAW3, Coax Antenna ground plane  
antenna ..... £29.95  
LAW4, Military standard antenna ..... £39.95  
LAW5, Window antenna for IBC antenna ..... £14.95  
LS1000, Wide range scanner antenna  
25 - 100MHz ..... £59.95  
TR55, Telephone relay antenna ..... £8.95  
SPANT, Walkabout mini-mount  
antenna for scanners ..... £19.95



AIRMASTER 2000, Software decoder  
for ACARS ..... £99.95  
SENGEL, Pack of 4 100MHz rechargeable  
batteries 1.75Ah ..... £9.00  
SIBCH, Special charger for SENGEL  
batteries ..... £9.95  
RELA, Table top stand for handheld  
scanners ..... £34.95  
SP41, Tunable coil with filter ..... £29.95  
PS100, Scanner PSU & low stand ..... £34.95  
SW1, Short Wave Interface for scanners ..... £14.95

QSC2, Mobile scanner feeder for handheld  
table ..... £10.00  
RSC1, Universal carry case ..... £18.95



## AOR AR5000

A dream receiver if ever there was one!

- Very wide frequency coverage 10kHz - 2600MHz
- All mode reception: AM, FM, USB, LSB & CW
- Automatic electronic preselection of the front end
- Excellent strong signal handling
- NCO (Numeric Controlled Oscillator) with tuning steps down to 1Hz
- TCXO fitted as standard
- Multiple I.F. bandwidths 3kHz, 6kHz, 15kHz, 40kHz, 110kHz & 220kHz
- Auto mode bandplan selection



£1495.00

## Yupiteru MVT7100

Still our best selling scanner and no doubt about it! Okay so it may lack computer control but that's hardly a problem when 99% of the time you'll probably be in a situation where it's hardly practical to lug around even the lightest of palm tops. Let your fingers do the walking over the back-lit keyboard to access the 503kHz to 1650MHz range with 1000 memories.



am fm wfm and  
ssb reception  
and it is so  
easy to use!  
(Carr.  
£10.00).

£199.00

## Icom R75E

Icom's latest receiver combines analogue and digital technology to bring you a receiver with excellent performance at an excellent price.

With expanded frequency coverage from 30kHz right up to 60MHz it will truly expand your listening horizons.

On the technical side, it features a high stability receiver circuit and better than 100dB dynamic range. Synchronous AM detection, twin passband tuning and optional IF filters help to reduce distortion and interference and at the audio stages, an optional Digital Signal Processor unit adds noise reduction and notch filtering. Operation is easy with several tuning step sizes and direct frequency entry complementing the tuning dial and FM is provided as standard. For those who need them, there are 101 memory channels that can also be named and optional computer control will extend many of the functions. The May 99 Short Wave Mag said it all - "little I could not resolve, even in poor conditions" ... "remarkably easy to programme" ... "I can't praise it too highly" ... Need we say more?



R75E from £699.00

# GREAT SECOND HAND BARGAINS!

Why not look at our great range of pre-owned scanners and receivers? We often have current product available at well below RRP so you make a great saving and with our full workshop inspection and warranty prior to sale, you'll have no worries either!

Ask for free second hand list.

# Timestep



PROsat for Windows is used by most leading weather satellite enthusiasts. They have grown up using Timestep products and now rely on the superior image quality and ease of use provided by PROsat for Windows. Features such as real time reception, auto-scheduling, temperature readout, totally automatic reception of all NOAA's and Soviet satellites and automatic animation have made PROsat the preferred package. Satellite profiles allow individual adjustment of synchronisation and input levels, giving unrivalled automatic or manual reception of even "difficult" satellites. Geostationary satellites are well covered and include METEOSAT, GOES, GOMS, GMS and even INSAT. All images can be in colour and because this is a full 32 bit Windows application it will work perfectly on Windows 95-98-NT4.

Our receivers are known throughout the world, 2,500 users cannot be wrong ! We can provide a single part or a complete system. Timestep are regarded by EUMETSAT and NOAA as prime suppliers of equipment and we have USA FCC approval as well as European CE approval. As a testament to our quality we are, we believe, the only weather satellite manufacture who has the prestigious ISO9002 quality award.

We supply APT, WEFAX, PDUS and HRPT systems to the world, right from SWM readers to the Military and Super Yachts. Ask us for a full set of colour brochures.

Timestep PO Box 2001 Newmarket CB8 8XB England  
Tel: 01440 820040 Fax: 01440 820281  
e-mail Sales@Time-step.com

# AKD

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

**£159.95**  
+ £6.00 P&P



## HF ACTIVE ANTENNA

### FREQUENCY RANGE:

30kHz - 30MHz

### LENGTH:

400mm

### COMPLETE WITH:

- ★ Fused 12V power cable
- ★ Power adaptor terminated with phono plug for direct connection to the Target HF3 & HF3S short wave receivers
- ★ Seven meters coaxial cable

### POWER CONSUMPTION:

20mA @ 12V

### WATERPROOF ANTENNA ASSEMBLY

**£39.95**

inc. VAT + £2.50 P&P



## HF3S SHORT WAVE RECEIVER

- ★ 30kHz - 30MHz
- ★ USB, AM & LSB
- ★ 10 PROGRAMMABLE MEMORIES
- ★ FULLY SYNTHESISED
- ★ SIGNAL STRENGTH METER
- ★ DATA LEAD FOR CONNECTION TO COMPUTER
- ★ JV FAX OR HAMCOMM SOFTWARE
- ★ PSU AND LONG WIRE AERIAL

Website: [akdinfo.com](http://akdinfo.com)

e-mail: [john@akdinfo.com](mailto:john@akdinfo.com)

[roger@akdinfo.com](mailto:roger@akdinfo.com)



■ LAWRENCE HARRIS, 5 BURNHAM PARK ROAD, PEVERELL, PLYMOUTH, DEVON PL3 5QB

■ E-MAIL: info.orbit@pwpublishing.ltd.uk ■ WEB SITE: <http://www.itchycoo-park.freeserve.co.uk>

# Info in Orbit

While spending some time monitoring WEFAX pictures (from METEOSAT-7), I was struck by the accuracy with which we can judge the onset of a change of weather. For several months now, I have been involved in the measurement of the position of asteroids (commonly thought of as solar system debris!), using my telescope fitted with a special (very low noise) electronic camera, mounted in my back yard.

My data submissions to America's Minor Planet Centre resulted in my being given an 'observatory code' (number 943, name Peverell) by which to refer to my measurements. Since that time in early January, the weather has been somewhat inclement, and most days have produced a steady succession of clouds on a south-westerly air stream.

When the possibility of clear skies has arisen, I have used the animation facility on the METEOSAT WEFAX software to monitor cloud movements more closely. By 'zooming' in on the D2 (European format) infra-red image, it has been possible to accurately assess the movement of weather fronts, and this has led to several occasions when I have chosen to ignore the official forecast because I could see cloud would arrive, or I have put the telescope out despite the official forecasts when I could see a suitable clearing in the clouds approaching.

The ability to animate weather images in this way is particularly useful to me in this astronomical work. I would be interested to know whether others have found METEOSAT WEFAX pictures useful in their everyday (or hobbyist) applications.

## Solar Flares & WXSAT Reception

My first effort at building a radio telescope - several years ago - was for use at 150MHz. This frequency is a good compromise because it is not too difficult to build or buy a high-gain antenna for this band, and the frequency can be set on most general purpose utility receivers and scanners.

If the receiver/antenna combination is efficient, the sun's activity in the 150MHz band can be monitored. Sooner or later, particularly around the times of high sunspot activity, enhanced noise levels will be detected from the sun. It is therefore not too surprising to hear that the current high level of solar activity is having an effect on reception of WXSAT transmissions in the v.h.f. band.

## Solar Activity In Early March

As part of an ongoing interest in solar activity, I receive daily summaries of sunspot and ionospheric activity via the Internet. Sunspots - regions of solar disturbances - often produce solar flares. These can produce large amounts of matter that get ejected from the sun's upper atmosphere, sometimes known as a CME (Coronal Mass Ejection).

Such material may eventually reach the earth, and can produce an aurora. Detailed descriptions of such solar flares



Fig. 1: METEOSAT-7 primary data (PDUS) image of Britain on 12 March at mid-day.

appear in the reports from the Space Environment Center (SEC).

To subscribe to the E-mail list that provides these daily forecasts, send the following E-mail as indicated: To: [majordomo@sec.noaa.gov](mailto:majordomo@sec.noaa.gov) body of message: **subscribe forecast your e-mail address**

The Report and Forecast of Solar and Geophysical Activity is the primary daily report prepared by SEC. It provides a summary and analysis of solar and geomagnetic activity during the previous 24-hours as well as the most recent solar indices. It also provides a forecast of activity and indices for the next three days.

One report, issued in early March, provided the following (edited) description: "One of the more interesting features of this flare (on 2 March) was its association with a very high velocity coronal shock wave. This wave excited electrons within the inner corona. When electrons get excited like this, they emit radio energy at a frequency that is related to the density of the electrons in the corona. The higher the density, the higher the emitted frequency of radio waves. We can observe how the radio noise from a flare behaves. If a burst of radio energy is detected that drifts from a high frequency to a low frequency over a period of time, we can reason that a shock wave is responsible for the emission as it travels from the inner/high-density corona toward the outer-lower-density corona. Such radio emissions are known as Type II sweep frequency events, because the radio emissions sweep a range of frequencies from several hundred MHz to the Hz range depending on the density of the electrons in the corona through which the shocked wave is propagating".

The intensity of the aurora - as given on <http://www.sec.noaa.gov/pmap/index.html> - may provide an indication of the visibility of the aurora from areas within Britain. With its high latitude, Scotland is especially favoured.

WXSAT reception in the v.h.f. band became somewhat degraded during the hours that followed this event, with many reports of noisy telemetry. This period of solar maximum can be expected to last a year or so, though the activity is not continuously high.

## SICH A Surprise

The Ukraine's oceanographic imaging satellite *SICH-1* captured our attention in February and March by virtue of an extended period of a.p.t. transmissions. For newcomers to the hobby of WXSAT monitoring, a little background information may help put *SICH-1* in context.

It is not a WXSAT as such, *SICH-1*, like the OKEAN series of oceanographic satellites, carries radar and microwave scanners, as well as a visible-light imager. Being power-hungry, radar imagers cannot simply be left operating or the spacecraft's power supplies would be drained - hence the sporadic operation.

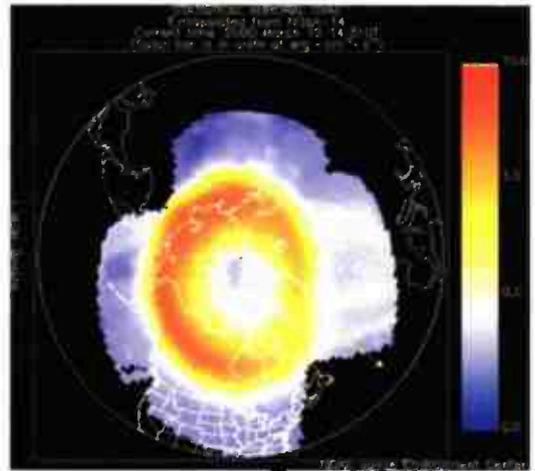


Fig. 2: Aurora imagery from the web, courtesy SEC.

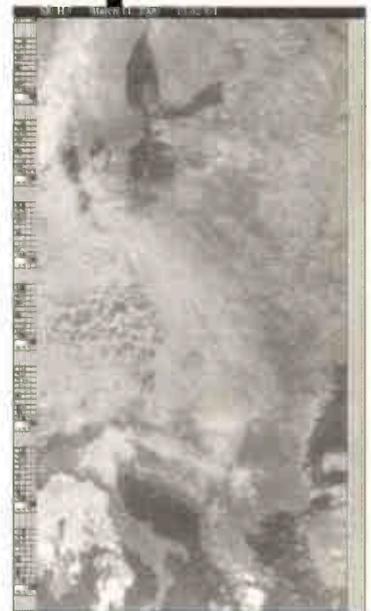


Fig. 3: SICH-11 March 1332UTC from Les Hamilton.



Fig. 4: SICH-14 March 1530UTC from Douglas Deans.

Continued on page 72

# THE SWM PERSONAL ORDER FORM

This month we're launching the SWM Personal Order Form service to help readers buy with extra confidence from advertisements in this magazine.

**M**any readers will have noticed how the battle for their custom has become more intense as the popularity of the hobby has declined. Fewer amateurs buying less equipment means there are now some great deals to be had but it also means that some dealers may try to cut corners when it comes to honouring their commitments. Also, as the real cost of amateur radio equipment has fallen and the competition for your custom has increased, some of the smaller shops have either gone out of business or been swallowed up by the bigger companies. In some areas, it's almost impossible to find a local shop and now the trend is towards mail order purchasing.

This, in itself, is not a bad thing but it does mean you'll probably be buying from a shop you've never visited and from a salesperson you've never met. So how do you know who to trust with your money? You could go on air and ask about the dealer you're thinking about buying from but the risk is that there may be one or two vociferous individuals who will be happy to tell the world about their grievances while the majority of satisfied customers just keep quiet. The same is true of the internet. The various radio related newsgroups are a good place to ask but, again, you may not get a representative (or honest) selection of answers.

The truth is, there is no real way of telling beforehand how your transaction will be handled, how well the equipment will perform or whether it will go wrong. All you can do is to take reasonable precautions before you buy and know what to do if the worst happens. This is where we aim to help. First of

all, take a look at the Top Ten Tips in the Buyer's Guide box. If you follow

those guidelines before you buy, you'll have minimised the chance of something unforeseen cropping up and you'll be prepared should the worst happen and you have to return the goods.

Secondly, whenever you order goods from an advertisement in SWM, make sure you use the Personal Order Form that will be printed in every issue from now on. Call around your list of potential suppliers first and then post or fax them this form when you place the order. It has been carefully laid out to help you make sure you've not forgotten anything and it will act as written confirmation of the deal. If you post it, don't forget to keep a copy! If you have placed the order over the telephone, still send them the form with ORDER CONFIRMATION written across it.

The vast majority of transactions are trouble free but, if you are one of the unlucky ones who does have a problem, here's what you should do. Write to the supplier enclosing a copy of the order form and the advertisement (you did keep them, didn't you?) and outline your complaint. The letter should be accurate and brief but should also contain the details of any telephone conversations you've had with

the company. It's always a good idea to make a note of the date, time and the name of the person you're speaking to whenever you call a company.

If the supplier fails to resolve the matter to your satisfaction, contact us and we will be happy to take up the case on your behalf. Just write (no 'phone calls please) to Roger Hall, Advertisement Complaints Dept., PW Publishing Ltd., Arrowsmith Court, Station Approach, Dorset BH 18 8PW enclosing copies of all relevant paperwork and we'll take it up with the supplier. We have helped many readers in the past and almost always succeeded in putting matters right but this has been on an *ad hoc* informal basis. Now that we have formalised this process, we can only accept complaints if the original order was placed on the SWM Personal Order Form to show you bought from an advertisement in SWM and not from one in another magazine. Also, the order must have been for goods that were advertised in this magazine (but not in Classified or Bargain Basement advertisements) and not for goods that did not appear in the advertisement. Not only will we help you to pursue your claim, we will also publish in the magazine a selection of the complaints we receive and the responses

from the advertisers. This will help other readers when it comes to deciding where to buy from and who they prefer to deal with.

