

Which AOR?

The SHORT WAVE Magazine SWM

& Scanning Scene



- Reflect on RIAT 2002
- Intercept Video Links
- Listen to the World
- It's All In SWM!



March 2003

£3.25



9 770037 426074

● Monitor the Iraq Conflict

Win a WINRADIO

ALINCO

wideband scanning receivers

Awesome.

DJ-X3 ULTRA MODERN SCANNING RECEIVER

- 100kHz - 1300MHz
- AM/FM/WFM
- 700 memory channels
- Steps: 5/6.5/8.33/10/12.5/15/20/25/30/50/100kHz
- Auto descrambler
- Bug detector
- Stereo FM (with headphones)
- Attenuator
- SMA Antenna
- Battery saver cct
- Size: 56w x 102h x 23d mm
- Weight: 14.5g (without batteries)
- Supplied with: 3 AA dry cell battery, case, carrying strap

Optional extras

- Lithium ion battery pack
- Ni-MH battery pack
- Drop in mains charger
- Earphone

 **£129.95**

DJ-X2 THE ULTIMATE LIGHTWEIGHT SCANNER

New micro-sized scanner from Alinco. If you are looking for a scanner that goes anywhere. Fits in your shirt pocket, or handbag so you can take it to the air show, boat show, on holiday in fact just about anywhere you like, then the DJ-X2 has got to be the radio to have.

Easy to operate but with enough power for the more demanding user.

- Receives: 522kHz - 999.995MHz
- AM WFM NFM
- Selectable scan modes
- 700 memories
- Audio descrambler
- Bug detector - detects presence and frequency of bug giving audible warning
- Selectable internal / external antenna
- Internal or external supply
- Program Search banks
- Illuminated backlight display
- 2 performance mode, easy and expert
- RX attenuator
- Auto power off mode
- Priority channel monitoring
- Squelch control
- Volume control



 **£129.95**



with
8.33kHz for
airband

DJ-X10E ADVANCED FEATURED SCANNING RECEIVER

- Receives: 100kHz - 2000MHz
- Multi mode reception
AM - WFM - NFM - SSB - CW
- 1200 memory channels
- Channel scope spectrum analyser that allows monitoring of 40 channels
- Advanced scanning features:
Programmed scan (up to 10 groups)
Programmed memory scan
Any memory scan
- Mode scan
(not found on many scanners!)
- VFO search
- Dual VFO search
- Band excursion scan
- Priority scan
- Any channel ship scan
- Battery save facility
- Facilities for cloning another set
- Built-in 24 hour clock
- Switchable attenuator

 **£299.95**



DJ-X2000 THE 'INTELLIGENT' SCANNING RECEIVER

- Covers 100kHz - 2,149.99MHz
- 2000 channel memory
- Modes:
AM/NFM/WFM/LSB/USB/CW
auto mode position
- 'Flashtune' reads the frequency of a nearby transmitter and instantly takes your receiver to it
- Translocator - instantly locates hidden transmitters that may be used for eavesdropping
- Record - Up to 100 seconds with the digital memory of audio direct from the receiver or voice via the built in microphone
- Decribler
- Channel scope
- Bug detector
- CTCSS decoder built in
- CTCSS - Search facility
- Frequency counter
- Field strength meter
- S Meter
- FM Stereo receive
- Two level attenuator
- PC programmable
- 24 hour timer

 **£499**



- DJX-2000**
INCLUDES FREE:
- Multi voltage 110V to 240VAC mains charger for easy use anywhere in the world
 - 4.8V DC 700mAh NiCad battery pack
 - Belt clip
 - Carrying strap
 - Flexible low profile antenna

Official UK Distributors of Alinco

nevada nevada

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Cover subject:
Down with a
bump - the
Italian G222 has
a mishap at last
year's RIAT.
Photo: Ian
Doyle.

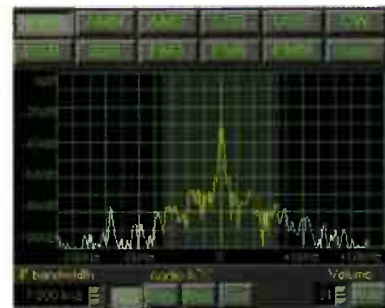
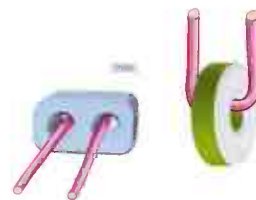
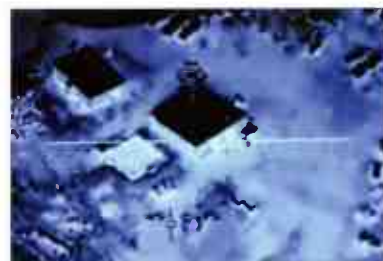
Broadcast

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Features

- 23 **There's Nothing New Under The Sun**
John Wilson recently made some interesting discoveries which set him on a path of experimentation, only to conclude that with antennas, there is very little which is new.
- 30 **More 2.4GHz Video Monitoring**
Video and microwave enthusiast Alexander James returns with more microwave monitoring primers.
- 33 **WIN! a WinRADiO**
Enter our competition and you could be in with a chance of winning the G-303i PC Card HF Receiver System as reviewed last month.

TURN TO PAGE 7 NOW FOR
DETAILS OF WHERE TO LISTEN
FOR THE RADIO ACTION IN
THE RAPIDLY DEVELOPING
IRAQ CRISIS.



Amateur Bands

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36 A Fine Pair!

With only subtle performance enhancements marking the release of AOR's top flight hobby receivers, the AR8200 hand-held and the AR8600 base, come transportable, we decided against a full technical review, having previously fully covered both sets in *SWM*. Peter Bond though was delighted to give the newly revitalised sets an extended session at his airband monitoring post.



42 Royal International Air Tattoo 2002

Warm beer, hot sunshine and the best airshow in the world. Ian Doyle reflects and provides a comprehensive callsign list for last year's arrivals days at the RIAT and confirms that the Cotswolds is the place to be in July.



46 BHi NEIM1031 Review

The bhi NEIM1031 in-line d.s.p. noise reduction system gets a work-out in the Ed's shack. See what Kevin Nice thinks of this new unit.



47 The Other Man's Shack

A quick trip to Buckinghamshire this month as Kevin Nice visits the compact shack of *SWM* reader Terry Aldridge G4GJR.



51 SWM UK Radio Club Listing

If you want to meet others with a radio passion, then look no further - use our comprehensive guide.

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Coming Next Month

AMATEUR SPECIAL

- It's all change with amateur radio licencing. Clive Hardy G4SLU looks at just what's involved in getting on air.
- John Wilson examines the DRM equipped AR7030 from AOR.
- Kevin Nice builds a Ten-Tec QRP transceiver.
- All those usual regular columns.
- Keep on top of the world of monitoring with *SWM*.
- Enter the *SWM* Listening Contest
- and much more...

in SWM April 2003

*contents subject to change

check out the **latest SWM** web site
www.pwpublishing.ltd.uk/swm

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Share your thoughts

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SWM Services

Subscriptions

Subscriptions are available at £36 per annum to UK addresses, £43 in Europe and £48 (Airsaver), £54 (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 £60 (UK) £73 (Europe) and £81 (rest of world), £93 (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 £3.25 each and photocopies are £2.50 per article.

Binders are also available (each binder takes one volume) for £6.50 plus £1.50 P&P for one binder, £2.75 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., Post Sales Department, Arrowsmith Court, Station Approach, Broadstone Dorset BH18 8PW**, with details of your credit card or a cheque or postal order payable to PW Publishing Ltd. Cheques with overseas orders must be drawn on a London Clearing Bank and in Sterling. Credit card orders (Access, Mastercard, Eurocard, 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

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

IRAQ

The political situation concerning Iraq is certainly hotting up. As I write this, public polls are being reported that indicate the majority of the population believe that there should not be any hostile activities towards Iraq. There is also a full alert with patrolling soldiers at Heathrow airport due to apparent terrorist threats. During the next few weeks almost anything could happen. One thing is certain, there will be lots of radio traffic of one kind or another. In consequence, I've take the decision to include some frequencies on the adjacent page that are likely to be buzzing.

New Licensee

On a somewhat lighter note, Eileen Saunders who works in our advertising sales section has just passed her Foundation Course and is now the proud owner of the callsign M3TTO. Well done Eileen, let's hear you using that call soon!

SWM Website

After quite a while of stagnancy, I'm very glad to announce that the SWM website is back up-to-date. If you've not looked recently then make sure you drop in

at www.pwpublishing.ltd.uk/swm and see what's happening. Now that we are back on track, there will be a steady development of the site.

G3SWM Activity Day

I mentioned last month that I'm planning a combined field day and listening contest. In next month's magazine there will be full details of how to enter the contest and a sample log sheet. I'm hoping that we will work many stations thought out the UK and the rest of the world during the 12 hours between 0500 and 1700UTC on the Sunday 4th May 2003. We are planing to operate on 40m plus, if we are able 80m too. The station will welcome visitors and we hope to meet many of you who live in the area. To encourage as much foundation licensee activity as possible, the station will ensure there is a ten minute M3 only window starting on the hour every hour that we spend on air.

I look forward to meeting you all on air.

4/4/03 Kevin

MONITORING THE IRAQ CONFLICT

With the situation in Iraq worsening on a daily basis, we thought it prudent to provide readers with a selection of frequencies to keep up with activities in the region and related movements throughtout the world.

Downlink	244.085	261.675	243.945	255.350	260.625
Frequencies	244.090	261.700	243.950	255.450*	260.650
	244.095	261.725	243.955	256.950	260.675
F3	244.100	261.750	243.960	258.450	260.700
FLTSATCOM	244.105	261.775	243.965	256.350	260.725
at 23°W	244.110	261.800	243.970	260.350	260.750
MHz	255.550*	261.825	243.975	260.375	260.775
(n.b.f.m.)	261.450	261.850	243.980	260.400	260.800
244.045	261.475	261.875	243.985	260.425	260.825
244.050	261.500	261.900	243.990	260.450	260.850
244.055	261.525	261.925	243.995	260.475	
244.060	261.550	261.950	244.000	260.500	
244.065	261.575		244.005	260.525	
244.070	261.600	F8	244.010	260.550	
244.075	261.625	FLTSATCOM	251.950	260.575	
244.080	261.650	at 172°E	253.650	260.600	

* Fleet Broadcast Channel

Radio Iraq International Address PO Box 8145, Baghdad 12222, Broadcasts from this staion have in recent years have been highly erratic. The current programming have greatly reduced from those previously. The following schedule is rather tentative.

UTC

0100-0200
0200-0230
0230-0300
1900-2000
1900-2100

Language

Arabic daily
German daily
French daily
Arabic daily
Turkish daily

MHz

11.785
11.785
11.785
11.785
11.785

MONITORING THE IRAQ CONFLICT

With the situation in Iraq worsening on a daily basis, we thought it prudent to provide readers with a selection of frequencies to keep up with activities in the region and related movements throughout the world.

International Committee of Red Cross

MHz	Mode
3.8015	u.s.b
4.2015	Pactor/u.s.b.
6.9955	Pactor 2
6.9995	Pactor 2

United States Air Force

HF-GCS Network Frequencies

MHz (u.s.b.)

4.724
6.712
6.739
8.992
11.175
13.200
15.016

Ground Station ALE Addresses

Station	Call
Andrews	ADW
Ascension	HAW
Croughton	CRO
Diego Garcia	JDG
Elmendorf	AED
Guam	GUA
Hawaii	HIK
Keflavik	IKF
Lajes	PLA
McClellan	MCC
Offutt	OFF
Salinas	JNR
Sigonella	ICZ
South Atlantic	MPA
Yokota	JTY

Military Frequencies

Royal Air Force

STCICS

MHz Callsign

4.742	Haven, Cyprus, Gibraltar, Viper, Architect
5.702	Architect
6.739	Architect
8.965	Architect
9.031	Haven, Cyprus, Gibraltar, Viper, Architect
11.205	Architect
11.247	Haven, Cyprus, Gibraltar, Viper, Architect
13.257	Haven, Cyprus, Gibraltar, Viper, Architect
15.031	Architect
18.018	Architect

NATO AWACS

2.2505	6.760
3.081	6.7625
3.089	8.5005
3.225	8.899
3.380	8.965
3.900	8.971
4.4785	8.980
4.542	8.9865
4.720	10.172
4.756	10.315
4.758	10.429
4.758	11.228
5.6911	11.2705
6.6735	12.165
6.690	15.016
6.693	15.018
6.695	15.050
6.700	17.9965
6.728	18.009
6.754	23.241

Mystic Star Network

Mainly u.s.b. - calls often initiated by ALE

MHz	5.398	7.469	9.023	11.153	15.687
3.032	5.4045	7.5005	9.043	11.214	15.821
3.046	5.411	7.687	9.057	11.217	16.083
3.064	5.431	7.690	9.120	11.229	16.157
3.113	5.4355	7.693	9.218	11.232	17.177
3.144	5.437	7.827	9.270	11.413	18.023
3.821	5.700	7.873	9.317	11.445	18.218
4.442	5.710	7.910	9.323	11.484	18.267
4.452	5.732	7.927	9.4145	11.488	18.290
4.4885	6.683	7.933	9.461	12.057	18.317
4.524	6.716	7.997	10.202	12.103	18.320
4.610	6.717	8.029	10.205	12.2270	18.323
4.645	6.730	8.032	10.427	13.204	18.331
4.742	6.731	8.036	10.580	13.207	18.387
4.757	6.756	8.047	10.583	13.221	18.393
4.763	6.817	8.053	10.648	13.246	18.400
4.894	6.830	8.057	10.717	13.440	18.403
4.9425	6.972	8.063	10.883	13.823	18.675
4.982	6.989	8.077	11.052	14.4205	19.002
5.026	6.993	8.967	11.056	14.8645	19.343
5.043	7.316	9.006	11.058	15.036	20.397
5.078	7.330	9.017	11.118	15.091	23.265

SATELLITE COMMS

In operation since 1978 in geostationary orbits, the FLTSATCOM system provides u.h.f. communications links between naval aircraft, ships, submarines, and ground stations. FLTSATCOM also provides links between strategic force elements and the National Command Authorities via the hosted Air Force Satellite Communications (AFSATCOM) payload. This system is being replaced by the u.h.f. Follow-On (UFO).

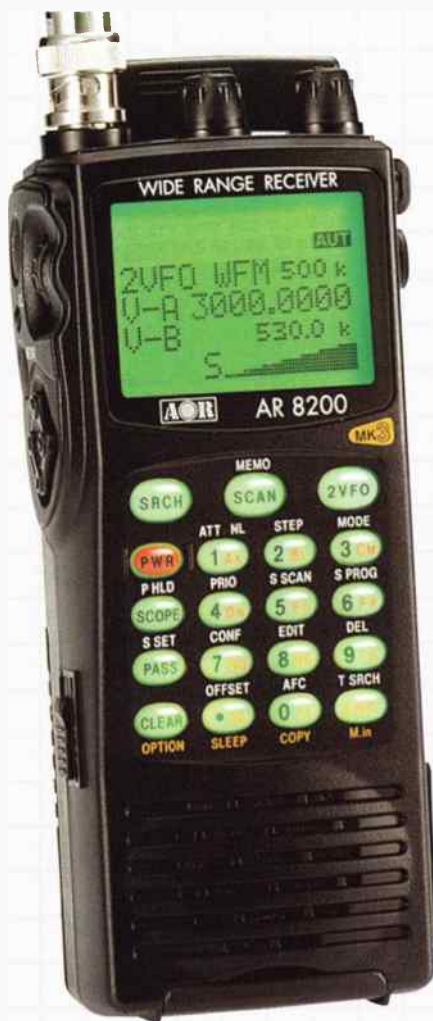
The FLTSATCOM satellite system provides global u.h.f. communications services between the latitudes of 70°N and 70°S. The satellite system supports mobile ground terminals which include the US Army AN/PSC-5 Spitfire, US Air Force Miniature Air Terminals, US Navy Mini-DAMA terminals, the Joint (UHF) MILSATCOM Network Integrated (JMINT) control system, and Navy Battlegroup and Special Intelligence (SI) Communications. The Navy uses one 25kHz fleet broadcast channel and nine 25kHz fleet relay channels. Air Force Satellite.

Communications (AFSATCOM) uses twelve narrowband 5kHz channels and one wideband 500kHz National Command Authority channel. The fleet broadcast channel receives broadcasts at s.h.f., performs on-board processing, and downlinks at u.h.f. Though seeming mostly unused, the FLTSATCOM military communication satellites are likely to play a vital role during times of large military exercises.

Two key spacecraft are the *F3 FLTSATCOM* and the *F8 FLTSATCOM*. These satellites are in fixed geostationary orbits and can be heard on u.h.f. frequencies using simple directional antennas or very low noise figure amplifiers and omnidirectional antennas. Bear in mind that signals will be weak due to the distances involved in the signal path.

AR8200 MK3 RECEIVER

evolution produces the very best 3000MHz hand portable



Evolution had led to the **AR8200 MK3** and provides excellent full coverage all mode receive including USB, LSB, AM, NFM, WFM with multiple IF bandwidths. Frequency coverage is **530kHz - 3GHz** with minimum acceptable input of 100kHz. Supplied with NiMH rechargeable batteries, charger, car lead, whip aerial, MW aerial and comprehensive illustrated operating manual.

The MK3 changes are in the following areas: •

1. As the RF components have been changed, there is a positive performance advantage with sensitivity and strong signal handling increasing on some frequencies.
2. The frequency coverage has been extended to 3GHz.
3. The AR8200 MK3 is supplied with 1500mAh NiMH batteries (in place of NiCads) for extended operation.
4. The LCD illumination may be switched to AUTO so that the illumination will automatically switch-on (for just a few seconds) when the squelch opens, ideal for noting the active frequencies at night time.

Many options are available including SLOT CARDS for CTCSS, analogue voice inverting, external memory, recording / playback, tone eliminator, computer interface lead, reaction tune lead, soft case, free PC software from the AOR web site.

Summary: A Temperature Compensated Crystal Oscillator (TCXO) forms the heart of the AR8200 MK3 resulting in **high stability with minimal internal spurious**. RF preselection in the mid-VHF bands ensures **best sensitivity and strong signal handling** with a wide coverage up to 3GHz (all mode receive without gaps).

Flexible tuning steps including 8.33kHz, programmable in all modes down to 50Hz. LCD illumination is nice and bright with sharp display of LCD characters and adjustable contrast, the beep is also configurable.

Flexible power, a set of 4 x 1500mAh AA rechargeable high capacity NiMH are provided, a DC lead with cigar plug is also provided along with AC charger which doubles up as a power supply. The receiver may also be powered from standard dry batteries such as alkaline.

Computer control, nearly all functions can be controlled via computer (optional 8200PC interface required). **£439.00 inc VAT**



AR8600 MK2 RECEIVER *wider coverage all mode receiver 100 kHz - 3000 MHz with RS232 port*

The **AR8600 MK2** is an amazingly versatile receiver which can be used mobile, base or trans-portable... powered from an external 12V d.c. power supply, 12V vehicle or from an optional internally fitted NiCad battery pack. Due to continuous development of our products, the AR8600 MK2 has been enhanced in several areas. The upper **frequency range has been extended to 3000MHz (3.0GHz)**, lower band sensitivity has been increased (now officially covering to 100kHz) with an **enhancement to short wave performance** by the addition of further bandpass filters and revision to I.F. filters. **Mini-Circuits RMS1 / RMS2 mixers** have been employed with **active SPM aerial switching devices** (not diode-switching) abundantly employed throughout the signal path. [Technical boffins will recognise the significance of such devices in minimising signal loss & maximum spurious free range, and will be versed with the quality of Mini-Circuits parts]. The AR8600 MK2 provides remarkable short wave performance, making other similar wide band competitors mediocre by comparison. When the AR8600 MK2 arrived in the UK, **short wave listeners were amazed at how the AR8600 MK2 sounds so much like a dedicated short wave receiver** with pleasant audio on SSB and good CW tone with Radio Japan rolling in on a simple telescopic whip, much less like the usual expectations of a scanning receiver!

A strong twin metal case with die cast front panel characterises the multi-purpose role. All mode receive capability is provided including Single Side Band with programmable tuning steps down to a resolution of 50Hz with the frequency established by a highly accurate **Temperature Compensated Crystal Oscillator (TCXO)**. An RS232 port further extends the capabilities with free supporting control software available from the AOR web sites. **The all important 8.33 kHz airband channel step is correctly implemented.**

Computer control is available via a standard 9-pin RS232 D-type connector on the rear chassis, just a standard RS232 cable is required for connection to a PC, the extensive RS232 command list is printed in the operating manual. A **FREE software package** is available as a download from the AOR web sites.

In addition, 'optional internal SLOT CARDS' (which fit into the rear chassis of the AR8600 MK2) extend the capabilities even further, five cards may be fitted with two operational simultaneously •**Memory slot card** (increase storage to 4,000 memories, 160 search banks). •**CTCSS slot card** squelch & search. •**Record chip slot card** (records up to 20 seconds of audio) with 'continuous loop' capability. •**Tone eliminator slot card**. •**Voice inverter card**. The slot cards are common to the AR8600 and AR8200 receivers.

Portable operation is a reality, when the optional BP8600 battery is fitted, **several hours operation** is provided away from the base or vehicle power supplies (optional PSU7030 15V power supply recommended for charging).



£719.00 inc VAT



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

It's that time of year again

The annual East Midlands Airport Aviation Enthusiasts Fair has reached its 7th anniversary with the event getting better each year, and this year we see that tradition continuing on Sunday 16 March.

Once again the event will take place in the main terminal at the east midlands airport with exhibitions, organisations and retailers demonstrating many varieties of products and services.

The event is not just for the dedicated aviation enthusiast, it's a family day out too. The fair is organised by Airtrans Ltd. and is held due to the kind permission of the management at East Midlands Airport.

Further details of the pleasure flights and car parking arrangements will be posted on the Fair web site www.airtrans.co.uk/page3.html

For up-to-date details, you can join the fair mailing list ema-aviation-fair@airtrans.co.uk



Even Less Noise

Since launching their Noise Eliminating Speaker, the Sussex based manufacturer bhi haven't stopped. They've been very busy developing more noise eliminating products.

The first new product from bhi is the **NEIM1031** Noise Eliminating In-line Module, which is a versatile compact noise cancellation unit that removes unwanted background noise and interference from speech, incorporating the Digital Signal

Processing Technology (DSP) and is fully adaptive to changes in noise levels.

The NEIM1031 has eight switchable noise cancellation levels allowing the user to optimise the unit to their own conditions. The unit has connections for high and low level audio signals, and is designed to be easily connected into the audio path of noisy signals where the intelligibility and clarity of the speech needs to be improved.

Supplied with a standard with a 1030-FPL fused power lead and a 3.5mm mono to 3.5mm mono audio lead, the NEIM1031 is powered by any 12 - 24V d.c. unregulated power supply and costs **£129.95 plus £6.95**. An optional mains power adapter or in-vehicle power adapter are available along with other optional extras. See page 46 to see what Kevin Nice thinks.

The second new product from bhi is the 1042 Switch Box, which allows the user to connect up to six pieces of equipment to a Noise Eliminating Speaker, In-line module or existing extension speaker.

Features of the 1042 include: three inputs - loaded at 8Ω, three un-loaded inputs (for low level signals) and is supplied with two 1.2m audio leads terminated with 3.5mm mono jack plugs.

The 1042 Switch Box costs **£29.95 plus £2.75 P&P**. Additional leads are available as well, these are the ALD-001 1.2m at £2.99 and the ALD-002 2.5m at £3.99.

Contact **bhi** at PO Box 136, Bexhill-on-Sea TN39 3WD. Tel: **(01293) 530147** E-mail: info@bhinstrumentation.co.uk Website: www.bhinstrumentation.co.uk



Kenwood's exciting Funkey446

Kenwood UK have just launched their first PMR446 product aimed specifically at the consumer market. The new Funkey446 has been developed from the successful UBZ-LH68 430MHz transceiver (used for the Low Power Device market in Europe) but operates on the UK/European standard PMR446 channels.

The new models, available in three bright colours, compliment the existing Kenwood TK-3101T, which is aimed at the Professional and high-end Business market. The new radios will be marketed by Kenwood and its dealers with a model name for the first time ever.

The Funkey446 has been designed to offer better r.f. performance and better audio than the cheaper competitors already on sale and preliminary tests confirm this. The Funkey446 radios also have their own website at www.funkey446.com which is a completely new departure for Kenwood in direct interaction with their customers.

Kenwood UK is already taking orders and expects these new models to sell in large numbers. For more details contact your local Kenwood Amateur Radio or Business Radio/PMR Dealer, or **Kenwood UK Ltd**, Kenwood House, Dwight Road, Watford, Hertfordshire WD1 8EB. Tel: **(01923) 655284**

Recommended price is **£79.99** for black, silver or yellow. There is also a range of accessories including helmet headsets.



JFK Aircraft Incident Mystery

In 'Communiqué' - *SWM January 2003* - Roger Bunney made mention of an unreported incident at JFK airport involving a Russian aeroplane. We have an answer from an *SWM* reader for which many thanks. His E-mail draws on a NY newspaper report October 23, 2002 that details Federal agents boarding Aeroflot Flight 317 after a tip that a man was carrying radioactive materials hidden in fur coats. Two men were detailed and questioned for five hours about fur coats in their luggage, but eventually left the airport uncharged, the 30 coats! were confiscated pending investigation. Flight 317 with 176 passengers plus 12 crew landed at JFK 1345 local and parked remote from passenger terminals. All on board were eventually ferried to terminal area 3 and met by customs officers.

A radioactive alarm was set-off during boarding at Moscow which alerted security officials. On landing at JFK, the Port Authority police surrounded the aeroplane and passengers "deboarded directly onto a 'plane mate', a vehicle resembling a bus on a hydraulic lift" (see picture in January *SWM*). Passengers remained calm, some assuming they were experiencing typical American security procedures!

Info from article - *Newsday inc* - check original article info at <http://www.newsday.com/news/local/newyork/ny-jet1024,0,6225856.story> (writers Bobby Cuza, Pete Bowles).

RIAT 2003

The **Royal International Air Tattoo 2003** at RAF Fairford over the weekend of **19/20th July 2003** will celebrate 100 Years of Flight with a panoramic display highlighting the best of British aviation, past and present, and the role played by the military in its success story.

The living history exhibition will see 10 themed decades, including vehicles and British heavy armour of the time, as a backdrop to more than 100 of the world's most famous aircraft. These will include replicas of the Wright Flyer and Blériot XI, together with the Sopwith Camel, Avro 504K, De Havilland Gypsy Moth, Hawker Fury, Westland Lysander, Spitfire, Lancaster and Bristol Blenheim.

As the jet age dawned, Britain was in the forefront with the Gloster Meteor entering RAF service on 12 July 1944. RIAT 2003 will give airshow visitors a rare chance to see the groundbreaking Meteor prototype and the unique Saunders Roe SR53 rocket-powered developmental aircraft of the late 1950s, plus the Javelin, Lightning, Canberra and Buccaneer that led to the jets of the RAF's front line force of

today. Helicopters will join the line-up from the early Dragonfly and Skeeter to the Lynx, holder of the rotary wing world-speed record. Concorde, the world's only supersonic passenger liner, is due to take pride of place in the 1970s airfield.

Looking to the future, the 21st century Eurofighter Typhoon and Merlin HC3 and Apache AH1 helicopters will also be on display.

RIAT Director Paul Brown says, "I hope this exhibition will be an exciting educational experience for all the family. Collectable information sheets will be handed to visitors at each period airfield, adding up to a complete account of British aviation across the decades".

Super-sized screens will also show the daring early pioneers, advances of the 1920s and 1930s the Battle of Britain and World War II, together with test flights of the first jet aircraft, Cold War footage and the modern RAF in action.

For a trip back to the events of RIAT 2002, see page 42.



IMD 2003

The **Cornish Radio Amateur Club** would like to inform *SWM* readers of the 15th International Marconi Day, which is taking place on **26th April 2003**. Details of the awards available and other information can be found at www.gb4imd.co.uk There is a s.w.l. award as well as those for transmitting amateurs.

Science Festival

After the resounding success of last year's event, the **Wrexham Amateur Radio Society** are making a return visit to Wrexham Science Festival's 'Scientriffic' event, where they will run a special event station - callsign **GB2WSF**. The station will run from 1000 till 1700 on Saturday 29th March 2003.

The format will be fairly similar to last year's event. The club will be running h.f./v.h.f./Data and hopefully ATV. It is also intended to have more 'hands-on' displays and more than one Morse set-up, given the immense success of the Morse demonstrations last year. Latest information on GB2WSF is available from www.qsl.net/gb2wsf - the organisers website is located at www.wrexhamsf.com

Rally News

The **RadioSport Communication & Computer Show** takes place on Saturday 31 May and Sunday 1 June 2003 at the Stevenage Leisure Centre, Lytton Way, Stevenage, Herts. Doors open 1000 till 1700 Saturday and 1000 till 1600 on Sunday (open 0945 each day for disabled visitors). Facilities include trade stands, special interest group, talk-in on 2m and 70cm, catering, licensed bar, disabled facilities, Bring & Buy, lectures, lots of parking close to the venue - plus the mainline railway station is just a one minute walk from the venue. More information from RadioSport Ltd. on **(01923) 893929** or visit www.radiosport.co.uk

QSL Open Day

QSL Communications are holding their Open Day on **Sunday 13th April 2003** and everyone is welcome to attend. There will be representatives from Kenwood, Icom and Yaesu will be attending. QSL Communications can be reached at **Unit 6 Worle Industrial Centre, Coker Road, Worle, Weston-Super-Mare BS22 6BX, Tel: (01934) 512757.**



Italian Job Drivers

Icom (UK) Ltd. have recently supported two local Radio Amateurs in their charity fundraising trip from Dover to Imola in a Mini Cooper. **Nick Gerolemou G8PFE** and his co driver, ex Icom Director **Fraser Stuart G8FEZ**, retraced the steps created by the classic British film starring Michael Caine. In doing so, they raised over £1000 for the National Children's Home. Nick said, "The highlights of the trip were travelling through the fantastic mountain scenery as well as driving around the rooftop test track on the Fiat Building. We both took our amateur equipment along for the journey and made several contacts across Europe". Icom (UK) Ltd. can be reached at **Sea Street, Herne Bay, Kent CT6 8LD, Tel: (01227) 741741, FAX: (01227) 741742** or visit www.icomuk.co.uk



If you're travelling a long distance to a rally, it could be worth phoning the contact number to check all is well, before setting off. The Editorial Staff of SWM cannot be held responsible for any information on rallies, as this is supplied by the organisers and is published in good faith as a service to readers. If you have any queries to a particular event, please contact the organisers direct. Editor.

March 2: A Spring Auction is to be held at the Community Centre, Front Street, Great Lumley, Chester-le-Street, Co Durham. Entrance fee is just £1. Booking in starts at 1030 and the auction starts at 12 noon. More information from **Nancy Bone** on **0191-477 0036**, E-mail: nancybone2001@yahoo.co.uk

March 8: The Crystal Palace Radio and Electronics Club Spring Radio Fair at St. John's Hall, Sylvan Road, London SE19. Doors open at 1030 till 1330. Traders Tables £5 in advance. Admission is just £1, which includes a free drink. Children under 16 free. Free local parking. Contact **Bob** on **(01737) 552170**. More details on www.members.aol.com/rfcburns

March 9: The 18th Annual Wythall Radio & Computer Rally is to be held at Wythall Park, Silver Street, Wythall, near Birmingham, on the A435, just two miles from J3 on the M42. Doors open 1000 till 1600 and admission is just £1.50. Plenty of traders in three halls and a large marquee. There will also be a bar and refreshment facilities on site, along with a Bring & Buy stand and a unique free park and ride for easy, comfortable parking. All are welcome. For licensed radio amateurs, there is a talk-in on S22. Information at www.wrcrally.co.uk or contact Rally Organiser **Martin V8VXX** on **0121-474 2077** evenings, FAX: **0121-742 3471** working hours, or E-mail: enquiries@wrcrally.co.uk

March 9: The 9th West Wales Amateur Radio & Computer Rally will be held at Penparcau School, Aberystwyth (as part of National Science Week). Doors open 1000 till 1530 and admission is just £1. Good parking facilities with easy access for disabled visitors and traders for all stalls. See **GB4FUN** Amateur Radio on the Move. Demonstrations on h.f., v.h.f., on the air. Amateur Radio and Computer Traders, Bring & Buy, Clubs and Special Interest Groups, including Motorcycle Display. Catering facilities.

* Look out for a representative from PVW Publishing Ltd. at this rally. Go along to the stand for great deals on subscriptions to SWM, PVW & PA, clearance books and a selection of back issues.

Talk-in on S22. More information from organiser **Ray GW7AGG** at home QTH or **(01686) 628778**, FAX: **(01686) 621880** or E-mail: mwmg01@aber.ac.uk

***March 16:** The Norbreck Amateur Radio, Electronics & Computing Exhibition, organised by the Northern Amateur Radio Societies Association (NARSA), is being held at the Norbreck Castle Exhibition Centre, Blackpool. Don't miss the largest single day exhibition in the country. Morse tests will be available on-demand. Details from **Peter Denton G6CGF** on **0151-630 5790**.

March 16: The Bournemouth Radio Society's 15th Annual Sale is to be held at Kinson Community Association Centre, Pelhams Park, Millhams Road, Kinson, Bournemouth. Admission is just £1 and doors open 1000 till 1600. Talk-in from **G1BRS** on 2m S22. Amateur Radio, Computer Traders, Antenna Suppliers, Bring & Buy stall, also Specialist Groups and Clubs and there will be home-made refreshments. More information from **Olive** and **Frank G0GOX** on **(01202) 887721**.

March 22: The South Normanton, Alfreton & District Amateur Radio Club, in association with the G-QRP Club, are holding their third Junction 28 QRP Convention. The venue once again is the Village Hall Community Centre, Market Street, South Normanton, near Alfreton in Derbyshire, just five minutes from M1 Junction 28 and the A38. This popular event features talks by guest radio personalities, a Bring and Buy and Special Interest Group stalls. Due to demand from previous traders, table space is limited, so please book early. Further details from the Rally Manager, **Duncan Walters G4DFV** on **(01623) 465443** or E-mail: pentode@ntlworld.com or the Club Chairman, **Russell Bradley G0OKD** on **(01773) 783394** or E-mail: russel.bradley@ntlworld.com

Competition Winners

Congratulations to **Tom Fabling** from Lenzie who is the winner of the Videoscanner competition and to **Ron Brown** from Northumberland, who is the winner of the PRO-82 competition - both competitions appeared in the January 2003 SWM. Prizes will be posted out shortly. Well done and thanks to everyone who entered. Turn to page 33 and see how you can win this month's SWM prize of a WinRADIO.

Club Corner

Members of **The Radio Society of Harrow** meet every Friday from 2000 at The Harrow Arts Centre, Uxbridge Road, Hatch End, Middlesex. Just a few up and coming events are: March 17: Club Dinner at The Vine Taverna, South Ruislip, at 1930 for 2000 and March 21: Newcomers Programme - supervised v.h.f. operating session, 2m station on the air to help newcomers with operating skills. For further details please contact **Jim GOAOT** on **(01895) 476933** or E-mail goaot@blueyonder.co.uk

The **Bangor & District Amateur Radio Society** meet on the first Wednesday of every month in "The Stables", Groomsport, County Down at 2000. On Wednesday 5th March 2003 at 2000 they are hosting a talk on PIC chips by Ian MISAFL. Learn about these fascinating ICs, complete (simple) computer systems on one chip. Ian will demonstrate some radio applications for these little marvels. As always, visitors and new members are most welcome. More information from **Mike G14XSF** on **0284-277 2383** or visit

<http://welcome.to/bdars>

The **Cannock Chase Amateur Radio Society** meet at St. Mary's Community Centre Social Club, Hunter Road, Cannock, Staffordshire on Thursdays at 2000 for an 2030 start. More information from Hon. Sec. **Arnold Matthews** on **(01543) 262495** or E-mail: g3fzw@mail.com

The **South Bristol Amateur Radio Club** meet at the Whitchurch Folkhouse Association, Bridge Farm House, East Dundry Road, Whitchurch, Bristol BS14 0LN. More information about club activities, etc., from **Len Baker** on **(01275) 834282**.

Meetings now take place at the COMED Aviation Lounge on Blackpool Airport for the **Fylde Amateur Radio Society**. Members meet on the 2nd and 4th Thursdays. More information from **Ken Randall G3RFH** at g3rfh@fsmail.net

GOING MOBILE

G. SCAN II MOBILE

Freq: 25-2000 Mhz Length: 620mm
 Dual coil capacitor trapped vertical coils, 3.5" magnetic base with rubber protection, 4mtrs RG58 coax cable, terminated with a BNC. (Don't loose those signals while on the move, the G-Scan II is the answer for continued high performance reception where ever when ever)

Our Price £24.95 plus £6.00 p+p.



SKYSCAN MOBILE

Freq: 25-2000 Mhz Length: 650mm
 4 tuned stainless steel vertical radials, 3.5" magnetic base with rubber protection, 4 mtrs RG58 coax terminated with a BNC. (With not just one but four vertical radials, take your scanner in the car & enjoy superior reception with this dedicated antenna)

Our Price £19.95 plus £7.00 p+p.



MINISCAN MOBILE

Freq TX: 144-146 430-440 Mhz
 Freq RX: 100-1300 Mhz Length: 300mm
 Spring loaded black stainless whip, 1" super strong magnetic mount, 4mtrs of mini hi-spec coax, terminated with a BNC. (Ideal for "low profile" scanning while for those with transceivers with wideband receive, its the perfect choice for dual band TX and continued large scale reception)

Our price just £14.95 plus £3.00 p+p.



PORTABLE ANTENNAS

TRI-SCAN III

Freq: 25-2000 Mhz Length: 900mm
 This Desktop Internal Antenna comes with 3 vertical capacitor loaded coils, mounted on a unique helically wound tri-pod, to give its own ground plane for smooth reception. Complete with 5 mtrs of RG58 coax, terminated with a BNC. (Get the most from your scanner with the Tri-Scan III Desktop and enjoy great performance without the hassle of attaching an external one)

Our Price £39.95 plus £8.00 p+p.



SKYSCAN DESKTOP

Freq: 25-2000 Mhz Length: 900mm
 This discone style indoor antenna comes with 4 tuned stainless steel vertical whips, 8 ground plane 12" radials, plus 4 loaded horizontal 3" helical radials. Complete with heavy duty base 5 mtrs RG58 terminated with a BNC. (Don't loose those wanted signals while indoors. Use the Skyscan Desktop at your radio station, on the window seal or even in the loft for increased performance)

Our Price £49.95 plus £6.00 P+P.



SWP GLASS MOUNT ANTENNAS

These two superb universal antennas, one for VHF/UHF & one for HF have internal tuned wound coils encased in a fibreglass tube with black covering. Includes two suction cups for easy fitting to any smooth surface, complete with 5mtrs of mini hi-spec coax terminated with a BNC. (With these antennas, take your hobby mobile in the car, at home on the patio or bedroom window. A perfect solution for sometimes awkward antenna installations. Great results - No hassle)

SWP2000

Freq: 25-2000 Mhz Length: 515mm.
Our Price £29.95 PLUS £6.00 P+P.

SWPHF30

Freq: 0.05-30 Mhz Length: 770mm.
Our Price £39.95 PLUS £6.00 P+P.



MAX-5 ACTIVE

Freq: 25-100 Mhz Length: 1400mm
 This portable active antenna incorporates a easy fold away 300 Ohm receiving element joining to a matching coil, wideband pre-amplifier (9v batt not inc) 4mtrs RG58, terminated in a BNC. (Don't loose performance by not choosing an external antenna! Install the in the loft, hang by the window, or even from a tree while out and enjoy upto 14dB Gain with the MAX-5 pre-amplified Active Antenna).

Our Price £49.95 PLUS £6.00 P+P.



SHORT-WAVE WIRE ANTENNAS

MD37 SKYWIRE

Freq: 0-40 Mhz Length: 25mtrs
 This complete HF wire antenna system comes with 25 mtrs of enamelled copper antenna wire, dog bone insulator, choke balun, & 10mtr RG58 patch lead terminated with a PL259.

Our Price £39.95



MD37 HFMAKII

Freq: 0-40 Mhz Length: 25mtrs
 This complete HF wire antenna system comes with 25 mtrs of high grade flexweave antenna wire, dog bone insulator, di-pole centre choke balun, guy rope, & 10mtr RG58 mil spec patch lead terminated with a PL259.

Our Price £49.95 plus £6.00 P+P.

(Both these wire antennas have our own ferrite wound baluns that give an extra 2 "S" points greater signal than some similar baluns. No ATU required as perfect 50 Ohm match is achieved over all 40 mhz).



Long Wire Balun

Balun only with SO239 socket and wing nut for wire connection.

Our Price Just £19.95 plus £2.00 P+P.



BASE VERTICALS

SUPERSCAN STICKS I & II

These two superb external antennas will receive on all frequencies unlike a mono base antennas. Both have capacitor loaded coils, (4 in the SuperScan Stick and 8 in the SuperScan Stick II) inside the vertical element to give maximum sensitivity to even the weakest of signals. Also the SuperScan Stick II has 3dB gain over standard SuperScan Stick !!!
(Perfect for every scanner, from the beginner starting out to the more experienced listener).

SUPERSCAN STICK

Freq: 0-2000 Mhz Length: 1000mm Socket: SO239

Our Price £29.95 PLUS £6.00 P+P.

SUPERSCAN STICK II

Freq: 0-2000 Mhz Length: 1500mm Gain: 3.00dB Socket: SO239.

Our Price £39.95 PLUS £6.00 P+P.

*(Both these antennas come complete with 3 ground plane radials 12" stub mast, v-bolts & clamps). * Also Available !!! Base Scan Sticks (as above) with Tx Capabilities !!! (for use with transceivers only) **



MULTISCAN STICK I

Freq RX: 25-2000 Mhz TX 144-146/430-440 Gain 2.0/4.0dB Length: 1000mm Socket: N-type.

Our Price £39.95

MULTISCAN STICK II

Freq RX: 25-2000 Mhz TX 144-146/430-440 Gain 4.0/6.0dB. Length: 1500mm Socket: N-type.

Our Price £49.95

IVX2000

Freq RX: 25-2000 Mhz TX 50-52/144-146/430-440 Gain 2.5/5.0/7.0dB

Length: 2500mm Socket: N Type **Our Price £89.95**

AR-AIR BAND ANTENNAS

These dedicated civil & military fibreglass antennas are made pre-tuned & dual band trapped for both Air Band frequencies. Easy connection with an SO239 socket (With these antennas you can obtain high dual band gain which is not available on wideband antennas. Just don't miss take off !!!)

AR-30

Freq: Civil & Military Gain: 3.0/6.0 dB
Length: 1000mm.
Our Price £39.95 PLUS £6.00 P+P.

AR-50

Freq: Civil & Military Gain: 4.5/7.0 dB
Length: 1500mm.
Our Price £59.95

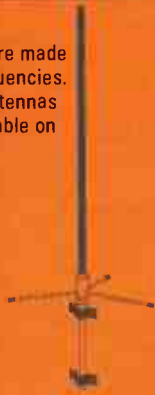
(Both these antennas come complete with 3 ground plane radials 12" stub mast, v-bolts & clamps).

X1-HF VERTICAL

Freq: 1-50 Mhz Length: 2005mm
Socket: SO239

The X1 incorporates loaded helical traps, similar to that of a horizontal di-pole, encapsulated in a heavy duty high impact plastic tube, with a top tapered stainless steel whip. (The answer for those enthusiasts looking for short-wave reception but haven't the space for a long wire).

Our Price £49.95 PLUS £6.00 P+P.



BE DEDICATED

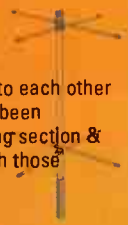
TURNSTILE 137

Freq: 137.5 Length: 1000mm

This weather satellite antenna has two di-poles adjacent to each other mounted on a 1mtr fibreglass section. Both di-poles have been internally connected, for easy use. Complete with mounting section & clamp to mount up to a 2" mast. (Beam skyward and reach those weather images)

Our Price £39.95 plus £6.00 P+P.

★ For dedicated Air Band Antennas see AR-Air Band Antennas ★



BEAM ANTENNAS

MLP32

Freq: 100-1300 TX&RX
Gain: 11-13 dB
Length: 1400mm
Con: N-Type

Our Price £99.95
plus £6.00 P+P

These two professional quality antennas, come with aluminium booms, aluminium and stainless radial & stainless bolts & fittings. (Don't strain to hear those long distance signals, with near perfect matching of 2:1 SWR across the whole frequency spectrum, make your scanner come to life with the ultimate receiving antenna !!! Sold mainly to our commercial and military customers, you know your getting the best !!!) AR300XL Rotator for above beams **£49.95** plus £6.00 P+P.

MLP62

Freq: 50-1300 Mhz
Gain: 10-12 dB
Length: 3000mm
Con: N-Type

Our Price £169.95
plus £6.00 P&P.



DISCONE ANTENNAS

STANDARD DISCONE

Freq: 25-1300 Mhz Length: 1000mm
Socket: SO239

This antenna comes with heavy duty centre cone with 16 sturdy aluminium radials, no capacitor coils just pure elements, complete with mounting pole, clamps & v-bolts to mount up to a 2" mast. (The discone has been around for over 25 years and is generally recognised as the original and probably the best all round scanner antenna).

Our Price Just £29.95 plus £6.00 P+P.



SUPER DISCONE

Freq: 25-2000 Mhz Length: 1380mm Gain: 3.0dB
Socket: SO239

The super discone has enhanced the original discone design with a vertical wire trapped fibreglass vertical element. Comes complete with mounting pole, clamps & v-bolts to mount up to a 2" mast. (Experience increase range and upto 3dB gain over standard conventional discone !!! Get more with the Super Discone !!!)

Our Price £39.95 plus £6.00 P+P.



HF DISCONE

Freq: 0.05-2000 Mhz Length: 1840mm
Socket: SO239

The HF Discone has the same spec as the Super Discone, but includes a 3ft heavily wire trapped vertical section, encapsulated in fibreglass, Thus enables to obtain a massive receive spectrum within the discone design. Come complete with mounting pole, clamps & v-bolts to mount up to a 2" mast. (Get the best of both worlds, use the HF discone for both scanner and HF receiver)

Our Price £49.95 plus £6.00 P+P.



ROYAL DISCONE 2000 (Stainless Steel)

Freq: RX 25-2000 Mhz TX: 50-52/144-146/430-430/900-986/1240-1325Mhz Length: 1550mm

Socket: N-type

The ultimate discone antenna !!! Highly polished centre cone, with 16 Stainless steel elements, loaded top coil & whip. Complete with mounting pole, clamps & v-bolts to mount up to a 2" mast. (With a WHOPPING 4.5dB Gain over standard discone, this highly sensitive, perfectly matched receiving and transmitting discone is the best there is !!!)

Our Price £49.95 plus £6.00 P+P.

★ Remember Discones can be placed in the loft with surprising results !!! ★



HANDHELD ANTENNAS

SUPER GAINER RUBBER DUCKS

Freq: 25-1800 Mhz Length: 400mm

MRW-100 BNC fitting **Our Price £19.95** plus £2.00 P+P

MRW-210 SMA fitting **Our Price £22.95** plus £2.00 P+P

(Going Out ? Don't Miss Out! Replace your existing hand-held antenna with a Super Gainer one).



GETTING RIGGED UP

5' SWAGED POLES

Heavy Duty Ali (1.2mm wall)

SINGLE 1 1/4"£7.00
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LM&S



Two important changes will be made at the end of March. Firstly, British Summer Time (BST) will commence on March 31st and all clocks in the UK will be advanced by one hour to display BST. However, the international broadcasters will continue to refer to the times of their short wave broadcasts in Universal Time Co-ordinated (UTC), which for most purposes is similar to Greenwich Mean Time (GMT). To avoid confusion, place a clock by your receiver before that date and set it to GMT (=UTC). **Do not** alter it on the 31st! The times stated in LM&S are also in UTC, so please be sure to quote UTC in your reports.

Secondly, quite a few of the international broadcasters will introduce new s.w. transmission schedules on the 31st to compensate for propagation changes and other factors during the summer. If you encounter alterations to times and frequencies when searching the bands could you please post the details to me at the above address for inclusion in 'LM&S'.

Long Wave Reports

Note: l.w. & m.w. frequencies in kHz; s.w. in MHz; Time in UTC (=GMT). Unless otherwise stated, all logs were compiled during December.

Whilst searching the band after dark **Jim Edwards** (Wigan) heard a few unidentified broadcasts co-channel under stronger stations on **162, 183, 234** and **252kHz**. On **189kHz** he picked up a broadcast from Radiotelevisione Italiana (RAI) via their 10kW outlet at Caltanissetta, Italy, at 1845. At 0635 he listened to a broadcast from Ríkisutvarpid (RUV) in Reykjavik, Iceland via their 300kW outlet at Gufuskalar, W.Iceland on **189**, which he found he could also receive via their 100kW outlet at Eidar, E.Iceland on **207kHz**.

The transmissions from the RUV outlets on **189** and **207kHz** were also received by **Simon Hockenhill** in E.Bristol during the early hours of the 8th. He rated them respectively as SINPO 15442 at 0025 and 14421 at 0027. During daylight hours on the 15th he noticed that there were almost night time conditions - Bolshakovo on **171**, Polski R-1 on **225**, Burg on **261**, Topolna on **270** and Sasnovy on **279kHz** were all audible. The 'Luxembourg effect' was noted on RMC on **216** and Tipaza on **252**, both with Allouis (**162kHz**) in the background.

A test transmission on **252kHz** from Clarkestown, Eire, was heard on the 20th by **Ernie Strong** in Ramsey, Cambs. He says "I logged it at 1142 and it was there every time I checked up to 1700. No speech or music, only a continuous **1kHz** tone. I don't think it was on full power as it only read S3 with noticeable background and atmospheric noise".

Enhanced conditions were observed during the Solstice (21st) by **Eddie McKeown** in Newry, Co.Down. At 0440 he picked up a transmission in Russian on **216**, which he rated 31432.

Medium Wave Reports

Some listeners searched the band after dark for the sky waves from the many m.w. stations in the Middle East, N.Africa, Europe and Scandinavia - see chart.

Quite a few of the low-powered outlets in Spain were noted in an interesting log compiled by **David Stevenson** in Swansea - see chart. While listening to RNE on **774kHz** Ernie Strong has noticed that it is always accompanied by a deep echo which at times almost amounts to a

flutter. This commences about two hours before sunset. He would be interested to know if any other listeners have observed this effect. Since this service is carried by several outlets in Spain, all of which share **774**, it seems likely that the sky waves from more than one of them may be reaching the UK, resulting in an echo.

Listening to Scandinavian rock music is one of the aspects of this hobby which **Scott Turner** enjoys in Rye. Between 2100 and 0000 on the 20th he tuned to Kvitsoy, Norway on **1314**, which he rated 32232 at 2100; Pori, Finland on **963** (33333 at 2225); Solvesborg, Sweden on **1179** (33333 at 2235); Espoo, Finland on **558** (43444 at 2345); also Vigra, Norway on **630** (33333 at 2355). He also listened to stations in Belgium, Holland and VOA via Hungary - see chart.

Good reception from the Middle East was observed on the 30th by Ernie Strong. At 2245 he logged the BSKSA 2000kW transmission from Duba, Saudi Arabia on **1521** as 33232.

During daylight some listeners searched the band for distant local radio stations. Between 1230 and 1300 **Dick Male** (Yeovil) picked up the ground waves from 14 local radio outlets - see chart. The most distant were BBC R.Cornwall via Redruth on **630** (rated 21441); BBC R.Cornwall via Bodmin on **657** (33442); BBC R.Devon via Plymouth on **855** (21441); BBC Wiltshire Sound via Swindon on **1368** (33442). He mentioned that BBC Somerset Sound via Taunton, on their new frequency of **1566kHz**, is a potent 55555.

Short Wave Reports

During several days in December the effects of solar activity were observed in the **25MHz (11m)** band by some listeners in the UK. In the intended areas of reception the broadcasts from Radio France International (RFI) on **25.820** (Fr, Eng to E/C.Africa 0830-1300); Deutsche Welle (DW), Germany on **25.740** (Ger to Asia 0800-1400); also DW on **25.700** (Eng to Africa 1100-1145) may well have been affected by the solar activity, but no reports arrived here to indicate how well they were received.

The SINPO ratings quoted by listeners in the UK for RFI to Africa on **25.820** were 34232 at 0905 in Newry; 44434 at 0918 by **Rhoderick Illman** in Oxted; 24432 at 0945 by **Vic Prior** in Seaton; 55434 at 0930 by **Bernard Curtis** in Stalbridge; 33333 at 1052 by **Thomas Williams** in Truro; 35522 at 1120 in E.Bristol; 25433 at 1124 by **Fred Pallant** in Storrington; 34233 at 1155 by **Ian Evans** in Ebbw Vale; 24242 at 1230 by **Peter Pollard** in Rugby; 25343 at 1235 by **Fred Wilmshurst** in Northampton.

Those for DW to Asia on **25.740** were 44422 at 0830 in Seaton; 44232 at 0904 in Newry; 34333 at 0916 in Oxted; 55434 at 0950 in Stalbridge; 45522 at 1123 in E.Bristol; 34433 at 1123 in Storrington; 32332 at 1213 in Ebbw Vale; 35444 at 1218 in Northampton; 33333 at 1345 in Truro. In contrast, DW to Africa on **25.700** was 35522 at 1115 in E.Bristol; 44444 at 1115 in Oxted; 25343 at 1126 in Storrington.

The solar activity also affected the propagation conditions in the **21MHz (13m)** band. Although R.Australia's early morning transmission to Pacific areas via Shepparton on **21.725** (Eng 0200-0900) reached the UK during some days, SINPO ratings were below average - for example, 13322 at 0840 in Seaton. Better reception of their broadcast to Asia on **21.820** (Eng 0900-1400) was noted here. Typical ratings were 24322 at 0908 in Newry & 34243 at 1302 in Rugby.

Also received in the UK were Swiss R.Int via Sottens on **21.770** (Eng, It, Ger, Fr to Near East, Africa 0830-1030), rated 22242 at 0830 in Seaton; R.Portugal Int, S.Gabriel **21.830** (Port to W.Africa 0800-1755, Sat/Sun) 44434 with echo at 0914 in Oxted; R.Pakistan, Islamabad **21.465** (Ur, Eng to Eur 0700-1010) 44433 at 1010 in Truro; R.Prague, Czech Rep **21.745** (Eng to E.Africa, S.Asia 1000-1030) 44444 at 1010 by **Ian Pakeman** in Folkestone; R.Japan via Yamata, Japan **21.755** (Eng, Jap to Australia 0500-1100) 24112 at 1010 in Newry; UAE R.Dubai **21.595** (Eng to Eur 1030-1050, 1330-1350, 1600-1635) 43333 at 1030 by **Sheila Hughes** in Morden; Vatican R, Italy **21.850** (It to Eur, Africa 1300-1400) 43444 at 1304 in Ebbw Vale; BBC via Cyprus **21.660** (Eng to E.Africa 1400-1700) 35433 at 1400 in E.Bristol; R.Portugal Int, Lisbon **21.810** (Port to

Long Wave Chart

kHz	Station	Country	Power (kW)	Listener
153	Bechar	Algeria	1000	A*,G*,H*
153	Donebach DLF	Germany	500	A,B,C,D,E,F*,G*,H*,I,J
153	Bod	Romania	1200	A*,E*,G*,H*
162	Allouis	France	2000	A,C,D,E,F*,G*,H*,I,J
171	Nador Medi-1	Morocco	2000	A*,H*
171	B'shakovo etc	Russia	1200	A,B*,C*,D,E*,F*,G*,H*,J
177	Oranienburg	Germany	500	A,B*,D,E*,F*,G*,H*,J
180	Polati	Turkey	1200	A*
183	Saarlouis	Germany	2000	A,C,D,E*,F*,G*,H*,I,J
189	Gufuskalar	W.Iceland	150	A*,B*,E*,H*
189	Caltanissetta	Italy	10	A*
198	Droitwich BBC	UK	500	C,E,G,H*,J
207	Munich DLF	Germany	500	A*,B,C,D,E*,F*,G*,H*,I*,J
207	Eidar	E.Iceland	100	A*,B*,E*,H*
207	Azilal	Morocco	800	A*,G*,H*
216	Roumoules RMC	S.France	1400	A*,B,C,E*,G*,H*,I*,J
216	Krasnoyarsk	Siberia	1200	H*
225	Polskie R-1	Poland	?	A*,B,C*,D,E*,H*,J
225	Van TRT-1	Turkey	600	A*
234	Beidweiler	Luxembourg	2000	A*,C,D,E*,F*,G*,H*,I*,J
243	Kalundborg	Denmark	300	A*,B,C,D,E*,F*,G*,H*,I,J
252	Tipaza	Algeria	1500	A*,B,C,D,E*,F*,G*,H*,J
261	Burg(R.Ropa)	Germany	85	A*,B,E*,F*,G*,H*
261	Taldom Moscow	Russia	2500	A*,B*,E*,H*
270	Topolna	Czech Rep	1500	A*,B,D,E*,F*,G*,H*,I*,J
279	Sasnovy	Belarus	500	A*,B,C*,D,E*,F*,G*,H*,J*

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

Listeners:-

- (A) Jim Edwards, Wigan
- (B) Simon Hockenhill, E.Bristol.
- (C) Sheila Hughes, Morden.
- (D) Rhoderick Illman, Oxted.
- (E) Eddie McKeown, Newry.
- (F) Fred Pallant, Storrington.
- (G) David Stevenson, Swansea.
- (H) Ernie Strong, Ramsey, Cambs.
- (I) Thomas Williams, Truro.
- (J) Fred Wilmshurst, Northampton.

Local Radio Chart

kHz	Station	ILR BBC	e.m.r.p (kW)	Listener	kHz	Station	ILR BBC	e.m.r.p (kW)	Listener
558	Spectrum, London	I	0.80	A,B*,C*,E*,F*,G	1152	CI.G, Birmingham	I	3.00	A
603	C.G.Litt'brne	I	0.10	A,C*,E*,FG	1161	R,Bedfordshire(3CR)	B	0.10	F,G
630	R.Bedfordshire(3CR)	B	0.20	A,B,C*,E,F,G	1161	Southern Counties R	B	1.00	C
630	R.Cornwall	B	2.00	D,E	1170	Capital G,Portsm th	I	0.50	C
657	R.Clwyd	B	2.00	E	1170	Signal 2,Stoke-on-T	I	0.20	F
657	R.Cornwall	B	0.50	D,E	1170	Swansea Snd,Swansea	I	0.58	A,E
666	CI.Gold 666, Exeter	I	0.34	A,D,E,F,G	1242	Capital G,Maidstone	I	0.32	C
666	R.York	B	0.80	B,F	1251	C.G.Amber,Bury StEd	I	0.76	C,F
729	BBC Essex	B	0.20	C,F,G	1260	Brunel CG, Bristol	I	1.60	D,E*
738	Hereford/Worcester	B	0.037	A,E,F,G	1260	SabrasSnd,Leicester	I	0.29	F,G
756	R.Cumbria	B	1.00	F*	1296	Radio XL,Birmingham	I	5.00	A,F,G
756	The Magic 756,Powys	I	0.63	A,E,G	1305	Premier via ?	I	0.50	C,F,G
765	BBC Essex	B	0.50	A,C,F,G	1305	Touch AM, Newport	I	0.20	E
774	R.Kent	B	0.70	C,F,G	1323	Capital G, Southwick	I	0.50	C
774	CI.Gold 774, Glos	I	0.14	E,G	1332	Premier, Battersea	I	1.00	C
792	CI.Gold 792, Bedford	I	0.27	F,G	1332	CI.Gold 1332,Pr'bo	I	0.60	F,G
801	R.Devon	B	2.00	A,D,E,F	1332	Wiltshire Sound	B	0.30	D
828	CI.Gold 828, Luton	I	0.20	C,G	1359	Breeze, Chelmsford	I	0.28	C,F*
828	Asian Net Sedgley	B	0.20	F*	1368	R.Lincolnshire	B	0.50	C
828	CI.G 828 Bourne'm'th	I	0.27	A,D,F	1368	Wiltshire Sound	B	0.10	D
837	Asian Net Leicester	B	0.45	A,B,C*,F,G	1413	R.Gloucester via ?	B	?	D,F,G
855	R.Devon	B	1.00	D,E	1413	Premier via ?	I	0.50	F
855	R.Norfolk, Postwick	B	1.50	B,C,F	1413	Premier, Dartford	I	0.50	C
855	Sunshine 855,Ludlow	I	0.15	A,B,E,G	1413	Fresh AM, Skipton	I	0.10	F
873	R.Norfolk, W.Lynn	B	0.30	B,C,F,G	1431	Breeze,Southend	I	0.35	C,F
936	Brunel CG, W.Wilts	I	0.18	D,F,G	1431	CI.Gold, Reading	I	0.14	G
945	CI.Gold GEM, Derby	I	0.20	F,G	1449	Asian Net Peterbro	B	0.15	F,G
945	Capital G, Bexhill	I	0.75	C,F	1458	R.Devon	B	2.00	A,D,E
954	CI.Gold 954 via ?	I	?	F	1458	1458 Lite AM Manch'	I	5.00	?
954	CI.Gold 954, H'ford	I	0.16	A,G	1458	R.Newcastle	B	2.00	F
963	Asian Sd, E.Lancs	I	0.80	E*,F	1458	Sunrise, London	I	50.00	A,C,F,G
963	Liberty R, Hackney	I	1.00	C,F,G	1458	Asian Net Langley	B	5.00	F,G
972	Liberty R, Southall	I	1.00	C,F,G	1485	CI.Gold, Newbury	I	1.00	A,B,G
990	R.Devon, E.Devon	B	1.00	A,E	1485	R.Humberside (Hull)	B	1.00	F
990	CI.G. Wolverhampton	I	0.09	G	1485	Southern Counties R	B	1.00	B,C
999	C.Gold GEM Nott'ham	I	0.25	F,G	1503	R.Stoke-on-Trent	B	1.00	A*,F
999	R.Solent	B	1.00	C	1521	CI.Gold, Reigate	I	0.64	C,F
999	Valley R, Aberdare	I	0.300	A,E	1530	R,Essex, Southend	B	0.15	C,F
1017	CI.G.WABC,Shr'shire	I	0.70	A,E*,F,G	1530	CI.Gold Worcester	I	0.52	A,G
1026	R.Cambridgeshire	B	0.50	A,C,F,G	1548	R,Bristol	B	5.00	D,E
1026	R.Jersey	B	1.00	A	1548	Capital G, London	I	97.50	C,F
1035	Mean Country 1035	I	1.00	C,E,G	1557	CI.Gold 1557,N.hant	I	0.76	F,G
1116	R.Derby	B	1.20	F,G	1566	CountySnd,Guildford	I	0.50	C,F,G
1116	R.Guernsey	B	0.50	C	1566	SomersetSnd,Taunton	B	0.63	A,D,F
1116	Valley R, Ebbw Vale	I	0.50	A	1584	London Turkish R	I	0.20	B,C,F
1152	CI.G.Amber, Norwich	I	0.83	F	1584	R.Nottingham	B	1.00	F,G
1152	LBC 1152 AM	I	23.50	C,E,F,G	1602	R.Kent	B	0.25	A,C,F
1152	CI.G. Plymouth 1152	I	0.32	F					

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

S.Asia 1400-1600) 35544 at 1405 in Northampton; HCJB Quito, Ecuador **21.455** (Eng to Eur, Australasia [u.s.b.]) 33333 at 1450 by David Hall in Morpeth; Channel Africa via Meyerton, S.Africa **21.760** (Eng to W.Africa 1300-1500, Sat/Sun) 55444 at 1450 by Stan Evans in Herstmonceux; R.Nederlands via Bonaire, Ned.Antilles **21.590** (Eng to Africa 1830-2025) 55445 at 1840 in Stalbridge.

The occupants of the narrow **18MHz (15m)** band now include R.Denmark via Sveio, Norway **18.950** (Da to N/C.America 1230-1255), rated 55545 at 1230 in E.Bristol & 54444 at 1250 in

Truro; R.Sweden via Horby **18.960** (Sw to N.America 1130-1140 daily, 1140-1200 Sat/Sun; Eng to N.America 1230-1300, 1330-1400, 1430-1500) 55544 at 1235 in Herstmonceux, 55555 at 1331 in Ebbw Vale, 55555 at 1435 in Newry & 45444 at 1450 in Folkestone; Family R, WYFR via Okeechobee FL, USA **18.980** (Eng to Eur 1600-1945) 44333 at 1620 in Morden.

In the **17MHz (16m)** band R.Australia's transmission to E/SE.Asia from Shepparton on **17.750** (Eng 0030-0400, 0530-0800, 0830-0900, 0930-1100) has been reaching the UK. It was rated 22212 at 0830 in Seaton & 25343 at 0935 in

- Listeners:-
(A) Simon Hockenhuil, E.Bristol.
(B) Sheila Hughes, Morden.
(C) Rhoderick Illman, Oxted.
(D) Dick Male, Yeovil.
(E) David Stevenson, Swansea.
(F) Ernie Strong, Ramsey, Cambs.
(G) Fred Wilmshurst, Northampton.

- DXers:-
(A) Bernard Curtis, Stalbridge.
(B) Jim Edwards, Wigan.
(C) Ian Evans, Ebbw Vale, Gwent.
(D) Stan Evans, Herstmonceux.
(E) Geraint Gill, Llanfairfechan, Conwy.
(F) Gerald Guest, Dudley.
(G) David Hall, Morpeth.
(H) Simon Hockenhuil, E.Bristol.
(I) Rhoderick Illman, Oxted.
(J) Eddie McKeown, Newry.
(K) Ian Pakeman, Folkestone.
(L) Fred Pallant, Storrington.
(M) Peter Perkins, Hemei Hempstead.
(N) Peter Pollard, Rugby.
(O) Vic Prier, Seaton.
(P) Thomas Williams, Truro.
(Q) Fred Wilmshurst, Northampton.

Tropical Bands Chart

MHz	Station	Country	UTC	DXer	MHz	Station	Country	UTC	DXer
2.310	ABC Alice Springs	Australia	1950	B	4.920	AIR Chennai	India	1746	B,J,L
2.325	ABC Tennant Creek	Australia	1955	B	4.925	R.S.Miguel,Riberatta	Bolivia	2350	B
2.485	ABC Katherine	Australia	2042	L,M	4.927	RRI Jambi	Indonesia	1530	B
3.200	TWR Manzini	Swaziland	0307	G,J	4.935	R Capixaba, Vitoria	Brazil	0420	B
3.223	AIR Simla	India	1540	B	4.940	AIR Guwahati	India	1745	B,L,M
3.230	SABC Meyerton	S.Africa	2305	B	4.950	R Nacional, Mulvenos	Angola	1925	B
3.240	TWR Manzini	Swaziland	0315	B,J	4.950	AIR Srinagar	India	1700	B,M
3.255	BBC via Meyerton	S.Africa	0305	B,G,H,J,M	4.950	VDA via Sao Tome	Sao Tome	2049	A,B,E,J,L,M,O
3.279	La Voz del Napo	Ecuador	0335	B,M	4.960	R Cima	Dominion Rep.2342	B,M	
3.315	AIR Bhopal	India	1648	B,M	4.960	AIR Ranchi	India	1610	B,J
3.320	SABC (RSG) Meyerton	S.Africa	1922	B,J,L,M	4.960	VDA via Sao Tome	Sao Tome	0350	B,G,J,D
3.365	GBC R-2	Ghana	2002	B,L,M	4.965	Christian Voice	Zambia	1835	B,G,L,M
3.365	AIR Delhi	India	1731	B,L	4.970	AIR Shillong	India	0036	B,J
3.390	AIR Gangtok	India	1615	B	4.975	R Uganda, Kampala	Uganda	2049	B,J,L,M
3.915	BBC via Kranji	Singapore	1729	B,E,J,M	4.980	PBS Xinjiang, Urumqi	China	1535	B
3.950	Qinghai PBS, Xining	China	1610	B,E	4.980	Ecos del Torbes	Venezuela	0250	J
3.955	R.Korea via Skelton	England	2200	D,F,H,I,J,O	4.985	R Brazil Central	Brazil	2319	B,G,M
3.955	R.Taipei via Skelton	England	1810	A,D,K,N	4.990	Hunan 1, Changsha	China	0034	B,J
3.965	R.Taipei via Issoudun	France	2202	E,J	4.990	AIR Hanagar	India	1615	B
3.965	RFI via Issoudun	France	1915	A,J,J,O,Q	5.005	R.Nepal, Kathmandu	Nepal	1610	B
3.975	R.Budapest	Hungary	0445	D	5.009	R.Cristal Int	Dominican Rep.0215	B	
3.985	Nexus, Milan	Italy	2159	J	5.009	R TV Malagasy	Madagascar	1825	B
3.990	Xinjiang BS, Urumqi	China	1615	B	5.010	AIR Thiru'puram	India	0034	B,J
3.995	DW via Julich?	Germany	1910	A,E,H,I,J,P,Q	5.014	R Pionera, Teresina	Brazil	0305	B
4.005	Vatican R.	Italy	2245	E,J,J,M,D,P,Q	5.025	R Parakou	Benin	1744	L,M
4.190	CNR Minority Sce	China	2220	B	5.025	R Rebelde, Bauta	Cuba	0249	B,J,M
4.330	Xinjiang BS, Urumqi	China	1555	7B	5.025	R.Pakistan, Quetta	Pakistan	2205	B,O
4.500	Xinjiang BS, Urumqi	China	1550	B	5.030	R.Burkina	Burkina Faso	1915	B,M
4.620	PBS Nie Menggu	China	2235	B	5.033	R.Bangui	C.Africa	2102	J,L
4.750	Hulun Buir-Mo	China	2315	B	5.035	R.Aparecida	Brazil	2355	B
4.755	R.Educ CP Grande	Brazil	0015	M	5.040	Jeyapore	India	1605	B,O
4.760	AIR Port Blair	India	0113	B,E,M	5.047	R.Togo, Lome	Togo	2015	B,L
4.760	ELWA Monrovia	Liberia	2105	M	5.050	Guangxi FBS, Nanning	China	2335	B
4.765	RTV Brazzaville	Congo	1944	L	5.050	Haixia 1.V of Strait	China	1646	L
4.770	FRCN Kaduna	Nigeria	2020	B,J,L,M,O	5.050	AIR Aizawl	India	1620	B
4.775	R.Liberal, Belem	Brazil	2325	B	5.050	R.Tanzania	Tanzania	0304	J
					5.060	PBS Xinjiang, Urumqi	China	0055	B,M



Northampton.

Other broadcasters using this band include R.Ext.Espana via Noblejas, Spain **17.595** (Sp to C.America 1000-1300), rated 44444 at 1025 in Rugby; R.Ukraine Int, Kiev **17.760** (Eng to Eur 1200-1300) 43333 at 1200 by **Gerald Guest** in Dudley & 45434 at 1220 in E.Bristol; Adventist World Radio (AWR) via UAE R, Abu Dhabi **17.870** (Eng to Asia 1300-1330) 43333 at 1310 in Morden; Voice of Turkey **17.815** (Eng to Eur 1330-1430) 45544 at 1330 in Northampton; Voice of Turkey **17.690** (Eng to S/SE.Asia, Australia 1330-1430) 44444 at 1350 in Herstmonceux; R.Japan via Moyabi, Gabon **17.755** Eng to M.East 1400-1500) 45233 at 1459 in Ebbw Vale; Channel Africa via Meyerton, S.Africa **17.870** (Eng to W.Africa 1800-1830) 55434 at 1820 in Stalbridge; R.Nederlands via Bonaire, Ned.Antilles **17.605** (Eng to C/W.Africa 1830-2025) 24112 at 1900 in Newry; BBC via Ascension Is **17.885** (Eng, Hausa to W.Africa 1915-2000) 25332 at 1939 in Storrington; World Harvest R. (WHRI) via Greenbush, Maine, USA **17.650** (Eng to M.East, Africa 1500-2200) 22222 at 1930 in Truro; Swiss R.Int (SRI) via Monsinery, Fr.Guiana **17.660** (It, Ar, Eng, Ger, Fr to Nr East, Africa 1830-2130) 43444 at 1935 in Folkestone.

R.New Zealand has been reaching the UK in the **15MHz (19m)** band. Their early morning transmission to Pacific areas on **15.340** (Eng 0500-0700) was logged as 44334 at 0635 on more than

one occasion by **Peter Perkins** in Hemel Hempstead. Later, their broadcast to NZ peacekeepers in Bougainville, the Solomon Is and E.Timor on **15.175** (Eng 1100-1300) was rated 33333 at 1300 in Folkestone. Much later, their transmission to Pacific areas on **15.265** (Eng 1755-1850?) was noted as 44132 at 1800 in Newry & 34333 at 1835 in Stalbridge.

R.Australia's broadcasts have been received in the UK on two frequencies from Shepparton: **15.240** (Eng to Pacific, Western N.America 0700-0900), rated 21222 at 0710 in Seaton & 35343 at 0830 in Northampton; **15.415** (Eng to SE.Asia 2330-0900), noted as 43333 at 0825 in Herstmonceux. Also mentioned in the reports were R.France Int (RFI) via Gabon **15.605** (Eng to Africa 0700-0800), rated 34333 at 0700 in Morden; Voice of Armenia, Yerevan **15.270** (Eng to Eur 0910-0930 Sun) 45344 at 0910 in Newry; BBC via Rampisham, UK **15.565** (Eng to Russia 0700-1800) 35544 at 1120 in Northampton; R.Bulgaria, Sofia **15.700** (Eng to W.Eur 12380-1300) 45555 at 1232 in Rugby; R.Finland via Pori **15.400** (Fin to N.America 1300-1330) 44444 at 1320 in Truro; WEWN Vandiver, USA **15.745** (Eng to Eur 1000-1700) 55444 at 1355 in Stalbridge; BBC via Skelton, UK **15.485** (Eng to W/SW.Eur 0700-1600) 34444 at 1400 in Dudley; Swiss R.Int via Julich, Germany **15.485** (It, Ar, Eng, Ger, Fr to Near East, Africa 1830-2130) 25222 at 1945 in E.Bristol; BBC via Ascension Is **15.400** (Eng to

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

Listeners:-

- (A) Simon Hockenhuil, E.Bristol.
- (B) Sheila Hughes, Morden.
- (C) Rhoderick Illman, Oxted.
- (D) Dick Maie, Yeovil.
- (E) Eddie McKeown, Newry.
- (F) David Stevenson, Swansea.
- (G) Ernie Strong, Ramsey, Cambs.
- (H) Scott Turner, Rye.
- (I) Fred Wilmshurst, Northampton.

Medium Wave Chart

kHz	Station	Country	Power (kW)	Listener	kHz	Station	Country	Power (kW)	Listener
531	Ain Beida	Algeria	600/300	A*	783	Barcelona (COPE)	Spain	50	E*
531	Berg	Germany	?	E*,F*	792	Limoges	France	300	A*,E*,F*,I*
531	RNE5 via ?	Spain	2	G*	792	Sevilla(SER)	Spain	20	E*
531	Beromunster	Switzerland	500	A,E*,G*	801	Munchen-Ismaning	Germany	300	E*
540	Wavre-Overijssel(VRT)	Belgium	150/50	A,E*,F*,G,I	801	Ajlun	Jordan	2000	G*
540	Sidi Bennour	Morocco	600	E*,G*	801	RNE1 via ?	Spain	?	E*,G*
549	Les Trembles	Algeria	600	G	810	Madrid(SER)	Belgium	20	G*
549	Nordkirchen (DLF)	Germany	100	G	810	Westerglen(BBCScot)	UK	100	A,C,E,F,G*,I
549	Thurnau (DLF)	Germany	200	A*,F*,I	819	Batra	Egypt	450	G*
558	Espoo	Finland	50	E*,G*,H*	819	S.Sebastian(El)	Spain	5	E*,G*
558	Gheslagh	Iran	1000	G*	828	Heinencord(CI.Rock)	Holland	20	E*,F*,H*
558	RNE5 via ?	Spain	?	F*,G*	837	Nancy	France	200	A*,E*,F*,G*
567	Tullamore(RTE1)	Eire	500	A,C,E,F,G,I	837	COPE via ?	Spain	?	E*
576	Muhlacker(SDR)	Germany	500	B,E*,G*,I	846	Rome	Italy	1200	A*,E*,G*
576	Barcelona(RNE5)	Spain	50	F*	855	Berlin	Germany	100	E*
585	Paris(FIP)	France	8	A,E*,G	855	RNE1 via ?	Spain	?	E*,F*,G*,I*
585	Madrid(RNE1)	Spain	200	A*,E*,F*,I*	864	Paris	France	300	A,E*,F*,G*,I
585	Dumfries(BBCScot)	UK	2	E*	873	Frankfurt(AFN)	Germany	150	A*,B,C,E*,I
594	Frankfurt(HR)	Germany	1000/400	B,E*,G,I	873	Zaragoza(SER)	Spain	20	B,E*,I*
594	Oujda-1	Morocco	100	E*	873	Enniskillen(R.U.I)	UK	1	E*,I*
594	Muge	Portugal	100	G*	882	COPE via ?	Spain	?	E*
603	Lyon	France	300	E*,F*,G*	882	Washford(BBCWales)	UK	100	C,D,E,F,G*,I
603	Newcastle(BBC)	UK	2	E*	891	Algiers	Algeria	600/300	E*,G*,I*
612	Atlhone(RTE2)	Eire	100	A,E*,F,G,I	891	Hulsberg	Netherlands	20	E*,G*,I*
621	Watre (RTBF)	Belgium	80	A,E*,F*,G,I	900	Brno(CRO2)	Czech Rep	25	E*
621	Batra	Egypt	2000	G*	900	Milan	Italy	600	A*,E*,I*
621	Barcelona(OCR)	Spain	50	E*	909	B mans Pd(BBC5)	UK	140	C,F,G*,I
630	Vigra	Norway	100	H*,E*,G	909	Clevedon(BBC5)	UK	50	O
630	Tunis-Djedaida	Tunisia	600	E*,G*	918	Domzale	Slovenia	600/100	E*,I*
639	Prahah(Liblice)	Czech	1500	A*,E*,G*,I*	918	Madrid(R.Int)	Spain	20	E*
639	RNE1 via ?	Spain	?	F*,G*,I*	927	Wolvertem	Belgium	300	H*,E*,F*,G,I
648	RNE1 via ?	Spain	10	E*	936	Bremen	Germany	100	E*,G*,I*
648	Orfordness(BBC)	UK	500	A,E*,F,G*,I	936	RNE5 via ?	Spain	?	F*,G*
657	Firenze	Italy	100	G*	945	Toulouse	France	300	E*,F*,G*,I*
657	Napoli	Italy	120	A*	954	Brno (CRO2)	Czech Rep.	200	E*
657	Madrid(RNE5)	Spain	20	A*,G*,I*	954	Madrid(CI)	Spain	20	E*,G*,I
657	Wrexham(BBCWales)	UK	2	E*,F*,G*,I	963	Pori	Finland	600	A,E*,G*,H*
666	Messkirch(Rohrd(SWF)	Germany	150	A*,B,E*,G*,I*	963	Hamburg(NOR)	Germany	100	E*,G
666	Sitkunai(R.Vilnius)	Lithuania	500	E*	981	Alger	Algeria	600/300	A*,F*,G
666	Lisboa	Portugal	135	E*,G*	990	Berlin	Germany	100	E*,F*,G,I
675	R10 FM	Holland	120	A,E*,F*,G*,I	990	R.Bilbao(SER)	Spain	10	E*,G
684	Tanaf	Iraq	1000	G*	999	Schwerin (RIAS)	Germany	20	E*
684	Sevilla(RNE1)	Spain	500	E*,G*,I*	999	Madrid(COPE)	Spain	50	E*,F*,G*,I*
684	Avala(Beograd-1)	Yugoslavia	2000	A*	1008	SER via ?	Canaries/Spain	?	G*
693	Tortosa(RNE1)	Spain	2	E*	1008	Flevo(NOS-5)	Holland	400	A*,G,I
693	Droitwich(BBC)	UK	150	C,F,G*,I	1017	Rheinsender(SWF)	Germany	600	E*,G*,I
702	Flensburg(NDR)	Germany	5	A*	1017	RNE5 via ?	Spain	?	F*,G*
702	TWR via Monte Carlo	Monaco	300	E*,G*	1026	SER via ?	Spain	?	A*
702	Presov	Slovakia	200	G*	1035	Lisbon	Portugal	120	E*
711	Rennes (R.Bleu)	France	300	A,E*,F*,I	1044	Dresden(MDR)	Germany	20	A*,E*,F*,G*,I*
711	Heidelberg	Germany	5	G*	1044	Sebaa-Aioun	Morocco	300	G*
711	Laayoune	Morocco	60	G*	1044	SER via ?	Spain	?	A*
720	Langenberg	Germany	200	G*	1044	S.Sebastian(SER)	Spain	10	G*
720	Lisnagarvey(BBC4)	N.Ireland	10	A*,F	1053	Talk Sport via ?	UK	?	C,E*,F,G*,I
720	Crystal Palace BBC4	UK	0.75	A,C,I	1062	Kalundborg	Denmark	250	A,E*,G*,I
729	Cork(RTE1)	Eire	10	E*,G*	1071	Bilbao(El)	Spain	5	A*,E*,G*,I*
729	RNE1 via ?	Spain	?	E*,G*,I*	1071	Talk Sport via ?	UK	?	E*,G*,I
738	Paris	France	4	E*	1080	SER via ?	Spain	?	E*,F*,G*,I*
738	Barcelona(RNE1)	Spain	500	E*,G*,I*	1089	Talk Sport via ?	UK	?	C,E*,F,G*,I
747	Flevo(NOS-1)	Holland	400	A,E*,G*,H*,I	1098	Nitra(Jarok)	Slovakia	1500	E*,G*,I*
747	Cadiz(RNE5)	Spain	10	F*	1107	AFN via ?	Germany	10	E*,G*
756	Braunschweig(OLF)	Germany	800/200	A*,E*,G*,I	1107	Talk Sport via ?	UK	?	C,E*,F,G,I
756	Bilbao(El)	Spain	5	F*	1116	Bari	Italy	150	G*
756	Redruth(BBC)	UK	2	E*	1116	Bologna	Italy	60	E*
765	Sottens	Switzerland	500	A*,E*,G*	1116	Pontevedra(SER)	Spain	5	E*,I*
774	Enniskillen(BBC)	N.Ireland	?	E*	1125	La Louviere	Belgium	20	E*,G*
774	RNE1 via ?	Spain	?	E*,F*,G*,I*	1125	Deanovec	Croatia	100	A*,I*
783	Leipzig(MDR)	Germany	100	A*,E*,G*,I*	1125	El Beida	Libya	500	G*
					1125	RNE5 via ?	Spain	?	G*
					1125	Llandrindod Wells	UK	1	E*
					1134	Zadar(Croatian R)	Croatia	600/1200	A*,E*,G*,I*

W.Africa 1500-2300) SIO 333 at 2056 by **Francis Hearne** in N.Bristol.

Noted in the **13MHz (22m)** band were the BBC via Skelton, UK on **13.660** (Ar to N.Africa 1200-1800), rated 43444 at 1235 in Stalbridge; Family R. (WYFR) Okeechobee FL, USA **13.695** (Eng to N.America 1200-1300) 33323 at 1240 in Morden; R.Austria Int via Moosbrunn **13.730** (Eng to Eur 1230-1300) 45544 at 1230 in Northampton & 54444 at 1255 in Herstmonceux; Voice International via Darwin, Australia **13.685** (Eng to Asia 0900-1300) 33433 at 1300 in Morpeth; Croatian R, Zargreb **13.830** (Cr to Eur) 25432 at 1340 in E.Bristol; UAER, Dubai **13.675** (Ar, Eng to Eur 0600-2045) 44333 at 1335 in Truro & 44434 at 1630 in Folkestone; All India R. (AIR) via Bangalore **13.620** (Ar to M.East 1730-1945) 32333 at 1830 in Seaton; VOA via Brieche, Morocco **13.640** (Special Eng News to M.East 1900-2000) 55555 at 1925 in Rugby; R.Netherlands via Flevo **13.700** (Eng to Africa 1830-2025) SIO 444 at 2014 in N.Bristol; R.Canada Int via Sackville **13.650** (Fr, Eng to Eur, Africa 2000-2159) 22122 at 2103 in Newry.

In the **11MHz (25m)** band R.New Zealand's 100kW transmission to Pacific areas on **11.675** (Eng 0700-1100) was rated 24433 at 0920 in Northampton & 43333 at 1035 in Truro.

R.Australia has been heard on two frequencies from Shepparton: **11.880** (Eng to Oceania 0900-1100; Eng to Asia 1100-1330), rated 22222 at 0907 in Newry; **11.660** (Eng to SE.Asia 1330-1700) 44444 at 1448 in Morpeth & 43333 at 1600 in Folkestone.

Also received in this band were China R.Int via Jinhau, China **11.730** (Eng to Australia & Pacific 0900-1100), rated 43333 at 0905 in Morden; RFI via Allouis **11.845** (Fr to N.Africa 0800-1600) 55445 at 1035 in Rugby; BBC via Woofferton, UK **12.095** (Eng to Eur 0700-1800) 55545 at 1130 in Folkestone; Voice of Korea, Pyongyang **11.335** (Eng to Eur 1300-1400) 44433 at 1350 in Herstmonceux; R.Jordan via Al Karanah **11.690** (Eng to W.Eur, E.U.S.A 1300-1730) 45544 at 1710 in Northampton; Israel R, Jerusalem **11.605** (Eng to Eur, N.America 1730-1745) 44444 at 1730 in Dudley; R.Kuwait via Kabd **11.990** (Eng to Eur, N.America 1800-2100) 55545 at 1800 in Seaton; R.Netherlands via Madagascar **11.655** (Eng to Africa 1730-2025) 25222 at 1834 in E.Bristol; All India R. (AIR) via Bangalore **11.620** (Eng to Eur 1745-1945) 54444 at 1835 in Stalbridge; VOA via Botswana **12.080** (Fr to Africa 1830-2030) 35444 at 1925 in Storrington; BBC via Ascension Is **11.855** (Hausa to W.Africa 1930-2000) 35444 at 1943 in Storrington; HCJB Quito, Ecuador **11.895** (Eng to Eur 2000-2200) 45434 at 2000 by Geraint Gill in Llanfairfechan.

R.Australia's broadcasts from Shepparton have been received in the UK on three frequencies in the **9MHz (31m)** band: **9.710** (Eng to Pacific 0800-0900), rated 25343 at 0815 in Northampton; **9.475** (Eng to Asia 1330-1858) 33433 at 1830 in Seaton; **9.500** (Eng to Asia 1900-2130) 34232 at 1900 in Newry & 22332 at 1931 in Storrington.

Also noted in this band were KNLS Achor Point, Alaska **9.615** (Eng to E.Asia 0800-0900), rated 21322 at 0816 in Newry & 33333 at 0830 in Morden; TWR Monaco **9.870** (Eng to Eur 0755-0920) 35555 at 0825 in Northampton; WTJC Newport NC, USA **9.370** (Eng to N.America 24hrs) 54444 at 0940 in Stalbridge; R.Vilnius, Lithuania **9.710** (Eng to W.Eur 0930-1000) 45444 at 0955 in Folkestone; R.Polonia (Polish R, Warsaw) **9.525** (Eng to Eur 1300-1400) 54544 at 1310 in Herstmonceux; Voice of the Mediterranean, Malta via Rome, Italy **9.850** (Eng to Eur 1730-1800) 45544 at 1745 in Seaton; RFI via Issoudun **9.485** (Fr to E.Africa 1900-2200) 24343 at 1938 in Storrington; R.Thailand, Udonthani **9.535** (Eng to Eur 1900-2000) 33333 at 1945 in Rugby; BBC via Cyprus **9.410** (Eng to W.Eur 1600-2200) 43434 at 1949 in Ebbw Vale; R.Netherlands via Flevo **9.895** (Eng to Africa 1830-2025) SIO 444 at 2011 in N.Bristol; Israel R, Jerusalem **9.435** (Eng to N.America? 2000-2025) 33333 at 2020 in Truro; R.Ext. Espana via Noblejas, Spain **9.680** (Eng to Eur 2000-2100) SIO 444 at 2023 in N.Bristol; R.Canada Int via Sackville **9.770** (Fr, Eng to W.Eur, Africa 2000-2200) 44334 at 2100 in Dudley; China R.Int **9.840** (Eng to Eur 2000-2200) SIO 333 at 2124 in N.Bristol; R.Mediterranean Int [Medi-1], Morocco **9.575** (Ar, Fr to N.Africa, S.Eur 0500-0400) 33333 at 2145 in

Llanfairfechan; R.Taipei Int via WYFR Okeechobee, USA **9.355** (Eng to Eur 2200-2300) 43433 at 2210 in Morden; Voice of Turkey, Ankara **9.655** (Eng to W.Eur, N.America 2300-2350) SIO 443 at 2344 in N.Bristol; R.Bulgaria, Sofia **9.400** (Eng to N.America 0000-0100) 55545 at 0056 in E.Bristol.

Some of the broadcasts in the **7MHz (41m)** band are intended for listeners in Europe. Mentioned in the reports were R.Japan via Woofferton, UK **7.230** (Eng 0500-0700), rated 44433 at 0650 in Herstmonceux; R.Polonia (Polish R), Warsaw **7.285** (Eng 1800-1900) 44344 at 1821 in Rugby; R.Slovakia Int. **7.345** (Eng 1930-2000) 53434 at 1935 in Ebbw Vale; VOIRI Tehran, Iran **7.320** (Eng 1930-2030) 33433 at 1936 in Newry; Voice of Greece via Kavala **9.475** (Eng 1930-2000) 44444 at 1937 in Rugby; RTV Tunisienne, Sfax **7.225** (Ar 1700-2300) 45545 in Llanfairfechan; Voice of Russia, Moscow **7.340** (Eng 1800-2200) 33333 at 2053 in Truro; Vatican R, Italy **7.250** (Eng 2050-2110) SIO 444 at 2058 in N.Bristol; R.Romania Int Bucharest **7.105** (Eng 2100-2155) 43333 at 2150 in Folkestone; R.Bulgaria, Sofia **7.500** (Eng 2200-2300) 45544 at 2215 in Northampton; R.Romania Int Bucharest **7.195** (Eng to Eur 2300-0000) SIO 333 at 2311 in N.Bristol; Family R. (WYFR) Okeechobee FL, USA **7.580** (Eng 2000-2245) 44434 at 2235 in Stalbridge.

Whilst beaming to other areas the Voice of Russia, Samara **7.135** (Eng to Asia 1500-1600) was rated 44444 at 1530 in Morden; R.Prague, Czech Rep **7.345** (Eng to N.America 2230-2257) 44444 at 2230 in Dudley; R.Vilnius, Lithuania **7.325** (Eng to N.America 0030-0100) 43444 at 0030 in Llanfairfechan; R.Yugoslavia via Bosnia **7.115** (Eng to N.America 0100-0130) 55444 at 0101 in E.Bristol; KTBN via Salt Lake City, USA **7.505** (Eng to N.America 0100-1500) 33333 at 0125 in Morpeth; VOA via Morocco **7.295** (Eng to Africa 0500-0630) 32442 at 0600 in Seaton; World Harvest Radio (WHRI) via Maine, USA **7.580** (Eng to Africa 0500-1000) 44444 at 0835 in Oxted.

Many broadcasters use the **6MHz (49m)** band to reach listeners in Europe. They include HCJB in Quito, Ecuador **5.965** (Eng 0700-0900), rated 44433 at 0725 in Herstmonceux; Deutschland R, Berlin **6.005** (Ger 24hrs) 34333 at 0900 in Seaton; R.Finland via Pori **6.120** (Fin, Sw 0500-2300) 44434 at 0907 in Ebbw Vale; R.Netherlands via Julich, Germany **6.045** (Eng 1130-1330) 44444 at 1245 in Rugby; R.Polonia [Polish R] Warsaw **5.995** (Eng 1300-1400) 33333 at 1310 in Truro; R.Slovakia Int. **5.915** (Eng 1730-1800) 43333 at 1733 in Ebbw Vale; Voice of Vietnam via Austria **5.955** (Eng, Viet, Fr 1800-2000) 42323 at 1812 in Ebbw Vale; Vatican R, Italy **5.890** (Ger) 44444 at 1920 in Rugby; R.Yugoslavia, Serbia **6.100** (Eng 1930-2000) 43443 at 1930 in Newry; R.Austria Int via Moosbrunn **6.155** (Fr, Ger, Eng 1830-2000) 45444 at 1956 in E.Bristol; RAI Rome **6.010** (Eng 2025-2045) SIO 333 at 2031 in N.Bristol; R.Canada Int via Skelton, UK **5.995** (Eng 2100-2200) 44444 at 2100 in Dudley; R.Japan via Skelton, UK **6.090** (Eng 2100-2200) 32322 at 2105 in E.Bristol; R.Bulgaria, Sofia **5.800** (Eng 2200-2300) 55555 at 2200 in Llanfairfechan; R.Yugoslavia, Belgrade **6.100** (Eng 2200-2230) 45544 at 2203 in Northampton; R.Budapest, Hungary **6.025** (Eng 2200-2230) 44444 at 2230 in Folkestone; Bayerischer Rundfunk, Germany **6.085** (Ger 24hrs) 55445 at 2230 in Stalbridge; R.Sweden via Horby **6.065** (Eng 2230-2300) SIO 333 at 2231 in N.Bristol; R.Austria Int, Moosbrunn **5.945** (Eng 2230-2300) SIO 444 at 2232 in N.Bristol.

Some to other areas have also been received here. They include the Voice of America (VOA) via Sao Tome **6.035** (Eng to W.Africa 1800-2200), rated 33433 at 1929 in E.Bristol; RAI Rome **6.010** (Eng to E.Africa, M.East 2025-2046) 44344 at 2026 in Newry; R.Ext.Espana via Noblejas **6.055** (Eng to N.America 0000-0100) 54444 at 0020 in Morden; R.Havana, Cuba **6.000** (Eng to N.America 0100-0500) 34333 at 0330 in Morpeth; WEWN Birmingham, USA **5.825** (Eng to N/C.America 0000-1000) 44423 at 0830 in Seaton; Family R. (WYFR) Okeechobee FL, USA **6.105** (Sp to S.America 0800-1100) 24333 at 0905 in Oxted; WHRI South Bend, USA **5.745** (Eng to N.America 2000-1000) 44334 at 0935 in Stalbridge.