We also intend to publish rulings from the Advertising Standards Authority. When we get complaints about the content of advertisements, some of which come from readers and some from other dealers, we refer them to the ASA whose job it is to decide whether the advertisement is legal, honest, decent and truthful. They then make an impartial ruling in favour of either the complainant or the advertiser. Up until now, we've just asked those concerned to comply with the ruling but now we're going to publish those rulings in the magazine so that readers can see for themselves how advertisements are judged.

We hope our Personal Order Form, along with our offer to take up complaints on your behalf and the publishing of complaints and ASA rulings will make it easier for you to make an informed choice when it comes to parting with your money. You should also look out for buying advice in future issues of SWM where we will be bringing you features on your rights when buying and returning goods, the pros and cons of buying 'grey' imports and many other topics that will allow you to buy with extra confidence from advertisements in SWM.

## Buyers Guide

### Top 10 Tips

1. Telephone first to confirm the price and details are as in the advertisement. Dealers often have to send in copy up to 8 weeks before the magazine is published and prices and availability can change in that time.
2. Ask if it's a parallel/grey import or if it came from the authorised UK importer.
3. Ask if it is the full UK specification and if it has CE approval.
4. Ask about extra charges (delivery, VAT etc.) and find out the final, all-inclusive price.
5. Ask about their return/refund/repair policy for faulty goods and if they have a restocking fee for the return of non-faulty items.
6. Ask for a written quotation if it's a large order.
7. Make a note of all calls and who you spoke to and keep copies of all paperwork.
8. Pay by personal credit card whenever possible as the card company has insurance to cover all transactions above £100 and you will almost certainly get your money back from them should something go wrong.
9. Check everything as soon as it arrives. Open all the boxes and check that you have been sent everything exactly as ordered. If there is a problem, contact the supplier immediately.
10. If a problem develops later, write the supplier a concise and accurate letter outlining the problem and asking them how they intend to rectify it. If that fails, write to us with all relevant paperwork and we'll take it from there.

# THE SWM PERSONAL ORDER FORM

Use this form when ordering by mail, fax or for telephone order confirmation

## TO THE ADVERTISER

Company \_\_\_\_\_  
Sales contact \_\_\_\_\_  
Address \_\_\_\_\_  
\_\_\_\_\_  
Postcode \_\_\_\_\_  
Date & time of telephone order \_\_\_\_\_  
Order reference number (if quoted) \_\_\_\_\_  
Despatch reference number \_\_\_\_\_

## CUSTOMER DETAILS

Name \_\_\_\_\_  
Address \_\_\_\_\_  
\_\_\_\_\_  
Postcode \_\_\_\_\_  
Daytime telephone number \_\_\_\_\_  
Fax number \_\_\_\_\_

## DELIVERY DETAILS

Delivery address \_\_\_\_\_  
\_\_\_\_\_  
Postcode \_\_\_\_\_  
Agreed delivery date \_\_\_\_\_  
Terms of warranty/money back/returns policy \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## PAYMENT DETAILS

- Tick method of payment
- Credit card
  - Cheque
  - Debit card
  - Postal Order

## CREDIT CARD DETAILS

Credit card company \_\_\_\_\_  
Card number \_\_\_\_\_  
Start date \_\_\_\_\_  
Expiry date \_\_\_\_\_  
Signed \_\_\_\_\_  
Date \_\_\_\_\_

## PLEASE SUPPLY THE FOLLOWING ITEMS:

QUANTITY	DESCRIPTION	UNIT COST	TOTAL £
----------	-------------	-----------	---------

**short wave magazine**

**ADVERTISEMENT APPEARED  
IN Short Wave Magazine**

**ISSUE NO. PAGE NO.**

**SUB TOTAL**

**DISCOUNT**

**CARRIAGE**

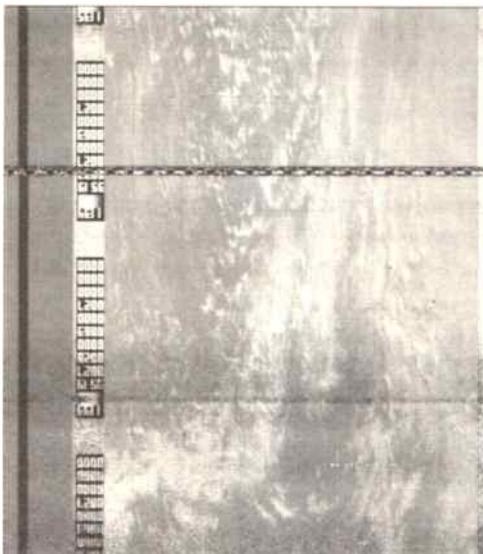
**SURCHARGES**

**VAT**

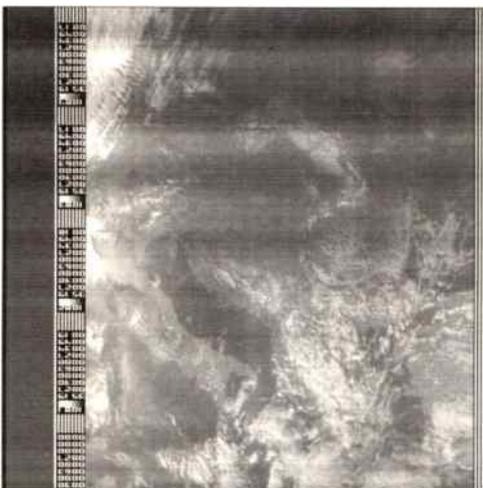
**TOTAL**

## PLEASE ACKNOWLEDGE RECEIPT OF THIS ORDER

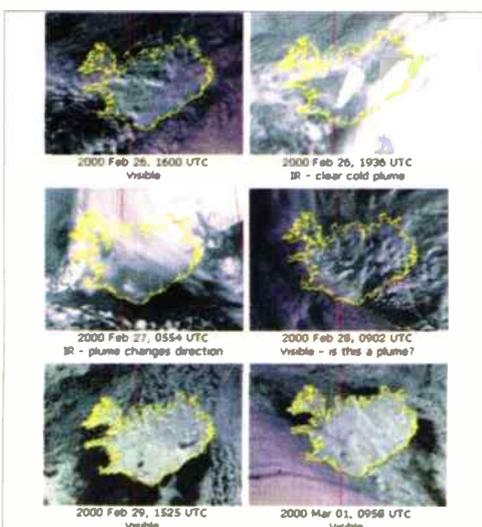
**Don't forget to keep a photocopy**



**Fig. 5:** SICH-11 March 1552UTC from George Newport of Canterbury.



**Fig. 6:** SICH-128 February 1500UTC from Martin Ellis.



**Fig. 7:** The eruption from Hekla - a montage from David Taylor. David thanks Roger Ray for the HRPT image included in this group.

Over the years, those monitoring the WXSAT 137MHz band have occasionally picked up transmissions on 137.40MHz from various early COSMOS satellites, then a sequence of OKEAN satellites (currently including OKEAN-4, also known as OKEAN 1-7) and SICH-1 - essentially an OKEAN craft with a different flag.

Transmissions from these satellites have usually been heard on 137.40MHz, using the standard a.p.t. telemetry format, and can be decoded with the usual hardware/software. On occasions, images have been multi-spectral, often a mix of radar images with microwave portions and a larger dose of the visible-light image.

Transmissions are by no means predictable, though for a year or two during the 1990s, a Russian subscriber to the 'wxsat-1' mailing list on the Internet was able to provide a weekly transmission schedule. The two common factors in many SICH-1/OKEAN-4 transmissions are that firstly, image transmissions mostly occur while the satellite is over Russia - corresponding to low elevation passes to the east of Britain.

Secondly, many images are transmissions of data recorded while over other parts of the world! This has led to some interesting situations in which image content has been difficult to identify.

Sometimes the image itself carries a clue in the form of a number sequence that can be interpreted as a minute counter from midnight in Moscow. Other numbers relate to the operation of onboard systems.

During early March, the transmissions broke the first of these 'rules'. A sequence of transmissions were received during north-bound passes as the spacecraft came up over north Africa! People subscribed to the 'rig-1' mailing list quickly alerted others to this unusual event.

On this occasion, I was actually testing an antenna's reception pattern and had fixed it pointing southwards at about 40° elevation. This enabled me to confirm that the transmission was already underway as SICH-1 rose above the horizon. Unfortunately, unknown to me, the transmission was not on exactly 137.40MHz, but slightly lower, resulting in a relatively poor signal strength.

Les Hamilton sent a superb image - see Fig. 3 - showing a visible-light scan from SICH-1, received using his new 'Paul Hayes' QFH - the competition prize mentioned in this column a couple of months back. His new antenna is



**Fig. 8:** Iceland from RESURS 01-N4 at 1238UTC on 18 February, 2000.

mounted outside on the garage roof, and feeds a Martelec MSR-50 receiver tuned to 137.375MHz and wxsat as decoding software.

"Attempts at reception on the original frequency (137.40MHz) now produce an image so degraded that almost nothing is discernable. Following a tip on the 'rig-1' list that reducing the frequency produced better results, I dusted off my MSR-50, followed suit, and was amazed at the transformation. The edge-codes are pin-sharp, suggesting that this frequency is currently the optimum".

Les noted that SICH had been transmitting daily since the start of the month, but was 'absent' for the three days before resuming transmissions. Les wondered if the Russians had possibly uploaded new software to the satellite in an effort to improve the hitherto poor imagery. He adds that the same effect was noted a month ago when Resurs went 'off the air' for a week, then returned with much improved images.

Les's picture shows the live 'real-time' transmission as SICH-1 passed near Italy and then the Baltic States. Other members of the list kindly responded to my request for sample pictures.

Douglas Deans sent Fig. 4 and comments that a cross patterning effect is seen on the visible images, and the signal level of the craft is substantially down. With the spacecraft close to the terminator in early March, illumination levels were low, so Douglas enhanced the image a little. He adds that more enhancing tends to accentuate the pattern problem.

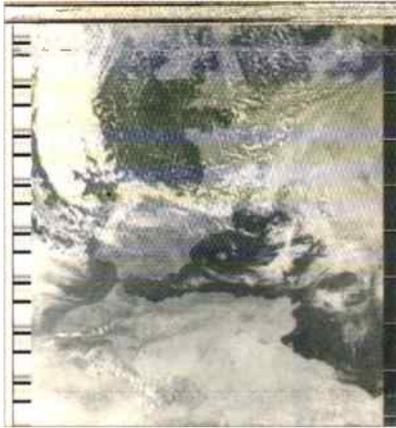
Despite the low light level, the French coastline and the south of England are visible. Douglas received his image using a loft mounted crossed-dipole feeding his Proscan receiver, Timestep interface and latest 'i' software. Douglas has been receiving both polar and geostationary WXSAT images for many years.

The orbit of SICH-1 is not sun-synchronous, it slowly precesses so that the late afternoon passes seen at the beginning of March had become well illuminated mid-afternoon passes by mid-March.

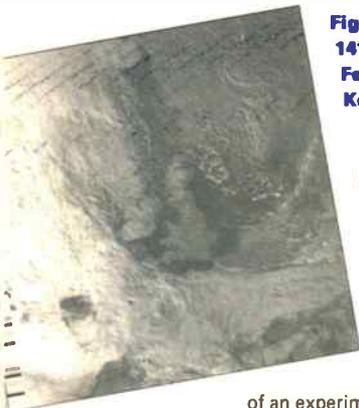
## Iceland In February

The eruption from the Hekla volcano on Iceland was captured by a sequence of images - see Fig. 7 - from David Taylor, the software writer whose prolific output has recently encompassed processing for high resolution picture transmissions. In a sequence of infra-red and visible-light images from 26 February to 1 March, David traces the eruption - within the limits of the cloud cover!

Hilda and Jim Richardson sent in Fig. 8, an image from RESURS 01-N4 received on 18 February. H&J's image shows that even by mid-February, there was enough solar illumination to allow RESURS to capture a clear picture.



**Fig. 9: NOAA-14 1512UTC 1 March - antenna pointing south.**



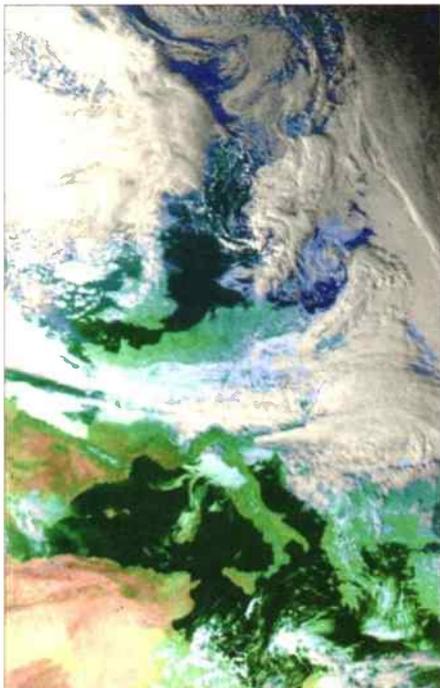
**Fig. 10: NOAA-14 1415UTC 13 February from Kevin Hughes.**

Iceland's coastline is clearly defined, as is the coastline of Greenland at upper left.

### Antenna Fix

Figure 9 shows the result of an experiment. Making time to checkout my grounded (!) antenna, I re-made the connections and mounted the crossed-dipole on a low-level mast for tests. The mast is only a few metres tall, but has a good view to the south and west.

For added fun, I tilted it about 45° above the southern horizon, despite Marion's fear that neighbours might think it was about to fall down. Only the birds were disturbed - they

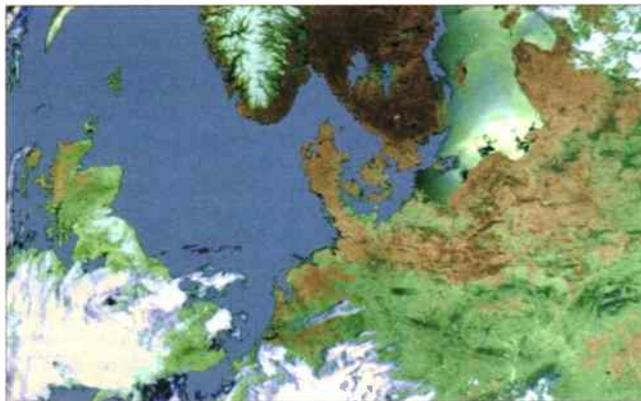


**Fig. 11: NOAA-14 Britain and western Europe 25 February 1429UTC from George Newport.**

## Shuttle Launch Schedule

STS-101 *Atlantis* is the 3rd ISS Flight (2A.2a) and scheduled no earlier than 13 April. Orbital inclination 51.6. STS-92 *Discovery* and STS-97 *Endeavour* currently have no scheduled launch dates, but will follow after STS-101.

A comprehensive listing of all Shuttle flights and payloads, together with associated information is available from me, at the address at the head of the column, as the *Shuttle Pack*. Please include £1.50 and stamped s.a.e. for the A4 booklet.