The SINPO code is used for broadcast station reports, here is an explanation of the code.

Signal Strength
5 excellent
4 good
3 fair
2 poor
1 barely audible

Interference
5 nil
4 slight
3 moderate
2 severe
1 extreme

Noise
5 nil
4 slight
3 moderate
2 severe
1 extreme

Propagation Disturbance
5 nil
4 slight
3 moderate
2 severe
1 extreme

Overall Merit
5 excellent
4 good
3 fair
2 poor
1 unusable

Don't forget to send your logs to Brian - address on page 12.

HAYDON

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 A brilliant new compact indoor antenna that covers 0.1-3GHz and is just 24" when collapsed. Features "horizontal or vertical" adjustable elements. Ideal for table top mounting or by the window. Patch lead with BNC plug fitted. (Frequency range: 0.1-3GHz).
INTRO PRICE £54.95 P&P £6.00

NEW 8th EDITION THE UK SCANNING DIRECTORY

 Britain's best selling scanner book now larger than ever. Nearly 700 pages packed full of frequencies from 25MHz-1.8GHz.
ORDER YOURS TODAY!
PRICE £19.75 P&P £4.00

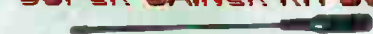
items of interest

WATSON HUNTER

 Frequency counter covers 10MHz-3GHz. Incl's nicad, charger, antenna.
ONLY £59.95
 P&P £6.00
 Optional case £14.99.....£7.50

DB-2000

 A superb "BNC" black telescopic whip. Ideal for scanners. Folds neatly away. (0.1-2GHz).
OUR PRICE £14.99 P&P £1.50
 DA-2000 SMAWith SMA adapter £19.99

SUPER-GAINER RH-9000

 "BNC" 40cm flexible whip for the ultimate in gain. (Rx:- 25MHz-2GHz) (Tx:- 2m/70cms).
OUR PRICE £21.95 P&P £1.50
 RH-9090 As above with SMA£26.95

QS-300

 A fully adjustable desk top stand for use with all hand-helds. Fitted coaxial lead with BNC + SO239 connections.
OUR PRICE £10.00 P&P £3.00

QS-200

 Superb quick fit dash mount for hand-helds. £9.99.
OUR PRICE £4.99 each P&P £2.00
 3 for £10.00 P&P £3.50

REGULAR-GAINER RH-770

 "BNC" 21cm flexible whip that is ideal as replacement. (Rx:- 25MHz-2GHz) (TX:- 2m/70cms).
OUR PRICE £16.95 P&P £1.50
 RH-790 As above with SMA£21.95

SECONDHAND LIST

MVT-7100 as new£169.95	IC-R75 as new + DSP.....£549.95
MVT-7300 as new£199.95	RD-500VX+ as new£549.95
MVT-9000 MkII as new.....£275.00	HF-150 as new£199.95
AR-8000 boxed as new£199.95	Alinco DJ-X2000 as new£369.00
AR-8200 MkI vgc£219.95	IC-R3 as new - boxed.....£339.95
AR-8200 MkII as new.....£299.95	UBC-780XLT as new - boxed.....£259.95
VR-120D as new£119.95	BC-9000XLT as new.....£179.95
MVT-7000 (boxed)£99.95	IC-R8500 as new.....£899.00
PRO-2042 (25-1300MHz).....£169.95	ICR70 VGC (private sale).....£299.99
DX-394 as new£119.95	ICR2 VGC£109.95
Yaesu VR-5000 as new.....£499.95	Yaesu VR-500 as new.....£179.99

Accessory items

PL-259 - PL-259 (short patch lead).....£5.99
PL-259-PL-259L (4 mtr patch lead)£9.99
BNC-BNC (short patch lead)£6.99
BNC-BNC "L" (5 mtr patch lead).....£9.99
50m roll flexweave (heavy duty antenna wire)£30.00
20m roll flexweave (heavy duty antenna wire)£15.95
50m roll PVC coated (stranded wire).....£10.95
30m roll nylon guy rope (4.4mm)£10.00
Nylon "Dog Bone" insulators£1.00
Roll self-amalgamating tape (25mm x 10m).....£6.50
Ferrite rings.....£2.00 each

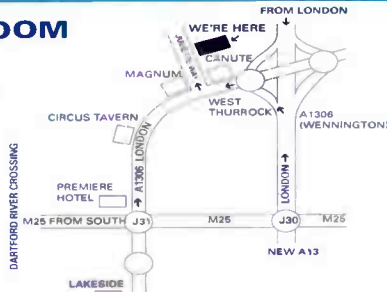
ALKALINE STARTER KIT

 Starter kit includes charger & 4 x AA cells.
£14.99 + £3.00 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. 4 x AA pack £5.99 £1 P&P. 4 x AAA £6.25 £1 P&P. Rechargeable Alkaline. No memory effects. 1.5V cells. 3 x capacity of nicads.

THURROCK, ESSEX SHOWROOM & MAIL ORDER:

Unit 1, Thurrock Commercial Centre, Purfleet Industrial Park, Aveley, South Ockendon, Essex RM15 4YA
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FAX: 01708 868441
 Open Mon - Fri 8.30am - 4.00pm.
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W. MIDLANDS SHOWROOM

Unit 1, Canal View Ind. Est., Brettel Lane, Brierley Hill W. Mids. DY5 3LQ
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 Sat 9.30-1pm
Tel: 01384 481681
NO MAIL ORDER TO MIDLANDS BRANCH

5 mins from Merryhill Centre

Q-TEK D.C. 2000 DISCONE



A high performance wideband discone offering superb performance from 0.2-2000MHz. Transmit range- 6m, 2m, 70cm, 32cm & 23cm (power handling 200W). Fitted with low loss 'N' type socket. Supplied with mounting brackets. (N-plug & coax not supplied).
OUR PRICE £54.95 P&P £10.00

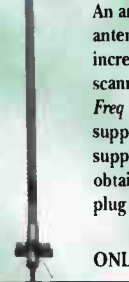
Comments from John Griffiths
 Putting the DC-2000 up gave me a tremendous boost to all signals with the ancient AR-2000 coming alive! Signals were well received and I found that I wandered out of airband.

ROYAL DISCONE



(Stainless steel)
 Frequency range: receives 0.2-2000MHz, transmit 6/2/70/23cm, connector N type. High sensitivity with an amazing range of transmitting frequencies. Comes complete with mounting hardware & brackets. (N-plug & coax not supplied).
OUR PRICE £44.95 P&P £10.00

NEW Q-TEK INTREPID 2000



An amazing vertical (glass fibre) colinear antenna. Quality construction with incredible performance. For the serious scanner enthusiast.
 Freq range: 0.5-2GHz. PL-259 fitting (not supplied). Length 3m. Mast clamps supplied. (Gain up to 9dB is easily obtained). SO-239 fitting. Requires PL-259 plug (not supplied).
ONLY £89.95 P&P £10.00

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". Fitting PL-259 (not supplied).
£79.95 P&P £10.00

DX-10 (R.F. SYSTEMS)



A superb quality active antenna with a very high intercept point ideal for weak signal reception without increases in radiated noise. A truly amazing antenna! Freq: 100kHz-30MHz. Bomb-proof over loading figures, 90cm long, mains PSU + controller supplied (coax optional). Atmospheric-noise compensated sensitivity.
£169.95 DEL £10.00

DX-1 PRO (R.F. SYSTEMS)



This is a professional wide band receiving antenna with a very high intercept point that ensures a low noise level allowing even the weakest signals to be heard. Constructed of high-impact plastic and aluminium alloy - the amplifier is protected inside a waterproof stainless steel vessel. The unit is supplied complete with mounting hardware and an indoor controller with PSU (coax not supplied). Freq. 20kHz-54MHz. Gain: +6dB (ref dipole). Intercept points: ≥+75dBm (2nd ord), ≥+50dBm (3rd ord). (Static protection included). For the true professional.
£329.95 DEL £15.00

AIR-44

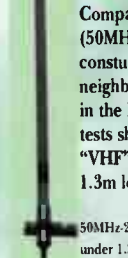


(Airband base)
 Prof quality base antenna for AIRBAND. (Civil & military). With SO-239 fitting (1.7m long). Gain 4.5/7dB.
PROFESSIONAL QUALITY £79.95 P&P £10.00

AIR-44N As above "N-type" fitting.....£84.95

AIR-33 (As above) 1m long. Gain 3, 6dB.
£49.95 P&P £8.50

Q-TEK 55-2000



Compact - indoor outdoor scanning antenna. (50MHz-2.6GHz). Superb glass fibre construction. Ideal in areas affected by "nosey neighbour syndrome". This antenna can be put in the loft or outside on the building. Initial tests show this to far outperform a discone at "VHF". SO-239 socket (PL-259 plug needed) 1.3m long (mast clamps supplied).
£49.95 DEL £10.00

NEW WSK-3000



Weather satellite antenna kit includes:
 A) A 2 element crossed dipole for receiving weather satellite pictures.
 B) Software for your PC. No interface needed (use your PC's sound card). Available at £4.50 extra. Requires scanner or receiver.
SALE PRICE £29.99 P&P £10.00

GLOBAL AT-2000



Deluxe SW ATU 0-30MHz. SO239 fittings.
ONLY £89.00 P&P £6.00

(Probably the best ATU around)
 PATCH LEADS AVAILABLE IF REQUIRED.
 PL-259 to PL-259 patch lead.....£5.99
 BNC to PL-259 patch lead.....£9.99

MLB (R.F. SYSTEMS)



The MLB contains a special impedance matching transformer which converts any piece of wire between 6 and 20 metres long into a wide band receiving antenna. 100kHz-40MHz. Low noise - probably the best there is!
£42.95 POST £3.00

E.M.F. ANTENNA



A low cost, superb passive broadband (500kHz-30MHz) antenna useable down to 150kHz. Ideal for indoor or outdoor use and at only 4mtrs long you most certainly will find the space! Using magnetic transfer technology, interference & noise is minimised. Ready assembled + PL-259/coax.
ONLY £62.95 P&P £4.00

WA-50 'AMPLIFIER'



Broadband amplifier for short wave, medium & long wave. 50kHz-50MHz. 10dB gain. Superb low noise amplifier. Ideal for short wave improvement. Requires 12V (150mA).
OUR PRICE £99.95 P&P £7.50

Optional AC adapter.....£16.99

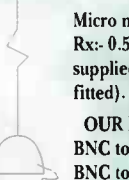
Q-TEK PL-25

0.2-2GHz. An easy to use PL-259 (right angled) telescopic whip. Ideal for all receivers.
OUR PRICE £19.95 P&P £2.50



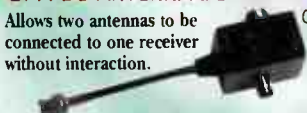
As above with 'rotary hinge'.
£29.95
 BNC adaptor.....£3.49
 N-type adaptor.....£3.95

MICRO MAG ANTENNA MM-1



Micro magnetic base with (19") whip. Rx- 0.5MHz-2GHz. Ideal for all scanners supplied with miniature coax lead & BNC (all fitted).
OUR PRICE £24.95 P&P £5.00
 BNC to PL-259 adaptor.....£3.49
 BNC to N-type adaptor.....£3.95

DPX-30 ANTENNA DUPLXER/COMBINER



Allows two antennas to be connected to one receiver without interaction. Can be used in reverse.
£54.95 P&P £3.50

Ant A (0-30MHz) } To receiver low insertion loss
 Ant B (30-2000MHz) }

SP-3 (PROFESSIONAL)



Two way combiner. one antenna feeds two scanners (without mismatch). 10-2500MHz. High isolation (BNC sockets).
£59.95 P&P £3.50

SP-1 TWO WAY COMBINER (PROFESSIONAL)



Very high quality combiner allows two short wave receivers to be connected to one antenna without interaction. 50kHz-30MHz (SO-239 fitting).
£59.95 P&P £3.50

HAYDON

Communications

See previous page for address.



Mail order: 01708 862524



PRICES SUBJECT TO CHANGE WITHOUT PRIOR NOTICE. PLEASE VERIFY BEFORE ORDERING. E&OE.

NEXT DAY DELIVERY TO MOST AREAS, £10.00.



hand-held scanners

A) M-75 SCANNER PRE-AMP

Superb BNC in-line amplifier to boost signals! Fits on top of your scanner and away you go. (Powered by PP-3 battery - not supplied). Freq: 24MHz-2.1GHz. Gain: -10dB to +20dB.

OUR PRICE **£79.95** P&P £5.00

B) YUPITERU MVT-7100

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.

OUR PRICE **£199.95**

Soft case for 7100EU/9000 - specify£19.99
MVT-9000 MkIISale price £325.00
MVT-7300EUSale price £219.00

C) ICOM IC-R5

New pocket hand-held scanner (0.1-1310MHz) AM/FM/WFM. Superb high-speed scanning featuring alpha tag and much more. Includes nicads & charger.

NOW IN STOCK **£159.00**

BATTERIES AND CHARGER INCLUDED

Soft case£17.99

D) ALINCO DJ-X3

Micro-handly scanner. 100kHz-1300MHz. 700 memories/stereo FM (earphones)/attenuator/bug detector/audio descrambler. AM/FM/WFM/ Selectable tuning steps (incl's 8.33kHz).

SALE PRICE **£99.95**

Optional battery pack and drop in charger £39.99

Soft case£15.99
PC interface£42.95

E) ALINCO DJ-X10

Full-featured handy. 100kHz-2GHz all mode. Includes SSB/CW band scope, alphanumeric display plus loads more. (Includes battery/drop-in charger).

OUR PRICE **£269.95**

Optional case£15.00
Optional battery box£14.99
PC interface£42.95

F) ALINCO DJ-X2000

The intelligent scanner! 100kHz-2.15GHz. All mode incl's SSB, "Flash Tune" reads frequency of nearby signal & tunes the handle for you. Incl's battery, charger & loads more.

Includes 8.33kHz spacing **£449.95**

Optional case£15.00
Optional battery box£14.99
Cigar lead£19.99
PC interface£42.95

G) AOR AR8200MkIII

Never before has one hand portable offered so much. ★ Covers 100kHz-3GHz (all mode) ★ Computer control capability ★ 8.33kHz steps for the new airband spacing ★ Reaction tune capability ★ Includes nicads/charger/antenna and car lead.

OUR PRICE **£385.00**

Optional case£19.99
CC-8200 PC interface£79.99

H) ICOM IC-R3

'A first!' TV/video picture & sound! Certainly a gadget for the future - see things you didn't know existed! A wide-band scanner covering 0.5-2.3GHz (AM/FM/WFM) with "TFT" colour display.

FOR THE TRUE ENTHUSIAST

OUR PRICE **£379.00**

Soft case for IC-R3£17.99



base stations

I) BEARCT UBC-9000XLT

25-1300MHz wideband desktop scanner with turbo scan. (Selectable AM/FM/WFM). Selectable tuning steps + alpha-numeric tagging. "Our best selling desk-top scanner". Incl's PSU.

Send SAE for review OUR PRICE **£235.00**

J) BEARCT UBC-780

New comprehensive scanner (25-1300MHz) Alpha Tag, PC cloning control. Smart scanner + trunk track facility. Incl's PSU.

Send SAE for review OUR PRICE **£299.99**

Software 780XLT£34.99

K) YAESU VR-5000

0.1-2.6GHz all mode receiver with DSP (optional) plus bandscope/world clock and too much more to print. Incl's PSU.

OUR PRICE **£575.00**

Optional DSP£79.95

L) AOR AR8600MkII

Extremely versatile all mode receiver (100kHz-3GHz). "Superb HF performance".

OUR PRICE **£649.95**

Optional power supply/8600£19.95
AR5000£1275
AR5000+3£1399
SDU5500£769
AR3000A£699

Short Wave Magazine, March 2003

THE PLACE TO SHOP



scanners

M) BEARCAT UBC-278

New base scanner with built-in clock radio. 25-956MHz (with gaps) 88-108MHz (WFM) 500kHz-1720kHz (AM). Fully programmable. Ideal for the bedroom.

OUR PRICE **£139.95**

N) COMMTEL 225

500 channel. 25-1300MHz. AM/FM/WFM.

LIMITED STOCK AVAILABLE

OUR PRICE **£199.99**

O) FAIRHAVEN RD-500VX+

Superb wideband receiver (all mode) with over 50,000 memories capable of holding text. 20kHz-1750MHz. Incl's remote control/PSU PC lead and software.

SSP: £899.00 OUR PRICE **£745.00**

P) ICOM IC-R8500

Next generation wideband receiver. 0.1-2GHz. (All mode)

Latest UK version

2 YEAR WARRANTY

(Includes PSU) OUR PRICE **£1149.95**

SP-21 extension speaker£74.99
Voice synthesiser board£34.95

Short Wave Magazine, Mach 2003

sw receivers

Q) REALISTIC DX-394

★ Superb performance SW receiver ★ 0.2-30MHz (all mode) ★ Selectable tuning steps (down to 100Hz) ★ 240 or 12V ★ Digital S-meter ★ Attenuator ★ Key pad entry ★ 160 memories ★ Noise blanker.

OUR PRICE **£199.95**

SEND SAE FOR COPY OF REVIEW

R) ICOM IC-R75

The short wave receiver for the true enthusiast.

- 0.03-60MHz (all mode)
- Synchronous AM detection
- PC control capability.

2 YR G'EE

Optional DSP unit
£85.00

OUR PRICE **£589.99**

OUR BEST SELLING HF RECEIVER

SP-21 Extension speaker£74.99

S) AOR AR7030+ MODEL

A superb top of the range HF receiver. This plus model has certainly earned a name for itself. Enter the world of "professional" short wave listening at well under £1000.

OUR PRICE **£799.99**

T) JRC NRD-545DSP

The ultimate short wave receiver with DSP for the real perfectionist. This is JRC's latest professional receiver.

OUR PRICE **£1299.99**

NVA-319 Extension speaker£189.00
CHE-199 VHF/UHF converter.....£269.00

portable receivers

U) SANGEAN ATS-505

NEW! Wins Dutch "Automobile" award. Excellent small short wave receiver (digital). 0.15-30MHz (AM, USB, LSB, CW). 88-108MHz FM stereo. Includes carry case.

OUR PRICE **£89.95**

Optional power supply for ATS-505/ATS-909.....£16.95

V) 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.

(Optional PSU £16.95) OUR PRICE **£139.95**

W) SONY SW-100E

★ Miniature portable all mode SW receiver ★ Station presets for 50 frequencies ★ Single side band system ★ Synchronous detector ★ Tuning in 100Hz + 1kHz steps ★ Includes compact antenna/stereo earphones/carrying case.

OUR PRICE **£159.95**

ACE-30

Power supply unit for above£24.95

X) EVOKE-1

Using the latest third-generation D.A.B. technology, Evoke-1 delivers outstanding digital sound quality at an affordable price. A stylish, mains powered receiver without the normal hiss, crackle and fade of old AM/FM broadcast. Transform your listening.

OUR PRICE **£99.95**

Car DC lead.....£14.99 Optional spkr.....£29.99

■ Greg Baker, PO BOX 3307, MANUKA, ACT 2603, AUSTRALIA

■ E-MAIL: greg@pcug.org.au

Bandscan Australia

Outside my house as I write this, the air is thick with smoke and I can hear the sound of helicopters passing overhead on their way to mopping up Canberra's worst ever fires. In the weekend just gone, four people have died here, over 400 houses have been destroyed and the famous Mount Stromlo observatory has been reduced to ruins. The sewerage treatment works has been partially destroyed, many Canberra suburbs are without electricity and, for safety, the gas has been turned off in many areas.

In this period, radio has been the only reliable means of communication with the people of this city; the local Australian Broadcasting Corporation (ABC) a.m. radio station operating around the clock bringing news and messages. This time I have news of digital radio, pay television, the ABC, reception reports and a grab bag of other news.

Digital Radio

Digital radio for Australia seems to have fallen into a hole. Readers will recall my columns of a few years ago saying that Australia had settled on the European Eureka 147 digital radio standard. Although there have been some small-scale trials, large-scale trials have been continually postponed.

There is currently no legislation in place confirming the standard or outlining a timetable. Although Eureka 147 is the most mature standard, and the most widely used, some commentators are saying that the local industry is waiting to see how the US IBOC system will work out as it develops. They say that industry is not enthusiastic and government is indifferent to digital radio. It is said that more extensive trials will begin soon, but I for one am not holding my breath on that. And one commentator while saying that digital radio is inevitable, says that they don't expect it in the next ten years.

Music

Australian radio stations may soon be receiving their music for on-air replay via the Internet services of MusicPoint. A joint venture between broadcast station scheduling software company Radio Computing Services (RCS) and on-line digital rights management company Wired Entertainment, MusicPoint will allow sophisticated track management and the download of songs in broadcast quality to play lists through direct integration with existing RCS software.

The service replaces promotional CDs currently sent out by music companies, allows station music directors to listen to samples on-line and to download those they wish to add to their play lists. In addition, the system can download information about the artist and the music, saving station staff the effort needed to do this manually as it has been done. The two large commercial radio networks Austereo and DMG (Daily Mail Group) have adopted the system. These companies can be found at www.musicpoint.com.au www.rscworks.com www.wiredentertainment.com.au and www.dmgradio.com.au This development seems to be an Australian first and US companies are reported to be watching with interest.

Pay TV

The plans of telecommunications carrier Optus to introduce 120 digital pay television channels have been affected by the explosion in French Guiana of an *Ariane 5* rocket in December last. Optus had planned to insert its C1 satellite into orbit on the *Ariane 5*, but

now after this failure is looking to negotiate with Arianespace to shift the satellite to another launch vehicle. The C1 satellite has 24 transponders each carrying ten channels. It is planned that pay television will use the bulk of the transponders with the Australian Department of Defence picking up the rest.

ABC

National broadcaster, the Australian Broadcasting Corporation (ABC) has been making a pitch for increased funding from the government for the next three-year period. Recently appointed managing director Russell Balding has said that quality cannot be maintained without additional federal funding.

Funding priorities are reported to be digital services, Australian content and regional services. In addition, the ABC wants to bring its youth radio Triple J to small regional centres down to 10,000 population and to improve RA's Asia Pacific service. The ABC will not find out the result of its efforts to gain more funding until the federal budget due in May.

Commentators are pessimistic of the ABC's chances, pointing out that with preparations underway for war in Iraq, there will be little money available for other than defence related expenditures. The only possible chink in that view seems to be that minority representatives in the Parliament have indicated that they are prepared to support some of the government's more controversial media legislation in exchange for additional funding for the ABC and the Special Broadcasting Service.

The ABC local a.m. network has been having some successes too with their ratings particularly in Melbourne. Melbourne manager for ABC 774 has been reported as saying that the residents of Melbourne are showing a renewed focus on local programming with less attention to academics and politicians.

Sydney sister station ABC 702 has recorded its best figures in twenty years. ABC Television has fared well too with its highest ever audiences and a growth in listeners of 7.5%. In addition, ABC Online has achieved a 25% increase in web site traffic. ABC Online is at www.abc.net.au This also links into the Radio Australia (RA) web site www.abc.net.au/ra

Meanwhile, as another ABC board position becomes available, the bun fight is on again as to a suitable appointment. In the past, governments of all persuasions have tended to stack boards with their own political sympathisers. In this climate, it has been suggested that something like the British Nolan Rules be introduced. As I understand it, these are intended to remove political cronyism and get the best person for an appointment.



Reports

Michael Beesley from Romsey in Hants reports signals from RA and RNZI booming in using his Sony ICF-2001D and ICF-SW100 with a loft wire attached to telescopic antenna. He has heard RNZI on 15.175MHz at 1200 at SINPO 54544 and 11.675MHz at 0800 at SINPO 45444. RA on 11.660MHz at 1515 was at SINPO 44544; 15.415MHz at 0830 at SINPO 35333; 15.240MHz at 0800 at SINPO 34333; 21.725MHz at 0845 at SINPO 25222; 21.820MHz at 1200 at SINPO 35333 and 9.500MHz at 2015 at SINPO 44433.

Martyn Gardiner from Portsmouth has been checking out RA again using his Icom receiver. He reports RA on 21.820MHz at 1200. He has also heard a clear and readable signal from RA on 17.750MHz in the mornings.

David Hall from Northumberland has written again. He reports hearing Christian radio Voice International at 1230 on 13.685MHz. David has also heard Radio Australia on 9.475, 11.660 and 21.820MHz; he says that the best reception was on 11.660MHz at 1400-1500. David's gear includes an AOR AR7030 and a Ten Tec RX-350 connected through a Global AT2000 a.t.u. to a 14m long wire. David is also a scanning fan with a raft of scanners including an Icom R8500, a Uniden Bearcat and a Yupiteru MVT-8000.

Other News

The body representing commercial television stations in Australia has changed its name from Federation of Australian Commercial Television Stations to Commercial Television Australia. The re-branded organisations is still at www.facts.org.au

RA has celebrated 40 years of Vietnamese broadcasting and 10 years of Khmer broadcasting. ABC Radio, Television and what is called New Media have for the first time been co-located at the ABC Sydney CBD offices; until now television production was undertaken at the Sydney suburb of Gore Hill, close to ABC transmission masts.

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

There's Nothing New Under The Sun

John Wilson recently made some interesting discoveries which set him on a path of experimentation only to conclude that with antennas there is very little which is new.

Particularly when you talk about antenna design, and over the many years I have been involved with h.f.

communications in both my working life and my hobby interests, I have seen the same ideas coming up time and time again. Take the T2FD antenna; From its first appearance in the June 1949 issue of *QST* in the famous article by Countryman (that was his name, not his *nom-de-plume* as a journalist for the *Sunday Times*), the T2FD has regularly re-appeared as a new idea, and is still in the current Rohde & Schwarz antenna

catalogue as a 'TFD' meaning 'Terminated Folded Dipole'. I made my first T2FD in 1951 and tried it out as a transmitting antenna on Top Band (I was pirating, of course). Because at the tender age of 13 I hadn't understood the basic laws of physics which said that my T2FD at a total length of about 15 metres could not possibly work at 1.9MHz, I became disillusioned, and it was not until many years later that I understood just how useful the T2FD could be when properly designed. We all have to learn.

However, some years ago I acquired a very interesting folder

issued by Kolster-Brandes (K-B) in 1933, the contents of which were the complete servicing manuals for the K-B range of radios, with full circuit and installation information, all of which makes fascinating reading (well, it does to me). Included was a sample guarantee for K-B products which offered a full three months warranty on the radio, excluding valves, batteries, lamps and accumulators. Not only that, the purchaser had to arrange and pay for carriage to and from the K-B factory - and it was stipulated that the radio had to be shipped in a wooden crate filled with wood wool, with

no compensation for actual or consequential damage. These terms would make a dealer of today weep for the good old days before the *Sale Of Goods Act!!*

Rejectostat

Of the 22 radio receivers covered in these service sheets, the majority are referred to as having the 'Rejectostat' system installed, and there is a complete section describing the system in detail. Reading this section made me think again that there is nothing new under the sun, and I thought that you might find the technical details of an antenna from 1933

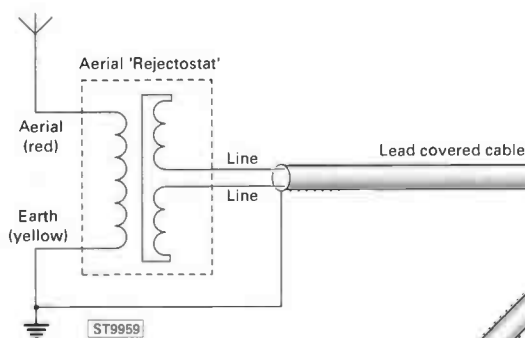
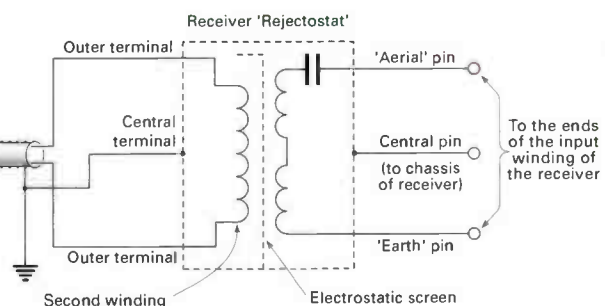


Fig. 1: The original 'Rejectostat'.

Fig. 2: The definition of 'one turn' of wire in the case of the twin aperture core.



quite fascinating, because the principles applied are still valid today, some 70 years later. Let me quote from the book:

"The purpose of the K-B 'Rejectostat' system is to enable radio reception to be obtained in places where interference previously rendered the programmes valueless. Throughout this section the word "interference" is used in the sense of parasitic noises heard in a radio receiver and caused by electrical machinery, neon signs, traffic signals, automatic telephones etc., and not in the sense of lack of selectivity."

So even in 1933 the problems of electrical noise were well known, and K-B were making real attempts to minimise noise from their receivers. How did they do it? Let's take another quote:

"Essentially, the theory is to use a completely and scientifically screened receiver (fitted with devices to prevent the entry of interference from the mains) in the field of the interference; and to erect the antenna in some place where the field of the interference is so attenuated as to be negligible. This is allowed by the 'Rejectostat' system, because the aerial and the receiver may be as much as several hundred yards apart without important loss being introduced. It is normally found that the greatest proportion of the interference is picked up by the vertical section of the aerial, both because it is vertical and

more suitable for collecting a locally generated wave, and because it usually approaches and even enters the building and it has been shown that the field of re-radiation of house lighting mains causes immense interference. With the 'Rejectostat' system the conventional vertical section may be eliminated if necessary."

Again you see that once you grasp the 1930's terminology, it was known (at least by Kolster-Brandes) that re-radiation from house wiring was picked up by a local antenna and transferred back to the receiver. Bear in mind that this was in the days when everyone had, or tried to have, a long and high wire antenna, with the antenna itself coming down into the house and connected directly to the receiver. Hands up all those who use this same system today, 70 years on! Note also, the reference to locally generated interference being vertically polarised, something which enthusiasts know to their cost. The basic idea behind the 'Rejectostat' is that the relatively high impedance at the end of a typical long wire aerial (remembering that for listening below about 10MHz the average 'long' wire will always be short relative to the wavelength), is fed to a transformer with a low secondary impedance suitable for feeding a low impedance transmission line. This allows the vertical section of the antenna system to be completely screened whilst minimising capacitive

losses which would occur if the transmission line were connected directly to the end of the antenna wire. The second part of the 'Rejectostat' system is the use of an isolating transformer between the incoming transmission line and the receiver itself, which is necessary to break the common mode ground loop to the a.c. mains supply to the receiver. Unless this is broken, electrical noise from the mains can be conducted via the chassis to the feeder screen and get back into the receiver through common mode coupling to the signal wire(s) inside the transmission line.

Starting Point

In the K-B text there are many illustrations of suggested installations for the 'Rejectostat' antenna, but one of the most interesting shows the feed point for the antenna at the end of the horizontal wire remote from the house, with the high to low impedance transformation taking place away from the noise sources of the dwelling, and the feed to the receiver being carried out at low impedance with a screened twin transmission line. At the receiver end an isolation transformer breaks the ground loop and transforms the low impedance feed up to a higher impedance for connection to the receiver. I found this all very interesting, but wondered how I could translate the system to today's use so that I could

determine whether or not the concept was of any value. The original circuit for the 'Rejectostat' is shown in Fig. 1.

My research was not helped by the lack of any real technical detail in the 'Rejectostat' information, but there was a table of resistance measurements which gave me a starting point. According to this table, the d.c. resistance of the high impedance side of the antenna transformer was 28Ω, which is actually quite high. What could this mean in turns of wire? Assuming that the r.f. transformer was air cored, which is reasonable considering that in 1933 high performance magnetic materials were not yet developed, I dug out some wire tables and looked at wire in the region of 35s.w.g. which is very thin, but typical of radio receiver coil construction in the early 1930s. Assuming a coil diameter which seemed to match the illustrations in the 'Rejectostat' literature, I used a modern r.f. simulation package to calculate a typical inductance for the primary winding. The values came out at between 500μH and 2mH so I took a guess at the middle and based everything I did on a primary inductance of 1mH. For an air cored coil with a d.c. resistance of 28Ω, this meant something in the region of 600 turns, but I didn't fancy winding a 600 turn coil of 35s.w.g., even assuming I could find a supplier for the wire. Neither did I want to wind several coils of this magnitude to enable me to carry

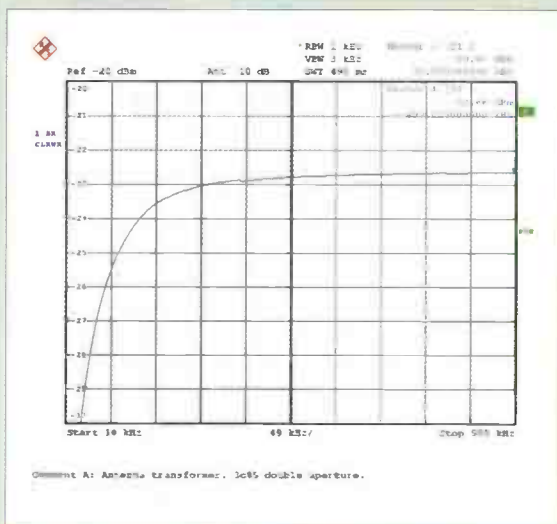


Fig. 3: The Rohde & Schwarz FSP-30 analyser plots for the response of the 3C85 transformer from 10 to 500kHz.

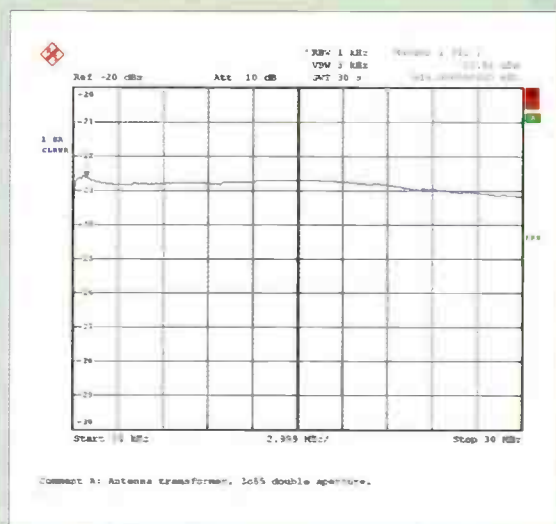


Fig. 4: The overall response to 35MHz of the 3C85 transformer. Using a Rohde & Schwarz FSP-30 analyser.

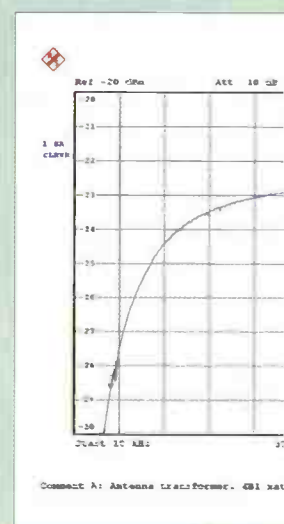


Fig. 5: Rohde & Schwarz FSP-30 analyser plots for the response of the 4B1 transformer from 10 to 500kHz.

out any practical investigations, but fortunately for me (and you) modern ferrite materials came to the rescue. But even this led me into the swamp!

The Requirement

What did I want to produce? Basically an r.f. transformer which would work satisfactorily over the frequency range of 10kHz to 30MHz, with a primary (antenna) inductance of around 1mH and a turns ratio primary to secondary of 4:1 giving an impedance ratio of 16:1. I didn't want to follow the costly 'Rejestostat' principle of having a balanced twin transmission line between the antenna and the receiver, so assuming I used 50Ω coaxial cable for the transmission line this gave a primary impedance of 800Ω; quite in line with what we find in practice at the end of a (short) long wire. The attraction of high permeability ferrites is that you need only a few turns of wire to get the kind of inductance required, and although ferrite data can be very complicated to understand, most suppliers use the term AL to indicate the number of turns of wire you need to achieve a specific inductance. AL is normally (but not always) given as a figure in nanohenries per turns squared, so for example with a core having an AL of 1000, a five turn coil will have an inductance of $25 \times 1000\text{nH}$ which is $25\mu\text{H}$. That's a long way from the required 1mH so let's try

a 30 turn coil on the same core, which gives $900 \times 1000\text{nH}$ which is 900 microhenries and more like the value we want. If you want to pursue some transformer winding yourself, don't get confused by the other commonly quoted parameter for ferrite materials, which is 'initial permeability'. This is a characteristic of the actual ferrite material itself, whereas the AL value applies only to a particular core size, even though the ferrite material may be the same. As an example, and taking my information from manufacturer's data, a 0.23 inch toroid in ferrite material 75 which has an initial permeability of 5000 has an AL of 990. A 0.5 inch toroid of the same material has an AL value of 2750, which means that for a wanted inductance of 1mH you need 32 turns on the smaller core compared with 19 turns on the larger core.

Which Ferrite?

As for the ferrite material to choose for the job; here we come to another interacting set of figures. Looking again at manufacturer's data you will find that the higher permeability materials are specified for low frequency use up to a few hundred kilohertz, whereas the low permeability materials are those recommended for h.f. and v.h.f., with mention of 'antenna baluns' and so on. However, for the purpose of making an antenna system which will work

at low frequencies we need the high permeability, because this will give us a transformer with relatively few turns in order to achieve the high primary inductance, but how will this work at higher frequencies? The answer is that when we get to frequencies beyond the normal range of the ferrite material, we still have a 16:1 transformer whether or not the ferrite is working, and with the right choice of permeability against transformer turns we can actually get a fairly flat response over a wide frequency range.

Time For Some Experiments

My method of choosing a range of ferrite samples was highly scientific; I looked in the RS and CPC catalogues to find what was readily available and bought some to try out. This is known as pragmatic engineering, otherwise called 'suck it and see'. Having got the samples, I wound a standard number of turns on each one and trotted off to the calibration lab to measure the inductance, and from that I could get the true AL value for the particular core. Note that AL values are often quoted as being $\pm 20\%$ or more, so measurement was the best way to establish the AL of the sample. All the cores I initially bought were of the 'twin aperture' type, which look rather like a miniature pair of binoculars. As with all toroidal cores, the definition of 'one turn'

of wire is a single pass of the wire through the core, but in the case of the twin aperture core, the manufacturers quote the AL value referenced to two passes through the core. I can just imagine the confusion, so take a look at **Fig. 2**.

I started with two twin aperture cores bought from CPC and listed as ferrite materials 3C85 and 4B1. Checking the characteristics of these two materials reveals that 3C85 is listed as obsolete, but in fact is still available from many suppliers. 3C85 and the recommended replacement 3C90 are quoted in the Ferroxcube catalogue as "Standard low frequency (up to 250kHz) power material". 4B1 material on the other hand is quoted as "Medium permeability NiZn ferrite for use in wideband EMI suppression (30 to 1000MHz) as well as r.f. tuning, wideband and balun transformers". Initial permeability of 3C85 is given as 2000 at 25°C, with 4B1 at a permeability of 250 at the same temperature, so I definitely had two quite different materials, and on the evidence of the catalogue description the 4B1 should have been the better bet. My other chosen twin aperture core came from the RS catalogue and is listed under part number 212-0594 with material given as EPCOS K1 with a quoted AL of 190. I chose this core because the K1 material is the equivalent of 4C65 which is widely used in h.f. power amplifiers and many EMC

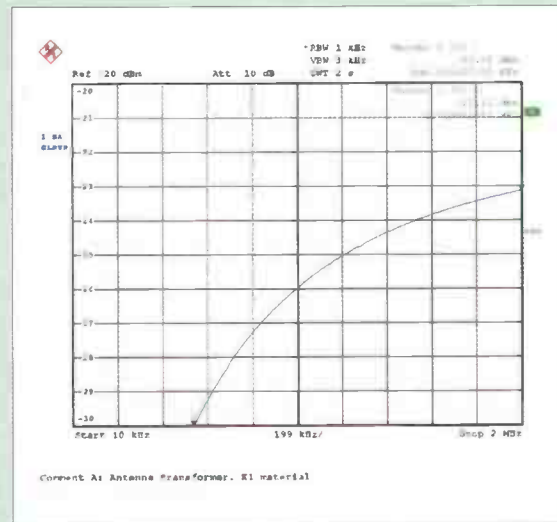
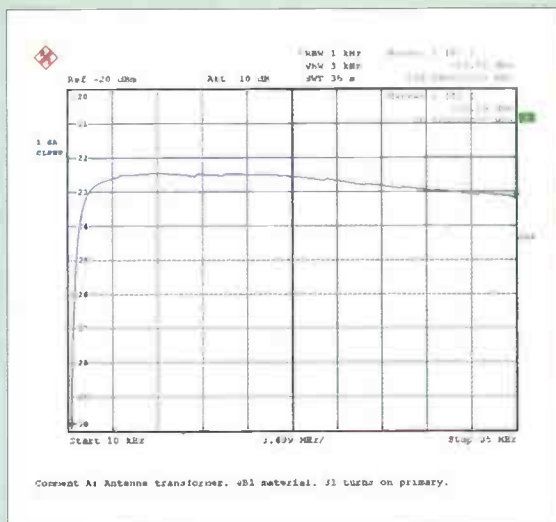
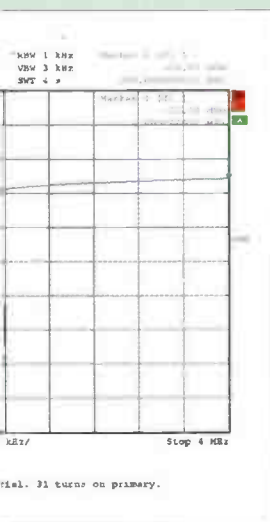


Fig. 5: The overall response of the 4B1 transformer.

Fig. 6: The overall response to 35MHz of the 4B1 transformer. Using a Rohde & Schwarz FSP-30 analyser.

Fig. 7: The I.f. response of the 4C65 transformer.

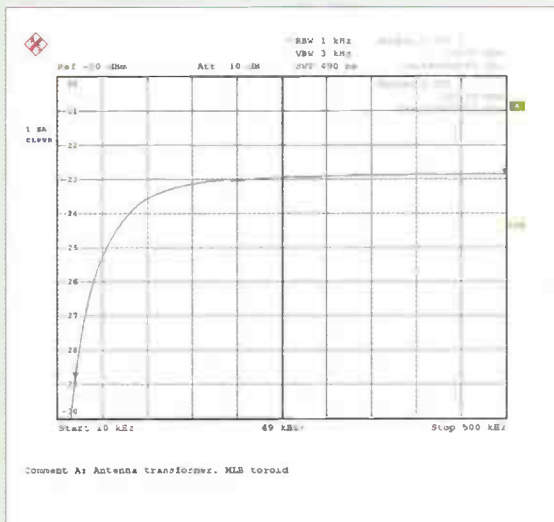


Fig. 8: Plots to 35MHz of the rewound MLB using the original winding configuration



Fig. 9: The I.f. response of the rewound MLB.

impedance determining networks. Once again I thought that an h.f. ferrite would be the logical choice for my application. Later on I also tried out the RS part number 212-0617 which is an EPCOS N30 material with an AL of 10,000, and a toroidal core, part number 212-0825 with a quoted AL of 5110 (material T38). Gets complicated doesn't it?

The calibration lab results for each core showed that the 3C85 had an AL of 5000, the 4B1 an AL of 400, the 4C65 (K1) an AL of 190 and the T38 and N30 I didn't check because by the time I reached them in the sequence I was fairly happy with the RS quoted figures for AL and took it on trust. Starting with the 3C85 I wound 4 turns for the low impedance (50Ω) secondary directly on the core and then 15.5 turns over the top of this for the high impedance antenna side. I always use enamelled wire-wrap wire for this type of winding because it is easy to handle, has good resistance to abrasion of the enamel, and can be 'soldered-through' with a very hot soldering iron, but being careful not to inhale the fumes from the melting enamel because it's toxic. CPC sell this wire as 'wiring pencil wire' in packs of four 34 metre spools for £6, which means you buy a lot more than you need, but think of all the transformers you can wind! Part numbers CBO 1211 (copper coloured) and CBO 1213 (pink coloured), and the two colours make it easy to distinguish one winding from another.

I wound the 4B1 and 4C65 (K1) cores with the same number of turns, accepting that they would have a much lower primary inductance than the 3C85 core, and then made some measurements by carrying out swept frequency response curves using a Rohde & Schwarz FSP-30 analyser. I used resistive padding on the high impedance side of the various transformers to simulate the correct input and output impedances, and the results were very interesting. The plot **Fig. 3** shows the response of the 3C85 transformer from 10 to 500kHz, with a 6dB I.f. point at 30.6kHz. Where as **Fig. 4** shows the overall response to 35MHz of the same transformer and is flat within 0.5dB from 500kHz to 35MHz. Plots **Fig. 5** and **Fig. 6** show the comparative response of the 4B1 transformer, and you can see the much poorer I.f. response using this ferrite, and the greater h.f. 'droop' across the whole band. The I.f. response of the 4C65 transformer can be seen in **Fig. 7**, and it is obviously not performing at all well below 2MHz, so out it goes. It has to be said that the primary inductance of the 4C65 transformer is much too low to perform well, but my objective was to duplicate the 'Rejectostat' with the minimum of effort, not to wind 72 primary turns on a small twin aperture core in order to get the 1mH inductance.

MLB Sacrifice

At this point it struck me that the 'Rejectostat' system had been

duplicated by the various 'long wire balun' manufacturers, so I sacrificed my MLB long wire balun and broke it open to see what ferrite was being used in there. I stripped the windings from the toroid, counting them on the way of course, and measured the AL to be so close to the figure for the 3C85 that I couldn't help thinking that it was probably the same material. There were 27 turns on the high impedance side and 9 turns on the low, giving an impedance transformation of 9:1, and the primary inductance worked out at $971\mu\text{H}$ which is also very close to my 'guesstimate' figures for the 'Rejectostat'.

I then rewound the MLB using the original winding configuration and repeated my measurements on it, with the results shown in **Fig. 8** and **Fig. 9**. If that isn't identical to the 3C85 I don't know what is, so my conclusion is that the MLB (and probably its derivatives) are nothing more than a modern 're-discovery' of a 1933 idea. Now you know why the title of my article is 'Nothing New Under The Sun'.

Ferrite Ferreting

As an aside, I found a very useful web site at www.xs4all.nl/~barendh which belongs to a Dutch company called Hendriksen HF Electronics, and is full of useful components including lots of ferrite toroids. I was interested to see that they list an FT50-75 toroid (0.5 inch diameter, type 75 material)

described as "Original Long Wire Balun Core". The price quoted is equivalent to about £1.25, but you can get the 3C85 twin aperture core from CPC for £3 for a pack of 10, and at 30p each they make the various commercial 'long wire baluns' look mighty expensive.

Having got well into this 'ferrite ferreting' I carried on with the various cores available from RS Components (Radiospares if you are as old as me) and rather than bore you with lots more response plots, I found that their part number 212-0825 produced virtually identical results to those of the 3C85 and MLB cores, whilst their 212-0617 with a quoted AL of 10,000 was not so effective with the correct number of turns on it to give my target 1mH inductance. The response at 500kHz was 1dB down on the 3C85, and the 6dB I.f. point was at 50kHz rather than the 30kHz of the 3C85. However, when I rewound this core with the same 15.5 primary turns as the 3C85, which gave a calculated 2.4mH primary inductance, I got the results shown in **Fig. 10** and **Fig. 11**. The low frequency response extended down to 10kHz, and the h.f. response, although down a bit at 35MHz was almost as good as the 3C85.