**Fig. 12: NOAA-14 Britain in late February from Jim and Hilda Richardson.**

cannot easily perch on tilted dipoles!

Reception in the south was considerably improved. The rapid signal drop-off near Scotland is a consequence of antenna direction. The next stage is another antenna 'swap'!

## More Readers' Images

**Kevin Hughes** used a Realistic PRO-2042 base scanner, a loft-mounted turnstile antenna and *wxsat* to receive a signal - see Fig. 10 - from NOAA-14. His receiver is a general purpose communications scanner and, as such, has limited suitability for WXSAT reception, having a very narrow bandwidth.

By selecting the w.f.m. (wideband f.m.) mode, one can get a better result, but at the cost of much lower sensitivity. In addition, utility receivers are less resistant to pager interference. Kevin plans to mount the antenna above roof height to improve coverage.

**George Newport**, and Jim and Hilda Richardson, sent in a number of images, and I thought I would group two of them together.

Both these images were received in late February - under conditions of poor illumination. It is notoriously difficult to achieve good artificial colour at such times, so some effort must have been expended by both parties. Jim and Hilda's image shows sun glint in the Baltic region, making a very attractive picture, after enhancement with *Paint Shop Pro*.

## Frequencies

NOAA-14 transmits a.p.t. on 137.62MHz.

NOAA-15 transmits a.p.t. on 137.50MHz.

NOAAs transmit beacon data on 137.77 or 136.77MHz.

METEOR 3-5 uses 137.30MHz.

OKEAN-4 and SICH-1 use 137.40MHz for brief transmissions.

RESURS 01#4 transmits a.p.t. on 137.85MHz.

METEOSAT-7 (geostationary) uses 1691 and 1694.5MHz for WEFAX.

GOES-8 (western horizon) uses 1691MHz for WEFAX.

## Kepler Elements - WXSATs, MIR and Shuttle

- 1 If you want a computer disk file containing recent elements for the WXSATs, AMSATs and others of general interest, together with a large file holding elements for thousands of satellites please enclose 50p with a PC-formatted disk and stamped envelope. A print-out is included that identifies NASA catalogue numbers for the WXSATs.
- 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. Transmission frequencies are given for the operating satellites. This data originates from NASA.

■ GRAHAM TANNER, 64 ATTLEE ROAD, HAYES, MIDDLESEX UB4 9JE

■ E-MAIL: [ssb.utilis@pwpublishing.ltd.uk](mailto:ssb.utilis@pwpublishing.ltd.uk)

# SSB Utilities

## Airnav

The first letter this month comes from **John MacDonald** in Stornoway, who writes to say that he is having problems installing the *Airnav* software. John does not have access to the Internet, but has been using a friend's PC to download the *Airnav* program, but the problems start when he tries to install and set-up the program.

John does not say if the program download was successful, but that is the first thing that I would check. When I did a review of the program last year, I downloaded the software from the Internet to see how long it would take, and to confirm that everything was included. I seem to remember that the download took about 30 minutes.

Currently there are two versions of *Airnav* available - *Airnav Internet Lite* which is about 1.3Mb in size, and *Airnav 3.1* (the full product) which is about 8.5Mb in size. With a fast modem, you should be able to download the 'Lite' version in about 10 minutes, but the full product will probably take about an hour.

John then goes on to say that he is having problems with 'dragging the program to the desktop'. Now this is certainly something that I don't remember from the installation instructions. I do remember that you download the software from the *Airnav* web-site onto your PC, and then you 'run' the downloaded program to install the software. Then, once it has been fully and completely installed, it is ready to run.

John's final comment is that he is having problems downloading the program - so perhaps this is the root of all his problems. As an alternative to downloading the program directly from the Internet, you can always buy a copy of the program. At least with this method, you are guaranteed to get the entire program without risking telecommunication problems.

It is available either directly from the author (details on his web-pages), or it is available from Simon Collings who advertises each month in *SWM* (see page 82). Does anyone else in the UK carry this product?

Staying with the *Airnav* program, **Roy Baskett** sent an E-mail asking for my advice on upgrading his *Airnav* system from the original version to the latest 3.1 version. He specifically wants to know about the Internet connection, and how expensive it can be.

I have used the Internet version of *Airnav*. In fact, version 3.0 upwards all have the ability to access the Internet should you desire. It is just a simple key-press or mouse-click, and the software will automatically dial your own ISP.

There is nothing special about the way that *Airnav* connects to the Internet, but you must have your own Internet access already set-up via an ISP. All that the *Airnav* program does is to connect to a site in the USA and download a file of weather data from aircraft around the world.

You are probably aware from listening to h.f. aeronautical frequencies that some aircraft are asked to 'send met reports' along with their position reports. These are collected by the ATC agency and passed-on to the World Meteorological Organisation (WMO) so that world-wide weather charts can be updated.

As an aside to this, it is made available for other uses - which is where *Airnav* comes in. It is important to remember that it is not every flight that is listed in this way - only those that are transmitting weather reports. When you have downloaded the data, you can disconnect from the Internet, so the 'phone-call probably lasts for only a few minutes at most. You also only need to get the data every hour or so, so there is absolutely no need to be permanently connected to the Internet.

Once the data has been downloaded, the program works out which flights are within the map area that you are currently using and displays those with the familiar 'plane' symbol. Of

course, these are just 'spot reports', so the program is unable to display the flight routing, but if you are listening to the right frequency and can enter flight details given by the aircraft, it is a simple task to update the plot for the flight and see the direction that the flight is going.

Roy made two other comments about *Airnav*, which deserve responses. I have not used the ACARS part of the program as I do not have an ACARS decoder (and no real interest in it, to be honest!). The program itself relies upon an external decoder (both hardware and software) to provide the data to be plotted. He also said that he found it difficult to keep up with the position reports by the aircraft due to the accents and speeds used, and had resorted to tape-recording the signals.

Well, when I did the original review for the *Airnav* program at the start of 1999, I did mention that trying to record every transmission from every aircraft was a problem, and the only way to do it was manually (technology has not advanced far enough for computer speech recognition to cope with noisy s.s.b. signals).

My solution to the problem was in two parts - do not try to track every flight; and to write down the position report given by the aircraft, and then double-check the data when the ATC agency gave a read-back. I would strongly suggest that you try to track fewer flights - maybe only those at a certain flight-level or oceanic entry point, or maybe only those of a particular airline. Any of these methods will give you more chance to hear and confirm the aircraft position report, and concentrating upon less flights the resulting *Airnav* screen is also less cluttered with flights.

## Web Watch

*Airnav* aircraft tracking software - [www.airnavsystems.com](http://www.airnavsystems.com)

Simon Collings (also for *Airnav*) - [wkweb4.cableinet.co.uk/simon.collings](http://wkweb4.cableinet.co.uk/simon.collings)

## Trawlers

It is not often that I get to mention maritime frequencies and subjects in this column. It is not for want of trying, but if I never get sent any information or queries, I have to rely upon other topics. So, this month, I am happy to report that I have some maritime items for you to listen to.

During February and March on the 'SWM Readers' mailing list on the Internet, there was a question about frequencies used by trawlers in the UK coastal waters. **Hugh Neal** said that he had 'accidentally come across informal chats between the skippers of fishing trawlers on low h.f.', and asked if anyone had a list of the frequencies normally used?

Several messages passed back and forth, until a reader called 'David' provided a list of 'intership frequencies'. I have included the list below, so that non-Internet readers can try to find some of these vessels.

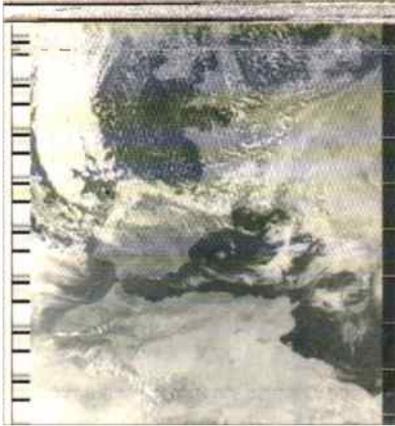
### Fishing Frequencies: (All MHz u.s.b.)

2.226	2.246	2.264	2.266	2.301	2.306	2.3109
2.311	2.331	2.340	2.371	2.395	2.398	3.050
3.052	3.090	3.168	3.186	3.456	4.076	4.063
4.129	4.235	4.747	5.180	5.246	5.300	5.556
5.566	5.602	5.620	5.656	5.678	6.644	6.688

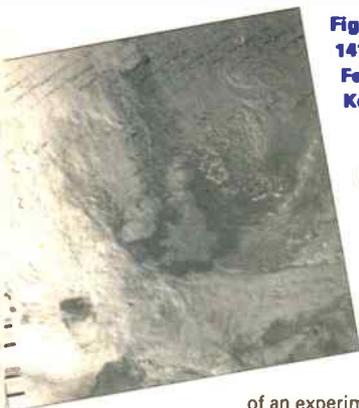
They are not necessarily all 'fishing' frequencies, but they are a good place to start. **Andy Cadier** reports that there are some other designated frequencies for fishing intership, with reference books showing 2.396 and 2.416MHz. A word of warning to those of a 'delicate nature'. You will know when you have found one of these frequencies, as you will be surprised at the amount of bad language and swear-words used - the communications are certainly 'salty'!

In fact, I could probably add several other frequencies to the list, but whenever I encounter this style of communications, I do not log either of the stations. Another distinct feature of these signals is that they are usually a very broad Scottish accent, one that I have a great difficulty in understanding (probably no bad thing, considering the language used), and also usually a very loud background noise from a diesel engine.

You might also encounter scrambled or coded transmissions in the m.f. bands, and these are also thought to be coming from trawlers and other fishing vessels. It is known that communications are scrambled when they are discussing where they have been fishing (especially if their catch has been good), and when they expect to return to port. All this kind of information could have an adverse effect upon the value of their catch, so Captains try to avoid giving away their fishing secrets.



**Fig. 9: NOAA-14 1512UTC 1 March - antenna pointing south.**



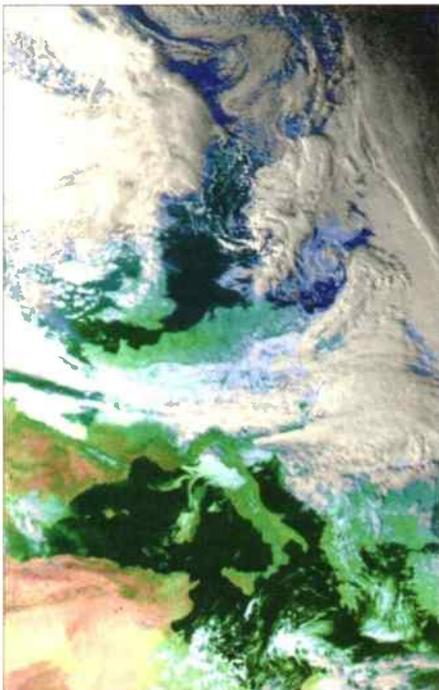
**Fig. 10: NOAA-14 1415UTC 13 February from Kevin Hughes.**

Iceland's coastline is clearly defined, as is the coastline of Greenland at upper left.

### Antenna Fix

Figure 9 shows the result of an experiment. Making time to checkout my grounded (!) antenna, I re-made the connections and mounted the crossed-dipole on a low-level mast for tests. The mast is only a few metres tall, but has a good view to the south and west.

For added fun, I tilted it about 45° above the southern horizon, despite Marion's fear that neighbours might think it was about to fall down. Only the birds were disturbed - they

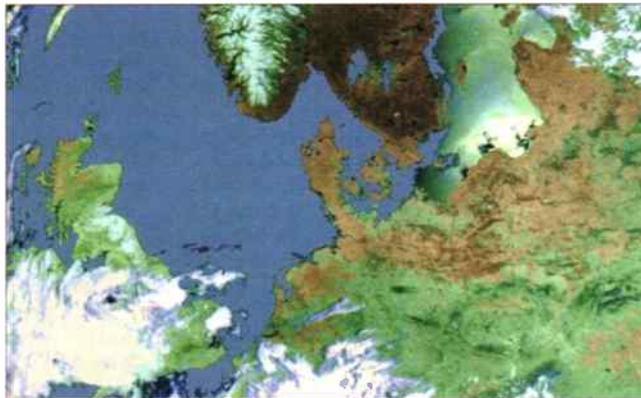


**Fig. 11: NOAA-14 Britain and western Europe 25 February 1429UTC from George Newport.**

## Shuttle Launch Schedule

STS-101 *Atlantis* is the 3rd ISS Flight (2A.2a) and scheduled no earlier than 13 April. Orbital inclination 51.6. STS-92 *Discovery* and STS-97 *Endeavour* currently have no scheduled launch dates, but will follow after STS-101.

A comprehensive listing of all Shuttle flights and payloads, together with associated information is available from me, at the address at the head of the column, as the *Shuttle Pack*. Please include £1.50 and stamped s.a.e. for the A4 booklet.



**Fig. 12: NOAA-14 Britain in late February from Jim and Hilda Richardson.**

cannot easily perch on tilted dipoles!

Reception in the south was considerably improved. The rapid signal drop-off near Scotland is a consequence of antenna direction. The next stage is another antenna 'swap'!

## More Readers' Images

**Kevin Hughes** used a Realistic PRO-2042 base scanner, a loft-mounted turnstile antenna and *wxsat* to receive a signal - see Fig. 10 - from NOAA-14. His receiver is a general purpose communications scanner and, as such, has limited suitability for WXSAT reception, having a very narrow bandwidth.

By selecting the w.f.m. (wideband f.m.) mode, one can get a better result, but at the cost of much lower sensitivity. In addition, utility receivers are less resistant to pager interference. Kevin plans to mount the antenna above roof height to improve coverage.

**George Newport**, and Jim and Hilda Richardson, sent in a number of images, and I thought I would group two of them together.

Both these images were received in late February - under conditions of poor illumination. It is notoriously difficult to achieve good artificial colour at such times, so some effort must have been expended by both parties. Jim and Hilda's image shows sun glint in the Baltic region, making a very attractive picture, after enhancement with *Paint Shop Pro*.

## Frequencies

NOAA-14 transmits a.p.t. on 137.62MHz.

NOAA-15 transmits a.p.t. on 137.50MHz.

NOAAs transmit beacon data on 137.77 or 136.77MHz.

METEOR 3-5 uses 137.30MHz.

OKEAN-4 and SICH-1 use 137.40MHz for brief transmissions.

RESURS 01#4 transmits a.p.t. on 137.85MHz.

METEOSAT-7 (geostationary) uses 1691 and 1694.5MHz for WEFAX.

GOES-8 (western horizon) uses 1691MHz for WEFAX.

## Kepler Elements - WXSATs, MIR and Shuttle

- 1 If you want a computer disk file containing recent elements for the WXSATs, AMSATs and others of general interest, together with a large file holding elements for thousands of satellites please enclose 50p with a PC-formatted disk and stamped envelope. A print-out is included that identifies NASA catalogue numbers for the WXSATs.
- 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. Transmission frequencies are given for the operating satellites. This data originates from NASA.