Now to the other wound component in the system, which is the matching transformer at the receiver end. We have to remember that the original 1933 receivers had a relatively high input impedance, since the radio had to work with 'normal' antenna of the period. The

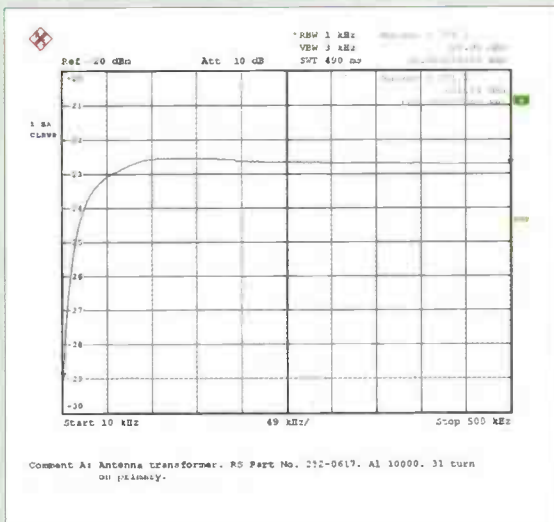


Fig. 10: The RS 212-0617 h.f. response almost as good as the 3C85.

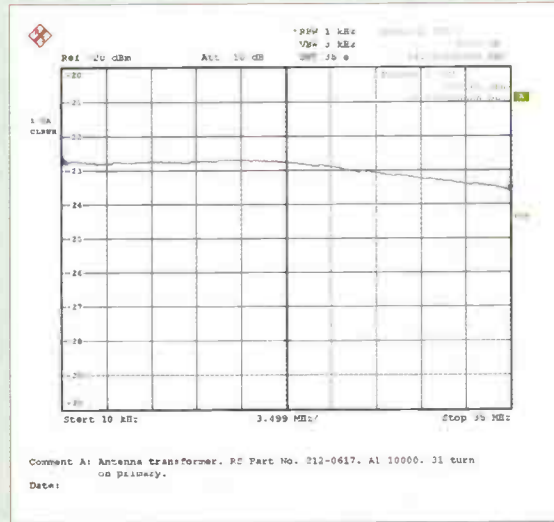


Fig. 11: The RS 212-0617 with extended response to 10kHz.

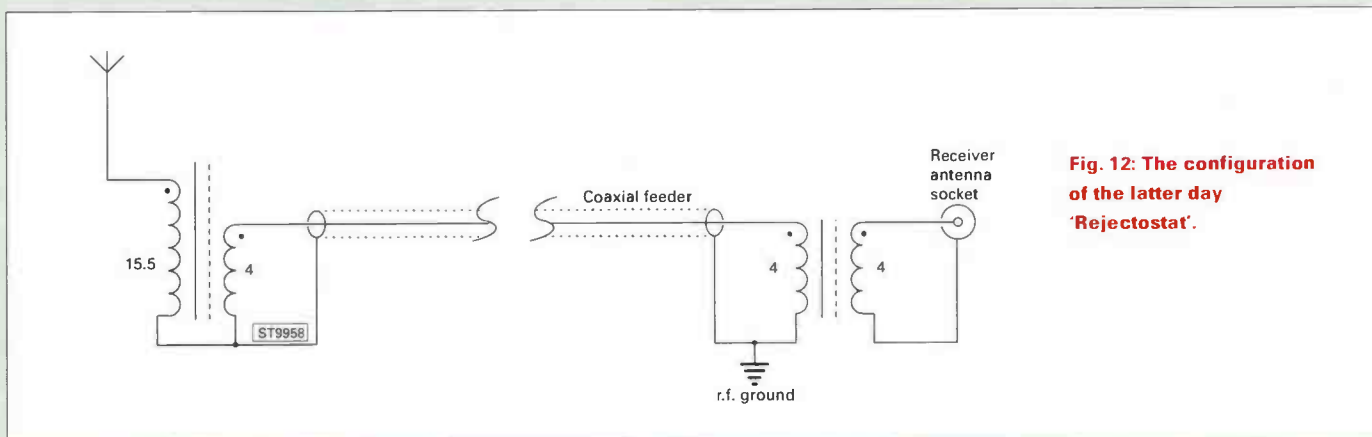


Fig. 12: The configuration of the latter day 'Rejectostat'.

'Rejectostat' transformer at the receiver therefore was a step-up impedance match from the low impedance feeder from the antenna system to the input of the receiver, the exact ratio being difficult to determine. Since the receivers we all use now tend to have a 50Ω input impedance, using the transformers I have described it would be possible to feed the coaxial cable from the antenna directly into the receiver, and in fact that is what is normally recommended by the 'balun' manufacturers. However, this removes one of the major advantages of the 'Rejectostat' in the removal of noise injected by common mode coupling from the mains earth system, and to complete the picture we need a 1:1 r.f. isolating transformer between the incoming coaxial feeder and the input socket of the receiver, with the screen of the coaxial cable connected to a good r.f. earth and not connected to the chassis of the receiver and thence to the mains earth line.

Using a matching core type to the one at the top of the antenna, wind an 4-turn primary and 4-turn secondary on the core, using one winding for connection to the receiver and the other for connection to the incoming coaxial cable. Take the outer screen to a good r.f. earth, such as a copper spike in the ground, and keep this winding isolated from the chassis of the receiver. That's it! You have a duplicate of a noise reducing antenna system designed in 1933 which works. I know, I have tried it out myself at home and the results were very good indeed.

Have A Go!

If you fancy having a go at making this antenna system, I would recommend using twin aperture cores made from 3C85 or equivalent material. For extended l.f. listening, the RS Components 212-0617 (EPCOS N30) core is brilliant, and still performs well all the way to 30MHz. Construction can be very

easy if you use either a waterproof plastic enclosure of the type readily available at electrical wholesalers, or the classic diecast box, and the whole lot with enough spare bits for extended experimentation can be had for a lot less than you would pay for a manufactured 'balun'. After all, there's nothing to these baluns apart from a 30p core, about half a metre of wire, and a couple of plastic plumbing fittings to house it all in. Finally, why use 15.5 turns rather than 16? Simple; if you wind 15.5 turns on a twin aperture core, the ends of the winding come out on opposite sides of the core which makes the perfect physical arrangement for connection between the low impedance input side and the high impedance antenna side of the transformer. Go on; buy a soldering iron and have some low cost fun!

SWM

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E-mail: barendh@xs4all.nl

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- 25 - 1300MHz with gaps
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- 10 Priority channels
- Twin Turbo scan & Search
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- BNC Flexible Antenna
- Leatherette case
- Earphone

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- NFM, AM (Airband)
- 200 memories
- 10 Priority channels
- 5/12.5kHz channel steps
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- AC Charger
- BNC Flexible Antenna
- Earphone

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UNIDEN-BEARCAT UBC-220XL



- 66 - 956MHz with gaps
- NFM, AM (Airband)
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- 100 Ch/sec scan speed
- Priority channel
- 4.8V 600mAh Ni-Cd int.
- AC Charger
- BNC Flexible Antenna

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UNIDEN-BEARCAT UBC-120XL



- 66 - 512MHz with gaps
- NFM, AM (Airband)
- 100 memories
- 10 Priority channels
- 5/12.5kHz channel steps
- Data skip (lockout channels)
- 4.8V DC Int. battery
- BNC Flexible Antenna
- Earphone

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- 66 - 512MHz with gaps
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- 5/12.5kHz channel steps
- Data skip (lockout channels)
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- 25-1300MHz with gaps
- NFM, WFM, AM
- 500 memories
- Analogue Trunk Tracking
- Alphanumeric display
- Automatic Tape recorder option
- Antenna BNC
- 13.8V DC 700mA

£349 C

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- 25-1300MHz with gaps
- NFM, WFM, AM
- 500 memories
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- 530kHz - 2040MHz
- FM, AM, SSB, CW
- 1000 memories
- Tuning steps programmable
- 8.33kHz airband spacing
- RS232 PC interface fitted
- Power 10.8-16V DC
- Telescopic Antenna
- Optional slot card sockets

£679 C

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- 100kHz - 2599MHz
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- 2000 memories
- Large digital display
- Real-time band scope
- DSP Noise & notch filters (Opt)
- Super HF performance
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YAESU VR-500 YAESU 2 YR WARRANTY



- 100kHz - 1300MHz
- NFM, AM
- 1000 memories
- 100 Skip channels
- Smart search feature
- 8 character Alphanumeric display
- Band scope
- PC programmable
- Flexible Antenna

£199 B

WINRADIO G303i NEW

HF PC RECEIVER
9 kHz to 30 MHz

See Review in February
Short Wave Magazine

*Tuning resolution: 1Hz *Modes: AM, AMN, AMS, CW, FM3, FM6, FMN, (ISB & DSB, Pro Demodulator Option only) *Antenna: 50ohm (SMA) *Dynamic Range: 95dB *IP3: +8dBm

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AVAILABILITY"

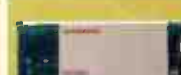
WINRADIO WR-1550E PC RADIO



- 150kHz - 1500MHz
- AM, NFM, WFM, SSB, CW
- Limitless memories
- Built-in speaker
- RS-232 Interface (D9)
- Requires PC (not included)
- BNC Antenna connection
- AC Mains adaptor
- Start-up Antenna

£479 B

WINRADIO WR-1550I



- 150kHz - 1500MHz
- AM, NFM, WFM, SSB, CW
- Limitless memories
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- Sound through PC system
- Power from computer
- BNC Antenna connection
- Start-up Antenna

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ICOM IC-R5 NEW



- 150kHz - 1310MHz
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- Flexible Antenna

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- Telescopic Antenna

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- 500kHz - 1300MHz
- AM, FM, WFM, SSB, CW
- 1000 memories
- 14 tuning steps
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- 4.8V DC Ni-Cds
- Flexible Antenna

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ICOM IC-R75 "BARGAIN SW RECEIVER"



- 300kHz - 60MHz
- USB, LSB, CW, AM, FM
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- Clock

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- BNC Antenna connector
- Requires PC (Not included)
- Radiocom software supplied

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OREGON SCIENTIFIC BAA 898 HG NEW



The BAA898HG Wireless Weather Station offers more info than ever! Weather, temperature, pressure trends as well as pressure readings, history and max and min readings. Operates with up to 3 remote thermo-hydro sensors, one supplied. *Wireless freq. 433MHz *Main unit 195x105x77mm, 4xAA cells *Remote unit 92x60x20mm, 2xAA cells. Optional Thermo-Hydro Sensor:THGR228N

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- WS antenna, 5m cable
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W&S 2003 CATALOGUE !!

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Following on from my previous look at 2.4GHz monitoring in January's *SWM*, I thought it might be interesting to have a look at some of the other traffic in the 2.4GHz ISM band. We'll also take a look at an active 2.4GHz antenna that has been seen in quantity at radio rallies in the UK. Some advances have been made in controllers for the Comtech Modules, and we'll also be looking at a prototype controller, which really does turn your receiver into a fully functioning scanner.

from *Kismet*. In the picture, the 'W' column indicates the network is encrypting the over the air data, and therefore, decoding is not possible. The *Kismet* software is a very useful tool for detecting wireless LAN traffic, but bear in mind that many other standards for use of the 2.4GHz band exist, including the following:

Usage Type	Data Rate
Home RF	1.6Mbps
802.11	2Mbps FHSS
Bluetooth	<1Mbps FHSS
RangeLan	1.6Mbps

a domestic 2.4GHz video-sender for example.

With a Symbol 2Mbps FHSS card and some free DOS software, it is possible to turn your PC into a reasonable 2.4 to 2.5GHz spectrum analyser - ideal for locating those signals that you would otherwise miss. A typical screen shot of the output of this spectrum analyser software can be seen in **Fig. 2**.

Active 2.4GHz Antennas

The recent interest in satellite telephony systems has led to some interesting equipment surfacing on the surplus market. One item of interest that has been seen at most of the recent UK amateur radio rallies was being sold as a d.c.-1GHz active scanner antenna. Closer inspection revealed that in fact the antenna would be useless under around 2GHz due to internal band pass filtering. You can see a sample of the antenna in **Fig. 3**.

These antennas are marked 540001 Rev A - be careful to pick the right one as they normally come as a TX/RX pair. The transmit antenna is not active and is centred on 1.6GHz - the wrong frequency entirely. The antenna specification

More 2.4GHz Video Monitoring

Long term video and microwave enthusiast Alexander James is back this month, with more hot information to aid microwave video monitoring success.

Wireless LAN Traffic

In the January feature, I touched on the fact that the majority of wireless LAN devices available today conforming to the IEEE802.11b standard use the 2.4GHz band for their transmissions. Looking at an active wireless LAN channel with a video receiver will result in a random selection of horizontal lines to correspond with the burst type traffic. How can you go about determining what this traffic is? Simply put, you need to use a wireless LAN card in r.f. monitor mode - and software to allow this is freely available on the Internet. Be aware, it should be noted that unauthorised connections to wireless networks could violate the computer misuse act.

The most suitable wireless LAN cards for r.f. monitoring are based on Intersil's Prism2 chipset, and certainly most of the cheaper cards will use these. In conjunction with some *Linux* software called *Kismet* available from www.kismetwireless.net it is possible to sniff wireless LAN data over the air. In **Fig. 1** you can see a typical screenshot

The use of a wireless LAN sniffer set-up can be of great help in identifying a potential interfering source when using

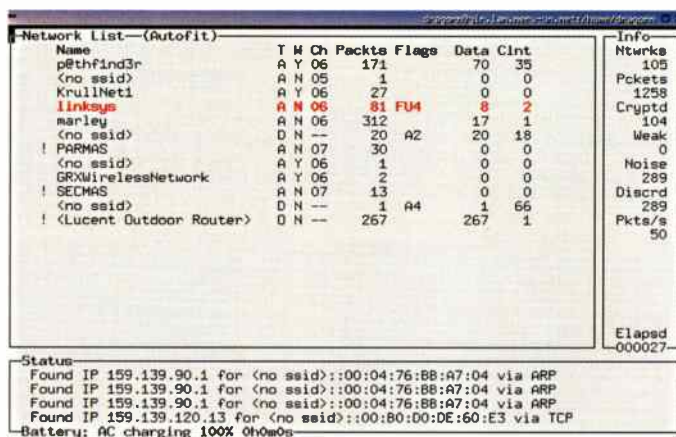


Fig. 1: WLAN Monitoring software *Kismet* displaying wireless nodes.

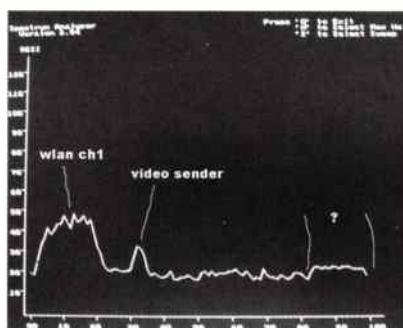


Fig. 2: A 2.4GHz ISM band spectrum plot.



Fig. 3: A useful 'surplus' active antenna obtained from a radio rally.

states that it has 26dB of gain with a reasonable noise figure of 1.4dB.

Out of the box, this useful antenna covers 2.483 to 2.500GHz due to the use of a band pass filter on the preamplifier board. On removing this filter, not only does the noise figure improve, but also the frequency coverage increases from around 1.2 up to 3.5GHz with a reasonable amount of gain. Power for the unit is fed up via the coaxial feeder, and this can be achieved very easily when using a Comtech board as the provision for this already exists. The radiation pattern of this antenna is left-hand circular, but don't let that put you off - the use of antennas with circular polarisation seems to help stop much of the usual multi-path interference problems when receiving video from airborne sources. Using this antenna as a dish feed would allow the reception of right-hand circular polarity signals, including the amateur radio satellites that operate at 2.4GHz.

Prototype Receiver Controller

If you recall, I mentioned in the first 2.4GHz article, that the superb Comtech receiver cards - such as those available from www.g1mfg.com only have very rudimentary control facilities which can render their use rather awkward, especially for those of use who have cut our monitoring teeth with rather more sophisticated receivers. What is needed is an effective user interface to simplify the entry of frequencies and other extended functions such as memory management, scanning and so on. Efforts are being made by some enthusiastic users of these cards, to produce a controller for the 1.3 and 2.4GHz receiver boards, that gives functionality similar to that of the all too familiar v.h.f./u.h.f. scanner.

The prototype controller **Fig. 4**, supports both the 2.4GHz receiver and transmitter boards, so it's also of interest to Amateur TV enthusiasts, and has a number of facilities that prove useful to the video monitoring enthusiast. Firstly, it provides a proper tuning knob which



Fig. 4: A prototype controller for the Comtech receiver cards.



Fig. 5: Internal 2.4GHz camera.



Fig. 6: Fixed External camera.



Fig. 7: Steerable external.

allows tuning and fast menu option access. The four soft keys under the liquid crystal display to select the various functions of the controller provided extended features.

Additionally, there is provision to allow for video recorder control which supports unattended operation when scanning or searching the band. Also, and rather usefully, computer control is



Fig. 8: Wireless in-store surveillance.

also possible via the built in serial port.

I've had some readers attempt to contact me to discuss the January feature. I'm happy to offer advice if I can, all I ask is that you address queries via the SWM Editorial Offices and provide return postage if you require a written reply. That's it from me until next time.

SWM

Web Watch

www.geocities.com/radproject.geo/2.4colinear.jpg A nice collinear antenna design.

www.frars.org.uk/cgi-bin/render.pl?pageid=1071 Another collinear antenna variation.

www.astroteleurope.com A source of S-band down converters in the UK is Astrotel.

www.videoscanner.co.uk UK company offering an all in one solution for 2.4GHz video monitoring.

G1MFG.com *The best amateur television gear in the world...*



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Read the review in this issue!

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- SMA - BNC RF i/p adapter£2.95
- 13cm rubber duck antenna£9.00
- 13cm mag-mount (5dBi)£55.00
- Phono - Phono AV leads£3.50
- Phono - SCART AV lead£4.95
- Mains 12V power supply£6.50
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See review in October 2001 *Short Wave Magazine*

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You can win a G-303i as reviewed in last month's SWM. This exciting Software Defined Radio has been donated by Falcon Equipment and Systems, the UK agent for WINRADIO.

Win a WINRADIO



**Worth
£369!**

Did you read John Wilson's extensive review of the G-303i last month? If so, you'll know that John said he'd rather own a G-303i than the computer controlled Rockwell Collins 95S-1 costing almost £6000 - a fine recommendation indeed.

Here's your chance to win this exciting new receiver

The G-303i is not a wideband device but a 'proper' h.f. receiver specified to cover 9kHz to 30MHz, and equipped with all the facilities which we have come to expect from a modern receiver. Some lateral thinking by WINRADIO Communications has resulted in their analysis of a typical receiver as consisting of three demodulation and signal analysis elements, nowadays often carried out by digital signal processing (d.s.p.), and a processor controlled management system which drives the whole receiver including the frequency synthesis for

frequency conversion and any front panel displays and so on. WINRADIO Communications have essentially separated sections; the r.f. and i.f. conversion elements, they point out that anyone with a semi-decent computer already has the processing power, and, with a reasonable sound card fitted, also has the d.s.p. system. For a competent, fully featured h.f. receiver plug the G-303i card into your PC, install the software and off you go.

To enter the WINRADIO G-303i prize draw, simply complete the entry form below answering the three questions and post your entry now.

Many thanks to the UK agent for WINRADIO **Falcon Equipment and Systems**, for the donation of the G-303i as a prize. They can be contacted by 'phone: **(01684) 295807** or E-mail: **winradio@sda-falcon.co.uk** For more details on the WINRADIO products, news of new developments, distributors in your home territory and software downloads visit: **www.winradio.com**

Good luck!

Entry Form

To enter this prize draw, please fill in your details on the entry form, (photocopies can be accepted with the original corner flash attached), answer the three questions and post your entry to: **SWM WINRADIO G-303i Competition, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW.**

Name

Address

Tel:

E-mail:

Do you receive SWM every month?:.....Where do you buy SWM?:

Q1: What is the first i.f. frequency for the G-303i

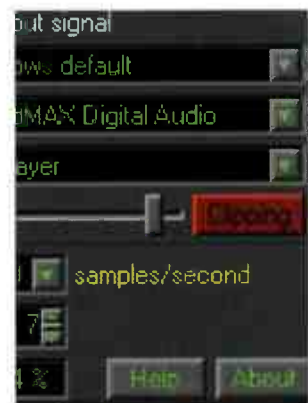
Q2: How many demodulators are available for the G-303i

Q3: What is the minimum host processor clock speed required for the G-303i

The closing date for this competition is 27 March 2003, the winner will be drawn on 6 April 2003 - the first correct answer drawn will win.

The winner will be announced in the May 2003 SWM. The Editor's decision is final.

If you wish not to be contacted by PW Publishing Ltd. or associated companies please tick here.



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With only subtle performance enhancements marking the release of AOR's top flight hobby receivers, the AR8200 hand-held and the AR8600 base, come transportable, we decided against a full technical review, having previously fully covered both sets in *SWM*. Peter Bond was delighted to give the newly revitalised sets an extended session at his airband monitoring post.

Well, Christmas came a bit early for me in the form of a brown box that was delivered during December. The contents were the latest offerings from AOR, the AR8600Mk2 and the AR8200Mk3. Sadly, unlike those items brought by Santa, these radios will have to be sent back! The brief from the Editor was to give them the once over and report back on their overall specifications and performance with perhaps a bit of bias towards the airbands.

AR8600 Mk1 & 2

Firstly, it is necessary for me to 'declare an interest' here. After *Short Wave Magazine* were loaned the original AR8600 for review a couple of years ago, I managed to retain it for an extended personal evaluation and as a consequence, I liked the radio so much I bought one! As it is now in use almost

every day, you could say that I am a bit biased, but then I do know it inside out!

I am not going to go into the radios' specifications at great length as it would take up more space than I am allowed, but I do think a reasonable résumé is in order. The AR8600 (Mk1 and Mk2), is a compact little set, measuring just 155 x 57 x 197mm (w x h x d). Because of its size and with a weight of just 1.8kg, including the optional battery pack, it has largely replaced my MVT-7100 hand-held on trips out and about. My set has the optional BP8600 battery pack fitted which gives up to four and a half hours use, plus the AR8600 is easy to operate from a vehicle's lighter socket. The AR8600Mk1 frequency range is 530kHz to 2040MHz, frequencies can be entered down to 100kHz but performance is not guaranteed below 530kHz. On the AR8600Mk2 the performance is guaranteed down to 100kHz,



A Fine P

and the frequency range has been extended to a very useful 3.0GHz, this is the first of the obvious changes between the two models.

There are a 1000 memory channels arranged as 20 banks of 50, these banks can be linked and scanned in a number of ways and are very flexible to use - very useful for the airband and other frequency bands. The banks are designated as (A to J) and (a to j), with each upper and lower case bank linked by the same alphabetical letter. This link enables you to move blocks of 10 memories between each pair of banks with the total always being 100. For example, as banks A and a are linked if you wanted to put all your London Military frequencies into one bank, you could move 30 memories from bank a to A, giving you 70 in A and 30 in a. This is perhaps not quite as flexible as a cut and paste system, but is still gives you the ability to tailor the

bank sizes to your own requirements.

For my listening needs, I find that a 1000 memories is more than enough, but if you really are memory hungry, then you can add the EM8200 optional extended memory card which enables you to store four separate sets of 1000 memories which can be copied to and from the card as required. This download facility also allows you to dump your 1000 radio memories onto the card leaving the radio with empty memories - handy if you want to avoid prying eyes! There are 40 Search banks, each of which can be programmed with their own settings, (A to T and a to t). These search banks can be linked together, so if you wanted to search both the civil and military airbands, you can. Each of the 40 search banks allows you to lock out 50 unwanted pass channels. During the search you can also 'Autostore' active frequencies



air!

into bank J which is pre-set to 50 memories but can be increased to 90 using the radio's memory bank resizing.

Modes

There are nine receive modes which include Wide, Narrow and Super Narrow f.m., Wide, Narrow and Standard a.m. - u.s.b., l.s.b. and c.w. Tuning steps are also very comprehensive with 17 settings available from 0.05kHz through to 100MHz, including 8.33MHz for the airbands and 9kHz for the Medium Wave. A user defined step setting is available offering from 50Hz to 999.95kHz.

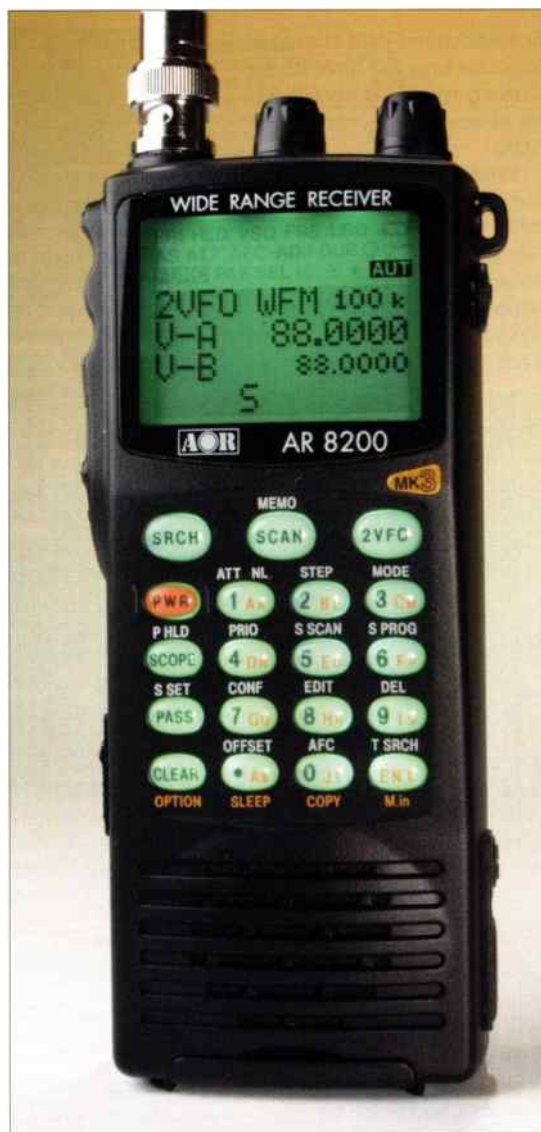
All the expected facilities are available and more, Twin v.f.o.s, Alphanumeric memory and bank labelling, Variable delay, Frequency offsets, Attenuator, Automatic Frequency Control, Priority Channel, Quick Memories, plus many others. In fact, a large number of parameters can be

changed on this radio to suit an individual's needs, perhaps more than most of us will ever use. Apart from the optional Memory card, four other cards are available, which are: (1) Tone eliminator, (2) CTCSS Tone search card, (3) Voice inverter, (4) Record and Playback card - Records 20 seconds of audio. Unfortunately, limited space means I cannot go into the operation of these cards in detail. All in all, this is a highly specified radio that can be set up to the requirements of almost everyone's listening interests.

There are two aspects of the AR8600 that has brought some slight criticism from several people I have talked to, (and with which I have to agree). The first is the closeness of the keyboard buttons which can lead to input errors especially when entering a frequency quickly, (if you have clumsy fingers like me). The second and the most commented on is the need for multiple key

presses to select some functions. Admittedly, you do get used to it, but at times it can be frustrating if you want to enter a new frequency in a hurry.

I assessed the performance of the AR8600Mk2 not only on the airbands but also on a variety of v.h.f. and u.h.f. bands between 40 and 1000MHz, the overall performance was good to very good. The sensitivity is good, pulling in some fairly weak signals and is not too far behind the performance of base stations costing around twice the price. On certain v.h.f. bands it did suffer from a small amount of intermodulation, but certainly no more than other radios in a similar price range and in many cases much less, the image rejection is also good. The audio quality was very clear, with minimal distortion even with volume turned up and there is plenty of power to drive an external speaker. I was



impressed with the performance of the AR8600Mk1 on v.h.f. and u.h.f. and this assessment continued with the Mk2, to be honest I could not tell any noticeable difference between them.

Other Enhancements

So, what are some of the other enhancements which have been added to the AR8600Mk2? The addition of a dimmer to the display lamp is useful, especially as I often listen at night and have to put a filter over my Mk1 to avoid waking 'her indoors'. A range of dimmer levels say between 1 and 5 rather than just On and Off would have been preferable. A squelch operated lamp has been added to the AUTO configuration, so that the display will be illuminated when the squelch opens as well as when the keys or controls are operated. There has been a re-assignment of the pins on the ACC Socket so that audio output is now squelch controlled via pins 6 and 7. In scan LEVEL squelch the link between the squelch level and the signal strength has been recalibrated. This is a facility where you set the squelch to only open above a pre-set level.

AOR point out, within the manual, that the AR8600Mk1 is not expected to give the sort of h.f. performance that a dedicated set can provide, this essentially is a wideband v.h.f./u.h.f. receiver that has h.f. capability. My experience with u.s.b. below 28MHz was that a long-wire or my active loop both overloaded the Mk1 dramatically. Even using the 10dB Attenuator, I found it difficult to get a balance to allow the reasonable reception of signals mainly because of intermodulation from a.m. broadcast signals. By changing to a relatively short 5-6m length of stranded wire with a BNC plug attached did reduce the input signal, but some overloading was still present even with the Attenuator on. Nevertheless, this did allow reception of strong signals such as the RAF Volmet and Shanwick Oceanic, but still the performance was only average mainly due to the broadcast station induced intermodulation.

By comparison, the AR8600Mk2 has had short

wave performance enhanced by the addition of further bandpass filters and selection of alternative i.f. filters, plus the signal path has been improved. So how did it perform compared with the Mk1? Continuing to use the short length of wire with 10dB of attenuation switched in, the first thing you notice as you tune around is that the AR8600Mk2 does sound more like a dedicated h.f. set. Putting the two sets side-by-side the improvement is quite noticeable and the RAF Volmet broadcast on 5.450MHz could be resolved quite easily. (Incidentally, both radios centre on the s.s.b. frequency with the readout being about 200Hz below the actual frequency, i.e. 5.4498MHz). Switching to my active loop with attenuation on, I expected the strong overload to return but the Mk2 improvements were definitely noticeable with the stronger signals being handled more effectively. Having said that, I noticed some overloading, perhaps a selectable attenuator between 5 and 20dB would help? Unfortunately, the broadcast station intermodulation was still annoying but nothing like the Mk1. To be fair, it was quite high pressure during most of the period of the review and propagation was generally good, this may have accentuated the a.m. stations?

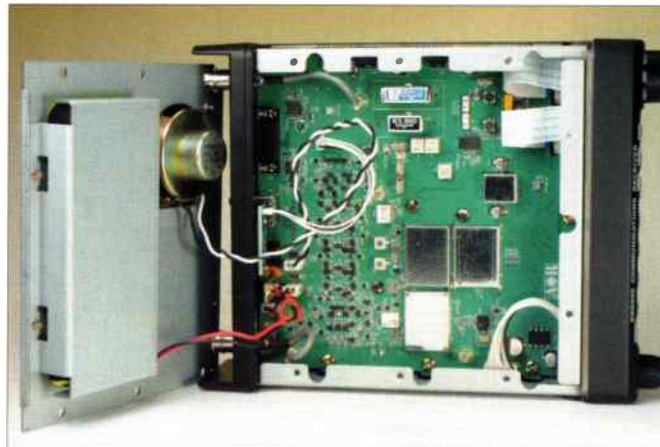
Lastly, for people like myself who own the AR8600Mk1, due to the nature of the modifications that have been made, they sadly cannot be upgraded to the Mk2 - Ho-hum! The improvements have been substantial, the AR8600Mk2 is a highly specified radio with not only good v.h.f./u.h.f. performance, but is now an acceptable performer on short wave and u.s.b. utility stations.

AR8200Mk3

To be honest it is well over two years since I have used a hand-held regularly, preferring as I said earlier to take my AR8600 mobile. Having used base stations regularly over this period with their better overall home performance, I consequently had to adjust my approach to this review and try not to make direct comparisons with these sets. Also, this is the

first AOR hand-held I have used for some time as I have stuck with my trusty old MVT-7100 for at least seven years, (sorry AOR).

When you take the AR8200 out of the box several things strike you immediately. The first thing was to rotate the volume control to turn the radio on only to find it has a separate power button on the front keyboard, probably the



first hand-held I have used that does this. The similarity with its big brother is obvious with the front keys and their labels having a distinct familiarity about them. I would imagine that the AR8600 and AR8200 were developed in parallel to share some component parts, firmware, software, etc. For example the display appears to be identical.

In spite of not being the smallest radio available in this class, the AR8200Mk3 fits neatly into the palm of the left hand. Having used transceivers professionally for many years, my thumb automatically rested on the left hand side where you would normally find the transmit (PTT) button. This immediately led me into problems with the controls located in this area, I kept touching the four-way rocker and consequently altered the chosen frequency. I must point out that this was just an initial observation and should not be taken as a criticism as once I had got used to this format, the convenience of having the controls in the side position soon became apparent.

In Control

The first three controls on the side are 'Function', 'Key lock' and 'Monitor', (which opens the squelch whilst pressed), all

of which are fairly self explanatory. Having the 'Function' key accessible to the thumb made the selection of facilities that required multiple key presses much easier. The first of the other controls is a recessed rotary control which acts as the main dial and is effectively the tuning knob that most hand-helds have on the top of the radio. In 'VFO' mode it will scroll up and down

operations easy to access.

The similarity between the two radios is obvious from the specifications. The AR8200 frequency range is 530kHz to 3GHz. Almost all of the comments I have made regarding the facilities of the AR8600 apply to the AR8200; Memories, Banks, Search banks, Pass channels, Optional Cards and so on.

Both receivers share



through the frequencies using the selected step size. In memory mode it will scroll up and down through the memory channels. The last control is a four way rocker switch, (providing up, down, left and right). This rocker performs different tasks subject to the selected mode. In memory mode these keys allow you to move between memory banks, (left/right) and memory channels, (up/down). The left and right keys can also be used to move the cursor position during text input, to tune the radio or to change values within the menus. In memory read mode the up and down keys can circulate through the memory channels, tune the receiver in v.f.o. mode and select and change items within the various menus. They can also force the scan or search to resume if it is stopped on an active channel. Assuming you are right handed and hold the radio in the left hand, this a very flexible system. I tried the radio out on a friend who is left handed and he found that it was quite easy to operate the AR8200 in his right hand using his fore and middle fingers to operate the side controls. The layout of the front keypad was easy to use, (even for my clumsy fingers), with the larger Search, Scan and v.f.o. keys making some of the primary

similarities in microprocessor and i.f. frequencies. On short wave they are superheterodyne receivers with i.f.s of 45MHz and 455kHz while on the v.h.f.-u.h.f. bands the i.f. is 754.850 or 243.850MHz depending on exact tuned frequency (w.b.f.m. final i.f. is 10.7MHz). The r.f. preselection of the AR8200Mk3 ranges from 75-174MHz while the AR8600Mk2 preselection extends to 470MHz. Tuning steps are programmable in multiples of 50Hz and supports 8.33kHz steps.

Internally the components are **not** the same and have diverged (rather than converged) over the various model versions. AOR tell me that the extra cabinet space of the AR8600Mk2 also reduces internal stray signals and helps create a purer local oscillator when compared to the AR8200Mk3. This leads to better strong signal handling and the cleaner sounding s.s.b. on the AR8600Mk2, as I mentioned earlier. There are many i.f. bandwidths which include narrow, standard, wide

choices for a.m. and f.m.

Consequently, there is little point in repeating the information listed above except to say that like the AR8600 this is a very highly specified radio. So, how did the AR8200 perform in the field?

Out & About

I took the AR8200 out and about and like the AR8600 exercised it thoroughly on the Civil and Military airbands, Marine Band, Emergency services and the Utility bands. Scanning around showed that it was a sensitive hand-held, performing well against similar sets. Scanning the various bands was easy and the ability to link the memory banks in the various permutations once again proved a very useful scanning tool. The received audio from such a small speaker was surprisingly good, especially when receiving strong signals. I wasn't certain at first, but once I had got used to the side controls and the various key presses needed for basic operation, I started to enjoy using the AR8200. In fact, the more I used it, the more I liked it.

I switched from scanning to searching and did a search of the civil airband, (118 to 136.075MHz). I removed the

antenna to assess if there were any internally generated signals, (birdies), it stopped just four times and with the antenna fitted this increased to about a fifteen. Not bad for a hand-held and with 50 pass frequencies available this was not really a problem. As quite a few readers use their hand-held as their home base station as well as mobile, I did the same airband search at home. Now this is not the ideal test scenario and no matter how good the radio, it once again proved to me that hand-held scanners in general are not really in their best operational environment in households that can be full of emissions from all sorts of electrical equipment.

Enjoyable

My first experience with a hand-held for a couple of years was most enjoyable. This is a compact little hand-held with some innovative design ideas. It performed well on the bands that I monitored and the powerful scan, search and other facilities are a great asset to good scanning. Space prevents me from mentioning all of the many facilities, such as the common software package which is available for free download from the AOR

web site (2.2MB) or can be supplied on a CD ROM for £5 inc. post.

However, while the AR8600MK2 requires just a straight RS-232 lead, the AR8200MK3 required a special lead with level shift built in (£74). It is however possible to purchase just the AUX connector (OS8200) for the AR8200MK3 and build your own interface using a MAX232 chip from circuits details that are available from the Internet. *(We will also be including this type of circuit and many other invaluable add-ons in the forthcoming Scanning Scene Extra supplement - Ed.)*

One final point, I was fortunate to have the benefit of hands-on experience of an AR8600, so operating the two radios proved relatively easy as I had no operating procedures and key sequences to learn. Some people have commented to me, via my 'Sky High' column, that the extensive specifications and the 140 page manual are a bit daunting. Initially when I got my AR8600, I was in the same position, but take your time and learn what these two receivers can do, in the long run I believe it will be well worth it and you will indeed be rewarded!

SWM

Test Results

It's interesting to look at the manufacturer's specification, but it may not be as enlightening as you may hope as it appears that manufactures often 'play safe' by quoting 'worst case'. Here we checked sensitivity and audio level against the manufacturer's figures, bearing in mind these are production units and not pre-production samples (dBm approx):

Model	AR8200MK3	AR8600MK2
Quoted a.m. 10dB (30-470MHz)	1.5µV (-103dBm))	1.5µV (-103dBm)
Measured a.m. 10dB (124.2MHz)	0.28µV (-118dBm)	0.28µV (-118dBm)
Measured a.m. 10dB (245.2MHz)	0.40µV (-115dBm)	0.32µV (-117dBm)
Quoted n.f.b.m. 12dB (30-470MHz)	0.85µV (-109dBm)	0.7µV (-110dBm)
Measured n.f.b.m. 12dB (145.2MHz)	0.21µV (-120dBm)	0.2µV (-121dBm)

A quick look at the audio output level also proved interesting - n.f.b.m. with 1kHz tone deviated by 5kHz and a.m. with 1kHz tone modulated at 80% both 10% distortion into 8Ω:

Model	AR8200MK3	AR8600MK2
Quoted audio output	120mW	800mW
a.m. - 13.8V d.c.	200mW	790mW, (800mW when warm)
a.m. - batteries (fully charged)	130mW	790mW, (800mW when warm)
n.f.b.m. - 13.8V d.c.	180mW	780mW, (800mW when warm)
n.f.b.m. batteries (fully charged)	120mW	790mW, (800mW when warm)

Optional Slot Cards

EM8200 - enables storage of memories but you cannot scan from the card, you have to transfer the data to and from the radio (easy operation). Ideal when folk want to travel with **no data** in the radio whatsoever, on arrival at the destination, the EM8200 data can be quickly uploaded and you are in action again.

TE8200 - called a tone eliminator, a better description is a 'tone skipper'. Program an unwanted audio frequency (such as public utility engaged beep) and the radio will skip over the 'engaged' frequency as if it were not active.

CT8200 - tone search and squelch control via CTCSS, for amateur and PMR repeater operation. Will not increase the activity, but will enable selective monitoring in busy environments.

VI8200 - simple voice inversion unscrambling, this will not touch digital transmissions such as GSM. If you encounter a transmission which sounds like a speeded up tape recorder with indistinguishable words being spoken, this may help.

RUB200 - can record 20 seconds of audio for playback. With the AR8200Mk3 you have to arm the card so need something of a sixth sense that something interesting is about to occur! With the AR8600Mk2 it can provide a continuous loop, so is more useful.

Our thanks to **AOR (UK) Ltd.**, for the loan of the review radios. The list price for the AR8200Mk3 is currently **£439** and the AR8600Mk2 **£719** they are both available from AOR direct or all good radio dealers. AOR can be contacted at **4E East Mill, Bridgefoot, Belper, Derbyshire DE56 2UA.** Tel: **(01773) 880788** Web: **www.aoruk.com**

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The AOR 8600mk2 Plus is the Coverage is 100khz-3000mhz

The "AOR8600mk2 Plus" comes supplied with the following:

- EM-8200 Memory Card
- VI-8200 Voice Inverter
- RU-8200 Record Unit
- CT-8200 CTCSS Card
- TE-8200 Tone Eliminator
- MF-2.5 Collins SSB Filter
- MF-6 Collins AM Filter
- PSU-8600



AOR 8600mk2 PLUS
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PC Programmable. Requires PC-R3 at £39.95
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AOR AR-8200 MKIII

The best Handheld Scanner available with AM/FM/ CW/WFM /USB/LSB. Frequency range: 530kHz-3000MHz, PC programmable and controllable (requires PC8200 £85). Complete with high capacity NiCads, Charger, Cigar lighter lead, rubber helical wideband antenna, medium wave plug-in antenna. Add the **Super Searcher** and **RT8200 (£119.99)** for reaction tuning to nearby transmitters

ML&S PRICE: £439 Zero Deposit 36 X £15.96



AOR AR-8200 MKIII

The best Handheld Scanner available with AM/FM/ CW/WFM /USB/LSB. Frequency range: 530kHz-3000MHz, PC programmable and controllable (requires PC8200 £85). Complete with high capacity NiCads, Charger, Cigar lighter lead, rubber helical wideband antenna, medium wave plug-in antenna. Add the **Super Searcher** and **RT8200 (£119.99)** for reaction tuning to nearby transmitters

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This scanner is very old in design and lacks a few features but offers good scanning facilities. Covering 100kHz-1300MHz AM/FM/WFM/USB/LSB. Complete with NiCads, Charger, Telescopic Antenna all for **£229.00**.

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AOR 8600 MKII new M



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	Deposit.....£00.00
	48 Payments of.....£17.72
	Total purchase price.£850.56

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HOT NEWS!
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Taking place at the Kempton Park Race Course, Sunbury-on-Thames, Middlesex

SEE YOU THERE!

Warm beer, hot sunshine and the best airshow in the world. Ian Doyle looks back and provides analysis on the set-up for last year's arrivals days at the Royal International Air Tattoo and confirms that the Cotswolds is the place to be in July.

The return of the Royal International Air Tattoo to RAF Fairford in Gloucester, once again provided the scanning enthusiast with some excellent opportunities to work the 'bands'. With this in mind, the womenfolk were duly despatched to the local shopping centre for some retail therapy whilst plans were put in



A long way from home Australian P3, Orion 'Aussie 131' was also monitored over that Atlantic on h.f. as well as during the recent Fincastle Trophy exercise.

place for this year's expedition.

My colleague and scanner man extraordinaire Mike Ridley duly arrived on the Wednesday evening and plans were laid

over a chilli and a reasonable bottle of Chianti for this year's trip to RIAT. As usual, we would be camping - this is much preferred to B&B as essentially this means that we could come and go as we pleased, with the traffic usually impossible, we wanted to be near the base by 0800 latest. As an added bonus, it meant the radio can also be monitored from the campsite as well as at the event itself. Departure was set for 0545 on the Thursday with all the essential items packed, scanners, camera, corkscrew, to name but a few.

A recent change of company vehicle meant unlimited restriction on weight, although Mike still seemed hell bent on busting his baggage allowance. With tent, bedding and ancillary

items duly loaded, departure was on time and having stopped briefly for a 'Full English', we arrived on station at Fairford at 0830.

What To Expect

Like many others, we were not quite sure what to expect, the relocation back to Fairford, although welcomed, might cause some teething problems as too would the undoubted increased security. In recent years we have always made for the park and view area at the Eastern end of the runway, mainly to shoot the arriving

aircraft with the camera, however this year we were determined to execute more in terms of radio work, this was confirmed when the weather

forecast was also deemed to be a bit 'iffy' on the Thursday, therefore providing the ideal opportunity to work the radios.

The previous evening we had studied an OS map of the area *Land Ranger Sheet 163* and had a couple of locations in mind where we might be able to see some action whilst being close to the 'VW Bora Command and Control Vehicle'. As we dropped through Fairford village, a sign appeared on the left for 'Tittensor Farm Park And View', we had this marked on the map the previous evening, it was located near to Horcott Hill, the highest point in the area. We had envisaged that it might be out of bounds, a quick 'reccy' however confirmed that this was the ideal location. We paid our five pounds and were directed

frequency bands likely to be used, in addition a number of Internet notice boards including SWM's own board had speculated on the expected list of arrivals for that day.

The vehicle would be running all the rigs, so was parked with a nose down attitude just in case we exhausted the battery. Both the Signal and the Bearcat would be run from the vehicle whilst the AOR and the Yupi would be run on rechargeable batteries. The radios were duly fired up, suffice to say we again had planned how best to structure the frequencies, in order to catch as much action as possible.

The AOR would be left primarily on the tower frequency, this would ensure that nothing on final approach

RiAT 2002

to the 'top field' overlooking the northern side of the airfield. It was ideal as we could see the local approach clearly, as well as the patterns at both nearby Brize and Lyneham.

Our Equipment

The 'Bora' Command Post was quickly set up - bemused onlookers who were already in-situ were clearly intrigued as they considered what was going on next door as antennas, scanners, and various other bits of technical equipment duly appeared in, or around the vicinity of the vehicle.

We had four scanners with us (*you can never have too much of a good thing - Ed.*), a Signal 535 base station, an AOR hand-held, a Bearcat 9000XLT Base and Yupiteru MVT-9000 hand-held, together with various mag-mount antennas, power leads and the local Aerad cards for the area. These had been pre-programmed the night before so we had a good idea on the potential set up.

In SWM's sister magazine *Radio Active*, Military Columnist Pat Carty had provided a comprehensive list of the



Heading south through Fairford village, Tittensor Farm is located on the right.

© Ordnance survey

would be missed. The Bearcat had the Fairford and Brize suite installed so that tower, area radar and final approaches could be monitored. The Signal had all the local London Mil frequencies patched in, so again anything approaching could also be snared in advance. The Signal, although cumbersome to operate, is in my opinion still the most sensitive scanner around. Finally, the Yupi would be used in a floating role in order to follow anything that might be channel hopping that was not covered by the other radios.

In addition, as a number of aircraft carry out practice displays on the Thursday, the action would clearly be



Another favourite, US Navy P3 Orion callsign 'Lima Victor 002'.

somewhat spasmodic, during these quieter periods the Bearcat would also be programmed to search up/down the bands

Both the Signal and the Bearcat were wired to the vehicle battery via the cigarette lighter, they would run for eight hours continuous operation so it is important to consider the amount of power left and ensuring that you not the last people left in the field at 2100 trying to start the car in semi darkness with no help at hand.