■ PAUL ESSERY GW3KFE, PO BOX 4, NEWTOWN, POWYS SY16 1ZZ

# Amateur Bands

Our anonymous correspondent asks this time why transceivers usually have two v.f.o.s. Go back to, say, the sixties, and most people who actively chased DX would have a transmitter plus two preferably different receivers. I used a KW Vespa transmitter plus linear, with KW77 and Eddystone 888 receivers. In a pile-up I always need to know the DX transmit frequency and his listening pattern. He may listen on his transmit frequency, above it, below it, or even dodge from side to side. I must call where he is listening, to call anywhere else merely adds to the QRM. I could turn to advantage the slight difference in receiver characteristics. It can take quite a time to make sure of both frequencies.

I recall an evening when I sat at the rig and heard VK3MR's CQ on 7MHz. Raised him OK, but the 339 contact was difficult. At the end, VK3MR sent 'CL', twice - telling the world he was switching off. I ambled to the local for a couple of celebratory pints. About 90 minutes later, the frequency was **still** full of people busy calling VK3MR. Ergo, none of them could have heard him.

## Earthing

Three aspects here. Firstly, the safety question, secondly the earth as part of the antenna. On safety, draw up your proposals, and either ask a professional or the electricity board to vet them before you start. As the number of homes fitted with PME increases, we must take this safety earthing method into account.

Some antenna systems - for example the end-fed wire - require an earth. For example, a quarter-wave is 'completed' by its 'image' in the ground. The resistance of the ground system is in series with the antenna. Let the earth resistance be fifty ohms - more than half our incoming signal never reaches the receiver.

Say our antenna is 'cut' for 3.5MHz. Go up to 7MHz and it becomes a half-wave and has a high impedance compared with the earth, so now nearly all of our signal reaches the receiver. As for the case so often noted that adding an earth connection to the receiver causes signals to drop - then the receiver was probably using strays in the mains wiring!

## Letters

**John Collins** in Birmingham enquired what happened to Wales at Rugby, when they played France. Well, John, we have to let 'em in occasionally, or they'd get demoralised, take the ball and leave the game! More seriously, John picked out GW4XLG and notes his QSL route as via MW1BLT.

Another interesting one was GX4BJC, cards either via Bureau or direct to MOCLO. A very big signal was noted from GW4GTE one afternoon, strong enough indeed to wipe out the European QRM. Finally, John mentions the Channel 4 TV series on the WW2 goings-on in France, radios hidden in bicycle handlebars and so on, which attracted quite a lot of praise from operators on the 7MHz band.

## Coming

First, the October Agalega operation. Everything is running to schedule, save for a couple of operators. Korea will be represented as you read this by 6K2000WFK until May 7 for the World Flower Exhibition. They will QSL 100% through the Bureaux. African DX will be Angolan D2FF until at least September 2001 - cards via EA8EE. However, low band activity must wait - wire is hard to come by in Luanda.

Jukka, VP6BR has been active from Pitcairn, but mains voltage variations have knocked out his amplifier and he is also not having too much success with the RTTY software. Petra Island, AS-063, activity is hoped for by UA4FRV. Mayotte activity under the call sign FH/TU5DX is hoped for by 6W1QV, who is based there for six months.

For the Top Band addicts, be aware the JAs now have 1.810-1.825MHz as well as their previous 1.9075-1.9125 allocation. Also that CX4SS and CX1SI are on 1.833MHz between 0000 and 0400 nightly.

Willis, VK9, looks OK for between May 6-16, signing VK9WI. In

June, PA3GIO has Mafia Is (AF-054), then Pemba Is till July 1 and then offers Cocos-Keeling, Christmas Is in August-September - all, alas, sideband.

Mount Athos has been activated by SV2ASP Monk Apollo for a decade, so he has been granted SY2A between October 1 and December 31 to commemorate.

Iraq activity comes from Y19OM, Peter, with the Slovak Embassy, after a year waiting. QSLs to his father OM6TX. Mainly c.w. up to writing.

## More Letters

Barnsley now and **Colin Dean** who stuck to sideband for the following: 7MHz AP2AR, BV2RS, EA9/EA7CTE, EK3GM, EK6LF, JAs 2-3-7, JW6WEA, OY4RN, RK0AZN, T77WI, UA0WDDW, UN2O, VR2MY, 4L1UN, 9N7RN; 14MHz HS1NGR, KH6/W7GMH, SU1ER, Y11ABC, Y11RS, 3V8BB; 18MHz A22EW, EX2X, HZ1AB, TF3BLS, UK9AA, VK9CO, VK9XU, VP2EBR; 21MHz AP2JZB, A92EV, EK8VW, ET3AA, ET3KV, EZ8AQ, JW9VDA, KP2/K8NI, OH0JTU, OX3SA, P43W, S79XC, TR8CX, UK8GK, UN7CDF, VKs 2-4-8, VU2XO, XE1YQQ, YBs 2-9-0, 3B8AD, 3B9FR and 3V8BB.

Finally on 28MHz A41LI, A41LZ, CP6EB, CX6EU, EK1700TK, EP3HR, JA1NSJ, JW9VDA, KP3A, OD5IU, PZ5RA, RU0AAM, RU0DFE, TA2IJ, VK8DK, VK9XS, VP5VAC, VU2RNC, XZ2A, ZD7VC, 3B8GD, 3V8BB, 4F3/GM4DKO, 4J4K, 5X4M and 8P6BGG. On the c.w. front, 18MHz saw OD5NJ, P4OK and 21MHz OD5NJ and P4OK again. 24MHz shows with them again and - dare one say it? the same two popped up on Ten!

It's c.w. all the way nowadays for **Ted Trowell** on the Isle of Sheppey. Ted starts on Top Band with VK6HD for Prize of the Month, then 3.5MHz stumped up 9K2UB, while 7MHz yielded HL1DH, A45XW, VK9NS, 9H1EL and JA4FKX. On 10MHz we find XU7AAV, JY9NX, OX3FWJ, J3/K4LTA, S21VJ before a shift to 14MHz for JA8QN, UA0AZ, JA8AZN, VK3DQS, 7L2VYT, C56JHF, ZS1AAX, HS4BPQ, V51AS, YS1/OH2BAD, XU7AAV, V44KJ, W7HQC and FM5CD.

At 18MHz, the crop included VQ9QM, FH/G3TXF, C6AKQ and on 21MHz Ted logged JA7OYF, JA1QXF, UA0FDK, KL7HF, ZS6ESU, VQ9GM, FH/G3SXW, P4/K2LE while 24MHz dealt with ZL4WA and LU5FC. Finally 28MHz for XU7AAV, VQ9QM, 9J2BO, PR7ZAJ, PY2OW, VQ9PO, TU2CI, P4/K2LE, YV1NX, J38A, ZV4C, PJ2/DL1CW, FM5CD, FH/G3SXW, LU4AAV, 8P9JA, J37ZA, PY2NHH, YV1DIG, YS1/OH2BAD and ZQ0YAF. Upside: two new countries; downside: QSL returned to indicating HL3LR being pirated.

**Peter and Paul Goodhall** were both recently elected to the Oxford club committee. Father and son both on the committee must be unusual - **and** they progressed to writing in separately!

Peter's SSTV program was exercised on February 1 on various Europeans, then using UA9OSV's *CwGet V0.09* program they tackled the DDH47 signals on February 11 - the last working Alexanderson alternator - and decoded it at 30w.p.m. By 2300 they had reported and next day were confirmed as the first two s.w.l.s to have heard and copied DDH47.

Peter used the c.w. facility to copy VK9NS, SP2LAS, FK8GJ, JF1VXB working M2000A, 9M2TO FK8VHM, W2YC in contact with CE9ZY, N5WD with JM3APP, JA4PXZ, LU8DWR, all on 14MHz, while 21MHz produced HL1ALA working successively EA5FIF and EA7WD, then 9G5ZW to HL4GKR and a bevy of JAs; back on 14MHz K4WW with CE0Y/G0KBD closed the list.

Turning to Paul, he offers a much longer list so we must 'prune' it a mite. Perhaps the highlight was on 3.5MHz with ZL3REX handling a string of Europeans at 1655 on January 30 giving Paul all continents heard over 90 minutes. On the 5th, XZ0A VK0MM and M2000A were noted among much other DX stuff on 28MHz where he went again on the 8th to find VP6BR, still operating despite all the problems.

It's notable how Jukka is concentrating on the Europeans. One small item entertained me for a few moments - YK9XU, Christmas Island, on 21MHz with VK9XT also on Christmas Is heard on 28MHz! Can't blame that one on the keyboard - just one of those little slips! For all that the Goodhalls have some very potent antennas.

Our space has run out, alas, so it only remains to remind you that the deadline is the first of the month to me at Box 4, Newtown, Powys SY16 1ZZ.

# Book Profiles

Remember, you can order your books by 'phone, FAX, E-mail or post.

## Radio Listener's Guide

The 2000 edition of the *Radio Listener's Guide* shows the frequencies and locations of all the radio stations in the UK and Ireland. There is information on BBC Radio, Independent Radio, The World Service, Overseas stations (primarily medium and long wave stations that can be heard in the UK), Satellite stations, Internet stations and much more - you will be surprised at how many stations there are to listen to. For BBC and Independent Radio stations, maps show which stations you are likely to receive in any particular area.

In the centre of this handy, pocket sized guide you will find colour frequency maps for the main national radio stations. So, for example, if you are looking for Radio 4's frequency while visiting Oxfordshire, look at the map for Radio 4. If, however, you are trying to track down the details for a particular station, try the index, which is listed inside the front cover. Order your essential guide now for just **£4.95**.



**£4.<sup>95</sup>**

The books listed have been selected as being of special interest to our readers. They are supplied direct to your door. Many titles are overseas in origin.

# SWM Book Store

## LISTENING GUIDES

### Airband

	Pages	Price
Abc AIRBAND RADIO GUIDE 4th Edition.....	96	£7.99
Abc AIRLINE LIVERIES 4th Edition. Gunter Endres.....	144	£9.99
Abc BRITISH AIRPORTS (6th Edition) A. Wright.....	112	£8.99
Abc CIVIL AIRLINER RECOGNITION 6th Edition. Peter R. March.....	128	£9.99
AIR BAND RADIO HANDBOOK 6th Edition. David J. Smith.....	192	£9.99
AIR TRAFFIC CONTROL 7th Edition. Graham Duke.....	112	£8.99
AIRWAVES 2000.....	134	£9.95
CALLSIGN 2000.....	168	£9.95
FLIGHT ROUTINGS 1999. Williams.....	160	O/P
NORTH ATLANTIC FLIGHT COMMUNICATIONS 2nd Edition (Inc. software).....	172	£16.50
UNDERSTANDING ACARS 3rd Edition. Aircraft Communications Addressing and Reporting System. Ed Flynn.....	80	£9.95
WORLD AIRLINE FLEET & SELCAL DIRECTORY.....	300	£16.00
WORLDWIDE AERONAUTICAL COMMUNICATIONS FREQUENCY DIRECTORY 2nd Edition. Robert E. Evans.....	260	£19.95

### Datamedes

FAX & RTTY WEATHER REPORTS. Philip Mitchell.....	88	£11.50
GUIDE TO WORLDWIDE WEATHERFAX SERVICES. 18th Edition Joerg Klingenfuss.....	436	£23.00
WEATHER REPORTS FROM RADIO SOURCES. Philip Mitchell.....	32	£7.50
RADIO DATA CODE MANUAL 16th Edition. Joerg Klingenfuss.....	788	£30.00
RADIOTELEX MESSAGES (25 Years of Monitoring Global Teleprinter & Data Communications, 1st Edition.....	568	£20.00

### DXTV

DXTV FOR BEGINNERS. Simon Hamer.....	31	£3.95
GUIDE TO DXTV. Keith Hamer & Garry Smith.....	36	£3.95
GUIDE TO WORLDWIDE TV TEST CARDS.....	60	£4.95
MASTS - PRACTICAL IDEAS FOR THE DXER. Hamer/Smith.....	36	£4.95
THIS IS BBC TV - FIRST 30YRS OF TV GRAPHICS. Keith Hamer & Garry Smith.....	38	£4.95
THE FIRST 30 YEARS OF BBC-2. Keith Hamer & Garry Smith.....	60	£4.95

Pages Price

## Frequency Guides

2000 SUPER FREQUENCY LIST on CDROM. Joerg Klingenfuss.....	n/a	£23.00
FERRELL'S CONFIDENTIAL FREQUENCY LIST NEW 11th Edition.....	450	£19.95
GLOBAL RADIO GUIDE 2000.....	32	£3.95
GUIDE TO UTILITY RADIO STATIONS 2000. 18th Edition. Joerg Klingenfuss.....	580	£30.00
PASSPORT TO WORLD BAND RADIO 2000.....	528	£15.50
RADIO LISTENERS GUIDE 2000.....	128	£4.95
SHORTWAVE FREQUENCY GUIDE 2000. Joerg Klingenfuss.....	564	£23.00
SHORTWAVE INTERNATIONAL FREQUENCY GUIDE.....	176	£12.95
WORLD RADIO TV HANDBOOK 2000.....	640	£19.95

## General

BUYING A USED SHORT WAVE RECEIVER NEW 4th Edition. F. Osterman.....	78	£5.95
GETTING ON TRACK WITH APRS. Stan Horzempa WA1LOU.....	165	£11.50
POP WENT THE PIRATES. Keith Skues.....	568	£16.95
RADIO COMMUNICATIONS HANDBOOK. New 7th Edition. Dick Bidulph/Chris Lorek.....	580	£28.00
RADIO SCIENCE OBSERVATION Volume 1 (inc. CD-ROM). Joe Carr.....	414	£26.95
SHORT WAVE COMMUNICATIONS. Peter Rouse GU1DKD.....	187	£4.50
SHORT WAVE EAVESDROPPER CD-ROM.....	n/a	£16.50
SHORT WAVE RADIO LISTENING FOR BEGINNERS.....	174	£14.95
SHORTWAVE RECEIVERS PAST & PRESENT (NEW 3rd Edition).....	450	O/P
SHORTWAVE LISTENER'S GUIDE. Ian Poole.....	192	£15.95
THE COMPLETE SHORT WAVE LISTENER'S HANDBOOK New 5th Edition Andrew Yoder.....	410	£19.95

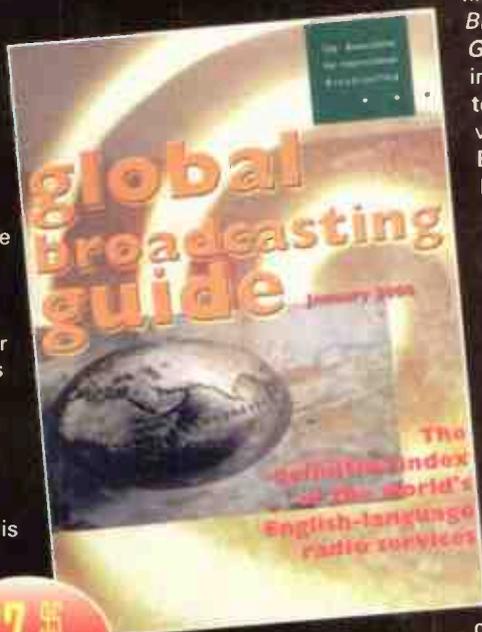
## Maritime

ELECTRONICS AFLOAT. Tim Bartlett.....	92	£8.95
GMDSS FOR SMALL CRAFT. Alan Clemmetsen.....	94	£11.95
RADAR FOR SMALL CRAFT. Tim Bartlett.....	96	£11.95
SCANNING THE MARITIME BANDS. 2nd Edition.....	158	£9.75
SHORTWAVE MARITIME COMMUNICATIONS. B.E. Richardson.....	195	£16.50
SIMPLE ELECTRONIC NAVIGATION. 2nd Edition. Mike Chenery.....	64	£8.95
THE VHF GMDSS HANDBOOK. New Edition. Michael Gale.....	64	£8.95
WATCHERS OF THE WAVES. Brian Faulkner.....	118	£13.50

# Book Profiles

## Global Broadcasting Guide

The world's airwaves are bubbling with a multitude of programmes throughout the day and night. But how do you discover what's on the air right now? The answer is inside this unique guide book. Every radio station broadcasting on short wave with English-language international programmes is listed. This book is all you need to listen to the world! And for the first time, to make this guide more useful than ever, there's a selection of television



**£3.95**

information included.

Whether you need the latest news from the renowned BBC World Service in London or a round-up of developments across Africa from Channel Africa in Johannesburg, you'll

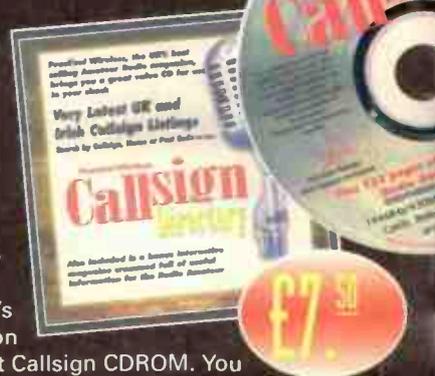
find the *Global Broadcasting Guide* tells you instantly how to hear the very best English-language radio. The *Global Broadcasting Guide* has been designed to slip easily into your pocket, briefcase or overnight bag, so wherever you're going, you can always be

sure of being in touch - don't leave home without it! Order your copy now for just **£3.95**.

## PW UK & Eire Callsign Directory

Do you want the most up-to-date UK and Irish Radio Amateur callsign database in your shack? It's all here on *PW's* first Callsign CDROM. You can browse by callsign, name or postcode to find the address you need, and when you have found it, you can print out a postal label. In addition to the callsign database, you'll also get a special 132-page electronic interactive magazine on CDROM. There are pages of amateur radio and related information including international callsign prefixes, frequency band data from 136kHz to 10GHz, v.h.f. and u.h.f. repeaters, beacons on h.f. and v.h.f./microwaves and lots of other band data.

There is a complete index of the articles that have appeared in *PW* from



### Satellite

	Pages	Price
AN INTRODUCTION TO SATELLITE COMMUNICATIONS BP326.F.A. Wilson	230	£5.95
ARRL SATELLITE ANTHOLOGY 5th Edition	150	£11.50
NEWNES GUIDE TO SATELLITE TV. Derek Stephenson	371	£19.95
SATELLITE HANDBOOK (ARRL) New Edition Marin Davidoff K2UBC	370	£15.50
SATELLITE PROJECTS HANDBOOK. Lawrence Harris	174	£14.99
SATELLITE TELEVISION. A layman's guide. Peter Pearson	73	£1.00
WEATHER SATELLITE HANDBOOK. 5th Edition. Dr Ralph E. Taggart WB8DQT	192	£15.50

### Scanning

AN INTRODUCTION TO SCANNERS AND SCANNING BP311. I.D. Poole	152	£4.99
SCANNER BUSTERS 2. D.C. Poole	100	£6.00
SCANNERS 2 INTERNATIONAL. Peter Rouse GU1DKD	261	£12.95
SCANNERS 3 PUTTING SCANNERS INTO PRACTICE. 4th Revision. Peter Rouse	271	£10.95
SCANNERS 4 SCANNING INTO THE FUTURE. Bill Robertson	245	£10.95
SCANNING SECRETS. Mark Francis	280	£16.95
UK SCANNING DIRECTORY New 7th Edition	604	£19.50
ULTIMATE SCANNING GUIDE. Richard Allport	640	£19.99

### AMATEUR RADIO

#### Amateur Television

AN INTRODUCTION TO AMATEUR TELEVISION. Mike Wooding G6IQM & Trevor Brown G8CJS	156	£5.00
THE AMATEUR TV COMPENDIUM. Mike Wooding G6IQM	104	£3.50

#### Antennas & Transmission Lines

25 SIMPLE AMATEUR BAND AERIALS BP125. E.M. Noll	63	£1.95
25 SIMPLE INDOOR AND WINDOW AERIALS BP136. E.M. Noll	50	£1.75
25 SIMPLE TROPICAL AND MW BAND AERIALS BP145. E.M. Noll	54	£1.75
ANTENNA IMPEDANCE MATCHING (ARRL). Wilfred N. Caron	195	£15.50
ANTENNA TOOLKIT (inc. CD-ROM). Joseph J. Carr	214	£25.00
ARRL ANTENNA BOOK 18th Edition	732	£24.00
ARRL ANTENNA BOOK ON CD-ROM	n/a	£28.00
ARRL ANTENNA COMPENDIUM Volume One	175	£10.50
ARRL ANTENNA COMPENDIUM Volume Two	208	£10.50
ARRL ANTENNA COMPENDIUM Volume Three. Edited by Jerry Hall K1TD	236	£11.50
ARRL ANTENNA COMPENDIUM Volume Four	204	£16.50
ARRL ANTENNA COMPENDIUM Volume Five	200	£16.50
ARRL ANTENNA COMPENDIUM Volume Six (inc CDROM)	200	£18.50
BEAM ANTENNA HANDBOOK. W.I. Orr W6SAI & S.D. Cowan W2LX	268	£8.95
BUILDING & USING BALUNS. Jerry Sevick	125	£18.95
CUBICAL QUAD ANTENNAS 3rd Edition. William Orr W6SAI and Stuart Cowan W2LX	110	£8.95
EXPERIMENTAL ANTENNA TOPICS BP278. H.C. Wright	70	£3.50
G-QRP CLUB ANTENNA HANDBOOK		
Compiled and edited by P. Linsley G3PDL & T. Nicholson KA9WRJ/GW0LND	155	£7.25
HF ANTENNA COLLECTION (RSGB). Edited by Erwin David G4LQI	233	£10.99

Pages Price

HF ANTENNAS FOR ALL LOCATIONS (RSGB). Les Moxon G6XN	322	£14.65
MORE OUT OF THIN AIR (PW)	112	£6.95
"ON-AUN'S" LOW BAND DXING (ARRL). J. Devidere	330	£23.00
PHYSICAL DESIGN OF YAGI ANTENNAS (ARRL)	270	£15.50
PRACTICAL ANTENNAS FOR NOVICES. John Heys G3BDQ	52	£6.30
PRACTICAL ANTENNA HANDBOOK 3rd Edition. (inc. software) Joseph J. Carr	580	£33.45
PRACTICAL WIRE ANTENNAS RSGB. John Heys G3BDQ	100	£8.95
RADIO ANTENNAS & PROPAGATION. William Gosling	260	£19.99
RADIO AMATEUR ANTENNA HANDBOOK. W.I. Orr W6SAI & S.D. Cowan W2LX	188	£8.95
RECEIVING ANTENNA HANDBOOK. Joe Carr	189	£17.50
SIMPLE, LOW-COST WIRE ANTENNAS FOR RADIO AMATEURS	224	£8.95
THE RIGHT ANTENNA. How To Select & Install Antennas For Entertainment & Communication Devices. 2nd Edition. Alvis J. Evans	78	£16.95
THE TRUTH ABOUT CB ANTENNAS. (Orr & Cowan) W.I. Orr W6SAI & S.D. Cowan W2LX	188	£8.95
VERTICAL ANTENNAS. W.I. Orr W6SAI & S.D. Cowan W2LX	192	£8.95
VERTICAL ANTENNA CLASSICS (ARRL). R. Schetsen	123	£11.50
W1FB'S ANTENNA NOTEBOOK (ARRL). Doug DeMaw W1FB	123	£8.00
WIRE ANTENNA CLASSICS (ARRL)	144	£11.50
YOUR ANTENNA COMPANION. Paul Danzer	130	£7.50

#### Beginners (inc RAE)

AN INTRODUCTION TO AMATEUR RADIO - New Edition. Ian Poole G3YWX	150	£4.99
BASIC RADIO PRINCIPLES & TECHNOLOGY. Ian Poole G3YWX	262	£14.99
BASIC RADIO & ELECTRONIC CALCULATIONS. Ray Petri GOOAT	160	£13.95
AN RAE STUDENTS NOTEBOOK. Bob Griffiths G7NHB	76	£6.95
PRACTICAL RECEIVERS FOR BEGINNERS (RSGB). John Case GW4HWR	165	£14.50
PRACTICAL TRANSMITTERS FOR NOVICES. John Case GW4HWR	126	£12.50
RADIO AMATEURS EXAMINATION/END OF COURSE TEST PAPERS. Ray Petri GOOAT	104	£13.95
RAE MANUAL (RSGB). New Revised Edition	127	£15.00
THE NOVICE LICENCE STUDENT'S NOTEBOOK. John Case GW4HWR	124	£6.00
THE NOVICE RADIO AMATEURS EXAMINATION HANDBOOK (BP375) Ian Poole G3YWX	150	£4.95
THE RADIO AMATEURS' QUESTION & ANSWER REFERENCE MANUAL. Fifth Edition. Ray Petri GOOAT	208	£13.95
TRAINING FOR THE NOVICE LICENCE A MANUAL FOR THE INSTRUCTOR (RSGB) John Case GW4HWR	101	£6.75
YOUR FIRST AMATEUR STATION. (RSGB) Colin Redwood G6MXL	120	£5.75

#### Callbooks

JOINT INTERNATIONAL & NORTH AMERICAN CALLBOOK (CD-ROM)	n/a	£30.00
PW UK & EIRE AMATEUR CALLSIGN (CD-ROM)	n/a	£7.50
RSGB YEARBOOK 2000 EDITION	432	£15.00

#### Computing

AN INTRODUCTION TO THE WORLDWIDE WEB FOR PC AND MAC USERS. (BP390) D.C. & O. Bishop	148	£6.99
ELECTRONIC PROJECTS FOR YOUR PC BP320. R.A. Penfold	102	£3.99
GETTING THE MOST FROM YOUR PC HARD DISK BP280	90	£3.95
HOW TO EXPAND & UPGRADE YOUR PC BP450. R. A. Penfold	170	£6.99



1993, right up to December 1999. There's also a complete review list along with the current Book Service listing. Browse through this CDROM using any of the methods available in Adobe Acrobat Reader (v4 included free on the CDROM). **£7.50.**

## North Atlantic Route Chart

This is the latest edition of this essential aviation monitors' accessory, last updated on 24/2/2000. Order yours for just **£9.**



**£9.<sup>99</sup>**

## Ultimate Scanning Guide

The frequencies above 30MHz - the v.h.f. and u.h.f. bands - contain a fascinating collection of signals: broadcast, amateur, emergency services, taxis, pagers and just about anyone using radio for short range communication. It is easy to monitor these signals with an inexpensive receiver, which because it searches for signals, is called a scanner.

The *Ultimate Scanning Guide* contains a huge listing of thousands of frequencies and who uses them, as well as reviews of scanners, an introduction to scanning and what's legal to listen to. The author, Richard Allport, has certainly made sure the frequency listing is as up-to-date as possible. Supplied free with this guide is a CDROM of all the articles and listings from the book, in a searchable form. **£19.99.**



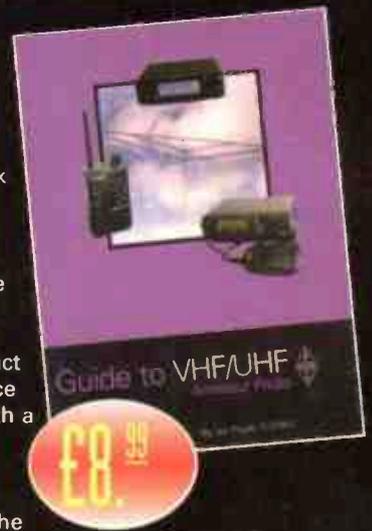
**£19.<sup>99</sup>**

## Guide To VHF/UHF Amateur Radio

The v.h.f. and u.h.f. amateur bands are some of the most interesting, useful and challenging of those available. They are an excellent place to start out in amateur radio as well as providing many different areas of interest for more

experienced operators.

This book by Ian Poole G3YWX has been written to help those starting out on v.h.f. and u.h.f., or to act as a reference for those with a little more experience who use the bands. Get the most from your v.h.f./u.h.f. station by



**£8.<sup>99</sup>**

	Pages	Price
INTERFACING PCs AND COMPATIBLES BP272. R. A. Penfold.....	86	£4.99
MS-OFFICE ONE STEP AT A TIME (BP402).....	77	£5.95
NEWNES COMPUTER ENGINEER'S POCKET BOOK Third Edition.		
Michael Tooley.....	256	£12.95
PERSONAL COMPUTERS IN THE HAM SHACK (ARRL).....	284	£11.50
THE INTERNET AND WORLD WIDE WEB EXPLAINED. J. Shelley.....	130	£5.95
WINDOWS '98 ASSISTANT (BP454) I. Sinclair.....	160	£6.99
WINDOWS '98 EXPLAINED (BP456). N. Kantaris & P. Oliver.....	160	£6.99
WINDOWS '98 - HARD DISK & FILE MANAGEMENT. (BP455) J. Gatendy.....	160	£6.99

### EMC

ARRL RFI BOOK (Practical Cures For Radio Frequency Interference).....	316	£15.50
INTERFERENCE HANDBOOK. William R. Nelson WA6FQG.....	250	£9.50
RSGB GUIDE TO EMC. 2nd Edition. Robin Page-Jones G3JWI.....	204	£18.50