Waiting For Action

With the weather reasonable, we sat back and waited for the action to begin, throughout the morning the usual mix of fighters, tankers, transports started to arrive, upwards of 350 aircraft over the two days.

As in previous years, each of aprons at Fairford are colour coded, so references to apron Gold and Bronze were in evidence. As each aircraft arrived on ground the 'Leader' or follow me vehicles are aware of the plan and took the aircraft to its designated position.

From our location, aircraft could be seen holding to the North as well as taxiing on the ground, as we were slightly elevated other local airfields could also be monitored. To provide a feel of how good this location is, we could clearly hear Benson ATIS coming though loud and clear, even though we were actually located some 50-60km away.

By lunchtime a large number of aircraft had arrived and a number were now setting up for practise display. In the overhead the hum of what sounded like a P3 Orion reconnaissance aircraft was discernible above the din from the local environment, we quickly keyed the local Boscombe Down frequencies as an experimental P3 aircraft of

Table 1: 17/19-07-02 Fairford - Royal International Air Tattoo 2002

The Arrival callsigns monitored with additional special thanks to Paul Van Der Linden of *Scramble Magazine* and Roger King of *Lowestoft Aviation Society*.

the US Navy had been based over at Boscombe in the previous few days, sure enough what sounded like 'Hornet1' or possibly 'Gauntlet1' was heard with a hand-off to Bournemouth radar for coast out to the Channel at 1500ft, the aircraft was faint, but the accent was definitely American so could conceivably have been our target.

Over at Brize, the somewhat unusual site of an Airtours A320 could be seen on take, c/s Kestrel 002P being a civilian Airbus A320 of Airtours presumably on an RAF trooping flight.

Back at Fairford and everyone was on their feet as sirens could be heard attending a practise drill in relation to an incident at the far end of the airfield, suffice to say that by now everyone was looking west, speculating as to what had gone down! The incident was in fact fortunately a rehearsal, although as many of you will by now be aware, a major incident took place during the airshow display on the Saturday when an Italian Air Force G222 light transport aircraft made a spectacular heavy landing resulting in a collapsed nose wheel.

All Over

By 1800, that day's arrivals were complete and so was our day. A quick 'recce' at Brize, then to the campsite and the local hostelry for a well earned pint or two.

By Friday the weather was glorious, so my first love, which is photography, now had to take precedence over the proceeding days events, if however scanning is your passion, then **Table 1** will confirm, a trip to Tittensor Farm at Horcott Hill should definitely be pencilled in for next year's event.

SWM

Country	Registration	Callsign	Freq	Notes	
United States	DY/83-0065	'7BW'	18	Hawk Flight	
	DY/86-0101		18	Hawk...	
	LA/60-0011	'11BS'	17	Tuff19	
	LA/60-0053		17	Doom60	
	69-0010		17	RCH9010	
	71-0882		18	Tune 82	
	86-0038		17	Cacti11	
	83-0502		19	Fendy11	
	86-0206		18	Not known	
	84-0086		19	Hook93	
	97-0401		19	SAM70401	
	94-1569		17	Boxer38	
	62-1823		18	Not Known	
	69-5826		19	Shadow24	
	88-0194		19	Talon13	
	94-8152		18	Hobby70	
	56-3648		18	Steel83	
	57-1429		19	Whiley86	
	58-0090		18	Tahoe91	
	62-3548		18	Quid41	
	65-0216		19	RCH5216	
	LN/86-0163		18	Chosen01	
	LN/86-0178		18	Conan22	
	LN/86-0182		18	Conan21	
	LN/91-0310		18	Matrix 91	
	AV/89-2001	'31FW'	18	Lion02	
	AV/89-2016	'16AF'	18	Lion03	
	AV/89-2035	'555FS'	18	Lion04	
	AV/90-0796		18	Lion01	
	HD/80-0791		17	Trend21	
	HD/88-0843		17	Trend22	
	70-1625		19	Devil51	
	RA/73-1153	'562FTS'	17	Gator01	
	161006/LN-006		17	LN451	
	161125/LV-125		18	VVLV002	
	156525/525		19	DS999	
	Australia	A9-657	P-3C	19	ASY131
	Belgium	AT24	Alpha Jet E	18	AFB151
		AT26	Alpha Jet E	18	AFB151
		CD-01	Falcon 900	18V	AFB625
		FA-69	F-16AM	18	AFB223
		FA-103	F-16AM	18	AFB223
		MT-13	CM 170	18	AFB161
	Canada	15004	CC-150	18	CFC4133
		142805	CT-142	19	CFC2478
Chile	902	B 707	17	FACH902	
	911	Gulfstream IV	18	FACH911	
Czech Republic	6006	L-159A	18	CEF6006	
	2601	Let 410UPV	18	CEF143	
Denmark	E-596	F-16A	18	DAE3271	
	ET-207	F-16B	18	DAE3271	
	T-409	MFI 17	19	DAE3160	
	T-432	MFI 17	19	DAE3160	
France	147/XS	TBM 700	18/19V	CTM3838	
	516/33-FH	Mirage F1B	19	FAF7860A	
	77/33-FR	Mirage F1C	19	FAF7860B	
	5/33-FC	Mirage F1C	19	FAF7860C	
	639/3-XQ	Mirage 2000D	19	FAF7260A	
	671/3-XK	Mirage 2000D	19	FAF7260B	
	30	Falcon 50SURMAR	17	FN55013	
	627	Lynx HAS4	17	FN5543	
	118	SA 321G	18	FN55334	
	159/ABU	TBM 700	19	FN58020	
	2318/CYL	AS 532U2	19	F.CYL	
Germany	29+03	MiG-29G	18	GA2901	
	44+55	Tornado IDS	19	GA2902	
	44+63	Tornado IDS	17	GA2903	
	44+89	Tornado IDS	17	GA2904	
	46+01	Tornado ECR	18	GA2905	
	46+35	Tornado ECR	18	GA2906	
	51+03	C 160D	17	GA2907	
	45+38	Tornado IDS	17	GA2908	
	61+11	Br 1150	17	GA2909	
	72+62	UH-1D	19	GA2910	
	72+95	UH-1D	19	GA2911	
87+11	Bö 105P	17	GA2912		
Italy	MM7115	AMX	19	I7115-1	
	MM7185/2-02	AMX	19	I7115-2	
	MM55000/6-51	Tornado IDS	19	I7018	
	MM55075/61-143	MB 339CD	18	I2153-2	
	MM62125/14-24	G 222RM	18	I2125	
	MM-C5X62127	C-27J	19	I2127	
	MM62153/RS-46	G 222TCM	18	I2153-1	
	CSX62164	P 180AM	18	I2164	
	MM62180/46-45	C-130J	18	I1990	
	MM62167	P 180AM	19	I2167	
	MM81197/EI-454	AB 412	17	I1197	
MM81391/EI-921	A 129	17	I1197		
	B-1B	7BW/9BS c/o	18		
	B-1B	7BW/28BS	18		
	B-52H	2BW/11BS c/o	17		
	B-52H	2BW/96BS	17		
	C-5A	60AMW	17		
	C-9A	86AW/75AS	18		
	KC-10A	60AMW9ARS	17		
	C-20A	86AW/76AS	19		
	C-20B	89AW/99AS	18		
	C-21A	86AW/76AS	19		
	C-37A	89AW99AS	19		
C-38A	201AS/DC-ANG	17			
C-130E	96AS/AFRC	18			
MC-130P	352SDG/67SDS	19			
MC-130H	352SDG/7SDS	19			
C-130J	815AS/AFRC	18			
KC-135E	147ARS/PA-ANG	18			
KC-135E	117ARS/KS-ANG	19			
KC-135E	314ARS/AFRC	18			
KC-135R	100ARW/351ARS	18			
C-141C	756AS/AFRC	19			
F-15C	48FW/493FS	18			
F-15C	48FW/493FS	18			
F-15D	48FW/493FS	18			
F-15E	48FW/494FS	18			
F-16C	31FW	18			
F-16C	31FW	18			
F-16C	31FW/555FS	18			
F-16D	31FW/510FS	18			
F-117A	49FW/8FS	17			
F-117A	49FW/8FS	17			
MH-53M	352SDG/21SDS	19			
T-43A	12FTW/562FTS	17			
P-3C	VP-45	17			
P-3C	VP-66	18			
P-3C	VQ-2	19			
	Alpha Jet E	1 Wing	18	AFB151	
Alpha Jet E	1 Wing spec. mks	18	AFB151		
Falcon 900	15WV/21smd	18V	AFB625		
F-16AM	no mks (2W/350smd)	18	AFB223		
F-16AM	no mks (2W/350smd)	18	AFB223		
CM 170	1 Wing spec. mks	18	AFB161		
	CC-150	437sqn	18	CFC4133	
	CT-142	402sqn	19	CFC2478	
	B 707	Grupo 10	17	FACH902	
	Gulfstream IV	Grupo 10	18	FACH911	
	L-159A	42SLt	18	CEF6006	
	Let 410UPV	61DLt	18	CEF143	
	F-16A	Esk730	18	DAE3271	
	F-16B	Esk730	18	DAE3271	
	MFI 17	FISK	19	DAE3160	
	MFI 17	FNSKar	19	DAE3160	
	TBM 700	ETEC 00.065	18/19V	CTM3838	
	Mirage F1B	EC 03.033	19	FAF7860A	
	Mirage F1C	EC 03.033	19	FAF7860B	
	Mirage F1C	EC 03.033	19	FAF7860C	
	Mirage 2000D	EC 03.003	19	FAF7260A	
	Mirage 2000D	EC 03.003	19	FAF7260B	
	Falcon 50SURMAR	24F	17	FN55013	
	Lynx HAS4	34F	17	FN5543	
	SA 321G	32F	18	FN55334	
	TBM 700	ESCAV/EMAT	19	FN58020	
	AS 532U2	1RHC	19	F.CYL	
	MiG-29G	JG73	18	GA2901	
	Tornado IDS	JBG38	19	GA2902	
	Tornado IDS	JBG33	17	GA2903	
	Tornado IDS	JBG33	17	GA2904	
	Tornado ECR	JBG32	18	GA2905	
	Tornado ECR	JBG32	18	GA2906	
	C 160D	LTG62	17	GA2907	
	Tornado IDS	MFG2	17	GA2908	
	Br 1150	MFG3	17	GA2909	
	UH-1D	HFR10	19	GA2910	
	UH-1D	HFR10	19	GA2911	
Bö 105P	HFR16	17	GA2912		
	AMX	2St/14Gr spec.	19	I7115-1	
	AMX	2St/14Gr	19	I7115-2	
	Tornado IDS	6St/102Gr	19	I7018	
	MB 339CD	RSV/311Gr	18	I2153-2	
	G 222RM	14St/8Gr	18	I2125	
	C-27J	RSV/311Gr	19	I2127	
	G 222TCM	RSV/311Gr	18	I2153-1	
	P 180AM	RSV/311Gr	18	I2164	
	C-130J	46BA/2Gr	18	I1990	
	P 180AM	28GrSq/281Sq	19	I2167	
	AB 412	11GrSq/111Sq EM	17	I1197	
A 129	1GrSq	17	I1197		

Lithuania 02	Let 410UVP-T	12TE	19	KOP121
NATO LX-N90444	E-3A	NAEW&CF	18	NATO 06
Netherlands				
J-004	F-16AM	322sqn	19	Polly01
J-016	F-16AM	312sqn spec. c/s	18	Orange1
J-866	F-16AM	312sqn	18	Orange2
J-068	F-16BM	322sqn	19	Polly02
L-13	PC 7	131(EMVO)sqn	19	Diamond14
Q-25	AH-64D	301sqn	18	Redskin13
U-02	Fokker 60UTA-N	334sqn	19	NAF62
U-03	Fokker 60UTA-N	334sqn	17V	NAF63
U-06	Fokker 50	334sqn	18V	NAF52
New Zealand				
NZ4206	P-3K	5sqn	19	Kiwi888
NZ7271	B 727-22C	40sqn	19	Kiwi851
Oman 502	C-130H	4sqn	19	Marjan293
Poland				
0827/6	TS 11	10SL/Team Iskry	17	PLF274
0204	M 28TD	13ELTr	17	PLF055
1114	M 28B1R	3DLMW	18	PNY683
Portugal				
11404	TB 30	Esq101	19	AFP1825
11417	TB 30	Esq101	19	AFP1825
15220	Alpha Jet A	Esq103/301	19	AFP1931
15234	Alpha Jet A	Esq103/301	19	AFP1931
16802	C-130H-30	Esq501	19	AFP1930
Slovenia				
L4-01	Let 410UVP	15 Brigada	19	Slovenian 401
L9-68	PC 9M	15 Brigada	19	Slovenian 968
Spain T.19B-19/35-37	CN 235M	Ala35	18	AME3551
Switzerland T-783	Falcon 50		18	T783
UK				
XS596	Andover C1PR	DERA	19	Gauntlet50
XP820	Beaver AL1	AAC HF	19	
WH874 'VN799'	Canberra T4	39(1PRU)sqn	18	Bengal1
XH135	Canberra PR9	39(1PRU)sqn	18	Bengal2
ZA681	Chinook HC2	27sqn	18	Vortex454
XS739/F	Dominie T1	55(R)sqn	17	Cranwell94
XZ939	Gazelle HT2	ETPS	19	Tester08
ZB625/N	Gazelle HT3	DERA	19	Tester08
ZJ236/X	Griffin HT1	60(R)sqn	19	Topaz
XX220	Hawk T1A	208(R)sqn	18	Mustang1
XX246	Hawk T1A	19(R)sqn	18	VYT94
XX247/CM	Hawk T1A	100sqn	18	Aztec 20
XX345	Hawk T1A	208(R)sqn	18	Mustang
ZD328/10	Harrier GR7	3sqn	18	Chaos1
ZD407/36	Harrier GR7	20(R)sqn	19	Striker04
ZD464/54	Harrier GR7	20(R)sqn	19	Razor2
ZG501/72	Harrier GR7	3sqn	18	Chaos2
XV301	Hercules C3	LTW	19	RRR671
ZH884	Hercules C5	LTW	18	RRR524
XX724/GC	Jaguar GR3A	54sqn	18	C01L6
XZ115/PD	Jaguar GR3	16(R)sqn	18	C01L6
XZ355/FJ	Jaguar GR3A	41sqn	18	C01L3
XZ372/ED	Jaguar GR3	6sqn	18	C01L25
XX493/L	Jetstream T1	45(R)sqn	18	Cranwell63
ZJ134/S	Merlin HC2	28sqn	18	Vortex312
WA638	Meteor T7mod	Martin Baker	19	Martin01
XV228	Nimrod MR2	Kinloss Wg	19	Nimrod42
XV232	Nimrod MR2	Kinloss Wg	19	Not Known - overflying to Brize Norton
XV240	Nimrod MR2	Kinloss Wg	18	Kinloss432
XW210	Puma HC1	230sqn	18	Vortex007
XW235	Puma HC1	33sqn	18	Vortex336
XZ587	Sea King HAR3	203sqn	18	Fireball
ZJ274/74	Squirrel HT1	DHFS	18	Spartan2
ZA373/H	Tornado GR4A	2sqn	18	Spartan1
ZA404/VV	Tornado GR4A	2sqn	18	Batman1
ZA557/AC	Tornado GR4	9sqn	18	Batman2
ZA585/AH	Tornado GR4	9sqn	18	LO544
ZA614/AJ-J	Tornado GR4	617sqn	17	Blacksmith2
ZE159/UV	Tornado F3	111sqn	18	Blacksmith1
ZE291/GQ	Tornado F3	43sqn	18	Stella1
ZD720	Tornado GR4	15(R)sqn	19	Marham26
ZG709/V	Tornado GR4A	13sqn	18	Marham24
ZG727	Tornado GR4A	13sqn	18	Phoenix1
ZG770/WVK	Tornado F3	56(R)sqn	19	Stella2
ZG794	Tornado GR4	15(R)sqn	19	Phoenix2
ZG798/UA	Tornado F3	56(R)sqn	19	Warlord2
ZH555/CV	Tornado F3	5sqn	18	Warlord1
ZH556/OT	Tornado F3	56(R)sqn	18	Piscis 1
ZF139	Tucano T1	1FTS	18	Venus 1
ZF375	Tucano T1	1FTS	18	Piscis 2
ZF407	Tucano T1	1FTS	18	Venus 2
ZF448	Tucano T1	1FTS	18	overflying in close formation with another VC10!
ZA148/G +1	VC 10K3	101sqn	18/19	RRR872
ZD240/M	VC 10K4	101sqn	18	RRR880
ZH118/TD	Vigilant T1	612VGS	18	Stag1
Z1173	C-17A	99sqn	18	Stag2
G-BYXM	Tutor T1	Southampton UAS	18	U04
G-BYXN	Tutor T1	Southampton UAS	18	U76/U50
G-BYXP	Tutor T1	London/Cam.UAS	17	0
G-BYUF	Tutor T1	London/Cam.UAS	17V	
G-BWXO	Slingsby T67	JEFTS	18	
G-BWXY	Slingsby T67	JEFTS	18	
G-BWXZ	Slingsby T67	JEFTS	18	
XW851	Gazelle AH1	847sqn	18	Navy CH
XX178	Hawk T1W	FRADU	19	Black3
XX234	Hawk T1	FRADU	19	Black2
XX238	Hawk T1	FRADU	19	Black4
XX240	Hawk T1	FRADU	19	Black1
XX484/CU-566	Jetstream T2	750sqn	18	Navy805
XZ233/644	Lynx HAS3ICE	702sqn	19	Lynx Pair



The Italians did make 'amends' with the national aerobatic team once again providing a superb display.



The BBC Radio Gloucestershire 'Command And Control Centre' setting up for coverage of RIAT 2002 in the media centre, not quite as sophisticated as the Bora!



Jordan				
344	C-130H	3sqn	17	RJF344
XZ235/304	Lynx HAS3S	815sqn	19	Harp Formation
XZ248/638	Lynx HAS3S	702sqn	19	Lynx Pair
ZX694/EB-411	Lynx HAS3SGM	815sqn	19	Harp Formation
ZH846	Merlin HM1	814sqn	19	Excalibur 1
ZH851/R-267	Merlin HM1	814sqn	19	Excalibur 2
ZD608/VL-731	Sea Harrier FA2	899sqn	19	Rattler2
ZE693/714	Sea Harrier FA2	899sqn	19	Rattler1
ZE698/R-123	Sea Harrier FA2	800sqn	18	Satan3
ZH804/R-125	Sea Harrier FA2	800sqn	18	Satan1
ZH806/R-122	Sea Harrier FA2	800sqn	18	Satan2
ZH808/717	Sea Harrier FA2	899sqn	19	Rattler3
XV664/R-187	Sea King AEW2	849sqn	19	Navy810A section
XV697/L-185	Sea King AEW2	849sqn	19	Navy810A section
XZ920/CU-826	Sea King HAS5U	771sqn	18	Navy810
ZA299/VV	Sea King HC4	846sqn	19	Navy VV
ZJ164	SA 365N2	FOST	19	Tester08
ZJ249/49	Squirrel HT2	670sqn	19	

Table 2: B2 Special Write Up.

Note the B2 on the 20th called Death 51 with Noble 11-14 flight as the F15 escorts.

B-2 Spirit 92-0700/W/M Spirit of Florida 509th BW c/s DEATH 51.

F-15C Eagle 84-0009/LN 493 FS/48 FW c/s NOBLE 11.

F-15C Eagle 84-0010/LN 493 FS/48 FW c/s NOBLE 12.

F-15C Eagle 84-0027/LN 493 FS/48 FW c/s NOBLE 13.

F-15C Eagle (84-0001)/LN 493 FS/48 FW c/s NOBLE 14.

NOBLE Flight's Air-to-Air Freq was 388.350MHz on which they talked with the B-2. After leaving Lakenheath they went to LONDON MIL on 299.975MHz, through the Westcot Corridor on 275.350MHz and then QSYed to 275.475.

The Mildenhall tankers were QUID 91/92 their Air-to-Air was 379.075MHz (Bull Pen) and the BOOM Freq was 300.125MHz. They were with LONDON MIL on 254.825MHz.

Sunday 21st July:

On the 21st the B2 was calling Death 71 with Ninja 11-14 flight 4 x F15s as escorts.

B-2 Spirit 89-0128/W/M Spirit of Nebraska 509th BW c/s DEATH 71.

This may have been a replacement aircraft, as rumours indicated that the same aircraft which appeared on Saturday would do an engine running crew change at Whiteman and return again on Sunday!

F-15C Eagle 84-0010/LN 493 FS/48 FW c/s NINJA 11

F-15C Eagle 84-0009/LN 493 FS/48 FW c/s NINJA 12

F-15C Eagle 84-0027/LN 493 FS/48 FW c/s NINJA 13

F-15C Eagle 84-0001/LN 493 FS/48 FW c/s NINJA 14

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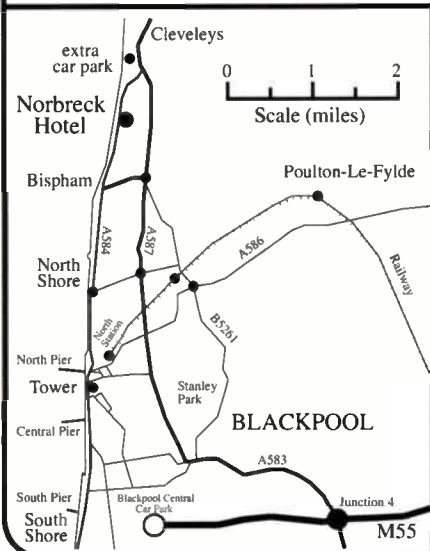
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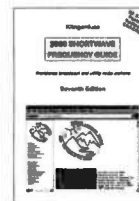
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Kevin Nice, already a regular user of bhi's first d.s.p. noise reduction product the NES10-2, tries out their brand new noise reducer - the NEIM1031 In-line module.

NEIM1031

Noise Eliminating In-line Module

I have been using the bhi Noise Eliminating Speaker for about five months now ever since I wrote about it for last September's *SWM*. Since then, it's become one of those items of equipment that I'd really rather not be without. It's rather like my Wellbrook active loop antenna, I just don't know what I did before acquiring one.

With this in mind, I guess it will come as no surprise to learn that I was keen to try the new offering from the Sussex based sound engineering solutions company bhi. This new module differs from its predecessor in that it has no loudspeaker built in to its enclosure.

Instead the NEIM1031 is housed in an ABS box measuring some 170 x 85 x 34mm input and output sockets at one end, a 3.5mm headphone socket is on the opposite face. The top panel, which houses the Noise Eliminating In-line module's controls is also home to a finger proof back printed legend label, which really looks good and tackles the age old problem of panel wear induced by much finger activity



over the life of the product. You only have to examine the like of some hand-held scanners and computer keyboards to see the effect repeated pressing and rubbing has on the legibility of idents. Graham Somerville, bhi's Sales and Marketing Director, was keen to inform me that the NEIM1031, due to customer demand, has both landscape and portrait versions of this top panel label available. This allows the unit to be operated either way round and the legends still being easily read. Customers can retrofit the labels should they feel the need.

Noise Reduction

So much for aesthetics and ergonomics, how does this digital signal processing unit perform? The NEIM1031 appears to utilise the same internal circuitry, but with the addition of the level controls and in/out sockets as the Noise Eliminating speaker. The aggressiveness of the unit's algorithms is preset to eight selectable levels, which are set via a rotary control which, at a guess, is a binary encoded switch rather than the dual in line (d.i.p.) switches of the NES10-2. The Noise Eliminating In-line module offers more flexibility as both the input and output levels can be varied by adjustment of rotary potentiometers. There are also level indicating i.e.d.s to show that there is sufficient audio drive for the processing to take effect and a red i.e.d. overload indicator to warn of when the input level is too high for the unit. To set-up the NEIM1031 for use requires a power source to be connected to unit. There is no p.s.u. supplied with the unit but there is an optional 12V 500mA 'wall wart' available from bhi. What is included in the standard package, are both a fused power lead with a suitable coaxial power connector fitted one end, to match the power socket of the NEIM1031, and just stripped tinned ends at the other. Plus there is a 1.2m long screened audio lead with 3.5mm jacks at both ends.

Thoughtfully, bhi have provided two inputs and two outputs for

interconnecting the NEIM1031 noise reducer to the other equipment in the audio path. Two connector types have been utilised, for low level signals phono sockets have been used, for low impedance higher level signals, such as those directly taken from your receiver's external speaker socket, for example, use 3.5mm jacks. One of the two input sockets is selected by a small slide switch. Both outputs are fed in parallel. The high level output, which is capable of delivering 2.5W of audio into an 8Ω load is interrupted when headphones are connected to the socket at the front, the low level line-out is however, is unaffected.

Just like its predecessor, the NEIM1031 is extremely easy to use and effective at dealing with audio from all the sources in my shack.

In use, once you've adjusted the audio input level high enough to ensure the illumination of the 'OK' i.e.d. and low enough to prevent the 'Overload' from flashing on peaks and the output level to suit your needs, you're off. One attribute of the unit that doesn't seem to be mentioned by bhi, is the ability to significantly reduce the level of heterodyne tones, I found this to be most useful monitoring weak s.s.b. signals on h.f., it even works well with c.w. Add this ability to the general reduction in random noise and the NEIM1031 transforms the audio of even the my RA1792, which has to be one of the quietest sets with no traffic I used, to a much quieter ambient level. When stations transmit, the effect is rather like having some in the room who had previous sat tight lipped and silent having suddenly having something to say. The effect is impressive.



No Squelch

Something I didn't mention back in September, is the ability of the bhi units to allow the use of an a.m or f.m. receiver with an open squelch and allow the d.s.p. unit to reduce the no signal noise to a low level. Clearly this doesn't allow scanning as most receivers will not move on to the next channel with an opened squelch. There are a few radios that will though.

Lastly I must mention the d.s.p. aggressiveness control. This seems to be most effective for me set to between positions 4 and 6. At the most aggressive setting the delay in initial noise reduction is greatest and due to the unit's increased level of 'number crunching'. I did notice a tiny amount of audio artefacts with no input at the max. setting, these are sounds that the unit's algorithms are generating from the random noise alone, that are not significant and don't really detract from the excellent job that the NEIM1031 performs.

Returning to my opening statement, how did I manage without a d.s.p. unit like this?

SWM

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The Other Man's Shack

After being inspired by last May's 'Other Man's Shack' featuring Eric Bray's minimal set-up, Terry contacted the Ed with a description of his own shack - or as his children call it "the radio cupboard".

Terry says that he was finally kicked into action by the 'OMS' visit to Eric's shack. Rather similar to Eric's cupboard - but more permanent - all Terry's radio and computing equipment (an integral part of his radio hobby), is fitted into a cupboard, or more specifically,

A quick trip to Buckinghamshire this month. Kevin Nice visits the compact shack of SWM reader, Terry Aldridge G4GJR.

what used to be a larder before the house was 'modified'.
 The station transmitting equipment consists of an FT-757GX II (all h.f. bands), for two metres an elderly FT-290R, with r.f. power amplifier to boost the standard 3W output, provides sterling service.
 "For monitoring, which is these days my main focus", says Terry, "I use in addition to the previously mentioned kit, an FRG-8800 (manual and computer control), an Icom PCR1000 and an IC-R10 handheld".
 Antennas in use at Terry's listening post are; for h.f., an inverted L and a Datong AD270 which is suitably waterproofed and used outside. For listening above 30MHz, Terry uses a discone and 5-element beam for two metres".

Interests
 Terry's main interests on the amateur bands are c.w. and

PSK31. On the monitoring side mainly aircraft, both Civil and military on h.f. and v.h.f./u.h.f. He's had an amateur licence for 25 years and he's been listening for about 35 years. The radio 'bug' started when his dad 'fixed' his broken 'tranny' - however, says Terry, "that's another story!"
 The photograph shows the 'Radio Cupboard' in its entirety. The white patch panel towards the top of the rack allows patching of the various radios inputs/outputs to the two PCs that are used for the various decoding and other functions.
 The 'shack' harmoniously co-exists in the dining room with the rest of the family - most of the time!



Terry feels that he should submit an article about his minimalist 'shack' construction so that other readers in a similar domestic situation can also be inspired. Well Terry, I guess that there are quite a number in your predicament who would benefit. I hope they'll write and let me know. Thank you Terry for sharing your outpost with us all. **SWM**

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Model Description £ RRP inc VAT



AR5000

AR5000 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. **£1295.00**

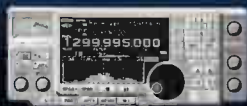
AR5000+3 High performance base receiver with three enhanced options factory fitted: noise blanker, synchronous AM, automatic frequency control. **£1449.00**



AR3000A

AR3000A Unique all mode extremely wide band base-mobile receiver 100kHz - 2036mhz with no gaps. RS232 port fitted. **£699.00**

AR3000A + (plus) Customised AR3000A with switchable narrow SM & SAT filters, Tape relay, SDU ready and discriminator output. **£799.00**



PCR1000

AR8200 MkIII 3 New advanced wide band all mode hand-held receiver with enhanced microprocessor facilities, slot card options available, multi-function display. **£399.00**

AR8000 The New Concept. Wide band all mode hand-held receiver with many microprocessor facilities, dot matrix display and computer compatibility. **£296.00**



£549.00

ICOM R2 0.1300mhz Handie. Fits in the palm of your hand. AM/FM, FM Narrow - 450 memory channels **£139.00**

IC R8500 100kHz - 2GHz Continuous. All mode no gaps. 1000 Memories. 4IF band widths Excellent all round for the professional listener **£1440.00**

IC-R75E 0-60MHz. High Stability receiver circuit 100 DB Dynamic range. Twin bandpass Tuning. Optional digital processor. Best selling receiver **£629.00**

IC-PCR1000 & PCR 100 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.

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Moving map features basemap, built-in European, African and Middle East to 20mi; includes lakes, rivers, cities, railways, coastlines, motorways and roads. Uploadable CD ROM, detailed map data available from MapSource CDs.

RWP **£325.00**



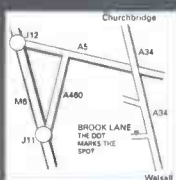
Built-in international map contains motorways, major roads, lakes, rivers, streams, airports, cities, towns, coastlines, motorway exits plus waypoints.

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The Garmin GPS12 series products are as rugged as GPS gets. Military-tough construction and waterproof cases make these units ideal companions for any outdoor adventure. All feature a 12 channel receiver that locks onto stellites fast and stays locked on, even under extreme conditions. These units may be tough on the outside, but their operations are easy and logical.

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

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- 1000 memory channels
- All modes: W-FM, FM, N-AM, AM, LSB, USB, CW
- Multiple scanning steps
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- 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

£329.00



Freq 25 - 1300MHz
500 Channels
Modes AM, FM,
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Alpha Tagging
With UK mains
adapter, Telescopic
aerial.

£299.00

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Desktop scanner with TURBO SCAN
Freq 25 - 1300MHz
AM,FM,WFM

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YUPITERU MVT 3300SD

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

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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

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All mode, wideband desktop scanner
530KHz - 2040MHz. Additional slot cards
PC Control. 1000 memories

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Excluding power supply

YUPITERU MVT 7100 MKII

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- C/W N/Cads & charger
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ICOM £449.00

ICOM IC-R3
The only scanner with built-in TV!

- PACKED FULL OF FEATURES
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Multi-band digital PLL preset stereo world radio.

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- AM wide-narrow filter
- MW switched tuning steps

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ALINCO	DJ-X2000 SCANNER	£375
ALINCO	DJ-X3 SCANNER	£99
ALINCO	DJ-X2 HANDHELD SCANNER	£99
ADR	AR-2800 SCANNER	£140
ADR	AR-3000 WIDE RECEIVER	£450
ADR	AR-3000A WIDE RECEIVER	£475
ADR	AR-3030 HF RECEIVER	£399
ADR	AR-5000 TOP CLASS RECEIVER	£999
ADR	AR-7030 TOP RECEIVER	£550
ADR	AR-8000 WIDE BAND RECEIVER	£199
ADR	AR-8200 WIDE BAND RECEIVER	£230
ADR	AR-8200mkII WIDE BAND SCANNER	£275
DRAKE	SW-2 RECEIVER	£275
DRAKE	SW-8 WORLD BAND RECEIVER	£375
FAIRHAVEN	RD-500 WIDE BAND RECEIVER	£575
GRUNDIG	SAT-800 SATELLITE 800 MILLENIUM	£400
ICOM	IC-R9000 TOP CLASS COMMUNICATIONS RECEIVER	£2,995
ICOM	IC-PCR100 COMPUTER SCANNER	£175
ICOM	IC-R2 HANDY SCANNER	£99
ICOM	IC-R7000 RECEIVER MINT! CONDITION	£550
ICOM	IC-R71E RECEIVER	£325
ICOM	IC-R72 RECEIVER	£399
ICOM	IC-R75 HF / 6m RECEIVER	£475
ICOM	IC-R8500 WIDEBAND RECEIVER	£899
JRC	NRD-345 RECEIVER	£299
JRC	NRD-535 HF RECEIVER	£600
KENWOOD	R-2000 RECEIVER	£225
KENWOOD	R-5000 RECEIVER	£499
KENWOOD	R-5800 RECEIVER + CONVERTER	£600
KENWOOD	R-600 RECEIVER	£175
REALISTIC	PRO 2042 1000 CHANNEL SCANNER	£175
SANGAEN	ATS-909 WORLD BAND RECEIVER	£130
TARGET	HF-3S RECEIVER	£99
TRIO	R-2000 RECEIVER + CONVERTER	£300
TRIO	R-1000 AC HF RECEIVER	£120
YAESU	FRG-100 HF RECEIVER	£300
YAESU	FRG-7700 HF RECEIVER	£220
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YAESU	FRG-9600 RECEIVER	£200
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YUPITERU	MVT-225 AIRBAND SCANNER	£150
YUPITERU	MVT-7300 MULTIBAND HANDHELD SCANNER	£199
YUPITERU	MVT-8000 SCANNER	£225
YUPITERU	MVT-9000mkII MULTIBAND HANDHELD RECEIVER	£275
YUPITERU	VT-125 AIRBAND SCANNER	£120
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	500KHZ - 1650 MHZ	£140

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G3

Introducing a breakthrough

Front Panel



An intuitive control panel features a wide variety of tuning and scan modes, memory functions, and many other facilities.

Demodulator



The Professional Demodulator (optional) is adjustable in many respects, including the digital filter parameters.



The Professional Demodulator (optional) includes interactive block diagrams for all modes, with two real-time spectrum scopes and THD and SINAD measuring facilities.

Spectrum Scope



The secondary wide-band spectrum scope complements the primary narrow-band one.

Specifications

- Frequency range: 9 kHz to 30 MHz • Tuning resolution: 1Hz
- Modes: AM, AMN, AMS, LSB, USB, ISB*, DSB*, CW, FM3, FM6, FMN
- Antenna: 50ohm (SMA) • Dynamic range: 95dB • IP3: +8dBm
- *Professional Demodulator Option only

System Requirements

- IBM PC compatible (CPU 500MHz or higher, PCI slot)
- Sound Blaster 16 (or compatible sound card)
- Windows 98/ME/NT/2000/XP

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UK Sales Information

Contact the authorized UK distributor

Falcon Equipment and Systems

Tel: (0)1684 295807

Fax: (0)1684 850011

Email: winradio@sda-falcon.co.uk

Just when you thought that there is nothing in shortwave that could surprise you anymore, here comes the new WinRADIO G303i Receiver.

This new receiver continues in the fine tradition established by WinRADIO's successful range of wide-band PC-based receivers. The "G3" stands for "the third generation": As the original, award-winning, first-generation WR-1000i receiver was the world's first commercially available wide-band receiver on a PC card when launched seven years ago, the newly introduced WR-G303i is the world's first dedicated shortwave receiver on a PC card. It is also the first commercially available receiver where the entire final intermediate frequency stage and an all-mode demodulator are entirely executed in software, running on a PC.

The advantages of this receiver are too numerous to list in this limited space: In addition to the flexible and friendly user interface of a PC-based receiver, with its numerous functions and facilities not normally available on any conventional receiver, the WinRADIO G303i Software-Defined Receiver excels particularly by the ability of its demodulators: While the Standard Demodulator provides the performance of a highly respectable shortwave receiver including synchronous AM demodulation and a real-time spectrum scope, the optional Professional Demodulator offers even more: continuous IF bandwidth adjustment (in 1Hz increments), interactive block diagrams with two additional audio spectrum scopes, and even built-in THD and SINAD measurement facilities. Additional demodulators are planned as further options, including a DRM (digital radio) demodulator.

The WinRADIO G303i - a ground-breaking shortwave receiver that will surely amaze you.



For more technical details please visit:
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NORTH WEST

CHESHIRE

CHESTER & DRS, G3GIZ. Meets at the Burley Hall, Waverton, Chester. Details from Bob Campbell G4CMI. Tel: (01244) 378669.

HALTON RADIO CLUB, MOBXZ. Meets at the Play Centre, Norton Hill, Windmill Hill, Runcorn. Details from Alan Parker 2E1DSF. Tel: (01928) 790228.

MACCLESFIELD WIRELESS SOCIETY, G4MWS. Meets at the Pack House Bowling Club, Abbey Road, Maccesfield. Details from Mrs Hazel Parrott.

MID CHESHIRE ARS, G3ZTT. Meets at the Cotebrook Village Hall, Cotebrook Nr. Tarporley, Cheshire. Details from Niall Reilly G0VDK.

NORTH CHESHIRE RC, G0BAA. Meets at the Morley Green Club, Mobberey Road, Willmslow, Cheshire. Details from Jill Gourney G0OZJ. Tel: 0161-485 5036.

RADIO OFFICERS ARS, MORDA. Details from Mr J. Bell G0CMM.

UKFM GROUP WESTERN, GB3MP. Meets at the Morley Green Club, Mobberey Road, Willmslow, Cheshire. Details from Gordon Adams G3LEQ. Tel: (01565) 652652, FAX: (01565) 634560.

WARRINGTON & DARS, G0WRS. Meets at the Grappenhall Community Centre, Bellhouse Lane, Grappenhall, Warrington, Cheshire. Details from John Riley G0RPS. Tel: (01925) 762722.

WIDNES & RUNCORN ARC, G0FWR. Meets at the Scout Hut, Castle Road, Halton Castle, Runcorn, Cheshire. Details from Martin Tust G4LUQ. Tel: (01928) 714843.

CUMBRIA

CARLISLE & DARS, G4ARS. Meets at the Morton Community Centre, Wigton Road, Carlisle. Details from Mr J.A. Ennis G3XVA. Tel: (01228) 27463.

EDEN VALLEY RS, G0ANT. Meets at the BBC Club, Penrith. Details from John Roze G0VMP. Tel: (01931) 716421.

FURNES ARS, G4AAR. Meets at the Farmers Arms Hotel, Newton-in-Furness. Details from Mr K. Moore M1BWA. Tel: (01229) 465691.

WHITEHAVEN ARC, MOBEE. Details from Mr N. Williams M0CRM.

GREATER MANCHESTER

BURY RS, G3BRS. Meets at the Mosses Centre, Cecil Street, Bury, Lancs BL9 0SB. Details from Steve Gilbert G3DAG. Tel: 0161-881 1850.

DOUGLAS VALLEY ARS, G3BPK. Meets at the Wigan Sea Cadet HQ, Training Ship Sceptre, Brookhouse Terrace, off Warrington Lane, Wigan. Details from Mr D. Snape G4GWG. Tel: (01942) 211397.

ECCLES & DARS, G3GXJ. Meets at the Eccles Liberal Club, Wellington Road, Eccles, Manchester. Details from Chris Hanson G8KRG. Tel: 0161-773 7899.

MANCHESTER & DARS, G5MS. Meets at the Simpson Memorial Community Hall, Moston Lane, Moston, Manchester. Details from Mr T. Lever, Sr.

OLDHAM ARC, G4ORC, G1ORC. Meets at the Royston Air Training Corps, Park Lane, Royston, Oldham. Details from Michael Crossley M1CVL. Tel: (01706) 367454.

OLDLER HILLS ARS, G0UQA. Meets at the Oldler Community School, Hudsons Walk, Oldler Hill, Rochdale. Details from Carolyn Hope G7WFF. Tel: (01706) 522687.

ROCHDALE & DARS (RADARS), G0ROC. Meets at the Barnfield & Fieldhouse, Oncton Club, Barnfield Village. Details from John Cannell G7QAL. Tel: (01706) 376204.

SOUTH MANCHESTER RAD & COMP CL, G3FVA. Meets at the Sale Cricket Club, Dawe Road, Sale, Cheshire. Details from Chris Ward G4HDN. Tel: 0161-483 5174.

STOCKPORT RS, G6GU, G8SRS. Meets at the T.S. Hawkins, Stockport Sea Cadets HQ, Pearmill Ind. Est., Stockport Road, West Howe, Lower Bredbury, Stockport. Details from David Simcock M1ANT. Tel: 0161-456 7832.

TRAFFORD ARC, G0TRC, G1TRC. Meets at the Watch House, Cruising Club, Canal Bank, Streteford, Manchester M32 8WE. Details from Roger May G4YLQ. Tel: (01457) 866675.

TRAFFORD RADIO GROUP, G0TRG. Meets at 17th Streteford Scouts HQ, Barton Road, Streteford, Manchester. Details from Jon Mossman G7JKK. Tel: 0161-865 5609.

WEST MANCHESTER RC, G4MWC. Meets at the Astley & Tyldesley Miners Welfare Club, Meany Road, Astley, Tyldesley, Manchester. Details from Jeffrey Moran M0BGU. Tel: (01204) 497694.

WIGAN & DARC, G0HRW. Details from Mr D.H. Barkley G0DPI. Tel: (01942) 237162.

ISLE OF MAN

ISLE OF MAN ARS, G03FLH. Meets in the Sea Cadets Hall, Tromode Road, Tromode, Douglas. Details from Dave Watton M00BX. Tel: (01624) 816308.

LANCASHIRE

BURNLEY & DARS, RS87674. Meets at Barden High School, Barden Lane, Burnley, Lancashire. Details from Bill Scvener G0BQC.

CENTRAL LANCAS ARC, G0FDX. Meets at the Priory Club, Broadfield Drive, Leyland, Lancs. Details from Steve Shearn M1ACJ.

DARWEN ARC, G4US. Meets at the Darwen Catholic Club, Wellington Fold, Darwen, Lancashire. Details from Len Jackson G0NPI.

FISTS OW CLUB, G0IFX. Details from Mr E. Longden G3ZQS. Tel: (01254) 703948.

FYLDE ARS, RS53939. Meets at the A.N.T. Flying Clubhouse, Blackpool Airport. Details from Ken Randall

G3RFH. Tel: (01253) 407952.

MORECAMBE BAY ARS, G4YBS. Meets at the Trnspell Sports & Social Club, Outrims Lane, Morecambe, Lancs. Details from Brian Watson G0RDH. Tel: (01524) 242522.

PRESTON ARS, G3KUE. Meets at the Lonsdale Club, Fuwood Hall Lane, Fulwood, Preston. Details from Mark Procter G1PIE.

ROLLS-ROYCE ARC, G3RR. Meets at the Club Room, Rolls-Royce Sports Ground, Barnoldswick. Details from Mr J.A. York G3KYJ.

ROSSENDALE ARS, G1RRS. Meets at the Old Fire Station, Burnley Road, Rawtenstall, Rosendale, Lancs BB4 6EW. Details from Ken Slaughter. Tel: (01705) 830306.

THORNTON CLEVELYS ARS, G4ATH. Meets at the Frank Townsend Centre, Beach Road, Thornton Cleveleys, Lancs. Details from Mr J.E. Duddington G4BFH. Tel: (01253) 853554.

MERSEYSIDE

LIVERPOOL & DARS, G3AMD. Meets at the Churchill Conservative Club, Church Road, Wavertree, Liverpool L15. Details from David G. Parr G8DEY.

SOUTH WIRRAL CONTEST GROUP, G3CSA. Details from Mr T.B. Saggerson G4WSE. Tel: 0151-339 0842.

SOUTHPORT & DARC, G2QA. Meets at St. Marks Church Hall, Scansbrick, Lancs. Details from Don Atkins M1BUL.

WIRRAL & DARC, G4MGR. Meets at the Irby Cricket Club, Mill Hill Road, Wirral. Details from Brian Black.

WIRRAL ARS, G3NMR, M0LARC. Meets at the Club Room, Ivy Farm, Arrow Park Road, Wirral L49 5LW. Details from Alan Upton G3UZU. Tel: 0151-677 3266.

NORTH EAST

CLEVELAND

EAST CLEVELAND ARC, G4CRD. Meets at the Committee Room of The New, New Marske Institute Club, Gurney Street, Cleveland TS11 8EG. Details from Malcolm Brass G4YMB. Tel: (01287) 638119.

STOCKTON & DARG, G4XXG. Meets at the Billingham Community Centre, Billingham, Cleveland. Details from David J. London G0VGB. Tel: (01642) 896395.

CO DURHAM

BISHOP AUCKLAND RC, G4ITF. Meets at the Stanley Village Hall, Rear High Road, Stanley, Crook, Co. Durham. Details from Mark Hill G0GFG. Tel: (01388) 745353.

DERWENTSIDE ARC, G4PFO. Meets at the Steel Club, 36 Medley Road, Consett, Co. Durham. Details from Mr G. Darby G7GUJ. Tel: 0191-370 2032.

GREAT LUMLEY AR & ES, G4EUC. Meets at the Community Centre, Great Lumley, Chester-le-Street, Co. Durham. Details from Mr D.J. Barclay M0BPM. Tel: 0191-388 8113.

PETERLEE RADIO CLUB, G0KVJ. Details from Andrew Pennell G0NSK.

HUMBERSIDE

EAST YORKSHIRE ARS, G0ECR. Meets at the Northern Foods Sports & Social Club, Millhouse Woods Lane, Cottingham, E. Yorks. Details from David Taylor G4EBT. Tel: (01482) 876702.

GOOLE R & ES, G0OLE. Meets at the West Park Pavilion, Goole, South Humberside.

GRIMSBY ARS, G3CNX. Meets at Cromwell Social Club, Cromwell Road, Grimsby, South Humberside. Details from Mr G.J. Smith G4EBK. Tel: (01472) 887720.

HORNSEA ARS, G4EKT. Meets at The Mill, Alwrick Road, Hornsea, North Humberside. Details from Jeff Southwell G4GY. Tel: (01964) 533331.

HULL & DARS, G3AMW. Meets at the SWL Centre, Club Room, Coathill Close, Watton Street, Hull. Details from Mr R. Hatton.

RAYWELL PARK SCOUTS ARS, G4CMT. Details from Mr A.D. Russell M0AXU.

SCUNTHORPE STEEL ARC, G4FUH. Details from Alistair Butler M1ECF.

NORTH YORKSHIRE

DARLEY ARC, G0FOS.

HAMBLETON ARS, G0JQA. Meets at the Menap Centre, Northallerton, N. Yorks. Details from Ian Brockwood G0JQA. Tel: (01609) 775598.

QUEEN MARY ARC, G6QM. Meets at Blazefield, Pateley Budge, Harrogate. North Yorks HG3 5DR. Details from Frank Hams G4IEY. Tel: (01242) 236715.