### Historical

100 RADIO HOOK UPS. 2nd Edition (reprinted).....	48	£3.35
1934 OFFICIAL SHORT WAVE RADIO MANUAL. Edited by Hugo Gernsback.....	260	£11.85
COLLECTOR'S GUIDE TO TRANSISTOR RADIOS (2nd Edition). Marty & Sue Bunis.....	320	£16.95
COMMUNICATIONS RECEIVERS - THE VACUUM TUBE ERA. R.S. Moore.....	141	£17.95
GUIDE TO OLD RADIOS, POINTERS, PICTURES, PRICES. David & Betty Johnson.....	278	£19.95
HENLEYS 222 RADIO CIRCUIT DIAGRAMS (1924).....	271	£9.45
HOW TO BUILD THE TWINPLEX REGENERATIVE RECEIVER. Lindsay.....	63	£5.75
HOW TO BUILD YOUR FIRST VACUUM TUBE REGENERATIVE RECEIVER. T.J. Lindsay.....	127	£7.30
HOW TO BUILD YOUR RADIO RECEIVER (A4) (Popular Radio Handbook No. 1).....	100	£6.95
HOW TO MAKE A NEUTRODYNE RECEIVER. Webb.....	63	£5.00
OLD TIME RADIOS - RESTORATION & REPAIR. J. Carr.....	256	£20.95
SECRETS OF HOMEBUILT REGENERATIVE RECEIVERS (Rockey).....	127	£7.95
SEEING BY WIRELESS - THE STORY OF BAIRD TELEVISION. Ray Herbert.....	27	£4.95
THOSE GREAT OLD HANDBOOK RECEIVERS (1929 + 1934).....	94	£6.95
TRANSISTOR RADIO! - A COLLECTOR'S ENCYCLOPEDIA & PRICE GUIDE.		
David & Robert Lane.....	170	£19.95
VISION BY RADIO (1925) (Jenkin).....	140	£7.85
DOUBLE TESLA-OUIDIN COIL.....	24	£3.95
RADIO TESLA - THE SECRETS OF TESLA'S RADIO AND WIRELESS POWER.....	36	£5.30
TESLA COIL.....	24	£3.95
TESLA - THE LOST INVENTIONS.....	32	£4.75
TESLA - THE TRUE WIRELESS.....	16	£3.95
THE MAN WHO INVENTED THE TWENTIETH CENTURY: NIKOLA TESLA.		
FORGOTTEN GENIUS OF ELECTRICITY.....	245	£12.99
THE TESLA HIGH FREQUENCY COIL (1910).....	120	£6.95

### Crystal Set Books (Xtal Set Society)

THE XTAL SET SOCIETY NEWSLETTER. Volume 1 & 2 Combined. Phil Anderson W0XI.....	96	£14.00
THE CRYSTAL SET HANDBOOK & VOL. 3 XTAL SET SOCIETY NEWSLETTER.		
Phil Anderson W0XI.....	134	£8.00
THE XTAL SET SOCIETY NEWSLETTER. Volume 4. Phil Anderson W0XI.....	88	£7.00
CRYSTAL SETS. The Xtal Set Society Newsletter, Volume 5. Phil Anderson W0XI.....	88	£7.00
CRYSTAL SET BUILDING & MORE (Vol 6 & 7 of Xtal Set Society Newsletter).....	168	£11.00
CRYSTAL RADIO HISTORY, FUNDAMENTALS AND DESIGN. P.A. Kinzie.....	122	£8.00

	Pages	Price
CRYSTAL SET PROJECTS - 15 RADIO PROJECTS YOU CAN BUILD. Phil Anderson.....	160	£10.00
CRYSTAL SET LOOPERS, A3 TUBER & MORE. Volume 8 Xtal Set Society Newsletter.....	128	£10.50

### Maps & Log Books

AMATEUR RADIO LOGBOOK (RSGB).....	50	£3.75
AMATEUR RADIO WORLD ATLAS (A4 SIZE).....	20	£8.00
GREAT CIRCLE MAP 600mm x 600mm.....	r/a	£1.50
NORTH ATLANTIC ROUTE CHART.....	740 x 520mm	£9.00
QTH LOCATOR MAP OF EUROPE. New Edition.....	1080 x 680mm	£7.00
RADIO AMATEURS MAP OF THE WORLD. New Edition.....	980 x 680mm	£7.00
RECEIVING STATION LOG BOOK (RSGB).....	60	£3.75
RSGB 1998 PREFIX GUIDE.....	32	£6.95

### Morse

SECRETS OF LEARNING MORSE CODE Mark Francis.....	84	£6.95
--------------------------------------------------	----	-------

### Microwaves

AN INTRODUCTION TO MICROWAVES (BP312). F.A. Wilson.....	134	£3.95
ARRL UHF/MICROWAVE EXPERIMENTER'S MANUAL. Various Authors.....	446	£15.50
ARRL UHF/MICROWAVE PROJECT MANUAL VOL 2.....	160	£11.50
ARRL UHF/MICROWAVES PROJECT MANUAL (ARRL).....	352	£15.50
MICROWAVE & WIRELESS COMMUNICATIONS TECHNOLOGY. Joseph J. Carr.....	436	£27.50
MICROWAVE HANDBOOK - COMPONENTS & OPERATING VOL 1 (RSGB).....	110	£12.00
MICROWAVE HANDBOOK - CONSTRUCTION & TESTING VOL 2 (RSGB).....	120	£18.50
MICROWAVE HANDBOOK - BANDS & EQUIPMENT VOL 3 (RSGB).....	140	£18.50

### Operating & Handbooks

ALL ABOUT HAM RADIO. Harry Helms.....	290	£16.50
ARRL HANDBOOK 2000 76th Edition.....	380	£24.00
ARRL HANDBOOK 2000 ON CDROM.....	r/a	£33.00
ARRL OPERATING MANUAL NEW EDITION.....	420	£18.50
ARRL RADIO BUYERS SOURCEBOOK VOL 1 1 (QST Reviews 1981-1991).....	280	£11.50
ARRL RADIO BUYERS SOURCEBOOK VOL 1 2 (QST Reviews 1991-1993).....	240	£11.50
ARRL VHF/UHF RADIO BUYER'S SOURCEBOOK.....	120	£11.50
COMPLETE DX'ER. Bob Locher.....	204	£9.50
DISCOVERING DXING (2nd Edition). John Zondlo.....	90	£7.50
HAM RADIO MADE EASY (ARRL). Steve Ford.....	204	£11.50
HINTS AND KINKS FOR THE RADIO AMATEUR.		
Edited by Charles L. Hutchinson and David Newkirk.....	129	£9.50
LOW PROFILE AMATEUR RADIO (ARRL). Jim Kearman KR1S.....	124	£7.50
SETTING UP AN AMATEUR RADIO STATION BP300. I.D. Poole.....	81	£3.95
TRANSMITTER HUNTING - RADIO DIRECTION FINDING SIMPLIFIED.		
Joseph D. Moell & Thomas N. Curlee.....	325	£24.95

### Packet

HF DIGITAL COMPANION. Steve Ford.....	120	£7.50
NOS INTRO: TCP/IP OVER PACKET RADIO. Ian Wade G3NRW.....	356	£11.50
PACKET RADIO PRIMER (RSGB). Dave Comber G8UYZ & Martyn Corft G8NZU.....	266	£8.95

studying the weather to predict greatly enhanced propagation; by using the correct part of each band; by choosing the right transmitter, receiver and antenna and by using the correct procedure. A chapter explains how to transmit and receive computer data on these bands.

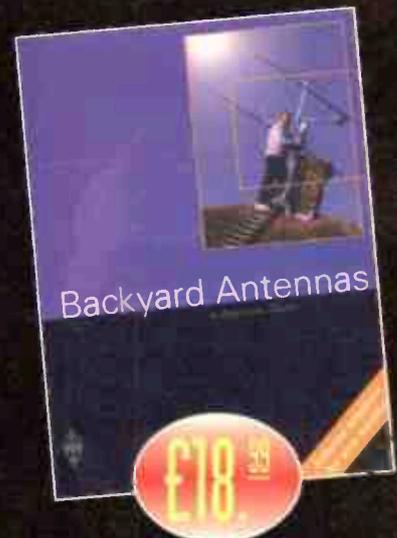
All in all, a handy sized book with everything you will need to know to help you enjoy v.h.f./u.h.f. amateur radio to the full. **£8.99.**

## Backyard Antennas

Radio amateurs and short wave listeners all want to achieve the very best from their h.f. and v.h.f.

equipment. Receivers and transmitters are available to professional standards, but very few people have the real estate to erect the sort of antenna used by a commercial radio station. Antenna guru Peter Dodd explains how, by using a variety of simple techniques, it is possible to achieve very high performance from a compact antenna. Also detailed is how to make an antenna efficient on several bands at once.

*Backyard Antennas* covers end-fed and centre-fed antennas, rotary beams, loops, tuning units, v.h.f./u.h.f. antennas, antenna and mast construction, transmission lines, and how to estimate and measure the performance on your antenna. **£18.99.**



	Pages	Price
PACKET, SPEED & MORE SPEED APPLICATIONS (ARRL).....	148	£10.50
PRACTICAL PACKET RADIO. Stan Horzepa.....	140	£10.50
YOUR PACKET COMPANION. Steve Ford WB8IMY.....	170	£7.50

### Propagation

AN INTRODUCTION TO RADIO WAVE PROPAGATION BP293. J.G. Lee.....	116	£3.95
YOUR GUIDE TO PROPAGATION (RSGB) Ian Poole.....	88	£6.95

### QRP

ARRL LOWER POWER COMMUNICATIONS - THE ART & SCIENCE OF QRP. Richard Arland K7SZ.....	204	£11.50
QRP POWER (ARRL).....	188	£11.50
G-QRP CLUB CIRCUIT HANDBOOK. Edited by Rev. G. Dobbs G3RJY.....	96	£9.00
INTRODUCING QRP. Dick Pascoe G0BPS.....	48	£6.95
W1FB's QRP NOTEBOOK (ARRL). 2nd Edition. Doug DeMaw W1FB.....	175	£8.00

### Test Equipment

AN INTRODUCTION TO THE ELECTROMAGNETIC WAVE BP315. F.A. Wilson.....	122	£4.95
BUILD YOUR OWN TEST EQUIPMENT. Davidson.....	285	£19.95
GETTING THE MOST FROM YOUR MULTIMETER BP239. R.A. Penfold.....	102	£2.95
HANDS-ON GUIDE TO OSCILLOSCOPES. Barry Ross.....	228	£20.95
HOW TO USE OSCILLOSCOPES & OTHER TEST EQUIPMENT BP267. R.A. Penfold.....	104	£3.50
MORE ADVANCED USES OF THE MULTIMETER BP265. R.A. Penfold.....	96	£2.95
OSCILLOSCOPES - HOW TO USE THEM/HOW THEY WORK. 4th edition. Ian Hickman.....	259	£17.99
TEST EQUIPMENT CONSTRUCTION BP248. R.A. Penfold.....	104	£3.99
TEST EQUIPMENT FOR THE RADIO AMATEUR. Clive Smith G4FZH.....	170	£10.95

### VHF

ALL ABOUT VHF AMATEUR RADIO. W. I. Orr W6SAI.....	163	£8.95
VHF/UHF HANDBOOK (RSGB). Dick Biddulph G8PDS.....	180	£22.00
YOUR MOBILE COMPANION. Roger Butch.....	190	£8.50
YOUR VHF COMPANION. Steve Ford.....	230	£7.50

## ELECTRONICS

### General

BEGINNERS GUIDE TO MODERN ELECTRONIC COMPONENTS BP285.....	166	£4.99
CIRCUIT SOURCE BOOK 1 - BP321. R.A. Penfold.....	182	£4.95
CIRCUIT SOURCE BOOK 2 - BP322. R.A. Penfold.....	214	£4.95
DIGITAL ELECTRONICS (CD-ROM). Mike Tooley.....	n/a	£45.00
ELECTRONIC PROJECT BUILDING FOR BEGINNERS. R. Penfold. (BP392).....	110	£4.95
ENCYCLOPEDIA OF ELECTRONIC CIRCUITS Vol. 7.....	1128	£32.95
FAULT FINDING ELECTRONIC PROJECTS BP391.....	133	£4.99
GETTING STARTED IN PRACTICAL ELECTRONICS BP345. Owen Bishop.....	198	£4.95
HOW ELECTRONIC THINGS WORK ... AND WHAT TO DO WHEN THEY DON'T. Goodman.....	390	£16.95
HOW TO TEST ALMOST EVERYTHING ELECTRONIC.....	326	£16.95
LADDER CRYSTAL FILTERS. John Pivnichny N2DCH.....	134	£14.95
NEWNES AUDIO AND HI-FI ENGINEER'S POCKET BOOK 3rd Edition. Vivian Capel.....	210	£14.95
PARTS GALLERY & ELECTRONICS CIRCUITS & COMPONENTS (CD-ROM). Mike Tooley.....	n/a	£35.00
PICTUTOR (CD-ROM). John Decker.....	n/a	£45.00
POWER SUPPLY PROJECTS BP76. R.A. Penfold.....	89	£3.99
PRACTICAL DIGITAL ELECTRONICS FOR TECHNICIANS. Will Kimber.....	262	£12.99
PRACTICAL ELECTRONIC FILTERS BP299. Owen Bishop.....	69	£4.95
PRACTICAL ELECTRONICS HANDBOOK. Ian Sinclair.....	439	£14.95

	Pages	Price
PRACTICAL OSCILLATOR CIRCUITS BP393. A. Flind.....	136	£4.99
RADIO ENGINEERS FACTFINDER FOR WINDOWS (Floppy Disk) John Davies.....	n/a	£18.00
RADIO FREQUENCY TRANSISTORS, PRINCIPLES & PRACTICAL APPLICATIONS Dye/Granberg (Motorola). Hardback.....	235	£39.95
SCROGGIES - FOUNDATIONS OF WIRELESS & ELECTRONICS. 11th Edition.....	292	£19.99
TECHNICAL TOPICS SCRAPBOOK (RSGB). 1990-94. Pat Hawker.....	310	£13.50
THE ART OF SOLDERING BP324. R. Brewster.....	84	£3.99
UNDERSTANDING BASIC ELECTRONICS (ARRL).....	314	£15.50
UNDERSTANDING DIGITAL TECHNOLOGY. F. Wilson. (BP376).....	110	£4.95
W1FB's DESIGN NOTEBOOK (ARRL). Doug DeMaw W1FB.....	195	£8.00

### Data

ARRL ELECTRONICS DATA BOOK. Doug DeMaw W1FB.....	260	£8.95
ELECTRONIC HOBBYIST DATA BOOK BP396. R.A. Penfold.....	242	£5.95
LF SOURCE BOOK (RSGB) 2nd Edition. Peter Dodd.....	130	£8.00
PRACTICAL ELECTRONIC DESIGN DATA BP316. Owen Bishop.....	327	£5.99
PRACTICAL RF HANDBOOK (2nd Edition). Ian Hickman.....	302	£19.99
RF CIRCUIT DESIGNS. Chris Bowick.....	176	£18.99
SECRETS OF RF CIRCUIT DESIGN. New Edition (Hardback) Joseph Carr.....	405	£41.95
SOLID STATE DESIGN FOR THE RADIO AMATEUR (ARRL) Les Hayward W7ZOI & Doug DeMaw W1FB.....	256	£11.50
SPREAD SPECTRUM SOURCE BOOK.....	320	£15.50
TOWERS INTERNATIONAL MOSPOWER & OTHER FET SELECTOR.....	140	£19.95
TOWERS INTERNATIONAL TRANSISTOR SELECTOR - UPDATE 5.....	476	£24.95
TRANSISTOR DATA TABLES (BP401).....	178	£5.95

### Projects

33 SIMPLE WEEKEND PROJECTS/CO.....	68	£7.95
35 OPTO-DISPLAY TERMINAL BLOCK PROJECTS BP140.....	104	£4.99
BUILD YOUR OWN INTELLIGENT AMATEUR RADIO TRANSCEIVER. Randy L. Henderson.....	350	£25.95
COIL DESIGN & CONSTRUCTION MANUAL BP160. B.B. Babani.....	106	£3.95
HOW TO DESIGN & MAKE YOUR OWN PCBs BP121. R.A. Penfold.....	66	£3.99
MORE ADVANCED POWER SUPPLY PROJECTS BP192. R.A. Penfold.....	92	£2.95
POWER SUPPLY PROJECTS (A collection of innovative and practical design projects). Newnes.....	170	£10.95
PROJECTS FOR RADIO AMATEURS & SWLs BP304. R.A. Penfold.....	92	£3.95
RADIO RECEIVER PROJECTS YOU CAN BUILD.....	312	£20.95
SIMPLE SHORT WAVE RECEIVER CONSTRUCTION BP275. R.A. Penfold.....	88	£3.95

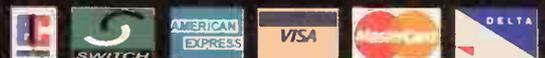
### Valves/Tubes

ELECTRON TUBE LOCATOR. George H. Fathauer.....	350	£21.95
ESSENTIAL CHARACTERISTICS (TUBES & TRANSISTORS) (Original publishers General Electric) Re-published by Antique Electronic Supply (Arizona).....	475	£10.50
HANDBOOK OF RADIO, TV, INDUSTRIAL & TRANSMITTING TUBE & VALVE EQUIVALENTS. 60.....	60	£2.95
RADIO VALVE GUIDE BOOK VOL 1.....	54	£2.95
RADIO VALVE GUIDE BOOK VOL 2.....	42	£2.95
RADIO VALVE GUIDE BOOK VOL 3.....	40	£2.95
RADIO VALVE GUIDE BOOK VOL 4.....	48	£2.95
RADIO VALVE GUIDE BOOK VOL 5.....	44	£2.95
MASTER INDEX TO VALVE TYPES, BOOKS 1-5.....	40	£1.50
RCA RECEIVING TUBE MANUAL (Original Publishers Radio Corporation Of America). Re-published by Antique Electronic Supply (Arizona).....	384	£10.50
RCA TRANSMITTING TUBES (Original Publisher Radio Corporation of America) Re-published by Antique Electronic Supply (Arizona).....	318	£10.50
TUBE SUBSTITUTION HANDBOOK.....	150	£15.50
VALVE AMPLIFIERS. Morgan Jones.....	374	£25.00
VALVE & TRANSISTOR AUDIO AMPLIFIERS. John Lindsay Hood.....	310	£19.95

Check out our Website for a selected description of these books

[www.pwpublishing.ltd.uk/books](http://www.pwpublishing.ltd.uk/books)

Telephone  
(01202) 659930



OR USE THE ORDER FORM ON PAGE 84

Please note: Cash not accepted with mail orders.

# ShackWare

Keep your letters and E-mails coming, I enjoy every one. Good listening.

Hello and a warm welcome to ShackWare, the bi-monthly column devoted to computers in the shack. There's a packed page this time around complete with an unusual change of tempo, so let's get started right away...

## Aladdin's Cave

Like many s.w.l.s and electro-tinkerers, I love to send off for catalogues of electronic salvage - you know the stuff, old circuit boards, power supplies, outdated i.c.s and the like sold by dealers around the UK.

One such, Greenweld, based in Southampton, was definitely one of the best especially if, like me, you constantly search for bits to support old computers. Every issue of its monthly 'Flyer' contained bits and bobs from the home computer heydays of the early 1980s.

I bought a job lot of joystick interfaces for the Oric computers for around 20p each for example. (A joystick interface is a direct route to the 6502 CPU's I/O support chip, the 6522 VIA or Versatile Interface Adapter, and that makes for an easy hack into an RS-232 serial port for a machine which doesn't have one...).

Anyway, back to the plot. Always amazingly cheap, Greenweld finally priced themselves out of the market (10 double-pole, double-throw switches for a pound is cheap by any standard!) and went under sometime at the tail end of 1999.

Imagine my amazement: then, when a copy of the Greenweld catalogue plopped onto the welcome mat this morning! Apparently, the entire Greenweld stock was bought from the liquidator, the 'Flyer' is being republished and Greenweld is now back in business, albeit under new management.

There are plans for a new web site at [www.greenweld.co.uk](http://www.greenweld.co.uk) and the company can be reached via E-mail at [service@greenweld.co.uk](mailto:service@greenweld.co.uk). Those without Net access can contact Greenweld at PO Box 144, Hoddesdon EN11 0ZG, Tel: (01277) 811042. By the way, I have no interest in this company other than a predilection for buying interesting computer, radio and related electronic items at breathtaking prices!

## Mailbag

There's a Beeb theme to this issue's letters so let's kick off right away with Dave Wagstaff of Bishops Stortford, Herts, who writes "I am a s.w.l. and a scanner enthusiast. I've recently acquired two BBC B micros and a 5.25in floppy drive and I'm interested in what can be done with them".

Dave goes on to list a number of questions which I'll deal with in order. Dave asks, "How much software is available for decoding? I'm interested in RTTY, FAX, SSTV, ACARS and satellite imagery".

No problem there, Dave. There's hardware and software to handle all those modes with the possible exception of ACARS (unless someone knows better?). The oft-mentioned and now defunct Technical Software once produced decode software of a quality that can only be marvelled at given the limitations of some of the target machines.

Technical Software's *RX8*, a decode suite that offered no less than eight modes for decode, was perhaps the peak of the company's prodigious output. *RX8* was shipped on EPROM, though previous correspondent Ray Fish of Loughborough offered the program on 5.25in floppy (and if you're reading this Ray, an update on Beeb software availability would be great).

*RX8* offered c.w., SITOR A/B, FAX, RTTY and packet among others. The program came complete with an interface which connects to the BBC's user port. The interface provides signal conditioning, filtering and demodulation for all modes. The only difficulty nowadays is sourcing the program and interface second-hand. However, a rummage around Bring & Buy sales at radio rallies or a small ad in *SWM* ought to do the trick.

All of which answers Dave's second question about Technical Software. And also (I hope) answers a question on receiving c.w. from BBC B owner J.R. Tallentire G4AFE of Middleton-in-Teesdale, County Durham, (a beautiful part of the UK. I once stayed in an outward bounds camp there, walking to Fairy Dell, High Cup Nick and, of course, High Force - where I fell over and broke my finger!).

In question number three, Dave says he's contacted the Remote

Imaging Group which has advised against the use of a BBC for decoding weather satellites. Well, I concede that RIG has a point. A cheap PC with a sound card and shareware software will provide spot-on polar orbiter decoding at full resolution for a modest outlay, but given that Dave already has the Beeb, what can be done?

A lot, is the (not very) surprising answer! Pre-dating domination of the planet by the ubiquitous PC, the BBC was the platform of choice for such luminaries as popular satellite decode company Timestep. I own a matching pair consisting of a Timestep satellite receiver and Timestep BBC decoder. The former plugs into the latter which is then connected to the Beeb via two IDC connectors.

Software was shipped on EPROM and disk and, while the results were low resolution and weirdly coloured (because of the machine's inability to display more than four colours when outputting high-res graphics), it was easy-to-use and produced pictures considerably better than none at all!

My set-up cost £75. Expensive? Not when you consider that the price included a turnstile antenna with masthead amplifier, a BBC B computer, colour Microvitec CUB monitor and a disk drive with 256K RAM expansion! And *that's* why it's still perfectly reasonable to consider such an antiquated set-up: less money spent on computers means more to spend in your shack...

Circuit also produced a self-build receiver and interface to suit the BBC and offered software on EPROM. I constructed the RX and interface but I don't have the firmware.

Finally Dave asks whether it's possible to take the 32K of RAM chips from one of his Bs and use it in the other to increase the memory to 64K? The answer, of course, is yes, but it's a pointless exercise. The Beeb has always had a tiny memory and virtually all software works around the problem rather requiring an expanded memory. Back then, RAM was expensive - 64K-bit DRAMs cost pounds rather than pence (and you need eight to make 64K bytes - think about it).

Typical users would not have opened their computers (instantly invalidating their warranties) even if RAM was cheap. The Beeb fared better in this respect than many, positively encouraging users to open up the machine and plug in EPROMs, but even so...

I've yet to find any software which takes real advantage of the extra 256K in my own machine whereas I've expanded some of my Atari 8-bits to 1088K and that whole meg of RAM is supported. So, my advice is to keep the second machine as a back-up in case the first gives up the ghost.

And now on to a letter from *SWM*'s own Godfrey Manning G4GLM of Edgeware, Middlesex, who gently chides me for omitting the venerable Acorn Atom from the list of also-rans in the recent 'ShackWare Special'.

Godfrey writes "You missed one out! The predecessor to the BBC was the Acorn Atom, a 6502 machine with inbuilt BASIC and a very useful in-line assembler. I made one from a kit. However, it is consigned to the totally useless category as far as radio-oriented software is concerned. Pity".

Indeed. The Atom first saw the light of day at the beginning of the 1980s when it could be bought as a going concern or in kit form (a popular alternative back then). The machine sported a full-size keyboard, neat case and high-resolution colour graphics (yes, colour!). An Atom kit featuring an 8K ROM and 2K RAM cost £140. Assembled, the same machine cost £174.50.

Alternatively, you could plump for the 12K ROM and 12K RAM pre-assembled Atom at £289. Add-ons included a 4K floating point package at £23, a colour encoder board at £21.85 and a p.s.u. for £9.20. A 32K RAM upgrade cost £74 - compare with a 64Mb upgrade for today's PCs at roughly the same price!

Godfrey goes on to say "Perhaps in a future column you could say how the BBC Master fitted into the series? My late next door neighbour had one and he saw it as an upgrade after trying a standard BBC Micro. His widow still has the (now unwanted) computer. If I can find all the bits to go with it, any suggestions as to a good home? Any takers contact me [i.e. Godfrey]". See Godfrey's column for contact details.

## Any Port In A Storm?

Though not normally within my remit (it's far too modern!), Godfrey's interest in USB pin-outs got me thinking. Unlike the RS-232 and parallel Centronics interfaces of yesteryear which required the user to delve within their murky depths, fiddling about soldering pins, using break-out boxes to see what was going on, today's ultra-modern interfaces such as USB are designed to minimise, if not remove, the need to tinker altogether.

This, let me say, is a very good thing. Anyone who's whiled away an afternoon trying to discover why two pieces of equipment fitted with 'standard' ports refuse to establish a communication across a fixed link will, I think, agree.

USB or Universal Serial Bus is an interface which provides unlimited expansion 'outside the box'. Devised by the likes of Microsoft, Compaq, DEC, IBM and Intel, there's no need to open the computer to install a card and USB completely dispenses with setting jumpers, allocating system resources such as IRQs and DMA channels yet enables a diverse range of devices - from mice to digital cameras - to communicate effectively and quickly. A USB device can be hot-plugged (without restarting the computer), whereupon it's recognised immediately and allocated resources automatically.

Even the physical connection is simple: four pins, power in, ground, a data in and a data out (1, 4, 2, 3, white, red, green and black respectively). Some equipment features a fifth pin which is used as a key to ensure the plug is inserted the right way around.

I'm not sure what's involved in programming the USB standard. Less hardware usually equates to more effort in programming to handle handshaking and the like, but I could be wrong.

Almost all modern PCs and Apple Macs come with USB as standard. Scanners, keyboards, mice and trackballs, cameras and more are available for the USB standard and today, several years on from its launch, USB-equipped devices cost no more (or perhaps only a little more) than their SCSI, IDE and parallel counterparts. It'll only be a matter of time before receivers which interface to computers (such as Icom) are shipped with a USB port.

## PHOTAVIA PRESS

# AIRWAVES 2000

**!!! NEW !!!  
PUBLISHED  
APRIL 2000**

**THE NEW 7th EDITION OF THE UK'S MOST COMPREHENSIVE AND UP TO DATE HF/VHF/UHF AVIATION FREQUENCY DIRECTORY AS/WIRE SPIRAL BOUND - FULLY UPDATED FOR 2000**

TOWER - APPROACH - RADAR - GROUND - AIR TO AIR - RANGES - ATIS - GCI SQUADRON OPS - AIR REFUELLING - VOLMET - AIRLINE OPS - AWACS - SAR AIR DEFENCE RADAR (UK & EUROPE) - GROUND OPS - AEROBATIC TEAMS UK/EUROPEAN CIVIL & MILITARY AREA RADAR - MILITARY AIRFIELD STUDS 4 LETTER AIRFIELD CODES - RUNWAYS - SSR CODES - UK BASED MILITARY UNITS MAPS OF - UK TRANSMITTER SITES AND FREQUENCIES - MILITARY TACAN ROUTES LOW ALTITUDE AND AIR REFUELLING AREAS - UK RADAR SECTORS AND FREQUENCIES UK PRIMARY AIRWAYS AND REPORTING POINTS - UK SUPERSONIC ROUTES UK OCEANIC ROUTES AND FREQUENCIES - MAJOR WORLD AIR ROUTE HF AREAS MILITARY AND CIVIL HF DIRECTORY - (INCLUDES MANY DISCRETE FREQUENCIES AND CHANNEL DESIGNATORS) - RAF/ROYAL NAVY - WORLDWIDE/NATO MILITARY AIR-ARMS UN - US MILITARY GLOBAL HF NET - MYSTIC STAR - US NAVY - US COAST GUARD HURRICANE HUNTERS - VOLMET - SEARCH AND RESCUE - SPACE SHUTTLE - MAJOR WORLD AIR ROUTES - AIRLINE OPS - LONG DISTANCE OPERATIONS CONTROL - DOMESTIC CIVIL HF

**UK PRICE £9.95 INCLUDING FREE P&P / EIRE & EEC ADD £1**

# CALLSIGN 2000

**!!! NEW !!!  
PUBLISHED  
MARCH 2000**

**THE NEW 6TH EDITION OF OUR CIVIL AND MILITARY AVIATION CALLSIGN DIRECTORY - FULLY UPDATED - OVER 3050 CHANGES 168 PAGES - WIRE SPIRAL BOUND - OVER 8450 AVIATION CALLSIGNS**

**MILITARY DIRECTORY** - CALLSIGNS ARE LISTED ALPHABETICALLY AND ALSO BY AIRARM / SQUADRON - INFORMATION INCLUDES : CALLSIGN AIRCRAFT TYPE - CODE - UNIT/SQUADRON - HOME BASE - REMARKS

**CIVIL DIRECTORY** - CIVIL CALLSIGNS FROM OVER 180 COUNTRIES ARE LISTED ALPHABETICALLY AND ALSO BY THREE LETTER AIR TRAFFIC PREFIX INFORMATION INCLUDES: CALLSIGN - THREE LETTER ATC PREFIX AIRLINE OR OPERATOR - COUNTRY OF ORIGIN - REGISTRATION PREFIX

**UK £9.95 INCLUDING FREE P&P / EIRE & EEC ADD £1**

VISIT OUR NEW WEB SITE AT: [www.photav.demon.co.uk](http://www.photav.demon.co.uk)  
(SORRY - NO CREDIT CARDS) CHEQUES/EUROCHEQUES/POSTAL ORDERS/PAYABLE TO:  
**PHOTAVIA PRESS (DEPT SW) - SUNRISE BREAK  
CHISELDON FARM - SOUTHDOWN HILL - BRIXHAM  
DEVON - TQ5 0AE - UK Tel: 01803 855599**