RIPON & DARS, G4SJM. Meets at The Bunker, rear of Ripon Town Hall, North Yorkshire. Details from Nigel Drumm M1BDZ. Tel: (01423) 884733.

ROYAL SIGNALS SCARBOROUGH ARC, G0RCS. Details from Mr A.W.W. Timme G3CWW. Tel: (01484) 842330.

SCARBOROUGH ARS, G4BP. Meets at the Scarborough Cricket Club, Pavilion, North Marine Road, Scarborough, North Yorks YD12 2TJ. Details from Mr D.P. Tipper G3JBR. Tel: (01723) 377296.

SCARBOROUGH SE GRP, G0000. Details from Roy Clayton G4SSH. Tel: (01723) 862924.

THE VINTAGE & MILITARY ARS, RS183536. Details from H.A. Aspinall.

YORK ARS, G3HWW. Meets at the Guppy's Enterprise Club, 17 Nunney Lane, York. Details from Keith Cass G3WVO. Tel: (01904) 422084.

YORK RADIO CLUB (AMATEUR) G4YRC. Meets at the Bishopthorpe Social Club, Bishopthorpe Main Street, York. Details from Gareth Foster G1DRG. Tel: (01304) 421392.

NORTHUMBERLAND

NORTHUMBRIA ARC, G4AAX. Meets at the Old Telephone Exchange, Crosswell Road, Ellington, Morpeth, Northumberland. Details from Mr D. Stansfield G0EVV. Tel: (01670) 513026.

SOUTH YORKSHIRE

FINNINGLEY ARS, G7HAH. Details from John Fennell G4HDY. Tel: (01427) 872522.

MALTBY & DARS, G4SKM. Meets at the Centenary Hall, Clifford Road, Hellaby, Rotherham. Details from Keith Johnson G1PQW. Tel: (01709) 798098.

MEXBOROUGH & DARS, G4BTS. Meets at the Harrop Hall, Mexborough, South Yorks. Details from Mr R.T. Sheppard G0SKK. Tel: (01709) 586329.

SHEFFIELD ARC, G0INF, NRAE/RAE tuition provided. Meets at the Sheffield University Staff Club, 197 Brook Hill, Sheffield. Details from Mrs Irene Glossop G0SPH.

TYNE & WEAR

Houghton-le-Spring ARC, G3NMD. Meets at the Dumrie Royal British Legion, Dumrie, Fenhouses, Tyne & Wear DH4 6LJ. Details from Foster Augles G0ABF. Tel: 0191-584 4673.

SOUTH TYNESIDE ARS, G1XMKQ. Meets at the Boldon Scout Hut, Grey Horse Car Park, Front Street, Boldon. Details from William Wilson M0BWI. Tel: 0191-421 9921.

TYNEMOUTH ARC G0NWM. Meets at the Linskill Centre, Linskill Terrace, North Shields, Tyne & Wear. Details from Mr G.N. Thompson G0S5H.

TYNESIDE ARS, G3ZQM. Meets at the St Teresa's Club, 200b Heaton Road, Newcastle-upon-Tyne NE6 5HP. Details from Mr J. Pockersill G0DZG. Tel: 0191-265 1718.

WEST YORKSHIRE

DENBY DALE & DARS, G4CDD, G8KMK. Meets at the Pie Hall, Denby Dale, West Yorkshire. Details from Mr J.P. Morley G4FSQ.

HALIFAX & DARS, G2UG. Details from Mr S.P. Ortmeyer G4RAW. Tel: (01422) 203062.

KEIGHLEY ARS, G0KRS. Meets at the Cricket Club, Ingrow, Keighley, West Yorkshire. Details from Mr I. Townson M1BGY. Tel: (01274) 723951.

LEEDS & DARS, G4LAD. Meets at The Radio Shack, Yarnbury (Horsforth), RUF Grounds, Brownberrie Lane, Horsforth, Leeds LS18 5HB. Details from Mr E. Howden G0BU.

NORTH WAKEFIELD RC, G4NOK. Meets at the East Ardsley Cricket Club, Nr. Wakefield. Details from Mrs Olga Parker 2E1ASV. Tel: 0113-253 9087.

OTLEY ARS, G3XNO. Meets at The RAOB Club, Westgate, Otley, West Yorkshire. Details from Jack Worsnop G0SNV. Tel: (01274) 636197.

PONTEFRACT & DARC, G3FYQ. Meets at the Carleton Community Centre, Pontefract, West Yorkshire. Details from Colin Wilkinson G0NQE. Tel: (01977) 677006.

SPEN VALLEY ARS, G3SVC. Meets at the Old Bank WMC, Milfield, West Yorkshire. Details from Mr J.R. Wilde G0FOI. Tel: (01274) 875038.

WAKEFIELD & DARS, G3WRS. Meets at the Ossett Community Centre, Prospect Road, Ossett, W. Yorks. Details from Ian Roberts. Tel: (01924) 216502.

WAKEFIELD RPTG GP, G0KNR. Details from Mike Chaffron G6OXZ.

WHITE ROSE ARS, G3XEP. Meets at the Mootown RUF, Moss Valley, Kings Lane, Leeds LS17 7NT. Details from Mr M. Wilson G7SDW. Tel: 0113-273 6039.

MIDLANDS

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UNDFOSTER DOWNS RC, G4DDC. Meets at the Chevs House, 77 High Street South, Dunstable, Beds LU6 3SF. Details from Phil Seaford G8XTW. Tel: (01525) 384419.

SHEFFORD & DARS, G3FJE. Meets at the Church Hall, Amphill, Shefford, Beds. Details from John West. Tel: (01462) 812739.

ST SWITHUN'S ARC, M0AIV. Meets at St. Swithun's Church, Rectory Rooms, Sandy, Beds. Details from Kelynn Darton G0WDD. Tel: (01767) 683179.

CAMBRIDGESHIRE

CAMBRIDGE & DARC, G2VX. Meets at the Colendge Community College, Raedegund Road, Cambridge. Details from Ron Huntsman G3KBR. Tel: (01223) 501712.

DUNFORD ARS, G82MM. Meets at Building 177, Imperial War Museum, Dunford Airfield, Cambs. Details from Mrs B.I. Pope. Tel: (01279) 656149.

GTR PETERBOROUGH ARC, G4EHW. Meets at the 6th Form Building, Stanground College, Farset Road, Fletton, Peterborough. Details from Alan D. Ralph G8DLH.

HUNTINGDONSHIRE ARS, G0HSR. Meets at the Medway Centre, Medway Road, Huntingdon. Details from David Leech G7DIU. Tel: (01480) 431333.

MARCH & DARS, G3PMH. Meets at the British Legion Club, Rookwood Road, March, Cambs PE15 8DP. Details from Mr J. Braithwaite G3PWK. Tel: (01353) 698885.

PETERBOROUGH R & ES, G3DQW. Details from Mr V. Edwards G8NGZ.

WISBECH AR & ELEC. CLUB, M5ARC, G4POL, G8NED. Meets at RAFA Club, Did Market, Wisbech. Details from Alan Bndgeland M0DUQ. www.warec.org.uk

DERBYSHIRE

BOLSOVER ARS, G4RSB. Meets at the Blue Bell, High Street, Bolsover, Derbys. Details from Colin Morris G0RXT. Tel: (01246) 822856.

BUXTON RA, G4SPA. Meets at the Leewood Hotel, Buxton. Details from Derek Carson G4IHO. Tel: (01298) 25506.

DERBY & DARS, G2DJ. Meets at Carlton Road United Reform Church, Carlton Road, Littleover, Derby. Details from Martin Shardlow G3SZJ. Tel: (01332) 556875.

EREWASH VALLEY ARG, G0PCX. Meets at The Sitwell Arms Public House (between Horsey Woodhouse and Woodside), Details from Peter Russell M0AQJ.

MOUNT ST. MARY'S ARC, G4MSM. Meets at the College, Spinkhill, Sheffield. Details from Rev. P. McArdle G0DAG. Tel: (01246) 812230.

NOTTS & DERBY BORDER ARC, G4NID. Meets at Marpool United Reform Church, Chapel Street, Marpool, Ilkeston. Details from Graham Bromley G4UTN. Tel: (01773) 834308.

NUNSFIELD HOUSE ARG, G3EEO. Meets at the Nunsfield House, Boulton Lane, Alvaston, Derby. Details from William F. Smith G7PJJ.

STH DERBYS & ASHBY W ARG, G0SRC. Meets at the Moira Replian Centre, 17 Ashby Road, Moira, Swadlincote, Derbyshire DE12 6DJ. Details from Mrs B. Walling. Tel: (01263) 760822.

STH NORMANTON, ALFRETON & DARC, G0CPO. Meets at the New St. Community Centre, New Street, South Normanton, Derbyshire. Details from Peter Gething M0CLU. Tel: 0115-955 5766.

GLOUCESTERSHIRE

CHELTENHAM AR ASSN, G58K. Meets at the Prestbury Library, Prestbury, Cheltenham. Details from Ivan Wilson G48GW. Tel: (01452) 731956.

CHELTENHAM CLUSTER SUPP GP, G87DXC. Details from Mr A.M. Davies G0HDB. Tel: (01684) 72178.

GLOUCESTER AR & ES, G4AYM. Meets at the Churchdown School, Churchdown. Details from Mr A.J. Martin. Tel: (01452) 618930.

SOMMS INDUSTRIES RS, G4MEN. Meets at the Sports & Social Club, Evesham Road, Bishops Cleeve, Cheltenham GL52 4SF. Details from A.J. Hooper G1JMF.

STROUD RS, G4SRS. Meets at the Minchampton Youth Centre, Nr. Stroud, Details from Mr S.G. Spencer G3ILD.

WHITE NOISE LISTENING GOWNL. Details from Adrian Deane G7KOG.

HEREFORD & WORCESTER

BROMSGROVE & DARC, G3VGC. Meets at the Avoncroft Arts Centre, Bromsgrove, Worcs. Details from Mr J.F. Burford G4OAZ.

BROMSGROVE ARS, G4TUI. Meets at the Liky End WMC, Bromsgrove, Worcs. Details from Barty Taylor G0TPG. Tel: (01527) 542266.

DROITWICH ARC, G4PYO. Meets in the Community Hall, Droitwich Spa, Worcs. Details from Hector Wrang M1BUV. Tel: (01905) 794399.

HEREFORD ARS, G3YDD. Meets at the Civil Defence HQ, Magistrates Court, Gaoi Street, Hereford. Details from Tim Bndgland-Taylor G0JWJ. Tel: (01432) 279435.

KIDDERMINSTER & DARS, G0WRC. Meets at the Sutton Arms, Sutton Park Road, Kidderminster, Worcs. Details from Mr A.W. Saunders G0ZNB. Tel: (01299) 400172.

MALVERN HILLS ARC, G4MHC. Meets at the Red Lion Inn, St. Anne's Road, Malvern, Worcs. Details from Dave Hobro G4IDF. Tel: (01905) 351568.

REDDITCH RC, G4CZC. Meets at the WRVS Centre, Ludlow Road, Redditch, Worcs. Details from Mr R.J. Mutton G3EVT. Tel: (01789) 762041.

VALE OF EVESHAM RAC, G0ERA. Meets at the BBC Club, High Street, Evesham, Worcs. Details from Mr A.C. Lindsay G4NRD. Tel: (01386) 41506.

Rose G4STO. Tel: (01427) 788356.

RAF CONINGSBY ARC, G3LQS. Meets at Essex Block, RAF Coningsby. Details from Peter Hanson G0NYY.

RAF WADDINGTON ARC, G0RAF. Meets at Pwysle Inn, Foswebank, Saxby Road, Lincoln. Details from Robert Pickles G3VCA. Tel: (01522) 528708.

SPALDING & DARS, G4DSP. Meets at The Old Fire Station, Spalding, Lincs. Details from Raymond Pearson G8ELV. Tel: (01775) 711953. Web: www.sdars.org.uk

SPILSBY ARS, RS91468. Details from Clive Ironmonger G6HYF. Tel: (01790) 752712.

NORTHANTS

KETTERING & DARS, G5KN. Meets at The Lilacs Public House, 39 Church Street, Isham, Kettering, Northants NN14 1JD. Details from Fay Barwell G6AKS. Tel: (01536) 390954.

MID NORTHANTS AR EXP, GOING. Details from Lionel Parker G5LP.

NORTHAMPTON RC, G3GWB. Meets at the British Timken, Social & Athletic Club, Cotswold Avenue, Duzon, Northampton. Details from Norman Miller G02XB. Tel: (01327) 349188.

NORTHAMPTON SCOUT ARS, G6NDS. Meets at Overstone Scout Activity Centre, Northampton. Details from Ian Rvett G6WPU.

PARALLEL LINES CG, G4LUP. Details from Mr P.S. Lidsay G4CLA.

NOTTINGHAMSHIRE

ARC OF NOTTINGHAM, G3EKW. Meets at the Haywood Radio Community Association, Haywood Road, Mapperley Road, Nottingham NG3 6AD. Details from Ron Hague G4XOU. Tel: 0115-919 9177.

DUKERIES ARS, G4XTL. Meets at Ambleside Community Centre, Ambleside, New Olterton, Notts. Details from Colin Foster G7DEX.

HUCKNALL ROLLS ROYCE ARC, G5RR. Meets at the Hucknall Rolls Royce Sports & Social Club, Watnail Road, Hucknall, Nottingham. Details from Mr P. Hart G4JSM.

MANSFIELD ARS, G3GQC. Meets at the Debdale Park Sports & Recreation Club, Debdale Lane, Mansfield Woodhouse, Notts. Details from David Peat GORDP. Tel: (01623) 631931.

NORTH NOTTS DATA GROUP, G0WNN. Details from Tony Jenkins G8TBF.

SIEMENS ARC, G8ZK, G8IGQ. Meets at the GPT Sports Ground, Beeston, Nottinghamshire. Details from Chns Archer G4VFK. Tel: 0115-943 3387.

SOUTH NOTTS ARC, G0QAU. Meets at the Fairham Community College, Farnborough Road, Clifton, Nottingham NG11 9AE. Details from Gary Bishop G0WUG. Tel: (01509) 672846.

WORKSOP ARS, G3RCW. Meets at the Club House, 59-61 West Street, Worksop, Nottingham S80 1JP. Details from Terry Calvert G4GBS. Tel: (01302) 743130.

SHROPSHIRE

OSWESTRY & DARC, G4TTO, G1ORA. Meets at the Sweeney Hall Hotel, Sweeney, Oswestry. Details from Ant Astley G0WAA. Tel: (01691) 860545.

SALOP ARS, G3SRT, M1AXW. Meets at the Telepost Club, Railway Lane, Abbey Forge, Shrewsbury. Details from John Burnford G0GNI.

TELFORD & DARS, G3ZME. Meets at the Dawley Bank Community Centre, Dawley, Telford, Shropshire. Details from Mr M. Vincent G3UKV. Tel: (01952) 255416.

STAFFORDSHIRE

BURTON-ON-TRENT & DARS, G3NFC. Meets at the Stapelthill Institute, Main Street, Stapelthill, Burton-on-Trent, Staffs. Details from Mr M.W. Cotton G4H8Y.

CANNOCK CHASE ARS, G6SW. Meets at the Four Crosses Inn, Watling Street, Hatherton, Cannock. Details from Arnold Matthews G3FWZ. Tel: (01543) 262495.

CHAD RC, G4CAR. Meets at the Swinfen Officer's Club, Swinfen, Lichfield, Staffs. Details from Bernard Jayne G8WFL. Tel: (01543) 268569.

LICHFIELD ARS, G3WAS. Meets at the Queens Head, Sandford Street, Lichfield. Details from Roger Smethers G3NLY. Tel: (01543) 672762.

MOORLANDS & DARS, G4NHT, G1MAD. Meets at the Creta Works, Blythe Bridge, Stoke-on-Trent, Staffs ST11 9LJ. Details from Mr B.J. Butcher G4HKG. Tel: (01782) 395793.

NEWCASTLE-U-LYME SCOUT AR COM GR, G7UQG

STOKE-ON-TRENT ARS, G3GBU. Meets at the '45' Club, 92 Lancaster Road, Newcastle-under-Lyme, Staffs. Details from Albert Allen G4DHO. Tel: (01782) 638801.

WARWICKSHIRE

AVON VALLEY ARA, MORAD. Details from Mr Peter Bradham G0WVJ. Tel: (01905) 724531.

MID WARWICKSHIRE ARS, G3UON. Meets at the St. John Ambulance HQ, 61 Emscote Road, Warwick. Details from Bernard Pittaway. Tel: (01926) 420913.

RUGBY ATS, G4APD. Details from Tony Humphries G0OLS. Tel: (01455) 552683.

STRATFORD-UPON-AVON & DRS, G0SOA. Meets at the Home Guard Club, Tiddingham, Stratford-upon-Avon, Warks. Details from Ron Horsley G0MRH. Tel: (01970) 148204.

WEST MIDLANDS

ALDRIDGE & BARR BEACON ARC, G0NEQ. Meets at the Aldridge Central Hall Community Centre, Middlemore Lane, Aldridge WS9 5AN. Details from Mr C.J. Baker G0NOL. Tel: (01922) 636162.

COVENTRY ARS, G2ASF. Meets at the Binley Rugby Hall, Bnniklow Road, Coventry. Details from John Beech G8SEQ. Tel: (01203) 673999.

DUDLEY ARC, G4DAR. Meets at the Community Centre, Sedgley, Central Library, St. James Road, Dudley. Details from Tony Lucas G4LYA. Tel: (01384) 277925.

HILLCREST ARS, G0SPM. Meets at The College, Simms Lane, Netherton, Dudley, West Midlands. Details from Mrs Megan Fleetwood G0TFM. Tel: (01384) 294804.

KYNOCH R & T.V.S, G3HPP. Meets at the Club Workshop, IMI Ltd., Sportsfield, Perry Bar, Birmingham. Details from Mr G. Nicholls. Tel: (01922) 635376.

MIDLAND ARS, G3MAR. Meets at Unit 22, 60 Regent Place, Hockley, Birmingham (jewellery quarter). Details from John A. Crane G0LAI. Tel: 0121-628 7632.

SANDWELL AMATEUR RADIO CLUB, G0CWC. Meets at Sandwell ARC, Broadway, Oldbury, Warrley, West Midlands B68 9DP. Details from Stuart Collins M0BTO. Tel: 0121-561 4663.

SIERRA HOTEL ARCG, G0OBS. Details from Warwick M. Hall G4WMH.

SOLIHULL ARS, G3GEI. Meets at The Shirley Centre, 274 Stratford Road, Shirley, Solihull, West Midlands. Details from Paul Gaskin G8AYY. Tel: 0121-783 2996.

SOUTH BIRMINGHAM RS, G3DHM. Meets at Hampstead House, Fairfax Road, West Heath, Birmingham. Details from The SBRS Secretary.

STOURBRIDGE & DRS, G6QI, G6SRS. Meets at the Old Swinford Hospital/School, Stourbridge, West Midlands. Details from Tom Edwards.

WEST BROMWICH CENTRAL RC, G4WBC. Meets at The Sandwell Public House, High Street, West Bromwich, West Midlands. Details from Ian Leitch G0PAL. Tel: 0121-561 2684.

WEST MIDLANDS POLICE ARC, G0COP, G1WMP. Details from Steven Jones G6JRL.

WILLENHALL & OARS, G4ETW. Meets at The Liberal Club, Villiers Street, Willenhall, West Midlands. Details from Dave Bradbury. Tel: (01902) 411252.

WOLVERHAMPTON ARS, G8TA. Meets at the Electricity Board Sports Club, St. Marks Road, Chapel Ash, Wolverhampton. Details from Mrs J. Smith. Tel: (01902) 751936.

WORDSLEY RC, G4WRA. Meets at the Brnk Makers' Arms, Mount Pleasant, Briery Hill, West Midlands. Details from Andy Evans G1PKZ.

LONDON & CENTRAL

BERKSHIRE

ARBOURFIELD ARC, G3IHH. Details from Mrs E.W. Harding 2E1AUQ.

BRACKNELL AEC, G4BRA. Meets at the Coopers Hill Community Centre, Bagshot Road, Bracknell, Berks. Details from John Eilerton G3NCH.

BURNHAM BEECHES RC, G3WMR. Meets at the Farnham Common Village Hall, Victoria Road, Farnham Common, Berks. Details from Mrs Eileen Chislett G6EIL. Tel: (01628) 625720.

MAIDENHEAD & OARC, G3WYX. Meets at the Red Cross Hall, The Crescent, Maidenhead, Berkshire. Details from Neil Savn G0SVN. Tel: (01628) 626210.

NEWBURY & OARS, G5XV. Meets at the Rugby Club, Monk's Lane, Newbury. Details from Mark Stide M0CUK. Tel: (01488) 638985.

READING ARC, G3ULT. Meets at the Woodley Pavilion, Woodford Park, Haddon Drive, Woodley, Reading. Details from Mamoch Standen G0JMS. Tel: 0118-972 3504.

BUCKINGHAMSHIRE

AYLESBURY VALE RS, G4VRS. Meets at the Harwick Village Hall, Aylesbury, Bucks. Details from Mr L.I. Cropley G0GDC.

CHESHAM & DARS, G3MDG, G1MDG. Meets at the White Hill Centre, Chesham, Bucks. Details from Mr T.J. Thriwell G0VFW. Tel: (01442) 832169.

CHILTERN ARC, G3CAR. Details from Roy Page G4YAN. Tel: (01494) 534216.

MILTON KEYNES ARS, G3HIU. Meets at Bletchley Park Museum (The Green Room, B Block Annex), Wilton Avenue, Bletchley, Milton Keynes. Details from Mrs J. Battersby M1EP. (Secretary) on (01908) 565636 or Frank Collins M0RPM (Chairman) on (01234) 713148

MILTON KEYNES SCOUT ARS, G0SMK. Meets at The Quarries, M.K. Scout Campsite, Cosgrove. Details from Mr P.A. Orchard G0RYZ. Tel: (01908) 648186.

GREATER LONDON

ADDISCOMBE ARC, G4LSE. Meets at the Lion Inn, Pawsons Road, Croydon. Details from Mr Q.G. Collier G3WRR. Tel: 0208-653 6948.

BARKING R & ES, G3XBF. Meets at the Parkside Community Centre. Details from Bill Chewter G0JQK. Tel: (01708) 474443.

BROMLEY & DARS, RS89030. Meets at the Victory Social Club, Kechill Gardens, Hayes, Bromley. Details from Alan G. Messenger G0TLK.

CLIFTON ARS, G3GHN. Meets at the Kidbrooke House, Community Centre, 90 Mycene Road, London SE3 7SE. Details from Mr J. Veaney G7BK4.

CRYSTAL PALACE & DRC, G3VCP. Meets at the All Saints Church, Parish Rooms, Beuiah Hill, London. Details from Bob Burns G300U. Tel: (01737) 552170.

DARENTH VALLEY RADIO, G0KDV. Meets at the Crockenhill Village Hall, Swanley, Kent. Details from Mr K.W. Halls G8VJG. Tel: (01322) 663022.

ECHFORD ARS, G3JES. Meets at The Community Centre, St. Martin's Court, Kingston Crescent, Ashford, Middlesex. Details from Robin Hewes G3DTR. Tel: (01784) 456513.

EDGWARE & DRS, G3ASR. Meets at the Watling Community Centre, 145 Orange Hill Road, Burnt Oak, Edgware, Middlesex. Details from Stephen Stater G0PQB. Tel: 0208-953 2164.

HAVERING & DARS, G4HRC. Meets at the Fairlykes Arts Centre, 51 Billet Lane, Homchurch, Essex.

RS OF HARROW, G3EPF. Meets at the Harrow Arts Centre, Uxbridge Road, Hatch End, Middlesex. Details from Mr C. Fnel G4AUF. Tel: (01895) 621310.

SILVERTHORNE RC, G3SRA, G2HR, G8CSA. Meets at the Chingford Adult Education and Community Centre, Friday Hill House, Simmons Lane, Chingford, London E4 6JH. Details from Dave Chnsty G0HHC. Tel: 0208-504 2831.

SOUTH LONDON COLLEGE ARS, G3HFY. Meets at the Lambeth College, Norwood Centre, Knights Hill, West Norwood, London. Details from Mr M. Knott G0WCR.

SOUTHGATE RC, G3SFG. Meets at the Winchmore Hill Cricket Club, Firs Lane, London N21 3ER. Details from Mr D.F. Bery G4DFB.

ST. DUNSTONS COLLEGE ARS, G4SDC. Details from Sam Kennard G4OHX. Tel: 0181-690 1274.

SURREY RADIO CONTACT CLUB, G3SRC. Meets at the T.S. Terra Nova, 34 The Waldrons, Croydon, Surrey. Details from Maurice Fagg G4DDY. Tel: 0208-669 1480.

WEST LONDON ARS, RS95599. Details from Robin Clay G0VJI.

WHITTON ARC, G0MIN. Meets at the Whitton Community Centre, Percy Road, Whitton. Details from Ian Clabon G0PFN. Tel: 0208-894 9131.

HERTFORDSHIRE

BISHOPS STORTFORD ARS, G5ZG. Meets at the Royal British Legion Club, Windhill, Bishop's Stortford, Herts. Details from Tony Judge G0PQF. Tel: (01279) 506933.

DACORUM ARS, G7RH, G0WH. Meets at the Guide Meeting Rooms (next to the Royal British Legion), Queensway, Hemel Hempstead. Details from Ian Hamilton G0TCD. Tel: (01442) 211925.

HODDESDON RADIO CLUB, G0TSN. Meets at the Rye Park Conservative Club, Rye Road, Hoddesdon, Herts. Details from Don Platt G3JNJ. Tel: 0208-292 367B.

MIMRAM CONTEST GP, M0ABC. Details from Alan Hodsorth G800. Tel: (01707) 392950.

RADIO SCOUTING TEAM, G8PST. Meets at Tolmers Scout Camp, Tolmers Road, Cuffley, Herts EN6 4J5. Details from Mill Levens G2CKB. Tel: (01992) 558493.

STEVENAGE & DARS, G3SAD. Meets at the Stevenage Bay Centre, Chelsi Way, Stevenage, Herts SG2 0LT. Details from Peter Bell 2E1CRK. Tel: (01462) 674505.

VERULAM ARC, G3VER, G8VER. Meets at the RAF Association HQ, New Kent Road, St. Albans, Herts. Details from Walter Craine G3PMF. Tel: (01923) 262180.

WELWYN & HATFIELD ARC, G3WGC. Meets at the Royal Naval Association, Black Fan Road, Welwyn Garden City, Herts. Details from Dean Jackson G7PKF. Tel: (07973) 560649.

SURREY

BENTLEY ARC, G0VZS. Details from Derek Gilbert G0NFA.

CATERHAM RG, G0SCR. Details from Mr P.N. Lewis G4PL.

COULSDON AMATEUR TRANS. SOC., G4FJR. Meets at St. Swithuns Church Hall, Grovelands Road, Purley, Surrey. Details from Andy Bners G0KZT. Tel: (01737) 552139.

DORKING & DRS, G3CZU, G7DOR. Details from John Greenwell G3AEZ. Tel: (01306) 631236.

FARNBOROUGH & OARS, G4FRS. Meets at The Community Centre, Meudon Avenue, Farnborough, Herts. Details from Mr M. Hearsey G8ATK. Tel: (01252) 715765.

GUILDFORD & DRS, G6GS. Meets at the Guildford Model Engineers HQ, Stoke Park, Guildford, Surrey. Details from Stella Whitbourn G0WKE.

KINGSTON & DARS, G3KIN. Details from Mrs Mary Ashdown G0BQV.

REIGATE ATS, G5LK, G7RAT. Details from Mr A.C. Embling G1LNT. Tel: (01883) 344723.

SUTTON & CHEAM RS, G2XP, G7SAC. Meets at the Sutton United Football Club, Borough Sports Ground, Garden Green Lane, Sutton, Surrey. Details from John Puttock G0BWW. Tel: 0208-644 9945.

THAMES VALLEY ARTS, G3TVS. Meets at the Thames Ditton Library, Watts Road, Gigg's Hill, Thames Ditton, Surrey. Details from Cdr. J. Pegler G3ENI. Tel: (01483) 284279.

WIMBLEDON & DARS, G3WHM. Meets at St. Andrews Church Hall, Herbert Road, Wimbledon, London. Details from Mr Reg Blackwell M1EEK. Tel: 0208-696 9857.

SOUTH & SOUTH EAST

EAST SUSSEX

BRIGHTON & DRS, G4GQR. Meets at the Roast Beef Bar, Brighton Racecourse, Elm Grove, Brighton. Details from Mr P.J. Fellingham.

CROWBOROUGH DARS, G0CWR. Meets at the Plough & Horseshoes Road, Jarvis Brook. Details from Mrs M. Clark. Tel: (01892) 663666.

EAST SUSSEX AMATEUR TV GROUP, RS178475 was G3BVX. Details from Keith Ellis G8HGM. Tel: (01323) 720220.

SOUTHDOWN ARS, G3WQK. Details from Jim Hams G4DRV. Tel: (01323) 728479.

THE ORZ ARG OF SUSSEX, G83VX. Meets at the Coach Station, Watling Road, Eastbourne. Details from Stuart Constable M0CWH. Tel: (01435) 883020.

HAMPSHIRE

ANDOVER ARC, G0AAR. Meets at the Village Hall, Wildhem, Andover, Hants. Details from Mr R.S. Coleman G0WYD.

BASINGSTOKE ARC, G3TOR, G8JYN. Meets at the GEMS Social Club, Lister Road, Basingstoke, Hants. Details from Bob Brown M0CJJ.

FAREHAM & OARC, G3VEF. Meets at the Portchester Community Centre, Westlands Grove, Portchester, Hants. Details from Andrew Sinclair G0AMS. Tel: (01329) 235397.

HIGHFIELD PARK RC, G4WDR. Meets at Highfield Park RC, National Air Traffic Service, Highfield Park, Heckfield, Hants RG27 0LD. Tel: (01734) 225019.

HORNEDEAN & DARC, G4FBS. Meets at Lovedean Village Hall, Lovedean Lane, Lovedean, Hants. Details from

Stuart Swan G0FYX. Tel: (01705) 472846.

ITCHEN VALLEY ARC, G0VNR. Meets at the Scout Hut, Brickfield Lane, Chandlers Ford, Eastleigh. Details from Sheila Williams G0VNI. Tel: (01703) 613827.

SONY BROADCAST ARC, G4SZC. Accredited C&G RAE centre. Meets at Sony Sports & Social Club, Priestley Road, Basingstoke. Details from Stephen Harding G4JGS. Tel: (01256) 55011.

SOUTH HAMPSHIRE INT. TELE SOC., G3DIT. Meets at G3JZV's QTH, space Is limited. Details from Rev. T.R. Mortimer G3JZV. Tel: (02392) 649254.

SUBMARINE ARC, G3BZU. Meets at HMS Collingwood, Newgate Lane, Fareham, Hants PO14 1AS. Details from Mr W.S. Blyth G0PPI. Tel: (01329) 232386.

THREE COUNTIES ARC, G4WWR. Meets at the Bramshot Parish inst. & Club, Headley Road, Liphook, Hants. Details from Damian Kamm G7RFV. Tel: (01428) 724456.

WATERSIDE ARS, G4JYN. Meets at the Applemore Scout HQ, Applemore, Hythe, Southampton. Details from Tony Horton G0LKG. Tel: (01703) 841794.

ISLE OF WIGHT

BRICKFIELDS ARS, G0BAR. Meets at Brickfields Horse Country Centre, Newnham Road, Binstead, Isle of Wight. Details from Mr Pebody.

ISLE OF WIGHT RS, G3SKY. Meets at The Old Cafe, Whitecliff Bay, Holiday Park, Bembridge. Details from Alan Reeves G4ZFQ. Tel: (01983) 294309.

OXFORDSHIRE

BANBURY ARS, G0BRA. Meets at St. John's Church Social Club, South Bar, Banbury, Oxon. Details from Mr R.S. Marsden G1YSY. Tel/FAX: (01295) 253509.

HARWELL ARS, G3PIA. Meets at the Social Club, Harwell Laboratory, Oldcot, Oxon. Tel: (01235) 223250.

OXFORD & DARS, G5L0. Meets at the Grove House Club, George Street, Summertown, Oxford. Details from Mr D. Walker G3BL5. Tel: (01865) 274731.

VALE OF WHITE HORSE ARS, G5RP, G4VWH, G6VWH. Meets at The Fox, Stevenston. Details from Ian White G3SEK. Tel: (01235) 531559.

WEST SUSSEX

CHICHESTER ARC, G2NM. Meets at the St. Pancras Hall, Chichester. Details from Graham Swann G0WSD.

CRAWLEY ARC, G3WSC. Meets at the Tilgate Forest Rec. Centre, Hut 1B, Tilgate Forest, Crawley, West Sussex. Details from Mr J.S. Spence G0PFI.

HORSHAM ARC, G4HRS. Meets at the Guide Hall, Denne Road, Horsham, West Sussex. Details from Alister Watt G3ZBU. Tel: (01403) 253432.

MIO SUSSEX ARS, G3MCS. Meets at Marie Place, Leylands Road, Burgess Hill, West Sussex. Details from Mr C. Childs 2E1DCP. Tel: (01444) 244689.

T.S. VINDICATRIX ASN, G0WVB. Details from Don Still G0OOC.

ST AUSTELL ARC, G0ECC. Meets at Poitair School. Details from Reg Pears G4TRV. Tel: (01726) 72951.

DEVON

APPLEDORRE & DARC, G2FKO. Meets at the Appledore Football Club. Details from Mr B. Jewell M0BRB.

AXE VALE ARC, G8CA, G7AXE. Meets at the George Hotel, Axminster, Devon. Details from Pat Cross G0GHH. Tel: (01297) 33756.

DARTMOOR RADIO CLUB, G1RCD, G0DRC. Meets at the Yelverton War Memorial Village Hall, Meavy Lane, Yelverton, Devon. Details from Ron Middleton G7LLG. Tel: (01822) 852586.

EXETER ARS, G4ARE. Meets at the Moose Centre, Spinning Path Lane, Blackboy Road, Exeter. Details from Ray Donno G3YBK.

EXMOUTH ARC, G0XRC. Meets at The Scout Hut, Marpool Hill, Exmouth.

NORMAN LOCKYER OBSERVATORY ARC, G0AXC. Meets at the Norman Lockyer Observatory, Salcombe Hill, Sidmouth. Details from Ron Hamson G0NOC. Tel: (01395) 515349.

NTE (PAIGNTON) ARS, G0OSH. Meets at Paignton Community College, Upper School, Waterleat Road, Paignton. Details from Rod Maude G0SWM. Tel: (01803) 521066.

SOUTH DEVON ARC, G4SSD. Meets at the Hillhead, Kingswear, Devon. Details from John May G0CDB. Tel: (01803) 522995.

TORBAY ARS, G3NJA. Meets at the Highweek Family & Social Club, Highweek, Newton Abbot, Devon. Details from John Oway G3RMA. Tel: (01304) 956425.

UNIVERSITY OF PLYMOUTH ARS, G0UOP. Details from Alan Sanblito G0XAV.

DORSET

BLACKMORE VALE ARS, G4RBV. Meets at Shaftesbury Club for Young People, Coppice Street, Shaftesbury, Dorset SP7 8PF. Details from Mr A. Marmot G0GFL. Tel: (01258) 860741.

BOURNEMOUTH ARS, G2BRS. Meets at the Kinson Community Centre, Kinson, Bournemouth, Dorset. Details from Chris R. Ellis M5AGG, Broken Ridge, Fir Tree Close, St. Leonards, Ringwood, Hants BH24 2QW. Tel: (01202) 893126.

CHRISTCHURCH ARS, G0MUD. Meets at the Siemens Plessey Sports & Social Club, Grange Road, Somerford, Christchurch, Dorset. Details from Mr K.P. Hams G7WSN. Tel: (01202) 484892.

FLIGHT REFUELLING ARS, G4RRF. Meets at the Flight Refuelling Social Club, Merley, Wimbome, Dorset. Details from Martin Axon 2E1DFZ. Tel: (01202) 693334.

POOLE RS, G4PRS. Meets at the Boumouath & Poole CFE, Constitution Hill Site, Poole, Dorset. Details from Phil Mayer G0WKL. Tel: (01202) 700903.

PORTLAND ARC, G0VOP/G7VQP. Meets at Clifton Hotel, Grove Road, Portland. Details from Kerry Morris G1WIK. Tel: (01305) 78591.

SOUTH DORSET RS, G3SDS. Meets at the Church Hall, Chickwell, Weymouth, Dorset. Details from John Rose M0BQO. Tel: (01305) 832057.

SWANAGE & PURBECK ARC, M0BLI. Meets at Kings Arms, Langton Matravers, Dorset. Details from Peter Waterfield M1WCH/M3WCH. Tel: (01929) 424413.

WESSEX AMATEUR WIRELESS CLUB, G1WAW. Details from Ken Powell G1NCG. Tel: (01202) 549376.

JERSEY

JERSEY ARS, G13DVC. Meets at the German Signal Station, Rue Baal, La Moye, St. Brelade. Details from Mrs Anne Mourant M0BJU. Tel: (01534) 734948.

SOMERSET

PRESTON COMMUNITY SCHOOL ARC, G0PCS. Details from Craig Douglas G0HJD. Tel: (01935) 71131.

TAUNTON & DARS, G3XWZ. Meets at The Memorial Hall, Trull, Taunton. Details from David Rosewar M0CIF.

WEST SOMERSET ARC, G0OWX. Meets at the West Somerset Community College, Minehead, Somerset. Details from Alan Elliott G7RSU. Tel: (01643) 707207.

WINCANTON ARC, G0WRA. Meets at King Arthur's Community School, West Hill, Wincanton. Details from Mr G.A. Fingstun G0EHW. Tel: (01963) 370506.

YEOVIL & DARC, G3GMH, G5YEO. Meets at the Bntish Red Cross HQ, 72 Grove Avenue, Yeovil, Somerset. Details from George Davs G3ICO. Tel: (01935) 425669.

ESSEX

BRAINTREE ARC & CCC, G4JXG. Meets at the Baintree Hockey Club, Church Street, Bocking, Baintree. Details from Keith Farthing 2E0ARS. Tel: (01376) 347736.

CHELMSFORD ARS, G0MWT. Meets at the Marconi Social Club, Beehive Lane, Chelmsford, Essex. Details from David Bradley M0BQC. Tel: (01245) 602838. E-mail: cars@dmw.co.uk

CLACTON RADIO CLUB, G3CRC. Details from Mr D. Fitzpatrick M0CHL.

COLCHESTER ARS, G3VCO. Meets at the Colchester Institute, Sheepen Road, Colchester. Details from Frank R. Howe G3PU. Tel: (01206) 851189.

DENGIE HUNDRED ARS, G0UTT, G7SDH. Meets at the Henry Samuel Hall, Maryland, Essex. Details from Mrs Christine Wade. Tel: (01621) 772986.

HARLOW & DARS, G6UT. Meets at the Mark Hall Barn, First Avenue, Harlow, Essex. Details from Len Blackstone G7UFF. Tel: (01279) 832700. FAX: (01279) 864973.

HARWICH ARC, G0GRH. Meets at the Park Pavilion, Barrack Lane, Harwich. Details from Eugene Krait G4FTF.

LOUGHTON & EPPING FOREST ARS, G4QNP. Details from Marc Litchman G0TCC. Tel: 0208-502 1645/(07803) 023501.

SOUTH ESSEX ARS, G4RSE. Meets at the Paddocks, Long Road, Canvey Island, Essex. Details from Mrs Betty Maynard G6LJU. Tel: (01268) 695474.

SOUTHEAST & DRC, G5QJK. Meets at the Alexandra Yacht Club, Clifton Parade, Southend-on-Sea, Essex. Details

from Alan Radley G0TTM. Tel: (01268) 741229.

STANFORD-LE-HOPE & DARC, G4SLH. Meets at the St Joseph Parish Rooms, Scarot Road, Stanford-le-Hope, Essex. Details from Ken Thompson G4PAD. Tel: (01375) 671238.

VANGE ARS, G3YCW. Meets at the Barnstable Community Centre, Basildon, Essex. Details from Mrs D. Thompson. Tel: (01268) 552606.

KENT

BREDHURST RX & TX SOC., G0BRC. Meets at Rock Avenue Working Mens Club, Rother Gate, Gillingham, Kent. Details from Mr T.M. Wheeler G7MHM.

CRAY VALLEY RS, G3RCV, G1RCV. Meets at the Progress Hall, Admiral Seymour Road, Eltham, London SE9. Details from Richard Perzyna G8TB. Tel: (01689) 602948.

DOVER RADIO CLUB, G3YMD. Meets at the Dover Grammar School for Boys, Astor Avenue, Dover. Details from Brian Hancock G4NPM. Tel: (01304) 821007.

EAST KENT RADIO SOCIETY, G0ENR. Meets at St. Bartholomew's Church Hall, Herne Bay. Details from Paul Nicholson G3VJF. Tel: (01227) 743070, FAX: (01227) 742288.

HASTINGS ELEC. & RC, G6HM, G1JHH, G6LL. Meets at West Hill Community Centre, Croft Road, Hastings, East Sussex. Details from Mr J. Boothroyd G0MTJ. Tel: (01233) 732656.

HILDERSTONE ARS, G0HRS. Meets at Hilderstone A.E.C., Broadstairs, Kent. Details from Mr G. Shaw M0AQA.

HOME COUNTIES ATV GRP, G6HCT. Meets at the Binfield Club, Binfield (near M4/J10), Details from Mr A. Brooker G4WZ.

MAIDSTONE YMCA ARS, G3TRF. Meets at YMCA Sports Centre, Melrose Close, Maidstone, Kent. Details from Colin Wilson G0VAR. Tel: (01622) 736636.

MEDWAY ARTS, G5MMW, G8MWA. Meets at Tunbury Hall, Catkin Close, Tunbury Avenue, Walderslade, Chatham. Details from Mr J. Hale G3FTH.

NORTH KENT RS, G4CW. Meets at The Pop-in-Parour, Graham Road, Bedgeheath, Kent. Details from Mr A.V. Friebens G8MLQ. Tel: (01474) 365694.

SWALE ARX, G4SRC, G6SRC. Meets at the Ivy Leaf Club, Dover Street, Sittingbourne, Kent. Details from Gordon Powell M0AKA. Tel: (01795) 665559.

THE MORSE CLUB, GX00K. Details from Mr K. Churchill M1CZA. Tel: 0208-301 5067.

WEST KENT ARS, G3WKS. Meets at the St. Marks School Hall, Tunbridge Wells, Kent. Details from Malcolm Sheppard G4FWG. Tel: (01892) 652272.

NORFOLK

ANGLIA TELEVISION ARS, G0TVX. Meets at Anglia TV, Norwich NR1 3AG. Details from Jim Bacon G3YLA. Tel: (01603) 615151.

GREAT YARMOUTH RS, G3YRC. Meets at the Bradwell Community Centre, Bradwell, Great Yarmouth, Norfolk. Details from Mr A.D. Besford G3NHU.

GRESHAM'S SCHOOL ARC, G3XPXO. Details from Rev. R.N. Myerscough G3PXO.

KINGS LYNN ARC, G3XYZ. Details from Derek Franklin G0MQL.

NORFOLK ARS, G4ARN. Meets at Norwich Aviation Centre, Norwich Airport. Details from John Wadman G0VZD. Tel: (01953) 604769.

NORTH NORFOLK ARC, G82MC. Details from Keith J. Martin G0GFQ. Tel: (01263) 588506.

SUFFOLK

BURY ST EDMUNDS ARS, G2TO. Meets at the Culford School Outpost, Bury St. Edmunds, Suffolk. Details from George Woods G3LPT.

FELIXSTOWE & DARS, G4ZFR. Meets at the Orwell Park School, Nacton, Near Ipswich. Details from Paul Whiting G4YQC. Tel: (01473) 642595.

FRAMLINGHAM COLLEGE ARC, M0CBB. Tel: (01278) 727232.

IPSWICH RADIO CLUB, G4IRC. Meets at the Golden Hind, Nacton Road (3rd Wednesdays at The Hollies, Bucklesham Straight Road), Ipswich. Details from Keith Gaunt G7CY. Tel: (01394) 420226.

LEISTON ARC, G0TUQ. Meets at Leiston Town Athletic Assn., Victory Road, Leiston, Suffolk. Details from Sam Lydiate G4IFD. Tel: (01728) 832999.

LOWESTOFT DRS, G3JRM. Meets at The George Barrow Hotel, Outton Road, Lowestoft. Details from Phil Holden G0JSG. Tel: (01502) 585448.

MARTLESHAM RS, G4MRS. Meets at the BT Laboratories, Martlesham Heath, Ipswich, Suffolk. Details from Darren Hatcher. Tel: (01473) 644475.

SUDBURY & DRA, G0SWI, G7SRA. Meets at the Old School, Wells Hall Road, Great Comard, Sudbury, Suffolk. Details from Bryan Parrott G1TWF.

SUFFOLK DATA GROUP, G87MXM. Details from Peter Pryke G8HUE. Tel: (01473) 631313.

NORTH WALES

CLWYD

CONWAY VALLEY ARC, G6WTM. Meets at the Studio, Penarth Road, Colwyn Bay, Clwyd. Details from Mr R.W. Evans G6PAC. Tel: (01745) 855068.

HALKYN & DARS, G6WHRG. Details from Mr D. Austen G1JHG.

NORTH WALES RS, G6WNRW. Meets at the Old YMCA, Queen's Drive, Colwyn Bay, Clwyd. Details from Ted Supton G6WDSJ. Tel: (01745) 336939.

WREGHAM ARS, G4WXM. Meets at the Community Centre, Meesswyn Road, Wrexham. Details from Mr P. Moran G0WER.

GWYNEDD

MEIRION ARS, G4LZP. Meets at the Royal Ship Hotel, Deirionau, Gwynedd. Details from Gervase Chavasse G4WURJ. Tel: (01341) 421028.

PORTRHAMDAG & DARS, G6WOMV. Meets at The Yacht

Club, The Harbour, Portrhmadog, Gwynedd. Details from Mr G. Cadwaladr M4W1DFN.

THE DRAGON ARC, G4W7TA. Meets at the Ebenezer Church Hall, Llan Faelraig, Llanfaelw, Isle of Anglesey. Details from Stewart Rolfe G6WTF. Tel: (01248) 362229.

POWYS

POWYS ARC, G4W4HVN. Meets at the ATC HQ, Park Lane, Newtown, Powys. Details from Mrs Jean Brown 2W1CEZ. Tel: (01686) 640814.

SOUTH WALES

DYFED

ABERPORTH YMCA, G4W4SZV. Meets at the Hut B17, The Afield, Aberporth. Details from Mr G. Camruder G4W4HG. Tel: (01239) 811205.

ABERSYSTWYTH & DARS, G6WARA. Meets at the Scout Hut, Plasnewydd, Abersystwyth. Details from John Woodward G6W4DK. Tel: (01970) 890657.

CARMARTHEN ARS, G4W4YCT. Meets at The Aelwyd Care Home, Carmarthenshire County Council, Tregynwr Road, Llangunnor, Carmarthen SA31 3BS. Details from Mr W.D. Hughes G4W4XL. Tel: (01267) 231359.

CLEDDAU ARS, G6W5YJ. Details from Trevor Perry G4W4XQK. Tel: (01646) 600725.

LLANELLI ARS, G6W0E2Q. Meets in the Furnace Community Hall, Furnace Square, Llanelli. Details from Roy Jones G6W0JZK. Tel: (01554) 820207.

PEMBROKESHORE RS, G6W0EJE. Meets at Furzy Park Community Centre, Furzy Park, Haverfordwest, Pembrokeshire. Details from Ian M. Jones M0W0CAB. Tel: (01437) 763028.

GWENT

ABERGAVENNY RS, G4W4GFL. Meets at the Hill Residential College, Pen-y-Round, Abergavenny. Gwent. Details from Glyn Hughes G6W0DQY. Tel: (01633) 483186.

BLACKWOOD & DARS, G6W5GW. Meets at the Oakdale Comprehensive School, Oakdale, Blackwood, Gwent. Details from John Evans G6W5TH. Tel: (01495) 225178.

EBBW VALE COLLEGE RS, G6W0HW. Meets at the Gwent Tertiary College, Ebbw Vale Campus, College Road, Ebbw Vale, Gwent. Details from Mr T. Hayden G6W0HCN. Tel: (01495) 305192.

NEWPORT ARS, G4W4EZW. Meets at the Brynagas Community Centre, Brynagas Road, Newport, Gwent. Details from Paul Nicholls.

PONTYPOOL ARS, G6W3RNN. Meets at the Settlement, Rockhill Road, Pontypool, Gwent. Details from Graham Smith G6W0OZL.

MID-GLAMORGAN

BRIDGEND & DARC, G4W4LNP. Meets at the Club Brynnyen, Brynnyen, Bridgend. Details from Alun Hulmes. Tel: (01656) 721574.

HOOVER (MERTHYR) ARC, G6W3ROB. Meets at the Hoover Sports Pavilion, Hoover Ltd., Pentrebach, Merthyr Tydfil, Mid Glamorgan. Details Robert Cummings G6W0RVG.

MID GLAMORGAN ARC, M0W0CNA. Meets at Aberkenfig Sports & Social Club. Details from Mervyn Carey G4W4VSE. Tel: (01656) 734668.

SOUTH GLAMORGAN

BARRY ARS, G6W3VKL. Meets at Sully Sports & Leisure Club, South Road, Sully, S. Glamorgan. Details from Richard Mortimore G4W4BVJ. Tel: (01446) 738756.

HIGHFIELDS ARC, G4W4LFO. Meets at the Highfields Physically Handicapped Centre, Allensbank Road, Cardiff. Tel: (01222) 561542.

WEST GLAMORGAN

PORT TALBOT (BS PLC) ARS, G6W3EOP. Meets at the British Steel PLC Sports & Social Club, Mangam, Port Talbot, West Glamorgan. Details from Mr J. Chinnock M0W0KAE.

SWANSEA ARS, G4W4CC. Meets at the Applied Sciences Building, Swansea University, Details from David Williams G4W4BNJ. Tel: (01792) 519046.

SCOTLAND WEST & WESTERN ISLES

CENTRAL REGION

FALKIRK & DARS, G6M0FCR. Details from Scott Waterfall G6M0KBU.

STIRLING & DARS, G6M0NKC. Meets at Baneath Industrial Estate, Throck, Mr. Stirling. Details from John Shery G6M0ZCC. Tel: (01324) 824709.

DUMFRIES & GALLOWAY

WIGTOWNSHIRE ARC, G4MARIV. Meets at the Aird Unit, Stranraer Academy, Stranraer, (entrance from Cairnport Road). Details from Neil Macdonald G4M4LQS.

STRATHCLYDE

AYR ARC, G6M0AYR. Meets at the Ctildal Leisure Centre, Ayr. Details from Peter Sturgeon M0M0BQP.

CENTRAL SCOTLAND FM GROUP, RS38728. Details from Thomas Stalker G6M7TZU. Tel: (01698) 816793.

DALRY ARC, M0M0ARC. Meets at The Turf, In Dalry Court, Hill Street, Dalry. Details from Alex McKernan M0M0ABM. Tel: (01294) 823295.

DUNOON & DARS, G6M0CDD. Meets at the Edward Street Community Centre, Edward Street, Dunoon. Details from A.B. Horton G6M0GUL. Tel: (01369) 840217.

HELENSBURGH ARC, G4M4HEL. Details from G. Capstick G6M7OAF. Tel: (01436) 875922.

INVERCLYDE ARC, G6M0GNK. Meets at the Cardwell Bar, Cardwell Road, Gourcock, Strathclyde. Details from Andrew Gervase G6M3YGR. Tel: (01475) 638226.

KILMARNOCK & LOUDOUN ARC, G6M0ADX. Meets at the Hurrford Community Centre, Cessnock Road, Hurrford. Details from Steve Campbell G4M4OSS. Tel: (01560) 483800.

LARGS & DARS, G6M0VKG. Details from Mr J. Clough G6M0MDD. Tel: (01475) 568584.

LORN ARS, G6M0LRA. Details from T. Olsen G6M0EQW. Tel:

(01866) 2580.

MID LANARK ARS, G6M3PKX. Meets at the Newarthill Community Ed. Cent., High Street, Newarthill, Motherwell, Lanarkshire M1L 5GU. Details from John Neary G6M0KFK. Tel: (01698) 822860.

MILTON OF CAMPSIE ARS, G6M0MCC. Meets at The Red Cross Hall, Kirkintulloch. Details from John Mackenzie G6M0HJU. Tel: (01360) 312954.

PAISLEY ARC, G6M0PYM. Meets at the Paisley YMCA Hall, 5 New Street, Paisley PA1 1JU. Details from John Quigley G6M7QTA. Tel: 0141-889 6860.

SCOTTISH DIGITAL COMMS. GRP, G6M7VSR. Details from Stuart Clark G6M1VBE. Tel: (01698) 884803.

WEST OF SCOTLAND ARS, G6A4AGG. Meets at the Multi Cultural Centre, 21 Rose Street, Glasgow. Details from Hon. Sec.

SCOTLAND EAST & HIGHLANDS BORDERS

BORDERS ARS, G6M0BRS. Meets at the St. John Ambulance Hall, Berwick-upon-Tweed. Details from A.M. McCreadie G6M0BPY. Tel: (018907) 50492.

GALASHIELS & DARS, G6M4YEQ. Meets at the Focus Centre, Galashiels. Details from Jim Keddie G6M7LLN.

KELSO ARS, G6M4KHS. Meets at the Abbey Row Community Centre, Kelso. Details from Margaret Chalmers G6M0ALX. Tel: (01573) 226372.

FFE

GLENROTHES & DARC, G6M4GRC. Meets at the Football Pavilion, Station Road, Thornton, Fife. Details from Alexander Adam G6M0FVD. Tel: (01592) 874374.

GRAMPIAN

ABERDEEN ARS, G6M3BSQ. Meets at the Red Cross HQ, 22 Queens Road, Aberdeen. Details from Robert Duncan. Tel: (01224) 896142.

BANFF & DARC, G6M0PYC. Meets at the Princess Royal Park Football Ground, Conference Room (Deveronvale F.C.), Banff. Details from Steve Roberts G6M4HWS. Tel: (01888) 551377.

MORAY FIRTH ARS, G6M3TKV. Meets at the Grant Arms Hotel, Forchabers, Details from Geoff Crowley G6M7SJC. Tel: (01542) 882818.

HIGHLAND REGION

■ CLIVE HARDY G4SLU, SWM, ARROWSMITH COURT, STATION APPROACH, BROADSTONE, DORSET BH18 8PW

■ E-MAIL: clive@pwwpublishing.ltd.uk

Amateur Bands

Quick bit of revision. Television pictures are made up of horizontal lines. The lines are generated sequentially, starting from the top of the screen. The ordinary domestic television picture is made up of 625-lines. A new 625-line picture is generated every 1/25th of a second, which means the television signal conveys the image and colour information for over 15 thousand lines every second. That's lots of data, needing a lot of bandwidth.

The problem for amateurs who want to send television pictures is that the only amateur bands with enough space for a signal wide enough to convey that much data are at u.h.f. and above. So how to send pictures over the h.f. bands? Enter Slow Scan TV (SSTV). 'Slow' because it only generates pictures at a few lines per second. No moving pictures then, but with much less data to send, the bandwidth required is much smaller. So much so that the signal uses less bandwidth than the average amateur speech transmission.

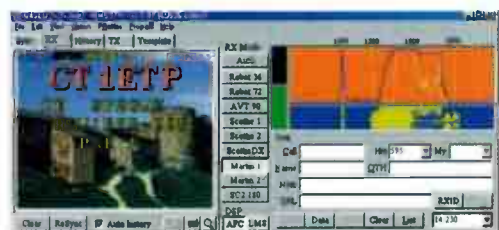
With SSTV there's plenty of space on the h.f. bands for images to be sent. And each image has fewer lines than domestic TV - 256 is typical. With between two and three lines sent per second, an average SSTV picture takes the best part of two minutes to receive and appear on screen.

There is no doubt that a home computer sitting in most radio shacks has increased interest in this mode. In days gone by, it was hard work to send and receive television pictures sent at only a few lines a second. The big problem was for the receiver to 'remember' the earliest lines of an image until all the lines of an image had been received. For a computer it's a walk in the park.

Receiving SSTV pictures today is very simple. Apart from the obvious h.f. receiver, the only other hardware needed is a computer with a soundcard. Plus an audio lead to connect between the rig's headphone socket and the input of the soundcard. There are several SSTV programs available, of which one of the most popular is *MMSSSTV*. Written by JE3HHT Makoto Mori it is free and can be downloaded from www.qsl.net/mmhamsoft/ It's very user friendly software and comes with a comprehensive 'Help' file.

There are various different SSTV systems, but the program automatically takes care of selecting the correct decoding mode. The quality of the received pictures can be very variable, just like any h.f. signal. A few examples here show that it is possible to receive almost perfect pictures when conditions are right. Looking at the images, note the signal report.

With SSTV, the report is given in the RSV form. The first two digits are the standard RS component, and third digit denotes video quality, with five being the best. A perfect signal would be reported RSV 595. Most bands have SSTV activity, but probably the best place to look is around 14.225-14.235MHz. For more local activity try 3.730MHz.



M3 QSO Party

I know that it's back in time somewhat, but the M3 Foundation Licence celebration on 7.070MHz on New Year's Day produced plenty of activity on the band. My co-pilot in crime **Chris M3SHE** warmed up the ether to put her call on the air, as did many other Foundation Licence holders.

Richard G3ZGC did a rock solid job as net controller for a couple of hours and **Nigel M3NRK** deserves special mention for stepping into the breach and keeping things on course for most of the afternoon. However, a little forethought by the organisers in ensuring that net controllers were available for the whole period would have been helpful. Despite that, and even though my listening stints were somewhat intermittent during the afternoon, I heard almost 130 stations at my south Dorset location.

Worthy of note was **Chris M3DOL/M** driving around Northampton in a London taxi. And with indoor antennas, **Jackie M3TBW** and **Alan M3YKV**, both in Sussex. As well as the many English stations, other prefixes were represented by **Dawn MD3EDQ**, **Keith MU3EFB**, **Rachel MW3SAI**, **Geoff MM3OKX** and **MI3JAN**. A good experience for all, and illuminating to the newcomers in the fun and games involved in working a pile up! Overall a resounding success, and well worthy of being repeated.

Jolly Rogers Deserters

Still with the M3 theme, listener **John Harrison** of Yorkshire confessed to having a little chuckle to himself when tuning to the h.f. aeronautical bands recently. His amusement wasn't provided by the legitimate users, but by the land based imbeciles who use the bands for private chit-chat. This pond life was complaining that there was a lamentable drop in pirate activity in the UK as so many of their associates had taken the M3 route to honest activity. Did HMG foresee that? Probably. Looks like another Brownie point for the Foundation Licence. And if you're one of those who's switched your flag of allegiance, may I offer you a warm welcome aboard the good ship Amateur Radio.

Tickets Please

When Ofcom, or is it OFCOM, swallows up the Radiocommunication Agency, or vice versa, there may be some procedural changes regarding the action taken against those who commit offences under the *Wireless Telegraphy Act*. One suggested option which could raise a few eyebrows is that fixed penalty tickets like those so beloved of traffic wardens would be used for certain offences. Which mis-deeds will be covered is uncertain. But the prospect of the man at Ofcom monitoring the amateur bands for individuals who, for example, fail to give their callsign every fifteen minutes and then, as soon as the offender identifies himself, popping a ticket in the post, may be closer than we think!



Check That Attic!

Regular contributor **Philip Davies'** credentials as an *SWM* reader are impeccable. His collection of the magazine from its inception in 1937 to the present day is all but complete, and only lacks half a dozen issues from 1946. So if you've got any or all of *SWM* for 1946 going spare, please contact me. I know where they'd receive a very big welcome!

SSB Utilities

DTIC & ACP Documents - Again!

In the February column I mentioned a comment from reader **John Stirling** who said that he had been unable to access the 'ships callsigns' document (*ACP113*) from the DTIC web-site. I offered a suggestion as to why John might be having problems and said that I was not having any problems myself. The Editor added a comment saying that the document could be downloaded from the *SWM* web-site and gave the URL. Unfortunately, I was not aware of this, and the Editor's E-mails to me requesting a copy of the documents went unanswered because I was away on holiday.

I am happy to report that copies of the *ACP113* and *ACP100* documents have now been added to the *SWM* web-site at the URLs given last month, and can now be downloaded as required. Sorry for all the confusion caused.

C-17A Selcalls

In the June 2002 issue of *SWM* I wrote an article about the USAF fleet of C-5 Galaxy transporter aircraft (see 'The USAF C-5 Galaxy on Short Wave', page 23). The article contained a list of aircraft tail-numbers and their selcall codes, and mentioned how there was a sequence to the system. In the latter half of 2002 a similar sequence has been detected with the fleet of C-17A Globemaster III aircraft.

It now seems that the USAF have acquired a series of just 50 selcall codes for their entire fleet of C-17A aircraft, and by the start of 2003, they operated just under 100 aircraft. Therefore, two individual aircraft currently use each selcall code. By the end of 2003 there will be well over 100 aircraft, and we will start to see instances of three aircraft with the same code. When you arrange the 50 assigned selcall codes in ascending alphabetical order they correspond with the tail-numbers of the first 50 aircraft, and the sequence is repeated again for the second 50 aircraft. It seems logical that the next 50 aircraft will repeat the same set of 50 selcall codes.

Duplicate selcall codes are not really a problem, except under unusual circumstances. There are many examples of codes being used by two or even three different aircraft, but they are usually assigned to different airlines, and they are usually allocated so that aircraft with the same code operate in different parts of the planet. Unfortunately, this plan does not always work with USAF aircraft, as their aircraft roam far and wide across almost all the skies of the world. It was just a matter of time before two aircraft with the same selcall codes were in the same piece of controlled airspace at the same time.

Just a few days after Christmas, two USAF 'Reach' flights were heard working Gander ATC on 5.598MHz. 'Reach 1195' passed their selcall code as 'EQ-PS' which was then checked by Gander. About an hour later 'Reach 7045' reported to Gander that their selcall code was 'EQ-PS' and Gander checked it with the aircraft. A short while later 'Reach 1195' called Gander to say that they were 'answering selcall'. Gander ATC told '1195' that there was another 'Reach' flight on the

frequency with the same code. This duplication has happened before, but it has always occurred with a code shared between different airlines.

This is the first time that I have heard it happen with the same 'airline' (if you could consider the USAF as an airline!). With the huge number of 'Reach' transport flights operating into the Middle Eastern region there are plenty of opportunities to hear these flights as they criss-cross the Atlantic. As I type these words in mid January, the threatened hostilities in Iraq have not broken out, but anything could happen in the next few weeks. It is possible that between me sending this column to the Editorial office and it appearing in the magazine on your doorstep, the 'war' could have started and finished. The first few months of 2003 will certainly be a very interesting period for h.f. listeners.

Canadian Cormorants

Last month I included a small picture of a CH-149 Cormorant helicopter from the Canadian Forces, which was used to illustrate an item about the Royal Navy Merlin helicopters and the change of h.f. frequencies by the Royal Navy. The Canadian version is the same basic airframe as the RN Merlin, but the Canadian version is much more photogenic!

This prompted an E-mail from **George Newport** which included an excellent picture of a similar CH-149 helicopter taken in 2002 at Manston Airport in Kent. This prompted me to do some more research into the CH-149 Cormorant to see what information was available. The Canadian Forces have taken delivery of 15 CH-149 Cormorant helicopters to replace their fleet of ageing CH-113 Labrador twin-rotor helicopters in the SAR role. The new CH-149 helicopters are based on both the Atlantic coast (two Squadrons of helicopters) and the Pacific coast (one Squadron), and a few in central Canada for training. These particular helicopters were built in Italy and were all delivered by air - they flew all the way from Italy to Canada with lots of refuelling stops en-route, which is how George managed to see one in Kent.

The existing CH-113 helicopters were equipped with selcall codes, and according to the crew of the one which I photographed at SBAC Farnborough in July 2002, the CH-149 Cormorant are similarly equipped.

The Canadian Forces have a number of h.f. frequencies that can be heard across the Atlantic in the UK and Europe. **Table 1** lists the known Canadian Forces h.f. frequencies, but a few deserve a special mention. The primary Canadian SAR frequency is **5.717MHz** and sometimes the SAR helicopters can be heard either checking their selcalls or even being called by selcall. Frequencies **6.754** and **15.034MHz** are used exclusively for VOLMET broadcasts, and can be heard at 20 minutes past each hour. The most active frequencies as far as European listeners are concerned are **9.007** and **11.232MHz**.

Table 1: Canadian Forces h.f. frequencies (all MHz u.s.b.).

MHz	Comments
3.047	
3.092	
4.703	
5.717	Primary SAR
6.706	
6.745	
6.754	VOLMET
8.989	
9.007	
11.232	
11.265	
11.271	
13.257	
15.031	
15.034	VOLMET
17.994	
18.012	
23.250	

Stations operating on some/all these frequencies are: Edmonton, Halifax, Trenton and St. John's. *ACP100* and *ACP113* can be downloaded from www.pwpublishing.ltd.uk/swm/ssbutils/

■ KEITH HAMER & GARRY SMITH, 17 COLLINGHAM GARDENS, DERBY DE22 4FS

■ E-MAIL: dxtv@pwpublishing.ltd.uk ■ WEB: www.testcards.fsnet.co.uk

DX Television

Sporadic-E activity provided some relief from the gloom of December. Weak F2, minor tropospheric lifts, the *Geminids* Meteor Shower event and a hint of auroral activity completed the picture.

Reception Reports

On December 11th, unidentified pictures were seen on Channel R2 between 1730 and 1741 by **Peter Barber** (Coventry). R1 later became affected. On the 22nd from 1940, Italian signals were present on Channel A, accompanied by Canal Plus on L2 from Bastia in north Corsica. Our old Spanish friend TVE-1 emerged on E2 (Madrid) at 2002 with the Telediario news, then later on E3, with signals continuing past 2100. **Simon Hockenhull** (Bristol) noted two R1 stations at around 1725. Norwegian E2 signals were evident at around 1930 on the 17th.

On the 18th, 19th and 20th, a 6m transatlantic F2 path was established between the UK and the US from around 1400. Alas, the m.u.f. failed to reach the lowest US TV channel at 55.25MHz (Channel A2). There was more transatlantic F2 on the 26th when Simon Hockenhull heard the US Fire Department from 1405 on 33.80 and 33.90MHz.

Tropospheric lift conditions on the 9th produced Canal Plus (France) on Channel L9 (Caen or Reims) for **Gordon Still** (Ruslip) and on the 19th for **Stephen Michie** (Bristol). Various UK f.m. stations were heard on the 8th, 18th and 19th.

Meteor Shower DXing

The *Geminids* failed to live up to past expectations during mid-December, even though there was evidence of f.m. band activity. During intense Meteor Shower events, Band I channels often resemble patchy Sporadic-E due to the sheer number of reflected multiple carriers. While so much activity is interesting to watch, very little can be reliably identified. Although Band III is relatively quieter, the reflections are more solitary, but the rewards are greater. Apart from the 'usual' Scandinavian and Central European transmitters, more distant ones in Iceland, Russia, Finland, Italy and Rumania have all been identified in Band III over the years in the United Kingdom. During the 1976 *Geminids* shower, over 27 Band III entries were logged over a six hour period.

Italian Mystery Solved

Fabrizio Magrone (Forli, Italy) advises that the mystery RAI UNO caption spotted by **Tom Crane** (*SWM*, December 2002) relates to the Italian National (or Republic) Holiday on June 2nd.

German TV Celebrations

Several German channels partied in style on New Year's Eve, followed by a traditional showing of the old ARD clock caption. Most German channels affiliated to ARD aired 'Dinner For One' at different times during the evening. This 20-minute monochrome comedy programme, (starring Freddie Frinton and made entirely in English by NDR in Germany), is shown every year. Interestingly, it has never been screened in the UK.

Channel Four Free

Owen Kemp disagrees with our earlier comments about Channel Four (*SWM* January 2003). He writes "Compared to 'soap-soaked' BBC-1 and ITV, Channel Four is a breath of fresh air and, unlike 50% repeat time on BBC-1 and BBC-2, we do not have to pay for it". You have a valid point Owen!

The Future Of Band I

Following the demise of 405-line TV in the UK in 1985, Band III was opened up to PMR (Private Mobile Radio) and later DAB (Digital Audio Broadcasting) at the upper end of the band. Over a decade ago there were plans to re-engineer the upper half of Band I (55.75-68.00 MHz) to provide a dedicated band for mobile communications networks. There are no user assignments at present, but 380 pairs of 12.5kHz channels are available for PMR and CBS (Common Base Stations). With the 27MHz Citizen Band slot becoming vacant in 2003/4 in the UK, there are fears that this may prompt the take-up of new services to the upper part of Band I.

The 70 and 80MHz sub-bands are currently used by the Fire Service in England and Wales, but should be vacated in 2007 when European-approved channel re-alignment can take place to pave the way for new users. Regional allocations may become available from around 2004.

Some DXers feel their hobby is under threat by the possibility of new users but we need to put things into perspective. Many veteran DXers will recall the nightmare days when Band I supported five BBC TV channels. The sound carrier of Channel B2 shared the same frequency as Channel E2 vision at 48.25MHz, so imagine how difficult DX-ing was, particularly if you lived within the reaches of the Holme Moss transmitter for instance!

Rare Test Cards

During the early hours of December 15th, test cards were being shown via BBC-2 during special engineering tests. Tom Crane (Hawkwell) noticed that Test Card 'J' (4:3 format) was aired via terrestrial analogue, while the digital satellite service was radiating Test Card 'W', a wide-screen version of Test Card 'F'.

An initial glance at Test Card 'F' and Test Card 'J' shows a remarkable similarity. Test Card 'J' features a zoomed out centre picture with more of Carole's toy showing, as per the original photograph produced for Test Card 'F' in 1967. As Test Card 'J' is designed for digital broadcasts, the greyscale incorporates a set of flashing peak-white dots (also used with Test Card 'W') to indicate that the image is 'live' and not simply a 'frozen' image due to a disrupted signal. There is also a green chrominance/luminance delay square in the letterbox area. The castellations around the edges of the Test Card are also slightly different. Does anyone have a good quality video recording of Test Card 'J' or Test Card 'W'?

Keep On Writing!

Please send your DXTV, slow-scan TV and f.m. reception reports, news, off-screen photographs and information to arrive by the first of the month to:- **Garry Smith, 17 Collingham Gardens, Derby DE22 4FS**. We can also use off-air pictures stored as JPG files on PC discs and good-quality video recordings.



Fig. 1: The old ARD clock caption shown at midnight to welcome in the New Year. This is the only occasion nowadays that this much-loved clock is radiated. It's good to know that ARD hold to long-standing traditions even if the BBC have completely lost their way! The BBC can't even be bothered to have a clock these days!



Fig. 2: The BBC Colour Test Card 'F'. This is the original version first transmitted in 1967.



Fig. 3: The BBC Test Card 'J' (4:3 aspect ratio).



Fig. 4: The BBC Test Card 'W' (wide-screen 16:9 aspect ratio).

■ DAVE ROBERTS c/o SWM EDITORIAL OFFICES, BROADSTONE

■ E-MAIL: scanning@pwpublishing.ltd.uk

Scanning Scene

Firstly, thanks to the dozens of you who responded to my request on behalf of reader **Mike Evans** in his search for a manual for his PRO-2004 receiver. Many people contacted me with details of websites that hold the document, also a large number of offers to photocopy the handbook were received and one anonymous reader actually copied and sent me the manual. I understand that Mike now has the handbook, but the response was much greater than could have been imagined.

Computers

As regular readers may realise, I'm not a tremendous fan of computers. Certainly I would never own one unless I had a real need to do so. Sadly, I do have that requirement and use the machine for putting these notes together and for sending them to Kevin and Zoë in the SWM office via E-mail. I also find myself using it for packet radio, POCSAG, JVFAX and latterly for Echolink radio linking.

In the last few years the beastly computer has found itself hooked up to a scanning receiver in order to record any received signal to the computer's hard drive. Do you remember how it used to be? Before the advent of computers and programs such as *Recall* and *Scanner Recorder*, I would set up a receiver, an old cassette recorder and link them with a circuit that turned on the recorder when the squelch opened on the set. I still have the little box here somewhere, it ran off a small 9V battery that would flatten every two days or so. Still I persevered with it and, of course, it nearly drove me mad. Using *Scanner Recorder* made the

job so very much easier and more user friendly.

Still I wasn't entirely happy with the *Scanner Recorder* program. There are several problems with it. The main difficulty being that the set up time is lengthy, you have to launch the program and then select file name and recording standard. If you are trying to save a short signal of immediate interest then you are bound to miss it, that's a guarantee.

New Kid On The Block

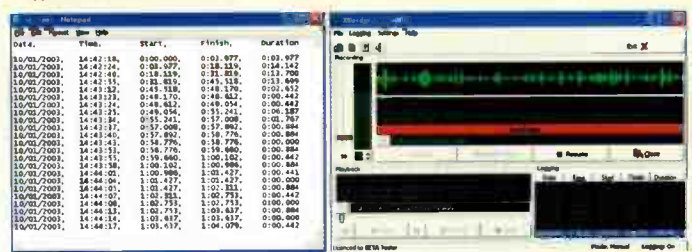
There's a new kid on the block, folks. It's called *Xcorder*.

Xcorder remedies all those nigglings that we have with other recording programs. Firstly, on launching the program there is a One Touch Record button (OTR). Yes, just hit that and the program is recording straight to the drive with the default settings. Not only this, but with *Xcorder* there is a 'Monitor Input' switch that allows you to set the receiver's audio without actually opening a file and making a recording. The program creates a log file including the date, start time and duration of each transmission received and this log is displayed in the program's window. Trigger level and record delay time are also adjustable as are record and playback controls.

Here's another big plus, recorded files can be played back within the program. Yes, there's a play window and you can select any previously recorded file to play from within *Xcorder*. On recording the available disk space is indicated, as well as clock time, program elapse time and time recorded. A file name is automatically created on record.

When a file is played, the record

A typical log file produced by *Xcorder*. The *Xcorder* main control panel.



time is displayed together with the total time recorded on that file and the total file size. Importantly, *Xcorder* also automatically displays the log associated with the file in the log window. This enables you to precisely establish at what time and date and particular transmission occurred. If no log is associated, then *Xcorder* displays 'No Log Associated With This File'. There is also a facility with the program to go on-line and check for *Xcorder* updates plus a user forum on the website for users to suggest improvements and post feedback to the author **MMOBFF**. It works under *Windows 95, 98, 2000, XP* or *ME*.

This is a powerful utility for those engaged in radio monitoring and will no doubt become extremely popular. *Xcorder* is freeware and is available to download from www.xcorder.com. The Zip file is some 584kB so doesn't take too long to download.

MOULD

I've mentioned the military MOULD system before and those people in the London area that monitor the low band v.h.f. region will no doubt have heard the system active during the sporadic strike actions by fire fighting staff. Those that regularly monitor the mould frequency of 75.825 in the London region had a surprise on the 9th January. Yup, they found themselves listening to a pirate radio station, broadcasting music. This went on for some hours and it's not currently known whether this was an unintentional occurrence or whether the jokers in question discovered that the Government had conveniently supplied them with re-broadcast facilities free of charge. It certainly livened up scanning in the Met. area for a while.

More v.h.f. happenings include interesting correspondence from the Lincolnshire area. Listeners have heard 'interesting' communications in the Stamford region on 163.95675MHz. The operation sounded professional, but not so professional that they scrambled their transmissions. If you happen by that area then you

may still hear these folks.

Call To Prayer

Has anyone been monitoring the 'Call To Prayer' channels in the UK? In case you were not aware there are a large number of frequencies between 454 and 455MHz that are allocated to mosques here in Britain. The mosque then transmits the call to prayer to the worshippers via radio instead of a generally audible summons being issued via a loud hailer from the roof of the mosque, thus avoiding annoying non Muslim neighbours.

There are a number of companies that supply these systems to mosques and they generally sell scanning receivers to the mosque members in order to receive the transmissions. It would be much more cost effective for the intended recipients to be able to purchase converted hand-held transceivers, set up on the local channel and programmed to operate only on receive but this does not seem to be happening at the moment.

Most of the transmissions are either in Arabic or other languages common in Pakistan or other dialects of that region of the world. Some, however, have been heard in English together with other transmissions not necessarily concerned with calling the faithful to prayer. The controversial Finsbury Park mosque transmits on 454.275MHz. The frequency is shared with other London mosques. If you live in any town there may well be a 'Call to Prayer' channel in your area. Interestingly one such mosque seems to scramble it's transmissions in the London area. Try listening for them on 454.700MHz. In all cases the mode is n.b.f.m.

My Thanks To You

Finally, and I meant to mention this two months ago, thanks very much for all the correspondence and E-mails that I receive. It's probably the most enjoyable part of being involved with SWM. If I get any queries regarding the hobby, I always try to find an answer them. I'm not always successful, but I always give it a go.

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

Satellite TV News

A cold, freezing and damp start to the new year here in Romsey with flood waters some 2m deep about 18m away from the old homestead. Despite the incessant rain, the dish has continued to track across the satellite arc and a few interesting sightings have appeared - I'm hoping to swap the 0.6dB noise LNB (£16) to a Manhattan 0.3dB (£30) when the weather warms to the task and I'll report on my improved results shortly.

The weather has been a major news topic on the UK regionals and we now have three ITV stations - HTV Wales, Meridian and Anglia now offering live reports back to respective studios in the weekday 1800-1830 segment. The regionals have moved from *Intelsat 801* @ 31.5°W to *Telecom 2D* @ 8°W.

Anglia for example usually downlinks at 12.600GHz-H [UKI-586], December 19th and an item from Ely Cathedral. The same evening 'Meridian 8MBIT-TES 9' featured a walk-on reporter on the 'Cinderella' stage at the Mayflower Theatre, Soton - 12.591GHz-H [UKI-813]. After Christmas an 8°W *Telecom* scan on the 'Spectralook' showed other digital activity and HTV Wales was now active on the bird.

Signing as 'HTV NEWS' and service ident 'BT TES-41', various South Welsh locations were featured on later evenings, the sat-truck appeared January 3rd outside Llanelli football club with vox-pops interviews and a local sports report - HTV can be found at 12.574GHz-H [UKI-596] - the above three ITV regionals all use SR5632 + FEC 3/4, in clear MPEG-2.

Interesting that the 'Reuters German News Service' appears on *Telecom 2D* as well, offering both international and German regional news exchange offerings - check out 11.523GHz-V SR 6666 + FEC 7/8. The 8°W Reuters service is uplinked out of German from the 'Teleport Koeln'. Track along the sky to 12.5°W and *Atlantic Bird-1*, this holds a few surprises. The 'Washington News Bureau Remote Router' for 'abc NY' pops up at 10.991GHz-H (SR3621 + 3/4), though occasionally it's the 'NEWS ONE CHANNEL abc NY YORK'.

Into memory the Manhattan DigiPlaza receiver logs it as 'SERVICE 1', but the mature RSD 302 prefers to memorise it as 'P 10991 01'. How a single signal can throw up two differing idents is one of the mysteries of digital TV!

I'll go one better, January 5th, I'm on *NSS-7* @ 21.5°W and clicking through a memory bank* on an RSD 302-C1 receiver - suddenly a traditional electronic test card appears with the 'DFA SNG4 D-43' ident stuck across the centre - obviously a German uplinked satellite source on 11.603GHz (6117+3/4). So I enter the frequency into the DigiPlaza to grab the German feed frequency into the Digi' memory bank - and up comes the 'Reuters WNS' news service - so there are now two different TV signals present from the same sat, both on the same frequency and on different receivers simultaneously - work that one out!

***Roy Carman** (Dorking) loaded his RSD 302 memory bank of about 1240 news feed signal frequencies onto my RSD receivers.

Skipping further along to *Intelsat 901* at 18°W and a favoured venue for Italian sat trucks in the analogue days. Pretty quiet on New Year's Eve, but a blip at 11.587GHz-V, a very unusual SR4273+3/4 and it's a German signal - 'Bundestag' - isn't this a bank, but an encrypted pix so no Deutsche Euros seen!

Remember the ITV Telethon a decade or so ago, the French still have their Telethon the first weekend in December and this year the sat-waves hummed with activity over the 6/7th December - it's the French version of *Children in Need*.

Edmund Spicer (Littlehampton) who is well versed in matters French (from his uni days) checked the *Telecom 2A sat* at 3°, this is a much forgotten bird mainly due to its 1.3° inclined orbit drift and suitable only for short duration news feeds, systems that can track the moving sat or folk with smaller (and wide beamwidth) dishes. Edmund found eight downlinking frequencies between 12.550 to 12.740GHz - all vertical polarisation at SR6111+3/4 plus a 9th football OB feed at 12.722GHz-V (SR13333+7/8 in 4:2:2).

The most 'exotic' signal viewed was ex Ajaccio, main town of Corsica and showed the local Lions taking pledges on the sandy beach, palm trees, etc. Both 'Globecast Reportages' and 'France Telecom Reportages' are responsible for the technical linking operation and the various feeds have service idents starting with either 'GCR' or 'FTR'. The French Telethon is the only televised fund raising event in that country and the following is really **huge** with massive coverage on the TV

networks, particularly France 2 and France 3. Edmund maintained reception on his 800mm dish throughout his two day spell of monitoring though the signal levels varies between 70-95% suggesting movement of the inclined orbiting sat.

Another new year, **Dave Dyson** watched the Sydney Bridge New Year's Eve fireworks over a Reuters feed live at UK midday December 31st. I caught the Bangkok fireworks later that afternoon over *NSS-7*, but the traditional floodlit snow covered Red Square, Moscow midnight was carried on *Atlantic Bird-1*, 12.5°W on the 10.991GHz slot (see above re 'abc NY'). The fireworks are not prolific, but there's an eerie feel to the vastness of the midnight Moscow Red Square, people huddled in the snow and the bell rings 12 times.

Backtracking to December 18th an American success in their 'War on Terrorism'. *NSS-7* on the 'CNN NEWSOURCE' lease, 11.563GHz-H (6117+3/4). Their combined 'Joint Terrorism Task Force' have captured seven immigrant terrorist supporters at Dallas, Texas - they've been money laundering lots of \$US sent from both Libya and Syria and now will serve a total of 450 years in prison plus a fine of \$US8M. Officials from the CIA and FBI, Dallas police chief, etc. each make statements on their departments recent success to the gathered media throng.

As storm clouds and troops gather in the Middle East, the sat uplinkers are also preparing for a possible war. Roy Carman has already noted several 'occasional circuits' out of Baghdad which obviously will fire up full time if hostilities break out. 'APTN BAGHDAD PATH 1' and 'APTN BAGHDAD PATH 2' have both appeared with reports on arms inspections, life in Baghdad, etc.

'Path 1' was seen at 12.788GHz-V and 12.678GHz-V; 'Path 2' at 12.788GHz-V and 12.688GHz-V in the clear on *Europe*Star-1*, 45°E - so this would be the general spectrum area to look. 'REUTERS BAGHDAD' has also appeared in the 11.0070GHz-V slot over *Eutelsat W1*, 10°E, all the Iraqi feeds were in 5632+3/4.

A remarkable article in the NZ *SatFACTS* satellite trade magazine December 2002 highlights the total lack of security at the PanAmSat NAPA teleport site in California, some 64km NE of Frisco. This site accesses both Pacific PAS-2 (169°E) and PAS-8 (166°E) to the West plus other back-haul sats to the East. These carry a mass of TV, radio, comms, commercial and military traffic.

Though the NAPA site (approx 14 dishes) has a guarded gate, several SAM missiles could be fired from undergrowth on the railway overpass adjacent to the junction highways of 12 and 116 about 100m distant directly into the site, a photograph shows how exposed the site is from a parked car on the road itself, the article even includes a road map. Once having fired your SAMS you're on the major highway heading North, South or East under two minutes. Startling how this article reads...but...anyone with a missile pack could trek across ploughed fields to behind NTL's Crawley Court, Winchester and zap many dishes from nearby woods. With jamming of Chinese TV in the news recently, it might be simpler just to buy a surplus uplink truck and jam the orbiting satellite in space!

Up in the Midlands **Dave Dyson** and **Alan Richards** (Nottingham) both noticed that in December signals from the 7°W slot were unusually strong. Alan found Dubai @ 12.273GHz-V (6111+3/4) and the Bahrain 'Channel 33' was very good just prior to Christmas for some days then 'fell back'. Best results are with clear skies on a frosty night. Most of the downlinks on NileSat are using SR27500+3/4, but programming can be found elsewhere on the arc such as *Arabsat 26°E* or *Eutelsat W2* @ 16°E.

Atlantic Bird-3 in the 5°W slot rose from slumber mid-December and offered numerous Italian major league football action using seven Ku-band slots between 11.503-11.671GHz vertical. There were several SCPC (single carrier per channel) offerings identifying with town names eg. 'PGM SIENA' - this on 11.682GHz-V SR6510+3/4.

Four frequencies however carried dual carriers such as 11.521GHz-V SR 13020+3/4 with 'CLN ELPITEL' and CLN ELPITEL'. The SR for the dual transmissions are double those SCPC, interesting! Most of these matches were encrypted. If you're a European regional football anorak then check out the air waves from *SESAT* at 36°E on a weekend afternoon. Germans predominate on Saturdays, the Italians on Sundays usually between 11.100-11.200GHz-V typical SR6666+7/8, not all the downlinks encrypt!



Dallas, Texas, a security official briefs the media on the terrorism gang capture (via *NSS-7*).

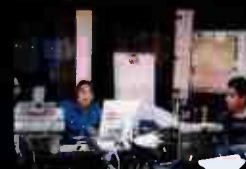


ALL NewsOne content is now available exclusively on the digital server.

'News One Channel' via *Atlantic Bird-1*.



Test pattern, mono, from Florida preceding the controversial 'human cloning' press meet, via 'CNN NEWSOURCE' feeder.



The Fox News production team in their hotel room, Amman, Jordan, via *SESAT*.



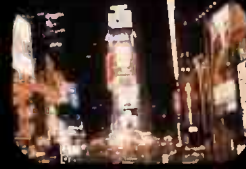
President Bush often speaks to his people...



Anglia TV reporter awaits his earpiece cue, via *TES-42* on *Telecom 8°W*.



Moscow city centre at New Year.



Times Square, New York, on New Year's Eve.

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Sky High

The Gulf 'Exercise'!

In the years I have been writing this column there has been a variety of conflicts to report to *SWM* readers, but perhaps nothing quite like what may be coming in the near future. With military air activity already increasing during January the frustrations of writing a monthly column with a five week lead time to publication start to become apparent.

In some ways, I do envy the TV companies and the daily newspapers who can bring breaking news to their customers either immediately or within 24 hours. (I don't envy the daily deadlines though). Nevertheless, I will still endeavour to bring you news of the future 'exercises', in as much detail as possible. Whatever happens in the next few weeks/months, don't forget to let me have your reports to make 'Sky High' as comprehensive as possible - by the time you read this it may well all be happening!

By the last week of January, extensive US forces have been sent to or were preparing to head for the Mediterranean and the Gulf, including some 130,000 troops. The Flag exercises due to take place at Nellis have been postponed/cancelled as the core units for the Flags are all to be deployed elsewhere! The biggest British Taskforce since the Falklands War have been sent to the Mediterranean on 'exercise', lead by HMS *Ark Royal* and HMS *Ocean*.

Other ships included *Northumberland*, *York*, *Marlborough*, *Edinburgh* and *Liverpool*, plus a number of RFA supply ships including Fort Victoria with four 814 Sqn Merlin HM.1s, deployed aboard.

On the 20th January it was announced that thousands of extra British troops are to be sent to the Gulf, that figure was later confirmed as 26,000 troops which is almost a quarter of the British Army - some exercise? That linked with the facts that dubious shell casings have been discovered in Iraq and papers on nuclear weaponry uncovered suggests to my mind, that unless a dramatic solution is found from around mid February onwards we could see a 'bit of a skirmish' in the Gulf.

So what has been heard on the military airbands so far? Saturday the 11th January brought a flurry of activity to RAF Fairford when no less than three U-2Ss arrived at lunchtime, first in was DRAGON 77, followed by DRAGON 88 and DRAGON 99. DRAGON 88 had radio communications problems and consequently squawked the SSR radio failure code 7600, this alerted Brize Radar and Fairford to their situation. They all departed Fairford on Sunday night as DEUCE 30, 40 and 50, heading South across the UK into French airspace working Brest Control on 375.3 and channel 133.24.

During their stay they used Fairford Operations frequency 379.475 on several occasions, (DRAGON OPS) and also the Air-Boss frequency 139.9. (which I am assuming is one of the 9 RW Air/Ground vehicle frequencies). Their route through France suggests a stopover at the detachment base at Istres, with the likely final destination being Taif in Saudi Arabia? On the 21st January the Iraqis announced that they

would not allow Reconnaissance overflights to aid the Arms Inspectors - we'll see!

In mid January, the airwaves in the South and West of the UK were very lively, not only because of the FOST movements, but also because of the departure of HMS *Ark Royal* (15th and HMS *Ocean*, (16th), plus the rest of the taskforce. Some of the more interesting items were:

(1) 815 Squadron Operations frequency 283.6 was noted on several occasions, callsigns in use Navy 303, 304 and 308, (Lynx).

The callsigns NAVY 304 and 308 were both also heard later on a RN ASW frequency 231.85.

(2) Navy 634, (Lynx) was heard calling '2JS' on 284.55, some reports indicate that this frequency is a Homer for either HMS *Ark Royal* or *Ocean*. My records indicate that it may be a RN Common Homer frequency used for helicopter to ship communications. It is not noted regularly, but in the past year it has been noted in use on exercises with Aircraft Carriers, Frigates and a Destroyer - Any ideas anyone?

(3) BROADWAY 20, (Falcon 20), was heard calling the primary Homer for HMS *Ark Royal* on 345.45, using the callsign 6PZ. He could not get a reply so he was then told to call 283.3, but still no reply. This is rather interesting as this frequency was noted by me just once during the Thursday war, back in March 2000 - Is this an *Ark Royal* or Royal Navy standby frequency?

(4) The frequency 369.1 was noted several times for Air/Ship communications, this is a primary RN Common Homer. Callsigns noted were: GAUNTLET which was a Merlin, Navy 373, NAVY 634, NAVY 301.

(5) Other frequencies noted by our correspondents were: 265.7 RN Fighter Control, 354.45 Plymouth Military Radar discrete, 255.95 with an AWACS, 'MAGIC 20' transmitting both voice and data

Plymouth Air Ops on h.f. 3.924MHz was very busy with numerous calls heard to both ships and helicopters. Ship callsigns were 4JS, N2R, R2G, 4LR, Z2G, etc., plus many NAVY helicopter callsigns. One correspondent also noted what is a new frequency to me, 5.113MHz. Heard was R8C, (HMS *Ocean*) calling 6PZ (HMS *Ark Royal*) in the clear and also scrambled. I am no expert on Royal Navy Ship alpha-numeric callsigns, are they randomly generated on a daily/weekly basis, (most likely), or are there any specific allocations made to each ship?

Between the 12 and the 15 January the callsigns RAZOR 93-97 were noted crossing the Atlantic either talking to the US HF-GCS or to Shanwick or Santa Maria. Telephone patches were heard to RAYMOND 19 which is Robins AFB so it is a fair assumption based on the facts that these are all E-8C J-STARS, presumably being deployed for action in the Gulf? Incidentally, the 93rd Air Control Wing which used to fly the E-8Cs has merged with the resident Georgia ANG unit, (who lost their B-1s last year). This merged unit is the 116th Air Control Wing which now flies the E-8Cs and is operated by both

Stop Press

Some last minute news, updating this month's 'Sky High' column. On the 20th March, there are to be significant changes to UK Airspace, these appear to include changes to Airways, Reporting Points, Danger Areas, Military Training Areas, plus a couple of frequency changes - further information next month.

USAF/CC and ANG personnel.

Lastly, the callsign SLUFF 91 was heard on the 13th January, one reader suggests that it was a B-52, another an Air Guard KC-135. I have a note of this as an Ohio ANG KC-135 back in 2001, but it doesn't seem to have been reported since - any offers anyone?

US HF-GCS

As Graham has covered this subject at length in the January 'SSB Utilities' column, I don't want to repeat too much information, but for those of you who don't read his column - shame on you - I feel a few quick comments are in order. The US Global HF System, (GHFS), became the US HF Global Communications System, (HF-GCS), on the 1st October 2002. From Jan 2003, the station at Thule in Greenland is to close and is to be replaced by a new station at Keflavik in Iceland, as of the 20th January both stations were still noted as operational.

The primary frequencies have not changed, (4.724, 6.712, 6.739, 8.992, 11.175, 13.200 and 15.016MHz), although some of the operational times appear to have been amended. The frequencies 8.992 and 11.175 still remain as the two Primary 24 Hour initial contact frequencies and with the current situation they will be well worth monitoring over the coming weeks. Also of note is that Diego Garcia and Sigonella are now fully adopted into the HF-GCS Network.

LACC

News has reached me that the London Area Control Centre, (LACC), is to be partially re-sectorised in April or May 2003, this apparently will also affect the airspace controlled by Manchester Centre. I would guess that this may well be the opportunity to introduce the first 8.33kHz channel, (expected to be London Upper West). I had hoped to include further information regarding these sector changes this month, but the information did not arrive by my copy deadline - hopefully, more information next month.

UK Airshows

As I mentioned last month, the potential situation in the Gulf means that the future of this year's two largest UK airshows, must be in doubt. Apart from Mildenhall Air Fete which will almost certainly be cancelled in the event of a conflict, the Royal International Air Tattoo must also have a question mark over it. With all the construction work that took place at Fairford during 2000/01, the airfield is now fully capable of operating a mixture of B-1, B-2 and B-52s.

As with Operation Desert Storm in 1991, the base will almost certainly be home to one or more bomber types plus any number of visitors. Obviously the start date and length of any conflict could affect the future of this year's RIAT but it is worth remembering that the bombing missions



carried out by the B-52s out of Fairford in 1991, lasted just 18 days. (Yes, I thought it was longer than that as well). Hopefully, the show will all go ahead as planned and as I understand it, it is quite a plan!

The format of the RIAT 2003, (18 - 20 July), week is to change this year. Defence 2003 will be the latest in a series of events that replaced the Royal Tournament with this year the RAF taking the tri-service lean in, *Taking Defence to the Nation*. A fictional scenario will be created which involves a trouble spot somewhere in the world.