## Simon Collings

<http://wkweb4.cableinet.co.uk/simon.collings>

Oregon Scientific Jumbo Wall Clock & Weather Station	£60.00
<i>MSL clock with internal thermometer and barometric pressure sensor weather forecaster</i>	
AirNav v3.1 CDROM Edition	£55 (Includes FREE update on floppy)
<i>Internet, ACARS and manual off-air aircraft flight tracking and monitoring</i>	
AirNav HF Selcal Decoder software on floppy disc	£30
<i>III airband selcal decoding using your PC and sound card</i>	
ARRL Handbook 2000 CDROM	£30.00
<i>The ARRL Handbook 2000 on CD - every chapter, every page, every word</i>	
Klingenfuss 2000 CDROM	£23.00
<i>CDROM now with powerful new search feature</i>	
VisualRadio v4 CDROM	£88.00
<i>Rv-232 control for a wide variety of radios</i>	
<i>Add £2.50 P&amp;P (UK) or £5.00 (Airmail)</i>	

Simon Collings, +6 St. Michaels Road, Cheltenham, Gloucestershire GL51 5RR  
Answering service 01242 514429 Send for more information or request a free catalogue

## IMPROVE YOUR RECEPTION



**TU3**  
Antenna tuner  
£54.00 ready built  
£44.00 (kit) + £4 P&P



**NRF2**  
Noise reduction filter.  
Enhances SSB & AM  
£16.50 + £1 P&P

SEND SAE FOR BROCHURE OR PHONE 0115-938 2509

### LAKE ELECTRONICS

7 Middleton Close  
Nuthall, Notts NG16 1BX (callers by appointment only)

### SPECIAL OFFER

## RACAL H.F. Communications Receiver RA1792

- Fully synthesized solid state receiver as used by government departments
- 150kHz - 30MHz
- Modes: LSB, USB, AM, CW & FM
- Digital AGC scan facility
- 100 channel memory



**Price: £550.00** (incl. VAT @ 17.5%)  
P&P £15.00 (mainland UK)

★★ Callers welcome strictly by appointment ★★

**TELFORD ELECTRONICS**  
OLD OFFICERS MESS, HOO FARM, HUMBERS LANE,  
HORTON, TELFORD, SHROPSHIRE TF6 6DJ, UK  
PHONE: (0044) 01952 605451 FAX: (0044) 01952 677978  
E-mail: [telfordelectronics@telford2.demon.co.uk](mailto:telfordelectronics@telford2.demon.co.uk)  
Web site: <http://www.telford-electronics.com>

WE NOW ACCEPT ALL MAJOR CREDIT CARDS. OVERSEAS ORDERS WELCOME. PLEASE SEND LARGE SAE FOR DETAILS.





## The Aviation Hobby Centre

Visitors Centre, Main Terminal  
Birmingham International Airport B26 3QJ

Tel: 0121-702 2112 Fax: 0121-702 0423  
E-mail: [orders@aviationhobbycentre.co.uk](mailto:orders@aviationhobbycentre.co.uk)

Issue 7 of our UK Pocket Frequency Guide is available. Full Civil & Military Frequencies plus much more. Still the best at £3.95 + 50p P&P.

Also - Videos by RSVP, Intelligent TV & Video & Avion. Models by Gemini, Herpa, Schabak, Dragon Wings. Books by Ian Allan, Arliffe, BuchAir, Mach III, Air Britain, The Aviation Hobby Shop (TAHS).

*Please ring or send for a free catalogue or visit our web site at [www.aviationhobbycentre.co.uk](http://www.aviationhobbycentre.co.uk)*

# QSL COMMUNICATIONS

UNIT 6, WORLE INDUSTRIAL CENTRE, COKER ROAD TEL/FAX 01934 512757  
WORLE, WESTON-SUPER-MARE BS22 6BX E-mail: [jayne@qslcomms.f9.co.uk](mailto:jayne@qslcomms.f9.co.uk)

**IC-R8500**



100kHz-2GHz  
USB, LSB, CW, AM, FM, WFM  
1000 memories, selectable steps, 3 antenna connections  
**£PHONE**

**AOR AR5000 +3**



10kHz-2600MHz  
USB, LSB, CW, AM, NFM  
1000 memories  
SDU ready  
**£PHONE**

**AOR AR8200**



**£337**

**YAESU VR-500**



**£265**

**CABLE 100M ROLLS**

Low loss WC519 £90 per roll or £1 per metre  
Mil spec RD213U £62 per roll or 80p per metre  
RG58CU £22 per roll or 30p per metre  
7 core rotator £45 per roll or 60p per metre  
P & P DEPENDANT ON WEIGHT

**EARTH RODS** 4ft long, adjustable brass fixing  
Solid copper £10.99 P&P £4.00  
Copper plated steel £8.99 P&P £4.00

**SECONDHAND EQUIPMENT WANTED**



## SUBSCRIPTION RATES

### SHORT WAVE MAGAZINE - 6 MONTHS

£17.50 (UK)

### SHORT WAVE MAGAZINE - 1 YEAR

£33.00 (UK)  £40.00 (Europe)

£44.00 (Rest of World Airmail)  £50.00 (Rest of World Airmail)

### SPECIAL JOINT SUBSCRIPTION WITH PRACTICAL WIRELESS (1 YEAR)

£55.00 (UK)  £68.00 (Europe Airmail)

£74.00 (Rest of World Airmail)

£85.00 (Rest of World Airmail)

Please start my subscription with the.....issue.

### MONITORING TIMES - 1 Year (12 issues)

£38 (UK)  £43 (Europe Airmail)

£49 (Rest of World Airmail)

### BINDERS

Please send me .....SWM Binders at **£6.50** .....£

Postal charges: £1.25 for one, £2.50 for two or more (overseas surface)

**FREE** P&P if you order two or more (UK only) .....£

Please send me the following books

.....£

.....£

.....£

### Postal charges.

**UK:** £1.25 for one item,

£2.50 for two or more items. ....£

**Overseas:** £2.50 for one item, £4.00 for two items, then add an additional 50p per item. ....£

### NEW FASTER NEXT DAY SERVICE (UK)

(For orders received before noon) £4.50 .....£

**GRAND TOTAL** .....£

# Order Form

FOR ALL MAIL ORDER PURCHASES IN *SHORT WAVE MAGAZINE*

You can now order on-line.

See [www.pwpublishing.ltd.uk/books/](http://www.pwpublishing.ltd.uk/books/) for more information

Back issues at £2.99 inc. P&P.  
Phone, FAX or E-mail for availability

### TELEPHONE ORDERS TAKEN ON (01202) 659930

between the hours of 9.00am - 5.00pm. Outside these hours your order will be recorded on an answerphone

### FAX ORDERS TAKEN ON (01202) 659950

Or please fill in the details ticking the relevant boxes, a photocopy will be acceptable to save you cutting your treasured copy!

To: PW Publishing Ltd., FREEPOST, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW.

### PAYMENT DETAILS

Name .....

Address .....

.....Postcode .....

Telephone No. ....

I enclose cheque/PO (Payable to PW Publishing Ltd.) £

Or

Charge to my MasterCard/Visa/Switch/AMEX Card the amount of £

Card No.



Valid from .....to.....

Issue No:.....Tel:.....

Signature .....

Orders are normally despatched by return of post but please allow 28 days for delivery. Prices correct at time of going to press. Please note: all payments must be made in Sterling. Cash not accepted.

### TELEPHONE ORDERS TAKEN ON (01202) 659930

### FAX ORDERS TAKEN ON (01202) 659950

## Index to advertisers

Aerial Techniques .....39  
AKD.....68  
AOR.....58, 59  
ARC.....75  
ASK Electronics .....45  
Aviation Hobby Centre .....82  
Broadcasting Communications.....63  
C M Howes.....55  
Chevet Supplies .....75  
Computer Aided Technology.....75  
Flightdeck .....60  
Haydon Communications .....19, 20, 21  
Icom (UK) Ltd.....49

Interproducts.....55  
Javitation.....55  
Jaycee Electronics.....60  
Lake Electronics .....60, 82  
Lowe Electronics .....OBC  
Martin Lynch and Sons.....42, 43  
*Monitoring Times*.....37  
Moonraker (UK) Ltd.....8  
Multicomm 2000 .....66, 67, 70, 71  
Nevada.....IFC, 1, 34, 35  
Northern Short Wave Centre.....60  
Pervisell Ltd.....60  
PhotAvia Press.....82

*Practical Wireless*.....39  
QSL.....82  
Radioworld .....52, 53  
Remote Imaging Group .....60  
Roberts Radio.....IBC  
Simon Collings .....82  
Solid State Electronics.....39  
SRP Trading.....14  
Telford Electronics.....82  
The Shortwave Shop.....60  
Timestep Weather Systems.....68  
Waters and Stanton .....26, 27  
Wellbrook Communications .....39

PUBLISHED on the fourth Thursday of each month by PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. Printed in England by Southernprint (Web Offset), Factory Road, Upton Industrial Estate, Poole, Dorset BH16 5SN. Tel: (01202) 622226. Distributed by Seymour, 86 Newman Street, London W1P 3LD. Tel: 0171-396 8000, Fax: 0171-396 8002. Web: <http://www.seymour.co.uk>. Sole Agents for Australia and New Zealand - Gordon and Gotch (Asia) Ltd.; South Africa - Central News Agency Ltd. Subscriptions INLAND £33, EUROPE £40, REST OF WORLD (Airmail) £44, REST OF WORLD (Airmail) £50 payable to SHORT WAVE MAGAZINE, Subscription Department, PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. SHORT WAVE MAGAZINE is sold subject to the following conditions, namely that it shall not without the written consent of the publishers first having been given, be lent, re-sold, hired out or otherwise disposed of by way of trade at more than the recommended selling price shown on the cover and that it shall not be lent, re-sold, hired out or otherwise disposed of in a mutilated condition or in any unauthorised cover by way of Trade, or affixed to or as part of any publication or advertising, literary or pictorial matter whatsoever.

# ROBERTS

*Sound for Generations*



## The New R9914 from Roberts

PLL digital world band radio – ideal for **BBC** WORLD SERVICE

- LW/MW/FM/SW wavebands
- 45 station presets
- SSB for reception of single sideband and CW transmissions
- Direct keypad tuning
- Rotary tuning
- Station tuning in 1kHz steps
- Dual conversion for improved SW image rejection
- Digital clock
- Alarm/time functions
- Key lock
- FM stereo via earphones
- Soft carry pouch
- Complete with AC adaptor



BY APPOINTMENT TO  
HER MAJESTY THE QUEEN,  
SUPPLIERS & MANUFACTURERS  
OF RADIO AND TELEVISION  
ROBERTS RADIO LIMITED



BY APPOINTMENT  
H.M. QUEEN ELIZABETH  
THE QUEEN MOTHER  
RADIO MANUFACTURERS  
ROBERTS RADIO LIMITED



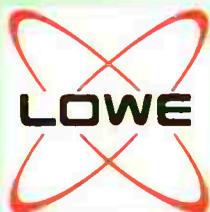
BY APPOINTMENT  
H.R.H. THE PRINCE OF WALES  
MANUFACTURERS & SUPPLIERS OF  
RADIO RECEIVERS  
ROBERTS RADIO LIMITED

ROBERTS RADIO LIMITED

PO Box 130, Mexborough, South Yorkshire S64 8YT

Tel: +44 (0) 1709 571722 Fax: +44 (0) 1709 571255 Website: [www.robertsradio.co.uk](http://www.robertsradio.co.uk)

WorldRadioHistory



# LOWE ELECTRONICS LTD

**Here at Lowe Electronics we've been advising people on monitoring the airbands for over thirty years. That kind of makes us unique as we believe no other company can match our expertise in this field. Just take a look at some of the products we offer the airband enthusiast and if that's not enough, send off for our free catalogue packed full of more goodies, or check out our website!**

## JRC NRD545



A superlative short wave receiver designed to fulfil the needs of professional monitoring stations, the NRD545 is equally at home with the serious hobby listener.

The DSP implementation starts at IF frequencies so don't confuse this with lesser DSP receivers that simply process the recovered audio. You can therefore control the IF bandwidth from 10kHz down to just 40Hz allowing total control for AM, SSB, CW or data signals, really helping to reduce interference. Heterodynes and noise can also be removed and the notch filter will automatically track changes in the frequency of the interfering tone. As you would expect from a top-flight receiver, computer control is fully integrated and there are 1000 memory channels, with memory and and programmable scan features.

**SPECIAL OFFER**  
Genuine UK Stock.  
Full Manufacturers Warranty.

**Ordering Information**  
Product Code: NRD545

**Low Price £1195**

Carriage: £10.00 by Courier

## NRD345



The NRD345 continues to be a popular option for listeners with a keen eye (and ear!) for quality. Easy to use and with great specification, the NRD345 is a great choice if you have a limited budget but want the best. Terms available.

- Frequency range 100kHz to 30MHz
- Dynamic range 100dB, 500kHz bandwidth
- Image rejection 70dB
- RS232 interface
- Modes AM, CW, SSB, Synchronous AM
- Noise blanker
- Clock & timer functions

**Ordering Information**  
Product Code: NRD345

**Low Price £399**

Carriage: £10.00 by Courier

## GPS3PLUS

New from Garmin. the GPS3Plus. This is Garmin's first GPS designed for vehicle mounting. The new improved basemaps contain much more detail than before and just wait till you see what you can do with Germin's MapSource CD-ROM maps! From these you can upload map sections into your GPS3P for even more detail and routeplanning. This will revolutionise your travel!



**Ordering Information**  
Product Code: GPS3P

**Low Price £349.00**

Carriage: £10.00 by Courier



## MVT7100

**In our view...simply the best!**

This is the scanner of choice for many of our serious users. If a radio is transmitting and you are close enough you will hear it on the MVT7100. Superb for monitoring military and civil airband channels - also allows you to listen to ground crews and base security. Its shortwave coverage with SSB offers opportunities for monitoring Shanwick and the trans-Atlantic routes!

- LSB/USB/AM/WBFM/NBFM Reception
- 1000 memory channels
- High sensitivity
- Signal Strength Meter
- Illuminated keypad
- High speed search & scan functions
- User friendly
- Battery save function
- Priority function
- Individual power/volume and
- Tuning dial
- Channel pass function on memory

**Ordering Information**  
Product Code: MVT7100

**Low Price £199.00**

Carriage: £10.00 by Courier

## IC-R2

Our lowest priced full coverage scanner also happens to be our smallest! The frequency coverage is from 0.495MHz to 1309.995MHz with NO GAPS making it ideal for monitoring military airband channels.



**Ordering Information**  
Product Code: IC-R2E

**Low Price £149.00**

Carriage: £10.00 by Courier

**Lowe Electronics Ltd**  
Chesterfield Road  
Matlock  
Derbyshire  
DE4 5LE

**Tel: (01629) 580800**  
**Fax: (01629) 580020**  
**E-mail: info@lowe.co.uk**  
**www.lowe.co.uk**

**Send us four first-class stamps for our latest full colour catalogue, full of receivers, antennas, books, accessories, nightvision and GPS receivers and more!**