All three armed forces will then take part in the planning and execution of a mission to resolve this situation, all within the confines of RAF Fairford and with the help of big screens. Because of the complexity of the flying programme which will incorporate this event, a full scale dress rehearsal will take place on the Friday. This consequently means that the **arrival days will now be Tuesday through to Thursday**, with any late arrivals landing at Fairford before 0930/1000 on the Friday morning or later in the day once the rehearsal has finished.

After any morning arrivals the airfield, (in theory), will be entirely given over to this full dress rehearsal. Also, for the first time there will be two official departure days on both the Monday and Tuesday. For those of you who spend the whole week at Fairford such as FRIAT members, it is therefore now extended to a total of eight days of non stop aeroplanes. One final thought, if you include camping/accommodation, petrol, tickets plus all the other costs involved it is becoming a very expensive week away.

Something different for our photograph this month - some Desert Storm tail art from a U-2 back in 1991, (TR-1A as it was then).

Coming Next Month

Starting next month, I'll be featuring a regular calander of the main airshows.

Don't miss it!

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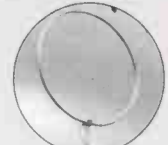
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Info in Orbit

Rarely have I watched so many weather satellite (WXSAT) images during a 'holiday' period! With two weeks off over Christmas, I had been expecting to open up the observatory and use the telescope for a winter's night or two. Instead, the clouds were almost continuous, allowing no more than a glimpse of planet Venus through the main telescope one bright morning.

The software review: a number of people have commented to me about *WXTOIMG* - the program written by New Zealand programmer Craig Anderson that decodes WXSAT sound files (audio files produced by recording the output signal from a WXSAT receiver). See my initial notes in this month's column. The recent Miami conference concerning the move from analogue to digital WXSATs was well attended, and summaries also start this month.

Current WXSATs

Pictures from the NOAA WXSATs received during the period of high pressure over Britain during the second week of January were quite dramatic. Large parts of Britain were under clear skies for several days.

On 8 January Cedric Roberts MBE received this NOAA-15 infra-red image "showing the main European rivers in great detail. The very cold conditions under the large anticyclone, together with the snow cover over much of the continent, enable the warmer rivers to show up well on the infra red image from the satellite. Both the Rhine and Seine show up in good detail for practically their full lengths on this image".

Also from Cedric is Fig. 2 which "shows the afternoon h.r.p.t. image of north-west Europe showing the polar air flow across the UK very well indeed with all of the snow shower activity across the UK highlighted".

With my h.r.p.t. dish at ground level, my horizon is limited in all directions; however this does not prevent me from receiving some dramatic pictures. Figure 3 (artificial colour added) was received from NOAA-16 during its dip between trees over my northern horizon. Just a short gap allows me to receive telemetry while the NOAAs are over the northern extremes of Norway, Sweden, Finland and Russia. Large icebergs and huge sheets of frozen ice can be seen around the Barents Sea and the White sea around the Kola Peninsula.

MSG-1 Developments

A few months ago I wrote about the planning that had gone into the design of the systems onboard the new digital WXSAT METEOSAT Second Generation, and the probability of early success during testing. Since that time, it has become apparent that the failure of a solid state power amplifier (SSPA-C) caused a significant hold-up in testing because it was the only redundant amplifier; a further failure would prevent the

subsequent transmission of HRIT - high resolution information transmission.

As of early January, EUMETSAT had announced that "All HRIT/LRIT commissioning activities are on hold". This near single-point failure surprised me, particularly when a contact told me that he believed the amplifiers had already failed earlier in ground tests. I have asked EUMETSAT to comment on this.

On a consequential matter: "EUMETSAT has already started preparations for the provision of alternative dissemination methods of MSG-1 data". "These alternative dissemination methods should cover the time period until the full LRIT/HRIT service will become available (either on MSG-1 or on MSG-2)". Frankly, this last statement from EUMETSAT could be of major significance!

British Developments In LRIT Systems

For amateur use, the development of an economical system to receive and display MSG-1 data - the LRIT (Low Rate Information Transmission) stream - is likely to be achieved by Timestep and/or RIG. With work very much under development and test, information remains limited at the moment. The following comments were received recently from Dave Cawley of Timestep:

"Our 'Software LRIT receiver' is being tested by NOAA next week with our associates in the USA. NOAA will start broadcasting 'test LRIT' through GOES East late January or February. Our system will comprise: 900mm dish, LNA, 20m cable, black box (though future versions won't have this), PCI card, software as demonstrated at the Miami conference. By the time MSG-1 comes on stream, the black box will have gone, and the SKU will plug into a RS-232 port via a Timestep RS-422/RS-232 converter. This converter will either be a 'bump' in the cable, or built into one of the connectors. So within six months or so, we should be looking at: dish/LNA, straight into a PCI card. Simple, efficient and cheap!".

Although LRIT data transmissions from MSG-1 may be received occasionally on a test basis, formal transmissions are not scheduled to start until the end of this year.

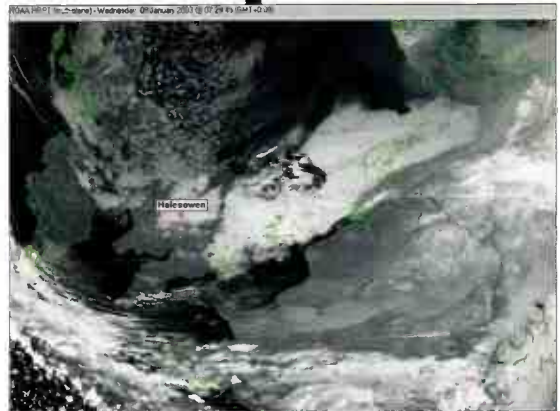


Fig. 1: NOAA-15 0729 8 January 2003 from Cedric Roberts.



Fig. 2: NOAA-16 7 January from Cedric Roberts.



Fig. 3: NOAA-16 1142 8 January h.r.p.t. image.

Miami Satellite Direct Readout Conference

NOAA/NESDIS (the American governmental bodies that control the NOAA WXSATs and their data flow) held a conference in Miami in December. Although the meeting was essentially emphasising the American aspect of the move from analogue to digital transmissions made by polar and geostationary WXSATs, everyone who receives telemetry from NOAA WXSATs has an interest in knowing what the future holds. What equipment will be required, can we use at least part of our current hardware and how much will it cost? Answering



Fig. 4: Delegates to the Miami Conference.

these questions was the aim of the conference. The transitions in the POES (polar WXSATs) and GOES Direct Readout programs were highlighted to an international audience. Yes, I would have liked to have attended, but travel and residence costs were too high for me. The meeting was attended by many delegates and Paul Ruscher kindly sent me a summary and Wayne Winston (of NOAA) kindly forwarded a CD that included a



Fig. 5: A display at the Conference.

summary of all the presentations. There was plenty of time for delegates to discuss matters with NOAA's senior management officials.

Many nations were represented, as was the user community, and the community of vendors that provide hardware and software. The following notes provide a brief summary; future articles will include further details.



Fig. 6: Outside display at the Conference.

GOES (American Geostationary WXSATs)

The transition from WEFAX to LRIT by GOES: WEFAX and LRIT will be on a shared broadcast mode from the new GOES East (GOES-12) beginning sometime late in March, with WEFAX receiving 35 minutes broadcast time per hour and LRIT receiving 25 minutes. This phased-in transition to LRIT will last two years, and then WEFAX transmissions will terminate, roughly in January 2005. GOES-W will follow GOES-E by a few months, according to the report.

NOAA described its new, full ground system control centre at Fairbanks, Alaska, which will be used to control the GOES-9 spacecraft,

operating at 155°E until Japan can launch MTSAT; this provides an additional ground station control facility that NOAA has not had before,



Fig. 7: METEOR 3-50735 12 January 2003.

complementing their Wallops Island, Virginia and Goddard Spaceflight Centre (Maryland) facilities.

POES (Polar Orbiting WXSATs)

Low resolution telemetry (a.p.t. - automatic picture transmission) will remain for some years to come (up to 2010 at least), but the transition to LRPT (the new digital data stream from polar WXSATs) is being planned. The constellation of satellites will be improved greatly as other non-NOAA birds are launched, providing many more imaging pass opportunities.

Look for more detailed notes from the Conference in future editions of 'Info in Orbit'. Thanks to Paul and Wayne for their contributions.

Software Update

WXSAT enthusiasts have access to high quality software from a number of authors, and I aim to provide updates when significant new versions become available. This month I look at *WXTOIMG*. Craig Anderson of Abstract Technologies New Zealand Limited has been developing his *WXTOIMG* (WXSAT to imaging) program, currently in version 2.3.19 (dated 30 December 2002). The program combines an audio recording module that records the audio output from a WXSAT receiver, and saves a sequence of WXSAT wav files for immediate or later processing. Visit

<http://www.weather.net.nz/wxtoimg/>

Craig describes his program as follows: "*WXTOIMG* is fully automated a.p.t. and WEFAX weather satellite recording, decoding, editing and viewing software for all versions of *Windows*, *Linux* and *MacOS*. Supports map overlays, advanced colour enhancements, 3-D images, animations, multi-pass images, projection transformation (for example Mercator), text overlays, temperature display and control for many weather satellite receivers, communications receivers and scanners."

It is not possible to completely review such a fully-featured program within a monthly column, so I am planning to cover different sections in future columns, together with other software reviews, particularly for readers who have recently taken an interest in WXSAT monitoring. It helps to show that the hobby need not be a major drain on resources!

The program can be downloaded from the web site above and run to install in your preferred directory. The default directory is of course 'Program Files', but I would suggest using a separate one for satellite operations, rather than adding yet more to 'Program Files'. The program includes a substantial 'Help File', though you can quickly achieve results before having read this in detail. Because it records the actual sound, it is essential to set the sound level accurately. Initial tests can be done using the audio output of your WXSAT receiver.

I used an audio cable plugged into my PROscan receiver and connected to the line input of my sound card at the back of the computer. Even without an a.p.t. signal present you can check that 'noise' gets into the card. Start the Windows' sound recorder (accessories, entertainment, sound recorder) to check the signal (noise) level. If nothing shows when you click 'Record', you may need to run the mixer control option found under File menu.

Ensure that line input is selected and then adjust the volume control to achieve a reasonable level - meaning not too high. Too high a signal will result in

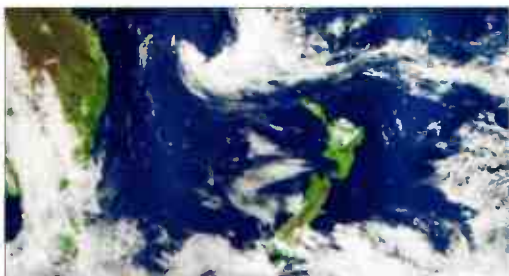


Fig. 8: A composite NOAA-17 image of Auckland, from Craig Anderson, showing some features from his program.

bleached whites with no detail. You need to check this level with the satellites; I found that NOAA-17 produced the largest signal. When recording the sound file, a numerical display gives the level, and the instructions recommend adjusting this to read between 50 and 75 when the WXSAT is overhead. The display is colour coded with green indicating 'good'.

Download the latest Kepler elements and place in the *WXTOIMG* directory. These enable the program to identify satellite data - well perhaps not always uniquely - and there are built-in safeguards to minimise problems. Ensure that your system clock is accurate. I use a Rugby clock (cost about £10), but recently I started using an automated update from the US Naval Observatory time server via the Internet.

After running the program for several hours, just to get the feel of what it can do, I left it running overnight to capture the METEOR 3-5 pass early next morning. Unfortunately, I forgot to check that the pass did not coincide with an earlier NOAA pass - which it did! The 0755 NOAA-15 pass effectively started earlier than the 0753 METEOR 3-5 pass because METEOR only switches on when the ground below is in sunlight - several minutes into the pass at this time of year.

Consequently, the METEOR pass was missed, but the NOAA pass was labelled METEOR in the processing files due to my having told the software to expect METEOR! This was of no importance because the sound files are retained unless you set them to be deleted after processing - so I reprocessed it using the NOAA option. When correctly set, everything works fine.

There are so many processing and program options that it is not easy to select even the principal ones. The menu options include file, direction, satellite, enhancements, options, projection, image and help. Some options are only available in the registered version. I am currently using the evaluation (freeware) version.

Basic features include Kepler updates via the Internet, multi-spectral analysis (MSA) to produce realistic colour, extensive image processing to achieve good quality images, map overlays for METEOR (as well as NOAA) WXSATs, improved decoding from narrow bandwidth receivers (I shall test this shortly). Unattended recording works well, especially if you check on the sequence of passes and set accordingly; you can set the program to record whenever the squelch is opened, or for selected passes.

The software can also operate a compatible WXSAT receiver. Instead of automatically processing each received pass, 'recording only' can be enabled; this may be useful if many enhancement options are selected because these

add to processing time, thereby possibly preventing a second recording just after reception is completed.

I have obtained some sample images, see Fig. 7, recorded during my tests, but my antenna is still at ground level, so these are shorter than would be expected. More features will be covered in later columns.

Finally - Fig. 9 shows evening twilight reaching Britain, and Fig. 10 is an enhanced infra-red h.r.p.t. image showing the frozen wastes in January!

International Space Station - Component Launch Schedule

STS-114 Shuttle *Atlantis* is scheduled for launch on 1 March to the ISS. The flight is for equipment delivery and crew rotation.

STS-115 Shuttle *Endeavour* is scheduled for launch on 23 May carrying arrays to the ISS.

Donald E. Lyven E-mailed me to say "My scanner clearly picked up a Russian speaking male voice on 143.625MHz during the 0800 to 0810 ISS pass this morning (30 December 2002). I first heard him about 0806 until the signal faded. Just goes to show, it always pays to keep old frequencies in the scanner!".

Kepler Elements

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. The disk file is ideal for automatic updating of tracking software.

Shuttle Columbia Disaster

Space shuttle *Columbia* was returning home from a 16-day mission when it lost contact with controllers during the final phase of re-entry at 1400 on Saturday 1 February for a scheduled touchdown at 1416. First indication of a problem was the loss of temperature sensors on the left wing, then increased temperatures in a wheel, then more sensors failed. Communications were lost as the Shuttle disintegrated - looking (to my eyes) like the re-entry of *MIR*). A very sad day.



Fig. 9: NOAA-12 1506 12 January - twilight approaches.

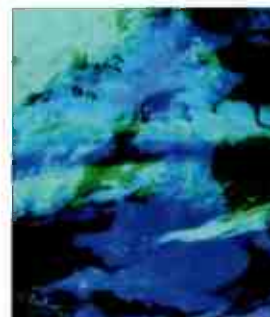


Fig. 10: NOAA-15 1743 11 January - frozen Britain.

Frequencies

a.p.t.

NOAA-12 and NOAA-15 transmit a.p.t. on 137.50MHz.

NOAA-17 transmits a.p.t. on 137.62MHz.

(during overlap periods, the secondary WXSAT a.p.t. may be switched off).

METEOR 3-5 usually transmits on 137.30MHz when in sunlight.

h.r.p.t.

NOAA-12 and NOAA-16 transmit h.r.p.t. on 1698.0MHz.

NOAA-14 and NOAA-17 transmit on 1707MHz.

NOAA-15 transmits on 1702.5MHz.

FENGYUN-1C and -1D transmit on 1700.5MHz.

WEFAX: METEOSAT-7 (geostationary) transmits WEFAX on 1691 and 1694.5MHz, and Primary Data on 1691.0MHz. Test transmissions will continue from MSG-1.

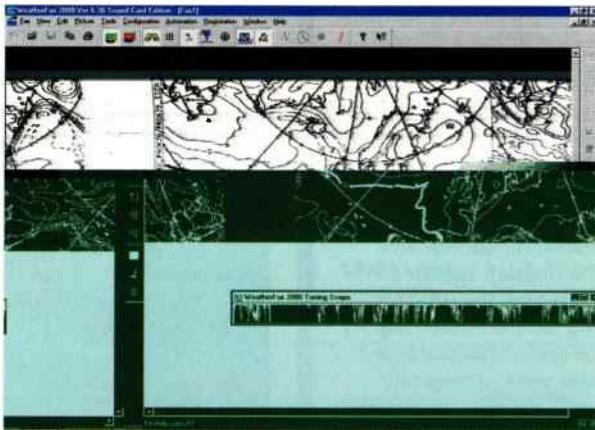
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Decode

Xaxero WeatherFax 2000

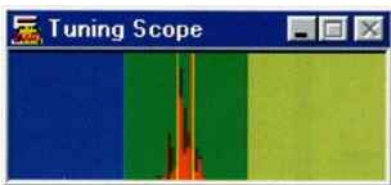
I have a new FAX suite for you to try this month - *WeatherFax 2000* from Xaxero. This is a rather neat decoding package that's aimed squarely at the



WeatherFax 2000 in operation.

maritime user. In addition to the standard h.f. FAX receive facilities, *WeatherFax 2000* includes a Telex (RTTY to you and I) decoder and a NAVTEX receiver. You even get a separate E-mail package included, but that's only any good if you have an external decoder and a SeaMail account.

The *WeatherFax* system is comprehensive and, as you would expect, features fully automated reception of FAX charts. Operation has been kept pretty simple with dedicated icons along the top panel to activate the most common functions. When you start a new FAX picture, a spectrum display automatically kicks-in, but this is rather different to those found on most amateur decoders.



Standard tuning indicator for NavTex 2000.

Instead of the usual spectrum display with frequency on the bottom axis, this one has the frequency axis along the left-hand side. The frequency scale is also limited to the 800Hz spread of a FAX signal, so the top of the spectrum display represents pure white and the bottom pure black.

I know it sounds a bit odd, but once you realise what's going-on, it actually works just fine. When you tune-in a FAX signal you just make sure that the predominant, white, tone rests neatly at the top of the display. One other point I noted was a few problems dealing with my Soundblaster Audigy soundcard. I use the Audigy specifically because of the front panel connections that make decoder and receiver connections so easy.

For some reason, *WeatherFax 2000* turned the line-2 input slider to zero every time the program started. I didn't

NavTex 2000 - neat message handling.

have time to fully investigate this problem, but I suspect a more conventional soundcard would auto-configure as it should. The Telex receiver was a pretty straightforward RTTY decoder with automatic speed and shift detection, though the constant searching was a bit of a disadvantage with weak or fading signals.

I particularly liked the NAVTEX receiver implementation. As you can see from the screenshot, it is set out rather like a conventional E-mail program. When you think about it, this is really rather appropriate for NAVTEX as the transmissions are arranged as separate messages, each with a dedicated message number. The NAVTEX decoder takes the raw data and separates-out each of the individual messages. These are then stored in the 'In Box' for review at your leisure.

When you've looked a message, you have the option to print it or to move it to a new folder. There's even a neat 3-day delete facility to help keep the mailbox list under control. If you'd like to try a copy, you just need to pay a visit to the Xaxero web site at: www.xaxero.com

Click on the *WeatherFax 2000* picture and choose the 30 day, 30 times trial offer. If you want the soundcard version, you first have to download *WeatherFax 2000* and then download and install the soundcard upgrade. The two files amount to about 7MB of download.

WUN Club Frequency Lists

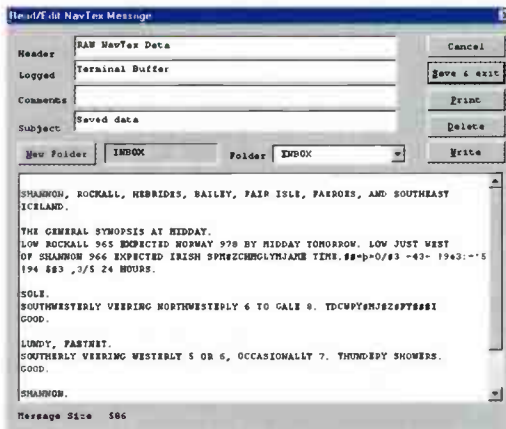
Now here's something a bit different for this month. You will probably have heard me going on about the WUN club in the column, particularly with respect to their excellent utility files. However, this time I'm going to show you how to make use of their excellent logs.

One of the great things about the WUN club is that they have a very active membership that not only spend a lot of time listening, but also supply lots of contributions. As a result, every *WUN Newsletter* features an excellent frequency list. The

only snag is that it is just a straightforward listing, with lots of commentary on each station. Whilst the lists contain lots of data, they're not that easy to use if you want to find particular types of signals. I've been processing the lists in Microsoft *Excel* so I thought you might be interested to see how to do it.

The first job is to get an electronic copy of the latest log - this is really easy to do. First of all go to the WUN web site at: www.wunclub.com





Viewing NAVTEX messages in NavTex 2000.

and choose the Electronic Newsletter tab. You should be presented with a list of the most recent Newsletters and alongside each one you will find two links: view or download. You need to select the view option and you should be presented with the Newsletter front page.

The reason we use this option is that you can now go to the top right hand corner of the screen where it says go to column and choose the WUN Logs Column. If all is well, you should now be looking at the main log. To get your electronic copy, just go to the file menu on your browser and choose 'Save As...' Where you have the option to save as type, select Text File (*.txt). You then then select an appropriate name and location for the saved file.

That completes the first part of the exercise and gives you a plain text file with just the WUN logs. Whilst this is quite useful in itself, importing the file into Excel releases up the tremendous potential of the list.

Here's the run-down on how to do this. First of all start Excel and use the menu to choose File - Open and go to the directory where you saved the WUN logs. At the bottom of the File - Open menu you will see the option to select the type of file you want to open: choose Text Files. If all has gone well you should now be able to see the log files you saved earlier.

When you select this file to be opened you should find that Excel automatically starts its Text Import Wizard showing step 1 of 3. On this screen you need to set the file type to Fixed width. The next critical action is to tell Excel where the data begins. If you look at a typical log you will see that there's an introduction - you don't really want to import this, so you just scroll down till you get to the start of the data and note the line number.

Now you just have to enter that line number where it says Start import at row: When you've done that, press Next to move on. In step 2 of the import you have to tell Excel where to put the column marker between the frequencies and the commentary. This is

simply done by clicking on the table just to the immediate left of the commentary. When you do this you will see the column marker appear.

Press Next to continue and you will see in stage 3 you have the chance to define the data types - you don't need to worry about this, so just hit Next again and the import will complete.

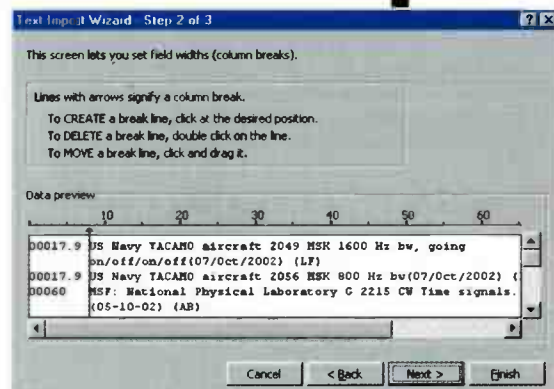
At this point you should have a spreadsheet with all the frequency data in column A and the commentary in column B. It's probably worth making column B wider at this stage - just put your cursor on the line between columns B and C, click and drag the column to the required width. For sake of tidiness put your cursor on the extreme end of row 1, right-click and choose insert to put a blank line at the top of list. You can then use this to put in your titles, e.g. Frequency and Commentary. At this point you ought to save your work!

Now we have the data in a spreadsheet we can use some of Excel's search and filtering options to our advantage. To do this, place your cursor on grid A1 and use the menu to choose Data Filter...

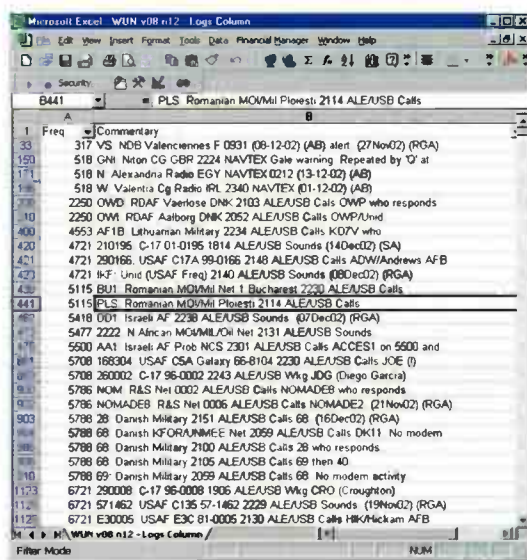
AutoFilter. If you want to do this the quick way, just hold the 'Alt' key and press 'D' 'F' 'F'. You will now find you have a small down arrow at the head of each column. Click on this and choose Custom - this is where you can decide just how you want to filter your data.

Here's a practical example to show the potential. To pluck-out all the ALE logs, click the down arrow for the Commentary column and choose contains in the left-hand box. Now type ALE in the right-hand box and press OK - now you have all the commentaries that mention ALE. As you can see, this is a very fast and powerful search system that you can use to pluck-out all sorts of interesting data.

This is by no means a perfect way to sort the lists, but it's a good start. One of the problems you will discover is that multiple line commentaries get split from their respective frequency. This is not too much of a problem as the main mode information is usually contained in the first line. If there's enough interest, I'll show you how to tidy this up in a later column.



Setting columns using Excel's Text Import Wizard.



Processed WUN log file.

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.

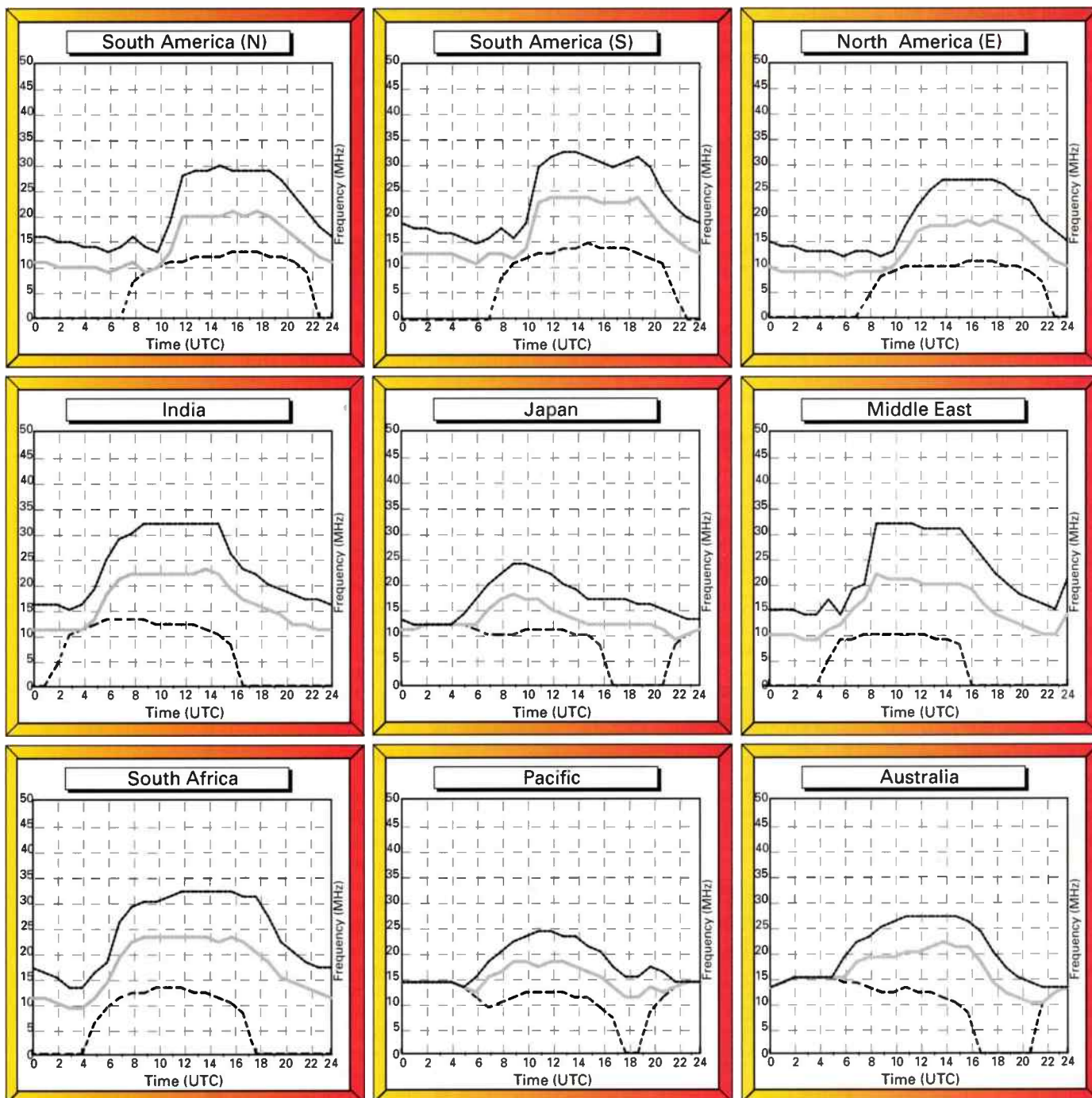
Lastly, the upper dashed line represents the maximum usable frequency (MUF), a 50%

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.

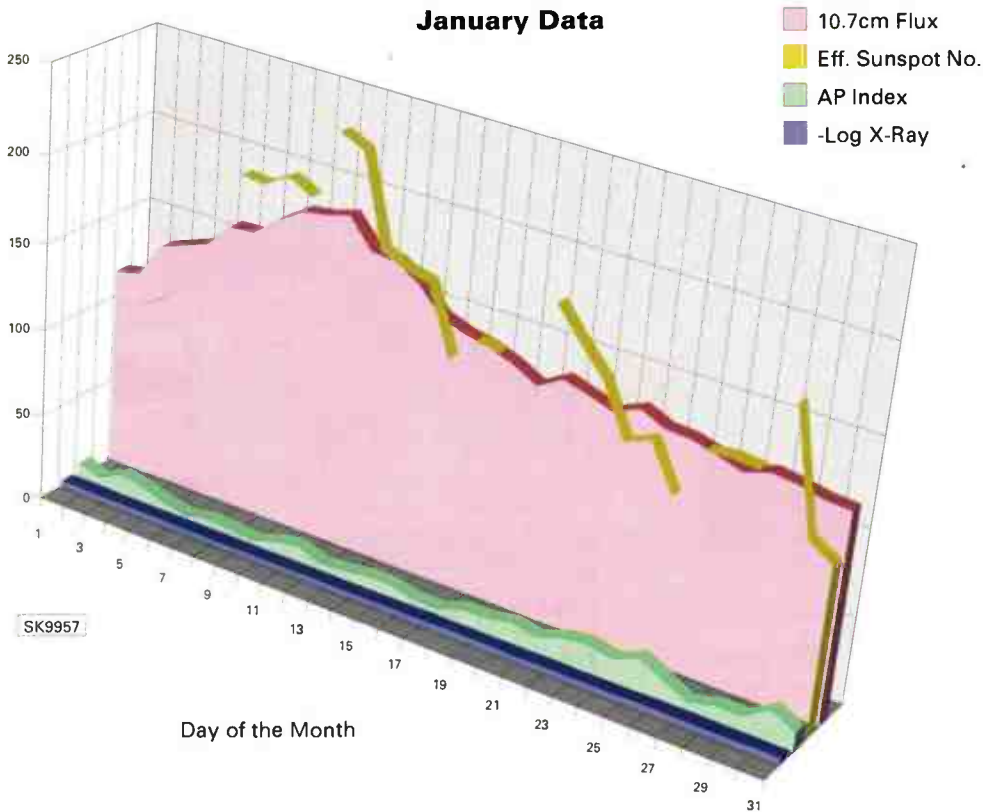
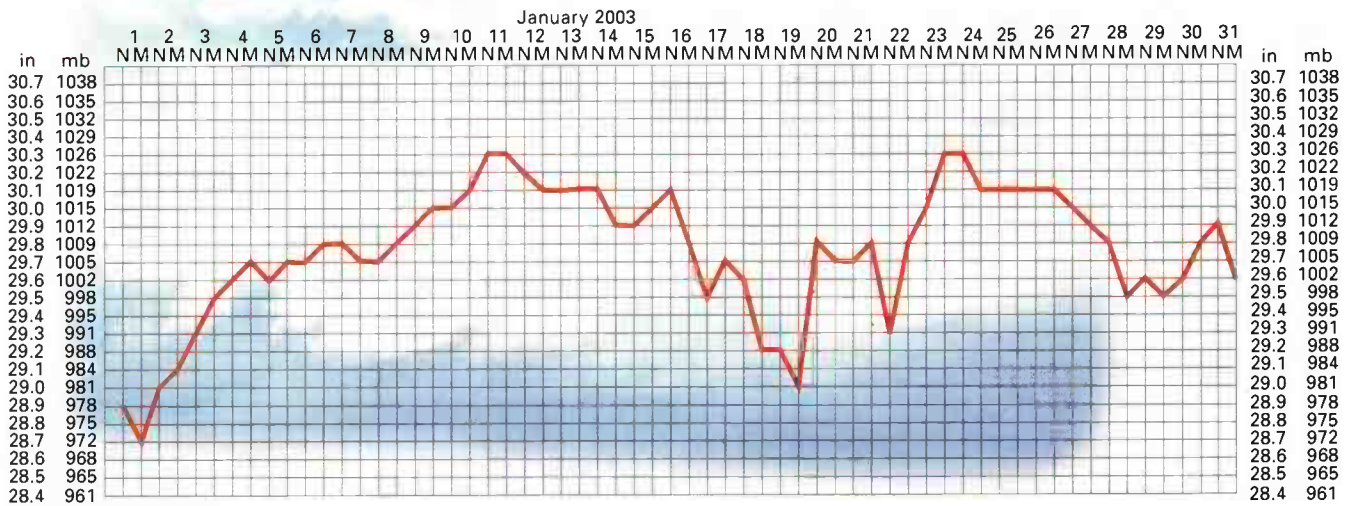
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Propagation Extra

Ron Ham's barometric pressure chart, taken at Storrington, W. Sussex, January 2003.



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.

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ShackWare

Welcome to 'ShackWare' and a Happy New Year to you all (I'm writing this at the beginning of January). I hope the festive season was peaceful and pleasant and that you received that little item to tuck away in the shack you were hoping for! My 'little item' this year was a new Mac desktop machine. I've recently embarked once again on a freelance career after a couple of years working for the local newspaper group here in Norwich and my Mac was looking decidedly long in the tooth!

What did I buy? Well, one of the flatpanel iMac G4 models, the upturned pudding basin with the i.c.d. colour panel on a stalk - you might have seen it advertised on television. It's certainly a fabulous and powerful machine. The i.c.d. screen is crisp, vibrant and excellent in use and the pudding basin base takes up little space compared with my PC 'mini' tower. The keyboard and mouse are truly first class (the mouse is one of the ball-less light-sensitive devices). However, I do have one or two gripes... Principal among these is the lack of any kind of reset hardware. That is, apart from the earliest models Macs have always responded to a control-command-power key combination (like the PC's control-alt-del) to perform a reset. Later Macs dispensed with this, but provided a reset button somewhere on the system case.

The flatpanel iMacs have nothing. They don't respond to key combinations and have no reset button. The only way to escape from a crash is to switch the machine off, wait until the hard drive spins down and switch on again!

Now as anyone with experience of computers will tell you, a 'power down' cycle is just about the worst thing you can do if you want to preserve the life of the machine. Electronic components prefer not to be power cycled - they work best if switched on and left on - and while normal powering on and off each day is to be expected, a machine used like mine, working as a file server on a network, with several demanding applications running and Internet sharing software too, means that crashes, sometimes several a day, are inevitable, and I don't like switching the machine off just to recover from a crash! I could be wrong, but I don't think this Mac will go on quite as long as my Mac Plus (which cost more for much less computing power, but is still going strong today).

Other moans are the system's inability to recognise my USB Zip drive with frustrating regularity - sometimes it's there, sometimes it isn't - and, worst of all (unless it's well hidden and I've missed it), there's no sound input port other than the built-in mic, which is useless for even occasional forays into decoding, where only direct input will do.

Powerful absolutely, sleek certainly, space and energy saving definitely, but with annoying niggles that cannot be easily worked around. Useful in my office, yes, but next to useless in the shack. A good thing I have several dozen older and more useful machines to take its place there!

More CB

Mr C. Stapleton of Torquay, Devon, decided to put pen to paper after reading my comments about CB radio in the last but one 'ShackWare' column. Mr Stapleton writes: "Where can I get books about CB, how to get started regarding receivers and antennas, etc. Any information would be appreciated."

Well, Mr Stapleton, I think it's fair to say that alongside PMR446, CB radio is probably the easiest route into amateur radio. There are still plenty of fans around and those who are on the air tend to be real fans too, rather than kids or fly-by-night hobbyists - this week, CB, next week golf! CB has been around a long time and those who transmit are dedicated (they certainly are here in Norwich). Your first stop is probably a local club, and many areas still have one. There, you'll meet enthusiasts brimming with advice and assistance for a novice. If you're lucky, there may be a CB shop near you too - they do still exist, though they're few and far between nowadays.

To get on the air, you'll need a transceiver. These come in three flavours and two designs: 40 UK channel frequencies (known as CB/81), 40 European frequencies (known as CEPT) or both combined into a set offering 80 channels, and either mobile or base station. Choose a basic 40-channel mobile and you'll pay as little as around £50, but you'll need an s.w.r. (standing wave ratio) meter (under £10) to tune the antenna and a power supply offering 5A or more (say, £20). Base stations generally plug in to the mains and have a meter built-in (if memory serves, there's currently only one base station on the market, made by Cobra).

Second-hand, there are many sets to choose from, both mobile and home-base, and they don't command big prices either. My Pama GX-25 mobile cost £11 (if I remember rightly) at a boot sale. It was boxed and in perfect condition and came with a power mic. and an extension speaker too.

Antennas are available cheaply new. You can choose a simple dipole if you have space, or opt for one of the many hybrid designs, but between £15 and £20 for a basic antenna will get your signals into the ether. Try Maplin for a suitable example or else make your own (I did, using enamelled copper wire with a vertical quarter wave and four ground radials - easy and effective).

Books? Well, my first point of call is always the library and most will let you browse their catalogue and reserve on-line if you have Internet access, which means you don't even have to leave the comfort of your PC. Failing that, there's always a selection of CB books (and radios, antennas, power mics and accessories) at Ebay, the Internet auction site, see www.ebay.co.uk

If you don't have access at home, pop along to your local library which usually offers one or two terminals for free public access. And if you do get on-line, be sure to visit www.thunderpole.co.uk which offers radios, antennas, accessories and advice at mail-order prices - perfect if there's no shop near you.

My other favourite hunting ground is the charity shop. Most of those who bought CB books on a first wave of enthusiasm back in the early 1980s have long since abandoned their interest and the books end up in charity shops. My most recent acquisition from this source is the *CB Bible* by Porter Bibb and published by Doubleday Dolphin in 1976. Admittedly a bit past it (!) but some of the information within is still very useful (and some of it is absolutely awful...). It cost £2.

Don't forget your licence - unless you're under 21 or over 70 in which case you don't need one. Have fun. (And if any CB fans care to write and correct inaccuracies in the information outlined here, I'll be glad to include them in a future 'ShackWare'.

And Finally

A quickie to finish this instalment. **Fred Green** of Leytonstone, London, has an old 486 PC and one or two projects (including automatic water monitoring in his greenhouse!) in mind and asks if I can explain how to interface the machine to the outside world? Well Fred, the short answer is that I can, but it would take a column five times as long as this one to do it!

Instead, I wonder if you will permit me to direct you to a really excellent book by R. A. Penfold entitled *Interfacing PC and Compatibles*, published by Babani (ISBN 0 85934 217 4) and priced very reasonably at £3.95. The book should be available at all computer booksellers and, though it's been around for a number of years, it is ideal for your applications. It explains all about clock circuits, address decoding and the like and gives many practical examples. Well worth tracking down. So, that's it for this 'ShackWare'. Until next time, good listening!

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Maritime Beacons

During some nights in October, November and December enhanced conditions were observed by the listeners who searched the band on a regular basis.

The sky waves from three beacons on the Faeroe Is at Myggenaes (MY) on **337.0kHz**, Akraberg (AB) **381.0** and Nolso (NL) **404.0** were received after dark by **Fred Wilmshurst** in Northampton. He also picked up the idents from three beacons located along the north and north-west coast of Spain - Cabo Machicharo (MA) on **284.5**; Estaca de Bares (BA) on **292.5** and Cabo Finisterre Lt (FI) on **296.5**. However, some of the beacons which he had logged previously were inaudible.

Whilst searching the band at night in Belfast **Victor Robb** picked up the ident (O) from Tarifa, S.Spain on **303.0**, but it was very faint. He also heard Cala Figuera, Majorca (FI) on **294.0** and Cabo Finisterre (FI) on **296.5**. However, Cabo Mayor (MY) and Cabo Machicharo (MA), both 'regulars' with him, were inaudible. He was pleased to hear at night the beacon (OZN) on **372.0**, which is located on the southern-most tip of Greenland at Prins Christian Sund, because he was unable to receive it during July, August and September. The idents from the Faeroe Is beacons at Myggenaes (MY), Akraberg (AB) and Nolso (NL) were heard by Victor during daylight, as was the beacon at Estaca de Bares, Spain (BA).

The beacon at Cabo Mayor (MY), N.Spain was heard on **289.5** instead of **283.5kHz** by **Fred Pallant** (Storrington), which may explain why it was not detected by some other listeners. He also heard at night two beacons along the north coast of Spain - Lanes (IA) on **287.0** and Estaca de Bares (BA).

During this quarter a fairly extensive log was compiled mainly at night by **Robert Connolly** in Kilkeel, Co.Down - see chart. He says "Shortly after sending you my last log in September some of my missing Spanish beacons re-appeared. (MA) was receivable here again by mid October and its temporary loss may have been due to conditions. At the end of October (MY) came back on air on a new frequency of **289.5**.

Also (UD) is transmitting on **290.5**. Another Spanish beacon that has not been heard here for a long time was (O) on **303.0** and it made its presence

known to me in late November. A seldom heard beacon here, (HA) from Israel on **287.3**, was heard here twice in the last few weeks. During late October (NA) from the Canaries on **283.5** was also heard here with an excellent signal during a good opening. In mid December, during my usual checks, (AK) from Morocco popped up and after checking other Moroccan beacons that night I found that (SP) was also just audible".

Robert has a number of contacts across Europe who monitor the beacons. A new one, who lives in Sardinia, has confirmed that the Spanish beacons at Castellon (AS) on **285.5** and Llobregat (OR) on **288.0** are currently active, but so far Robert has not received them. With regard to the impending closure of the Italian l.w. maritime radiobeacons (see page 48, *SWM* December 2002), Robert is of the opinion that it is unlikely to be a significant loss for listeners in the UK because they have been only occasionally audible in Kilkeel.

Long Wave Maritime Radiobeacon Chart

kHz	C/S	Station Name	Location	DXer
283.5	NA	Punta Lantaila	Canaries	A*
284.5	MA	Cabo Machicharo	NE.Spain	A*,D*
286.5	PZ	Cozzo Spadaro	Sicily	A*
287.0	IA	Llanes Lt	N.Spain	A*,B*
287.3	HA	Haifa Lt	Israel	A*
289.5	MY	Cabo Mayor	Spain	A,B*
290.5	UD	Cabo Salou	S.Spain	A*
292.5	BA	Punta Estaca Bares	N.Spain	A,B*,C,D*
293.5	MH.	Mahon, Minorca	Balearic Is	A*
294.0	FI	Cala Figuera	Majorca	A*,C*
294.5	KA	Kaybolovo Lt	Balt.Russia	A*
295.0	DV	Djupivogur	Iceland	A*
295.5	PS	Cabo Penas Lt	N.Spain	A*
296.5	FI	Cabo Finisterre Lt	NW.Spain	A*,C*,D*
300.0	LT	La Isleta	Canaries	A*
301.5	PA	Cabo de Palos Lt	S.Spain	A*
303.0	O	Tarifa	S.Spain	A*,C*
305.0	KA	Klaipeda Rear Lt	Lithuania	A*
305.7	DA	Dalatangi Lt	Iceland	C*
308.0	AK	Table D'Oukacha	Morocco	A*
312.5	BK	Baltiysk	Balt.Russia	A*
312.5	BT	Mys Taran Lt	Balt.Russia	A*
312.6	SP	Cap Spartel	Morocco	A*
314.0	SN	Cabo San Sebastian	S.Spain	A*
337.0	MY	Myggenaes	Faeroe Is	A*,C,D*
372.0	OZN	Prins Chris's Sund	Greenland	A*,C*
381.0	AB	Akraberg	Faeroe Is	A*,C,D*
404.0	NL	Nolso	Faeroe Is	A*,C,D*

Note:

Entries marked * were logged during darkness.

All other entries were logged during daylight or at dawn/dusk.

DXers:-

- (A) Robert Connolly, Kilkeel.
- (B) Fred Pallant, Storrington.
- (C) Victor Robb, Belfast
- (D) Fred Wilmshurst, Northampton.

APPENDIX - List of equipment used:-

Robert Connolly, Kilkeel: JRC NRD-525 + Timewave DSP9+ filter plus Datong AD-370 active antenna.

Fred Pallant, Storrington: Trio R-2000 + a.t.u. plus inverted L antenna erected outdoors.

Victor Robb, Belfast: Lowe HF-150 + home-built loop - for guidance he referred to the loop article in *SWM* April '89 and modified it using the ideas in the October '93 issue.

Fred Wilmshurst, Northampton: Icom IC-R70 + Global AT-1000 a.t.u + random wire antenna in loft.

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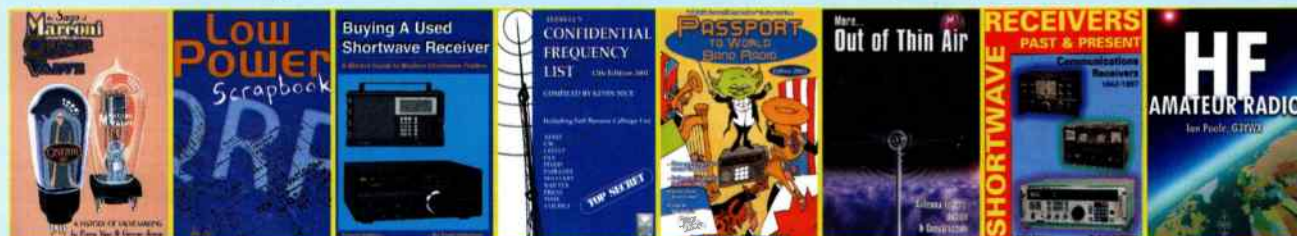
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*John Wilson, SWM April 2002... Third order intercept point measured at a nominal 14MHz was +15dBm with a 50kHz signal spacing as used by Ten-Tec themselves (handbook specification +10dBm). **Dynamic range was 98dB** against the specification of 90dB, so all better than manufacturer's figures. The RX-320 has a wide band front-end, so I expected the second order intercept point to be quite modest, but it measured at +53dBm with a dynamic range of 92dB... it is remarkably good when compared with any receiver in the middle-price class, and considerably better than the Lowe HF150 which also had a wide-band front end... In conclusion, the Ten-Tec RX-320 is an **amazingly satisfying receiver to use**, and despite its simple appearance when you look inside, it really does perform and has perhaps come the closest yet to marrying the power of a PC with a high performance short wave receiver. The tuning action is smooth, the **a.g.c. system works properly**, the **d.s.p. is excellent**...*



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